Voluntary Cleanup Program Work Plan:

Former Weyerhaeuser Dallas Mill
1551 Southeast Lyle Street
Dallas, Oregon
ECSI File #6710

Central Project: DallasMill-1-02

Prepared For:

Oregon Department of Environmental Quality
4026 Fairview Industrial Drive Southeast
Salem, Oregon 97320

Date: Revised January 6, 2026

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Revised January 6, 2026

Oregon Department of Environmental Quality
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Attention: Nancy Sawka (Nancy.Sawka@deq.oregon.gov)

Subject: Voluntary Cleanup Program Subsurface Site Investigation Work Plan
Central Project Number: DallasMill-1-02
Former Weyerhaeuser Dallas Mill
1551 Southeast Lyle Street
Dallas, Oregon

Dear Nancy Sawka,

Central Engineering Services (Central) is pleased to provide this Voluntary Cleanup Program (VCP) Supplemental Site Investigation (SSI) Work Plan for the Dallas Mill Properties site in Dallas, Oregon (Site; ECSI File #6710). The Work Plan was prepared on behalf of Dallas Mill Properties, LLC. In August 2024, the Site entered the Oregon Department of Environmental Quality (DEQ) VCP. Between March 2025 and the present, Central and Dallas Mill Properties, LLC (Client) have worked with DEQ to develop an approach for additional investigation to address data gaps for the purpose of completing the characterization of the Site with the goal of developing a regulatory agency-approved closure plan for the Site.

Please contact the undersigned if you have questions on the Work Plan. We certainly appreciate your assistance in moving the project forward in a timely manner.

Respectfully,

Central Engineering Services

Megan Masterson

Megan Masterson, RG
Senior Geologist

Charles T Esler

Charles Esler
Principal Scientist

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1.0 INTRODUCTION AND BACKGROUND

Central Engineering Services (Central) has prepared this Voluntary Cleanup Program (VCP) Supplemental Site Investigation (SSI) Work Plan (Work Plan) to document proposed environmental investigation activities for the Former Weyerhaeuser Dallas Mill property at 1551 Southeast Lyle Street in Dallas, Oregon (Site; Figure 1). The Work Plan was prepared on behalf of Dallas Mill Properties, LLC, the property owner and Client. In August 2024, the Site entered the Oregon Department of Environmental Quality (DEQ) VCP, and the Site was assigned a DEQ project manager in March 2025.

1.1 PURPOSE

Between March 2025 and the present, Central and Dallas Mill Properties, LLC worked with the DEQ to develop an approach for additional investigation at the Site. This work plan outlines proposed activities to address data gaps for the purpose of completing the characterization of the Site with the goal of developing a regulatory agency-approved closure plan for the Site.

This Work Plan includes a brief description and history of the Site; a summary of regional geologic and hydrogeologic conditions; proposed field activities; anticipated schedule; and expected content of the SSI Report.

1.2 SITE DESCRIPTION AND HISTORY

The Site, which operated as a raw timber sawmill from at least 1906 until 2009, consists of approximately 140 acres of land located on Polk County tax lots 1700, 1800, 2000, 2001, and 2100. Approximately 110 acres of the Site were developed as part of the mill. The North Fork of Ash Creek (Ash Creek) enters the Site from the west and generally flows east across the property through a culvert. This Work Plan covers approximately 66 acres of the total former mill property.

1.3 GEOLOGY AND HYDROGEOLOGY

The Site lies within the western portion of the Willamette River Valley and at the eastern base of the Coast Range physiographic province. The geology of the Coast Range consists of accreted oceanic rocks, including Paleocene to middle Eocene volcanics, and marine sandstone and siltstone. Overall, the rocks are gently folded and have a slight westward dip. In drainages, the bedrock generally is overlain by younger alluvial deposits. The Site lies on an outcrop of the early to middle Eocene-age Siletz Terrane, a massive formation of marine basalt and deep marine sediments that formed as an oceanic island chain and accreted to North America. Younger alluvial terrace deposits overlie the bedrock in the vicinity of the Site.

Shallow groundwater migration in the Coast Range generally is confined to the most-recent alluvial deposits of silts, sands, and gravels. Shallow groundwater flow direction typically can be estimated by examining surface topography. Groundwater generally flows from areas of high elevation to areas of low elevation. Shallow groundwater flow usually parallels or migrates toward nearby surface water bodies. Surface features such as streets, utility trenches, and paved areas can locally alter the flow direction of shallow groundwater.

Based on the topography in the vicinity of the Site and the presence of Ash Creek, which flows west to east through the approximate central portion of the Site, groundwater flow direction is presumed to be to the south and southeast on the northern portion of the Site and north to northeast on the southern portion of the Site toward Ash Creek. Central cannot determine the actual direction of groundwater flow at the Site without groundwater elevation data.

1.4 PREVIOUS INVESTIGATIONS

The information in this section is summarized from the following documents provided to Central by the Client:

- Level 1 Environmental Site Assessment (ESA) prepared by PES Environmental, Inc (PES) dated October 2009 (2009 Level I Report);
- Phase II ESA prepared by PES dated September 26, 2011 (2011 Phase II Report); and
- Focused Subsurface Investigation prepared by Farallon Consulting L.L.C. (Farallon) dated January 9, 2023 (2023 SI Report).

According to the provided documents, the 2009 Level I ESA prepared by PES identified several recognized environmental conditions (RECs), generally consisting of areas with significant soil staining, as well as potential impacts related to the following: a former underground storage tank (UST) near the plywood building, suspected gasoline USTs near the main office, and the application of anti-sapstain solutions. In the 2011 Phase II Report, PES categorized the remaining RECs into Areas of Potential Concern (AOPCs).

In 2022, Farallon reviewed the AOPCs identified in the 2009 Level 1 Report and the 2011 Phase II Report (collectively referred to as the PES Reports) and prioritized them in a table based on various environmental risk factors, including the type and magnitude of chemical contaminants and where the contamination was located on the Site, and included others not identified by PES Reports. The five highest-priority AOPCs were selected for additional assessment by Farallon and the Client, and included the Railroad Spur, Oil-Water Separator (OWS), Hydraulic Press, Peeler Lathe Pit, and Fungicide Application areas. Farallon conducted an additional subsurface investigation of these AOPCs and presented the results in the 2023 SI Report. The AOPCs are presented on Figure 2 and previous investigation boring locations are shown on Figures 3 and 4.

Based on the results of the previous environmental investigations and with the goal of obtaining regulatory closure of the known AOPCs, the Site was enrolled into the DEQ VCP in August 2024.

Central provided DEQ with the aforementioned reports and DEQ conducted a site visit on May 23, 2025 to observe the Site and remaining mill features. On June 30, 2025 (and revised on July 9, 2025), DEQ provided Central and the Client with project file review comments (Project File Comments). In the Project File Comments, DEQ identified several data gaps based on the review of the provided reports and the site visit. On July 29, 2025, Central submitted a Response to the Project File Comments letter (RTC Letter, provided in Appendix A) that included responses to DEQ comments, along with proposed investigation scope items to address the identified data gaps. Following a series of email communications and virtual meetings, Central, the Client and DEQ agreed on a scope of work to address identified data gaps. That scope of work is presented in Section 2 below.

1.5 AREAS OF POTENTIAL CONCERN

AOPCs, which are shown on Figures 2, 3, and 4, were identified based on the PES Reports, the 2023 SI Report, the Project File Comments, and subsequent communications with DEQ. The AOPCs selected for further assessment for the scope of work presented herein include the following:

- Former Log Pond (two areas);
- Fungicide Application/Storage (two areas);
- Engine Room;
- Peeler Lathe Pit;
- Railroad Spur;

- Oil Water Separator (OWS);
- Historical Agricultural Uses (two areas); and
- Ash Creek.

2.0 DATA GAP INVESTIGATION SCOPE OF WORK

Proposed field activities by AOPC are described in the sections below.

2.1 PREPARATORY ACTIVITIES

Site Health and Safety Plan. A Site-specific health and safety plan (HASP, Appendix B) has been prepared for the proposed SSI activities at the Site. The HASP was prepared in general accordance with applicable Occupational Safety and Health Administration (OSHA) and Oregon Administrative Rules (OAR). A copy of the HASP will be maintained on-site during the field activities.

Property Access. Access to the property will be provided by the Client. Central will coordinate directly with the Client for access during the investigation.

Subcontractor Procurement. Subcontracted services required for the SSI will include utility locating, drilling services, laboratory services, and investigation-derived waste (IDW) disposal. Private utility locating services will be provided by Alpha Locates of Mulino, Oregon. Drilling services will be provided by Anderson Environmental Construction, LLC (AEC) of Kelso, Washington. Laboratory services for soil, groundwater, and sediment samples will be provided by Apex Laboratories of Tigard, Oregon and for soil gas samples will be provided by Eurofins Air Toxics of Folsom, California.

Underground Utility Locates. Prior to initiating the work, Central will contact the Oregon Utility Notification Center, who will notify applicable utilities to identify and mark any underground installations that enter the Site. Central will also procure a private utility locator to survey the area of each exploration for underground utilities.

2.2 FIELD ACTIVITIES

This section presents the field activities associated with the proposed scope of work. Tables 1 through 4 show the proposed sampling media (soil, groundwater, soil gas, and sediment), laboratory analyses, and corresponding AOPCs. Figures 3 and 4 show the AOPCs and proposed sampling locations. The scope of work generally consists of:

- Advancing 15 borings (CESB-1 through CESB-15) to depths ranging between 1 and 20 feet below ground surface (bgs) across the Site using a direct-push drill rig;
- Collecting soil, groundwater, and soil gas samples from selected borings;
- Collecting sediment samples from catch basins and Ash Creek;
- Tracing the stormwater lines from the sampled catch basins to their outfalls in Ash Creek;
- Coring through the concrete floor in the engine room; and
- Collecting near surface soil samples from beneath the engine room concrete floor.

The proposed field activities are discussed below in more detail by AOPC. The field and sampling procedures (including Standard Operating Procedures) and the analytical testing program are described in more detail in the Sampling and Analysis Plan in Appendix C. The sample names, depths, media, corresponding AOPCs, and analytical plans are summarized in Tables 1 through 4.

2.2.1 Former Log Pond AOPC

A former log pond was identified along the western portion of the Site in historical aerial photographs for the years 1936, 1955, 1970, and 1982. As no characterization has been completed thus far of the former log pond, the following investigations will be performed to characterize the former log pond sediment and fill material:

- Advance four borings in the main portion of the Former Log Pond AOPC (CESB-1 through CESB-4) to depths up to 20 feet bgs (Figure 3).
- Collect continuous soil samples from each boring in disposable acetate sleeves. Soil will be logged and field screened by a Central Field Scientist in accordance with the Unified Soil Classification System. Field screening will consist of identifying visual and olfactory indications of contamination, as well as collecting photoionization detector (PID) measurements every 5 feet and if field observations of potential contamination are identified.
- Collect the following soil samples:
    - One discrete soil sample will be collected from the fill material from the area of highest observed contamination based on field screening or, if no contamination is observed, collected directly above the soil-water interface or the native soil-fill soil interface, whichever is encountered first.
    - One discrete soil sample will be collected from the top foot of the native soil in each boring.
    - An equal portion of both the fill and native pond soil sample from each boring will be placed into respective stainless-steel bowls and homogenized for a composite soil sample. Samples will be homogenized following the U.S. Environmental Protection Agency (EPA) quartering method of homogenization, as described in the Soil Sampling Operating Procedures prepared by Kevin Simmons of Region 4 EPA dated April 22, 2023.
- Collect one reconnaissance groundwater sample from each boring at the depth of first encountered groundwater. Reconnaissance groundwater samples will be collected as described in the '*Procedures for Reconnaissance Groundwater Sampling*' in SOP GW-04 (provided in Appendix C).
- Place soil and groundwater samples directly into laboratory-provided sample containers.
- Install a temporary soil gas probe approximately 3 feet from the borings (CESB-01 through CESB-04) using Post-Run Tubing methodology. The temporary soil gas probe will be set at approximately 3 to 5 feet bgs. Measure the approximate concentration of methane in each soil gas probe using a hand-held meter. Collect a soil gas sample from the boring with the highest methane measurement, using a laboratory-provided 1-Liter Summa Canister.
- Backfill borings with hydrated bentonite as required by state law and minimize surface disturbance to the extent practical.

2.2.2 Fungicide Application/Storage AOPC

The 2009 Level 1 Report identified two areas of anti-sapstain storage and/or use. To investigate these areas, five borings will be advanced (CESB-05 through CESB-09; shown on Figure 4) across the two areas as follows:

- CESB-05 advanced near the store, mixing room, and equipment for treatment solutions on the west end of the planer building;
- CESB-06 advanced near the spray booth in the planer building;
- CESB-07 advanced near the spray booth at the lumber exit on the east side of the planer building;

- CESB-08 advanced near the outfeed conveyor for lumber on the north side of the planer building; and
- CESB-09 advanced near the green chain exit and application area on the east side of the sawmill.

As borings CESB-05 through CESB-08 are located throughout the planer building, soil will be collected from the first 6 inches of recoverable soil from these borings, placed into a stainless-steel bowl and composited, and placed into laboratory-provided containers for analysis. A discrete sample will be collected from the first 6 inches of recoverable soil at boring CESB-09 and will be placed directly into a laboratory-provided container.

In addition, a sediment sample will be collected from two catch basins near the green chain exit/east side of the sawmill to evaluate the potential for surface water runoff or spills that may have flowed into catch basins and discharged to Ash Creek during outdoor application activities. Catch basin sediment will be collected using a stainless-steel container attached to a swing sampler and sediment will be placed directly into laboratory-provided containers.

In order to better understand the stormwater line configuration in the area, the utility locating subcontractor will perform a trace of the stormwater line from each catch basin to confirm its discharge route.

2.2.3 Engine Room AOPC

Significant staining was identified in the engine room during the site walk with DEQ. Central will evaluate the condition of the building slab in the engine room by visually assessing for cracks and perforations. In addition, the drilling subcontractor will core the concrete slab in two locations to allow for the evaluation of the subsurface media.

In anticipation of further cleanup, Central will collect one sample of the potentially impacted material on the ground surface for waste profiling purposes. The sample will be collected using a stainless-steel spoon or similar tool and placed directly into a laboratory-provided container.

2.2.4 Peeler Lathe Pit AOPC

The 2023 SI Report recommended additional investigation of the Peeler Lathe Pit AOPC to determine the extent of soil and groundwater contamination. The following scope of work is proposed to further delineate the extent of contamination associated with the Peeler Lathe Pit AOPC:

- Advance three borings (CESB-10 through CESB-12) to the north, northeast, and west of the Peeler Lathe Pit (Figure 3). Borings will be advanced to 15 feet bgs.
- Collect one discrete soil sample from each boring from the area of highest contamination based on field observations and screening or from directly above the soil-water interface if no contamination is observed.
- Collect one reconnaissance groundwater sample from each boring. Reconnaissance groundwater samples will be collected as described in the '*Procedures for Reconnaissance Groundwater Sampling*' in SOP GW-04 (provided in Appendix C).
- Backfill borings per state and local regulations.

2.2.5 Railroad Spur AOPC

The 2023 SI Report recommended additional investigation of the Railroad Spur AOPC to determine the extent of soil and groundwater contamination. The following scope of work is proposed to further delineate the extent of contamination associated with the Railroad Spur AOPC:

- Advance three borings (CESB-13 through CESB-15) in the southern, western, and central portions of the Railroad Spur AOPC (Figure 3). Borings will be advanced to 15 feet bgs.

- Collect one discrete soil sample from each boring from the area of highest contamination based on field observations and screening, or from directly above the soil-water interface if no contamination is observed.
- Collect one reconnaissance groundwater sample from each boring. Reconnaissance groundwater samples will be collected as described in the '*Procedures for Reconnaissance Groundwater Sampling*' in SOP GW-04 (provided in Appendix C).
- Install a soil gas probe (CESB-16) near Farallon boring FB-15. Set the soil gas probe at approximately 5 feet bgs using Post-Run-Tubing methods.
- Collect a soil gas sample directly into a 1-Liter laboratory-provided stainless steel Summa canister.
- Backfill borings with hydrated bentonite as required by state law and minimize surface disturbance to the extent practical.

2.2.6 Oil-Water Separator AOPC

The 2023 SI Report recommended additional investigation of the OWS AOPC to determine the extent of soil and groundwater contamination. The following scope of work is proposed to further delineate the extent of contamination associated with the OWS AOPC:

- Collect one discrete soil sample from already-proposed borings CESB-01 and CESB-10 (Figure 3) from the area of highest impact or the soil-water interface if no contamination is observed.
- Collect a reconnaissance groundwater sample from already-proposed borings CESB-01 and CESB-10.
- Backfill borings with hydrated bentonite as required by state law and minimize surface disturbance to the extent practical.

2.2.7 Historical Agricultural Use AOPC

Historical agricultural use was identified on the southern portion of the Site along the hillside in the 1936, 1955, and 1970 historic aerial photographs. The historical aerial photographs also show a significant amount of soil disturbance of the previous agricultural land, such as grading and/or re-use of the soil between 1970 and the mid-1990s. No records or further information regarding grading and soil disturbance activities/designs were identified and the final location of disturbed soil is unknown. However, two areas appear to have remained undisturbed (or only slightly disturbed) in the southeastern portion of the Site. To evaluate the risk of potential historical pesticides application, the following scope is proposed:

- Collect two composite shallow soil samples from the areas where no/limited soil disturbance was identified (CSA-01 and CSA-02, see Figure 3).

Each composite sample will consist of 10 subsamples collected between 0 and 1 foot bgs using a stainless-steel hand auger or similar tool. Samples will be homogenized in the field using the EPA quartering method.

2.2.8 Ash Creek AOPC

In order to evaluate whether upland mill operations have affected Ash Creek, shallow sediment samples will be collected from the following locations: an upgradient sample west of the Main Street bridge; a downgradient sample east of Uglow Avenue; and two samples from exposed portions of the creek on the Site (exact locations to be determined in the field). Samples will be collected using a stainless-steel swing sampler.

2.2.9 Investigation-Derived Waste

IDW, including soil cuttings, sediment, purge water, and decontamination water generated during the field activities, will be temporarily stored on the Site in 55-gallon U.S. Department of Transportation-approved steel drums with locking lids. Based on the analytical results of soil, groundwater, and sediment samples, IDW will be transported and disposed of at an appropriate landfill. Copies of the waste disposal manifests following disposal will be included in the SSI report.

2.3 SAMPLING AND ANALYSES

Soil, sediment, and groundwater samples will be submitted to Apex Labs and soil gas samples to Eurofins Air Toxics under standard chain-of-custody protocols for the analyses presented in Tables 1 through 4. Analytical methods, detection limit goals, anticipated number of samples, sample container requirements, and applicable DEQ risk-based concentrations (RBCs) are shown in the SAP (Appendix C).

2.4 REPORTING

Central will prepare a letter report documenting the results from the activities proposed herein and provide conclusions and recommendations based on the data collected. The letter report will include:

- A brief description of the Site;
- A summary of the subsurface conditions encountered during subsurface investigation activities;
- Scaled figures depicting the sample locations;
- Tables summarizing the laboratory analytical results, with a comparison of detected concentrations of hazardous substances to applicable regulatory standards;
- Copies of the laboratory analytical reports as an attachment;
- Copies of the boring logs as an attachment; and
- Central's conclusions and recommendations based on the results.

3.0 ASSUMPTIONS

The following assumptions are included for implementation of this work plan:

- Collection and analysis of samples will be limited to the scope of work presented herein. Additional sampling, if required by DEQ, will be performed as a separate mobilization.
- Direct-push drilling methodology will allow for successful collection of representative samples.
- IDW sampling, profiling, and transportation will be performed as part of the work proposed herein.

4.0 CLOSING

We certainly appreciate your assistance in moving the project forward in a timely manner. Please contact the undersigned with any questions or comments.

Central Engineering Services

Megan Masterson

Megan Masterson, RG
Senior Geologist

Charles T Esler

Charles Esler
Principal Scientist

5.0 REFERENCES

Farallon Consulting L.L.C. 2023. Focused Subsurface Investigation, Former Weyerhaeuser Dallas Mill. Prepared for Dallas Mills Property, LLC. January 9.

PES Environmental, Inc (PES). 2009. Level 1 Environmental Site Assessment, iLevel by Weyerhaeuser Dallas Lumber Facility. Prepared for Weyerhaeuser NR Company. October.

PES, 2011. Phase II Environmental Site Assessment and Data Evaluation Report. Prepared for Weyerhaeuser NR Company. September 26.

U.S. Environmental Protection Agency. 2023. Soil Sampling Operating Procedures ID: LSASDPROC-300-R5 Prepared by Kevin Simmons of Region 4 EPA. April 22.

TABLES

Table 1
Analytical Program - Soil
Dallas Mill Work Plan
Central Project DallasMill-1-02

AOPC	Boring ID	Depth of Boring (feet bgs)	Sample Depth (feet bgs)	Sample Type	Primary Analyses								
					DRO and ORO	PAHs	Waste Oil Metals	D/F	Penta	Formaldehyde and Propiconazole	Organochlorine Pesticides	Organochlorine Herbicides	Agricultural Metals
Former Log Pond	CESB-1	20.0	TBD1	Discrete	X	X	X						
			TBD2	Discrete	X	X	X	H	H				
	CESB-2	20.0	TBD1	Discrete	X	X	X						
			TBD2	Discrete	X	X	X	H	H				
	CESB-3	20.0	TBD1	Discrete	X	X	X						
			TBD2	Discrete	X	X	X	H	H				
	CESB-4	20.0	TBD1	Discrete	X	X	X						
			TBD2	Discrete	X	X	X	H	H				
	CEBS-1-4-COMP-Fill	--	TBD1	Composite				X	X				
	CESB-1-4-COMP-Nat	--	TBD2	Composite				X	X				
Penta Storage Areas	CESB-5	1.0	0.5	Discrete									
	CESB-6	1.0	0.5	Discrete									
	CESB-7	1.0	0.5	Discrete									
	CESB-8	1.0	0.5	Discrete									
	CESB-9	1.0	0.5	Discrete				X	X	X			
	CESB-5-8-COMP	--	0.5	Composite				X	X	X			
Historical Agricultural Use	CSA-01	1.0	0-1	Composite							X	X	X
	CSA-02	1.0	0-1	Composite							X	X	X
Engine Room	CES-SS-1	--	--	Discrete	X	X	X						
Peeler Lathe Pit	CESB-10	15.0	TBD1	Discrete	X		X						
	CESB-11	15.0	TBD1	Discrete	X		X						
	CESB-12	15.0	TBD1	Discrete	X		X						
OWS	CESB-1	15.0	TBD1	Discrete	--		--						
	CESB-10	15.0	TBD1	Discrete	--		--						
Railroad Spur	CESB-13	15.0	TBD1	Discrete	X		X						
	CESB-14	15.0	TBD1	Discrete	X		X						
	CESB-15	15.0	TBD1	Discrete	X		X						
Forestry Shed	CESB-1-4-COMP	--	TBD2	Composite							X	X	X
					17	9	17	8	8	2	3	3	3

Notes:

AOPC = Area of Potential Concern

Penta = Pentachlorophenol

D/F = Dioxins/Furans

Waste oil metals to include cadmium, chromium, and lead.

Agricultural metals to include to include lead, arsenic, cadmium, and mercury.

DRO = diesel range organics

ORO = oil range organics

PAHs = polycyclic aromatic hydrocarbons

TBD1 = to be determined based on field screening

TBD2 - to be determined, based on depth of native sediment

H = sample will be submitted to the analytical laboratory on HOLD pending other sample results.

X = Sample will be analyzed for the corresponding constituents.

Table 2
Analytical Program - Groundwater
Dallas Mill Work Plan
Central Project DallasMill-1-02

AOPC	Boring ID	Primary Analyses				
		DRO and ORO	PAHs	Waste Oil Metals	D/F	Penta
Former Log Pond	CESB-1	H	H	H	H	H
	CESB-2	H	H	H	H	H
	CESB-3	H	H	H	H	H
	CESB-4	H	H	H	H	H
Peeler Lathe Pit	CESB-10	X		X		
	CESB-11	X		X		
	CESB-12	X		X		
OWS	CESB-1	X		X		
	CESB-10	--		--		
Railroad Spur	CESB-13	X		X		
	CESB-14	X		X		
	CESB-15	X		X		

Notes:

AOPC = Area of Potential Concern

Penta = Pentachlorophenol

D/F = Dissolved Dioxins/Furans (filtered)

Dissolved waste oil metals to include cadmium, chromium, and lead. Filtered Sample

Agricultural metals to include to include lead, arsenic, cadmium, and mercury.

DRO = diesel range organics

ORO = oil range organics

PAHs = polycyclic aromatic hydrocarbons

H = sample will be submitted to the analytical laboratory on HOLD pending other sample results.

X = Sample will be analyzed for the corresponding constituents.

Table 3
Analytical Program - Soil Gas
Dallas Mill Work Plan
Central Project DallasMill-1-02

AOPC	Boring ID	Primary		
		Methane	GRO and VOCs	DRO
Log Pond	CESB-1, CESB-2, CESB-3, or CESB-4	X		
Railroad Spur	CESB-16	X	X	X

Notes:

CESB-1, CESB-2, CESB-3, or CESB-4 = Central will collect a methane measurement from borings CESB-1 through CESB-4 using a hand-held meter. A soil gas sample will be collected from the boring with the highest methane measurement from the hand-held meter.

AOPC = Area of Potential Concern
DRO = diesel-range organics
GRO = gasoline-range organics
VOCs = volatile organic compounds
X = Sample will be analyzed for the corresponding constituents.

Table 4
Analytical Program - Sediment
Dallas Mill Work Plan
Central Project DallasMill-1-02

AOPC	Sample Name	Primary					
		DRO and ORO	PAHs	PCBs	Waste Oil Metals	D/F	Penta
Ash Creek	AC-01	X	X	X	X	X	X
	AC-02	X	X	X	X	X	X
	AC-03	X	X	X	X	X	X
	AC-04	X	X	X	X	X	X
Catch Basins	CB-1-COMP					X	X

Notes:

AOPC = Area of Potential Concern

Penta = Pentachlorophenol

D/F = Dioxins/Furans

Waste oil metals to include cadmium, chromium, and lead.

DRO = diesel-range organics

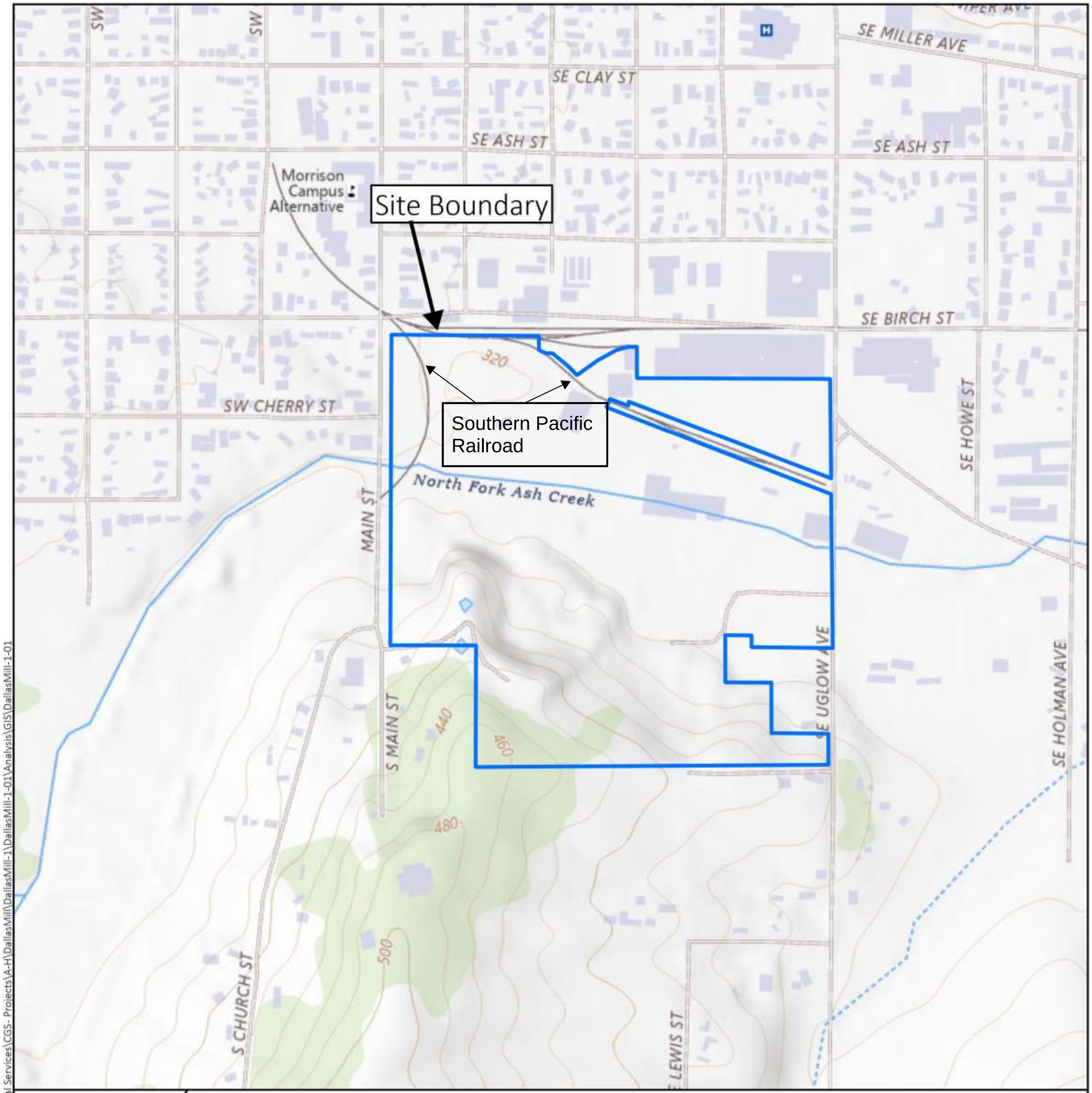
ORO = oil range-organics

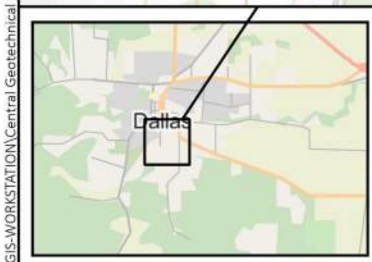
PAHs = polycyclic aromatic hydrocarbons

PCBs = polychlorinated biphenyls

X = Sample will be analyzed for the corresponding constituents.

FIGURES





DallasMill-1-02
Site Location
1551 SE Lyle Street, Dallas, OR
CENTRAL Engineering Services | Figure 1

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed October 27, 2025., Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

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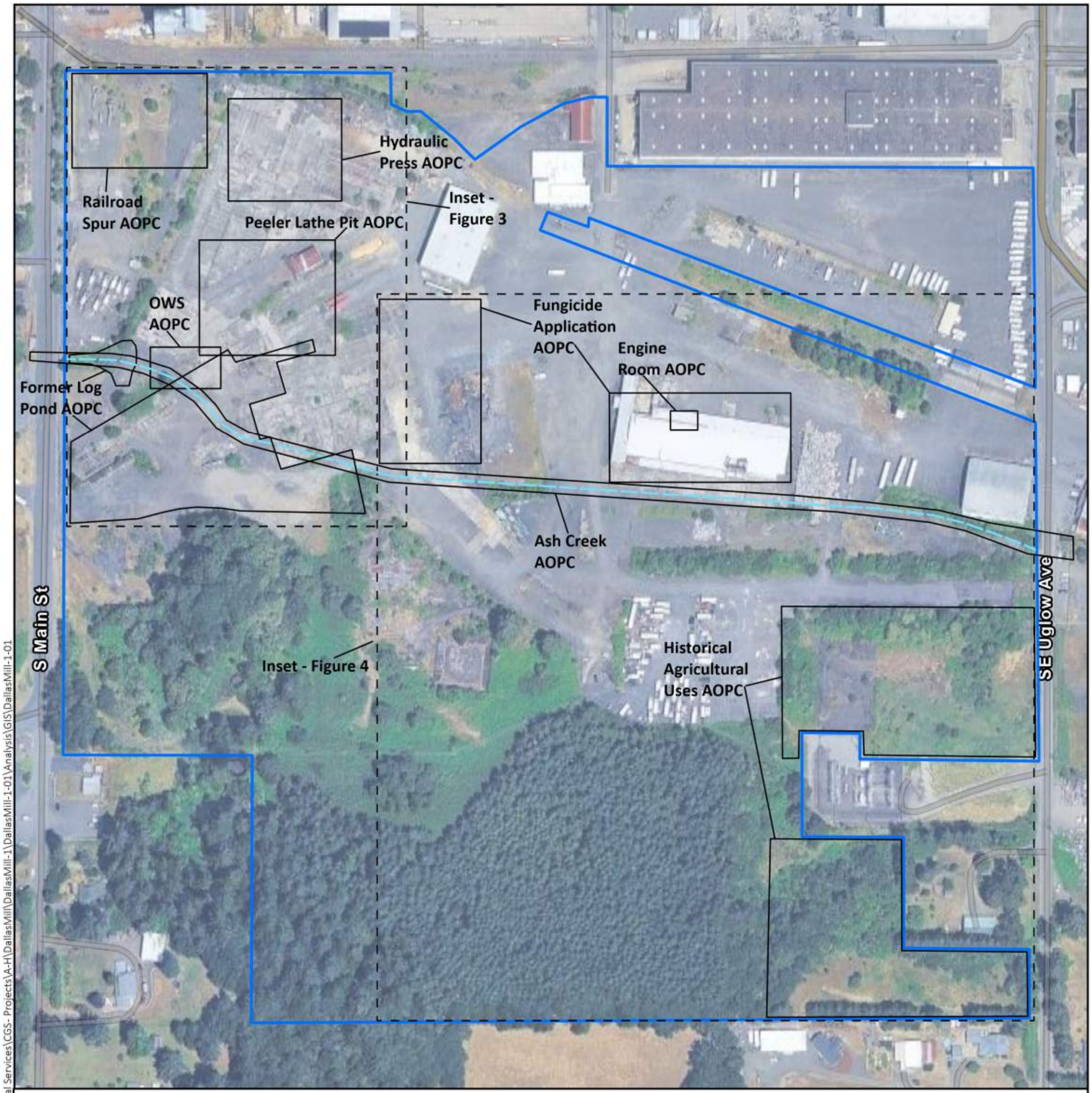

Legend

- Approximate Site Boundary
- Area of Potential Concern (AOPC)
- Ash Creek

OWS = oil/water separator

DallasMill-1-02

Site Areas of Potential Concern

1551 SE Lyle Street, Dallas, OR

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Figure 2

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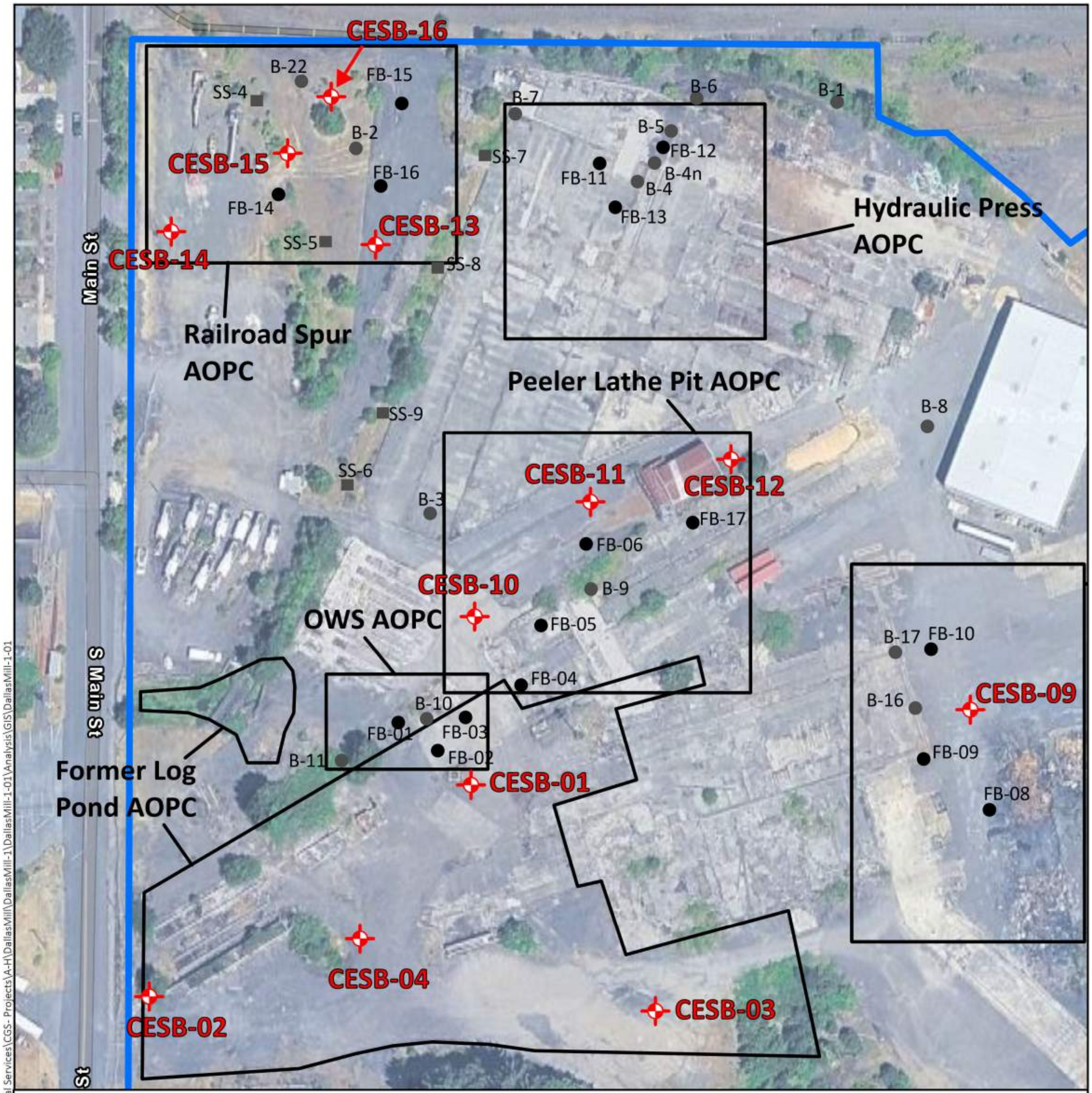

Legend

▭ Approximate Site Boundary

▭ Area of Potential Concern (AOPC)

✛ Proposed Boring

● Soil Boring (PES Environmental, INC., 2011)

■ Surface Sample (PES Environmental, INC., 2011)

● Soil Boring (Farallon, 2023)

OWS = oil/water separator

N

0 400 Feet

DallasMill-1-02

AOPCs with Proposed Sample Locations

1551 SE Lyle Street, Dallas, OR

CENTRAL ENGINEERING SERVICES

Figure 3

Sources:© OpenStreetMap (and) contributors, CC-BY-SA, Esri Community Maps Contributors, Oregon Metro, Oregon State Parks, State of Oregon GEO, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS

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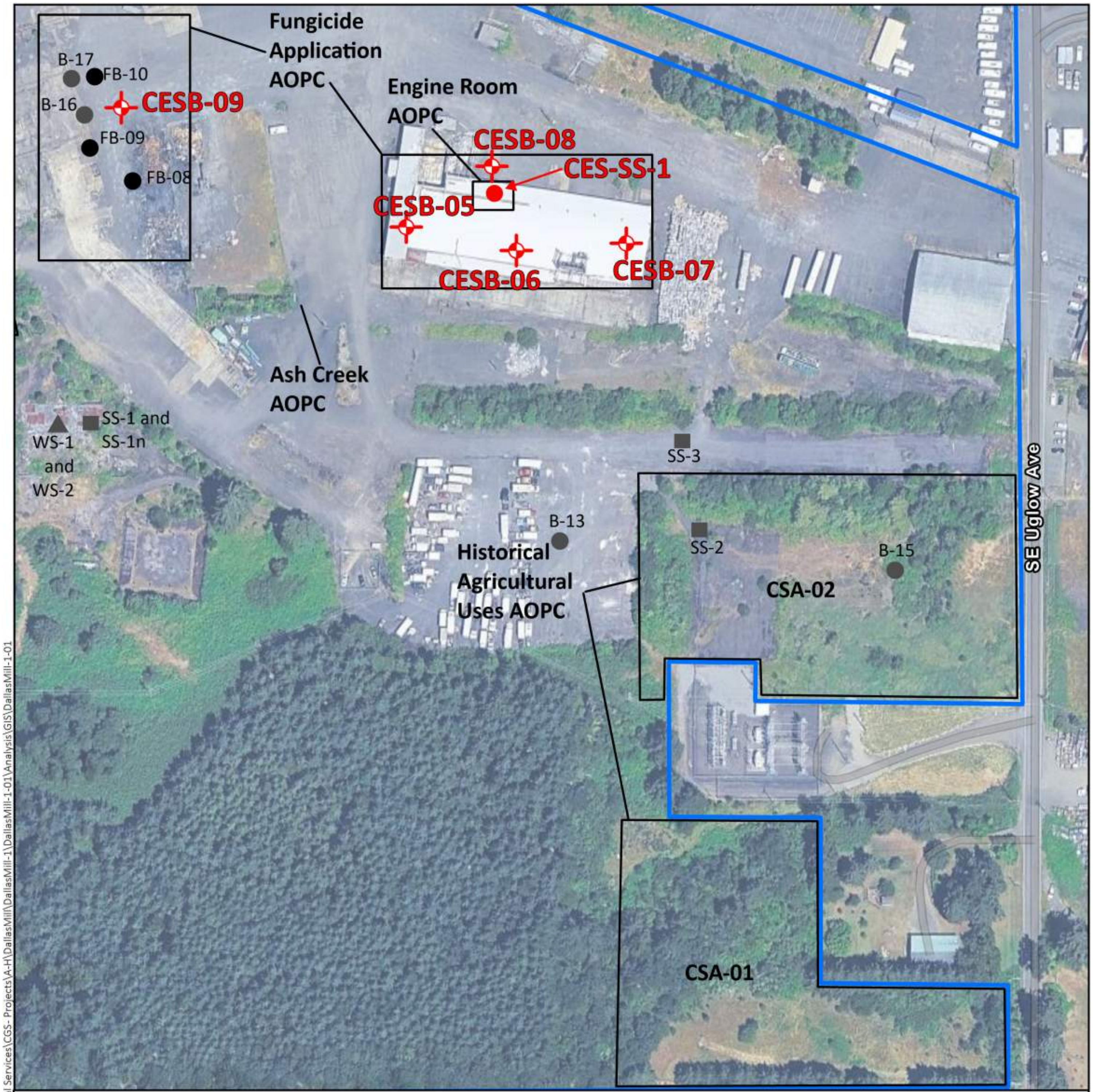

Legend

- ▭ Approximate Site Boundary
- ● Proposed Surface Sample
- ⌖ Proposed Boring
- ● Soil Boring (PES Environmental, INC., 2011)
- ■ Surface Sample (PES Environmental, INC., 2011)
- ▲ Wipe Sample (PES Environmental, INC., 2011)
- ● Soil Boring (Farallon, 2023)
- ▭ Area of Potential Concern (AOPC)

N

0 600 Feet

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DallasMill-1-02

AOPCs with Proposed Sample Locations

1551 SE Lyle Street, Dallas, OR

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Figure 4

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APPENDIX A: Response to Comments Letter

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7662 SW Mohawk Street
Tualatin, Oregon 97062
(503) 616-9419
www.centralengr.com

July 29, 2025

Oregon Department of Environmental Quality
4026 Fairview Industrial Drive Southeast
Salem, Oregon 97320

Attention: Nancy Sawka (Nancy.Sawka@deq.oregon.gov))

Subject: Response to DEQ Comments
Central Project DallasMill-1-01
Dallas Mill Properties
ECSI File #6710
1551 Southeast Lyle Street
Dallas, Oregon

DEAR NANCY SAWKA:

Central Engineering Services (Central) is pleased to provide this response on behalf of Dallas Mill Properties, LLC, to Oregon Department of Environmental Quality (DEQ) comments on previous environmental investigation reports related to the Dallas Mill Properties site in Dallas, Oregon (ECSI File #6710). These reports were prepared in 2009 and 2011 by PES Environmental, Inc. and more recently in 2023 by Farallon Consulting, L.L.C. employees Megan Masterson and Charles Esler, both of whom are now employed by Central.

Attached to this letter is a table presenting DEQ's comments and Central's responses, along with proposed investigation scope items that will address data gaps identified by DEQ during the project document review which includes the data gaps and recommendations from the 2023 investigation. Also attached for your information are figures depicting the site layout and proposed investigation locations, historical aerial photographs, and Safety Data Sheets for products known to have been used on the site.

CLOSING

Central appreciates the opportunity to work with DEQ toward closure of this site. Please contact the undersigned with questions on this submittal.

Respectfully,

Central Engineering Services

Megan Masterson, RG
Senior Engineer

Charles T. Esler
Principal Scientist

Attachments:

- Response to Comments
- Figures
- Historical Aerial Photographs
- Safety Data Sheets

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Response to Comments

Response to DEQ File and Report Review Comments (revised July 9, 2025)
Dallas Mill Properties
ECSI File #6710
July 29, 2025
Central Project No.: DallasMill-1-01

DEQ Comment	Response	Proposed Scope of Work
Level I^{a} Review		
1. The former log pond located on the west side of the site will need to be investigated for site contaminants of concern in the soil, groundwater, and soil gas (including methane). Also, please provide the location of this former pond on the site figures and if possible, provide the historical photo where it was identified.	The former log pond was identified along the western portion of the Subject Property in historical aerial photographs for the years 1936, 1955, 1970, 1972, and 1982. Copies of historical aerial photographs are included for your review. In addition, the approximate maximum former log pond footprint is provided in Figures 1 and 2. Upon review, PES Phase II boring B-11 appears to be within the footprint of the former log pond. One soil sample, collected between 1.5 and 3 feet below ground surface (bgs), was analyzed for diesel-range and oil-range organics (DRO and ORO, respectively) and polychlorinated biphenyls (PCBs). ORO was detected at a concentration of 1,410 mg/kg. DRO and PCBs were not detected. One reconnaissance groundwater sample was collected from boring B-11 and analyzed for DRO and ORO, polycyclic aromatic hydrocarbons (PAHs), and total suspended solids. DRO and ORO were detected at concentrations of 615 and 1,940 µg/L, respectively. PAH results for groundwater were not provided, although Attachment A of the PES Phase II report states that PAHs were detected at concentrations below generic DEQ Risk-Based Concentrations (RBCs). Considering this one sample does not adequately characterize the entire former log	To characterize the former log pond area, we propose advancing four (4) borings (CESB-01 to CESB-04; Figure 1) within the former log pond footprint for collection and analysis of soil, reconnaissance groundwater, and soil gas sampling. **SOIL** Fill Material: Collect one discrete soil sample from the former log pond fill material. Sampling depth will be determined during drilling based on evidence of impacts and depth to native pond sediment. The fill material soil samples will be analyzed for the following: • DRO and ORO • PAHs • Waste oil metals (cadmium, chromium, lead) Native Pond Sediments: Collect one discrete soil sample from the approximate top 1 foot of the native log pond sediments. The log pond sediment will be analyzed for the following: • DRO and ORO • PAHs • Waste oil metals Samples for dioxins/furans (D/F) and pentachlorophenol (penta) analysis will be collected and submitted to the analytical laboratory on HOLD pending results of the composite soil sample, described below. One composite sample will be collected by adding an equal portion of the log pond sediment from each of the four boring sampling areas to a stainless-steel bowl, where it will be

DEQ Comment	Response	Proposed Scope of Work
	pond area and did not analyze for several chemicals of interest (COIs), we propose additional characterization of the former log pond area *and* fill material used to close the former log pond, as summarized in the next column.	homogenized into one composite soil sample and analyzed for the following: - D/F - Penta **RECONNAISSANCE GROUNDWATER** A reconnaissance groundwater sample will be collected from each boring and will be submitted to the laboratory on HOLD pending the results of the soil samples. Based on the soil results, two reconnaissance groundwater samples will be analyzed for the following: - DRO/ORO - PAHs - Waste oil metals - Penta - D/F **SOIL GAS** Central will collect a methane measurement from each boring using a hand-held meter. A soil gas sample will be collected from the boring with the highest methane measurement from the hand-held meter. The sample will be collected above the groundwater table, at an anticipated depth of 3-5 feet bgs. The soil gas sample will be analyzed for methane.
2. Level I, Page 9, 1st paragraph – was soil in the area at the west end of the infeed decks where transformers were located sampled for PCBs and metals?	We are not aware of previous environmental sampling efforts on the west side of the infeed decks. According to the Level I, the transformers area is paved with asphalt and the report does not indicate any signs of release or reasons to suspect release based on facility personnel interviews. In addition, the facility personnel stated the transformers contained non-PCB oil.	Based on the information provided in the Level I and lack of evidence of a release, no assessment is proposed at this time.

DEQ Comment	Response	Proposed Scope of Work
3. The Level I report identified several areas of anti-sapstain (pentachlorophenol) storage and/or use. Soils and possibly groundwater in these areas should be analyzed for pentachlorophenol and dioxin (a byproduct of penta). Dioxin should be analyzed even if penta is not detected as it reacts differently in the environment and is often detected even in the absence of penta. These areas include: • The store, mixing room, and equipment for treatment solutions on the west end of the planer building (Photos 17 & 19 of Level I), • a spray booth in the planar mill where anti-sapstain was applied, • a spray booth at the lumber exit of the planar where the chemical was applied (east side portion of planar mill), • the outfeed conveyor for lumber located on the north side of the planar building (Photo 16 of Level 1), • green chain exit and area on the east side of the sawmill where anti-sapstain was	Noted. We will retain these areas for further investigation (generalized SOW provided in the next column). We have no records or knowledge of where treated lumber was dried and stored after the anti-sapstain application. We recommend investigating the areas of known anti-sapstain application and storage and can discuss additional sampling areas at a later phase of investigation if the preliminary results suggest it is necessary.	To investigate the five areas of anti-sapstain storage and/or use identified in the Level I report, we propose to advance five (5) borings (CESB-05 through -09) across these areas as follows: • CESB-05 advanced near the store, mixing room, and equipment for treatment solutions on the west end of the planer building; • CESB-06 advanced near the spray booth in the planer mill; • CESB-07 advanced near the spray booth at the lumber exit on the east side of planer building; • CESB-08 advanced near the outfeed conveyor for lumber on north side of the planer building; and • CESB-09 advanced near the green chain exit and application area on the east side of sawmill (also near PES borings B-16 and B-17, and Farallon borings FB-19 and FB-20). For borings CESB-05 through -08, soil will be collected from the first 6 inches of recoverable soil from each boring and will be composited into one sample and analyzed for D/F and Penta. One discrete soil sample will be collected from boring CESB-09, from the top 6 inches of recoverable soil (i.e., soil below the asphalt/concrete and below any construction rock) and will be analyzed for D/F and Penta.

DEQ Comment	Response	Proposed Scope of Work
applied to lumber (sampled for penta, but not dioxin), and - areas where treated lumber was dried and stored after anti-sapstain application.		
4. Level I, Page 13, 1st paragraph – sediment sampling for contaminants of interest should be conducted in exposed areas of Ash Creek, Ash Creek outfalls, upstream area of Ash Creek (background) and any exposed ditches and their outfalls.	Central will perform baseline sampling of Ash Creek, as described in the next column.	For a baseline evaluation of the Ash Creek, we propose collecting the following shallow sediment samples: an upgradient sample west of the Main Street bridge; a downgradient sample, east of Uglow Avenue; and two samples from exposed portions of the creek on the Site. Exact locations are to be determined. Sediment samples will be analyzed for Site COIs and include: - DRO/ORO - PAHs - PCBs - Waste oil metals - D/F - Penta
5. Level I Page 17, 1st paragraph – provide available documentation on the solid waste permit and the fill removal of the hillside waste fill.	No documents associated with the solid waste permit and the fill removal of the hillside were identified. Per our last meeting, the DEQ PM was planning to inquire about the Subject Property to the Solid Waste Program at DEQ. Please let us know if any documents were identified.	None.
6. Level I, general – review historical photos for locations of former hog fuel boilers and potential wigwam burners. These areas need to be	According to the Level I Report, and confirmed with information provided by Dave Williams, President of NorthWest Demolition, who has been familiar with the Subject Property since it	None.

DEQ Comment	Response	Proposed Scope of Work
investigated for contamination released during burning.	was purchased from Weyerhaeuser in 2012, the mill historically used hog fuel, stored on the hillside, to feed two boilers to power the plant. No mention or knowledge of a wigwam burner was identified in the Level I Report or from communications with Dave Williams. In addition, we reviewed previous environmental documents, historical site plans, and historical aerial images from EDR (included as an attachment) and GoogleEarth images. No potential wigwam features were identified in the review.	
7. Level I, Page 23, second to last paragraph and other text on site history identified historical agriculture land and orchards possibly on the site which could be sources of pesticides to the site. Historical pesticides are persistent and can remain as contaminants in the soil for years.	Historical agricultural use was identified on the southern portion of the Subject Property along the hillside in the 1936, 1955, and 1970 historical aerial images provided by EDR (attached). The historical aerial images also show a significant amount of soil disturbance of the previous agricultural land (apparent grading and/or re-use of soil) in the 1970, 1972, 1982, and 1994 historical aerial images. No records or information regarding grading or soil disturbance designs were identified and the final location of historical surface soils is unknown. However, soils in a few small areas do not appear to have been disturbed and/or were only slightly disturbed and include (1) the southeastern portion of the Subject Property,	To evaluate the risk of historical pesticides to the Subject Property from historical agricultural uses, we propose collecting two composite shallow soil samples from the areas where no/low soil disturbance was identified in historical aerial images (CSA-01 and CSA-02; Figure 1). Each composite sample will consist of 10 subsamples collected between 0 and 1 foot bgs. The composited samples will be analyzed for the following: • Organochlorine pesticides; • Organochlorine herbicides; and • Agricultural metals (lead and arsenic).

DEQ Comment	Response	Proposed Scope of Work
	and (2) the vegetated area north of the electrical substation on the southeastern portion of the Subject Property. We propose investigating these areas as they are the most likely to retain contamination from potential historical pesticide application.	
8. Level I, Page 27 and 28, discusses surface water runoff from the anti-sapstain areas and spill areas that flowed into catch basins onsite and then discharged to Ash Creek. These areas need further investigation to determine the location and if sampling is needed.	Our understanding is the only known area of outdoor anti-sapstain application is the green chain exit/east side of the sawmill. Stormwater runoff in this area would flow to one of two catch basins identified on the SPCC Plan for the Subject Property. The stormwater line design and connections are unknown, but it is presumed that stormwater from these catch basins discharges to Ask Creek.	To evaluate potential contamination from stormwater runoff in the area of outdoor anti-sapstain application, we propose collecting a sediment sample from the two the catch basins identified in the vicinity, if accessible. The stormwater sediment will be composited into one sample and analyzed for the following: • D/F • Penta To better understand the stormwater line configuration in this area, we propose tracing the stormwater line from each catch basin to confirm its discharge route.
Phase II, Focused Subsurface Investigation and Site Visit[b]		
1. Metals analysis was not conducted on any of the samples. Metals are often associated with waste oils and should be analyzed in areas where used or waste oils could have been released including oils containing PCBs.	We will augment data for metals in future investigations by adding waste oil metals as a COI in investigation areas where used/waste oil and/or oils containing PCBs may have been present, as reflected in the proposed scopes herein.	Waste oil metals are included as a COI for several proposed areas of investigation described herein, and include the former log pond, infeed deck (where transformers were staged), and in areas of additional investigation from the focused SI report (see response to comment 5 herein).
2. Please provide supporting documentation for the investigation work that was	Documents have been requested from Farallon. None have been provided at this time. We will continue to reach out to Farallon to coordinate	N/A

DEQ Comment	Response	Proposed Scope of Work
completed including soil boring logs and sampling forms.	the project file transfer and will provide those forms via an email attachment once received.	
3. At a minimum, DEQ requires that all sites (except for a few exempt situations) conduct a Tier I Exposure Pathway Assessment for potential ecological risks. Guidance on conducting the assessment can be found on DEQs public website at https://www.oregon.gov/deq/Hazards-and-Cleanup/env-cleanup/Pages/ERA.aspx.	A Tier I Exposure Pathway Assessment will be conducted as part of project closure request documentation.	N/A
4. During the site visit, significant staining was observed in the engine room on the north side of the planar building. This area needs to be cleaned, and subsequent subsurface sampling conducted for contaminants of concern.	The engine room will be evaluated, as described in the next column.	We will evaluate the condition of the building slab by visually assessing cracks, and by cutting the concrete in two locations and evaluating the extent of total petroleum hydrocarbon (TPH) infiltration to the concrete slab. In addition, we will collect one sample of the potentially TPH-impacted material on the ground surface (CES-SS-1) for waste profiling and to inform COIs in the area if additional investigation is warranted. The surface sample will be analyzed for the following: • DRO/ORO • PAHs • Waste oil metals
5. We agree with the conclusions and recommendations of the focused SI report that additional	The 2024 Focused SI Report prepared by Farallon for Dallas Mill Properties, LLC, recommended the following:	The Peeler Lathe Pit, OWS, and Railroad Spur AOPCs will be further investigated as follows.

DEQ Comment	Response	Proposed Scope of Work
investigation is needed to define the extent of contamination in the peeler/lathe pit, oil-water separator and railroad spur areas. Additionally, based on the concentrations of gasoline and diesel in groundwater in the railroad spur area, a soil vapor assessment will likely be needed at some point in the future to evaluation the potential for vapor intrusion into future buildings.	• Additional subsurface investigation to the north, northeast, and west of the Peeler Lathe Pit area of potential concern (AOPC) to determine the extent of contamination. • Additional subsurface investigation north and south of the oil-water separator (OWS) AOPC to determine the extent of contamination in groundwater and a possible source area of contamination. • Additional subsurface investigation north and southeast of the Railroad Spur AOPC to determine the extent and possible source of contamination. These areas will be further evaluated, along with the potential for vapor intrusion in the railroad spur AOPC, in the next phase of investigation, as summarized in the column to the right.	**Peeler Lathe Pit** Advance three borings (CESB-10, CESB-11, and CESB-12) to the north, northeast, and west of the Peeler Lathe Pit AOPC, respectively. One soil sample will be collected from the area of highest observed contamination, based on field screening results, or from the soil-groundwater interface if no obvious signs of contamination were observed. Soil samples will be analyzed for the following: • DRO/ORO • Waste oil metals Collect one reconnaissance groundwater sample from each boring and analyze for the following: • DRO/ORO • Waste oil metals **OWS** Advance two borings to the north and south of the OWS AOPC. The boring to the north of the OWS AOPC will be addressed with already-proposed boring CESB-10 and the boring to the south of the OWS APOC will be addressed with already-proposed boring CESB-01. At least one soil and one grab groundwater sample will be analyzed from each boring for DRO/ORO and waste oil metals, if not already in the analytical plan for the boring. **Railroad Spur** Further investigation into the north of the Railroad Spur AOPC (i.e., off-site) is not feasible without an access agreement with the railroad company, which is unlikely.

DEQ Comment	Response	Proposed Scope of Work
		Advance three borings to the south, west, and center of the Railroad Spur AOPC, borings CESB-13 through -15, respectively. At least one soil sample will be collected from each boring at the area of highest observed contamination or the soil-groundwater interface if no contamination is observed through field screening. If contamination is observed, a second soil sample will be collected below from an area of no observed contamination, if identified, for vertical delineation. Soil samples will be analyzed for the following: • DRO/ORO • Waste oil metals One reconnaissance groundwater sample will be collected from each boring and analyzed for the following: • DRO/ORO • Waste oil metals While backfilling the borings, a temporary soil gas probe will be set a depth of approximately 5 feet bgs. An additional temporary soil gas probe (CESB-16) will be installed near Farallon boring, FB-15, near the northern Subject Property boundary where the highest concentrations of petroleum hydrocarbons were observed in groundwater during previous investigations. Soil gas samples will be collected and analyzed for the following: • GRO and VOCs by EPA Method TO-15 • DRO by EPA Method TO-17

Additional Questions (should be answered prior to addressing data gaps)		
1. Forestry shed was used for mixing pesticides and herbicides. Any idea what kind and what they were used for? Did they spray any areas of the ponds for mosquitos?	The Level I did not observe evidence of release in the vicinity of the Forestry Shed. No records or information regarding the use and/or type of pesticides and herbicides in the Forestry Shed were identified. It is also unknown if historical operations included the spraying of the ponds for mosquitos.	Based on the information provided in the Level I and lack of evidence of a release, no assessment of the Forestry Shed is proposed at this time. To evaluate potential contamination associated with the possible application of pesticides and herbicides in the former log pond, we propose to sample the native pond material collected from borings CESB-01 and CESB-04 for the following: • Organochlorine pesticides • Organochlorine herbicides • Agricultural metals (arsenic and lead)
2. What is the chemical make-up and carrier of the different anti-sapstains/wood treatments that were used including Diacon, Mycostat p20, cherry-tone stain, Kop-coat, NP-1 and Kop-coat Bazooka?	No records or information regarding the chemical make-up and carrier of the aforementioned anti-sapstain/wood treatment materials were provided to Dallas Mill Properties from Weyerhaeuser or were identified at the Subject Property. Safety Data Sheets (SDSs) for the products listed in the Level I Report or similar products were identified through an online search and are attached for your review. The chemicals listed on the provided SDSs were not included as COIs in the DEQ RBCs.	N/A

Notes:

[a] PES Environmental, Inc., 2009. *Level I Environmental Site Assessment* and 2011. *Phase 2 Assessment Review and Data Evaluation Report*. Prepared for Weyerhaeuser NR Company. October 2009 and September 26, 2011.

[b] Farallon Consulting, L.L.C. 2023. Letter Regarding Focused Subsurface Investigation, Former Weyerhaeuser Dallas Mill, 1551 Southeast Lyle Street, Dallas, Oregon. To Peter Cairns, Dallas Mills Property LLC. From Megan Masterson and Charles Esler. January 9.

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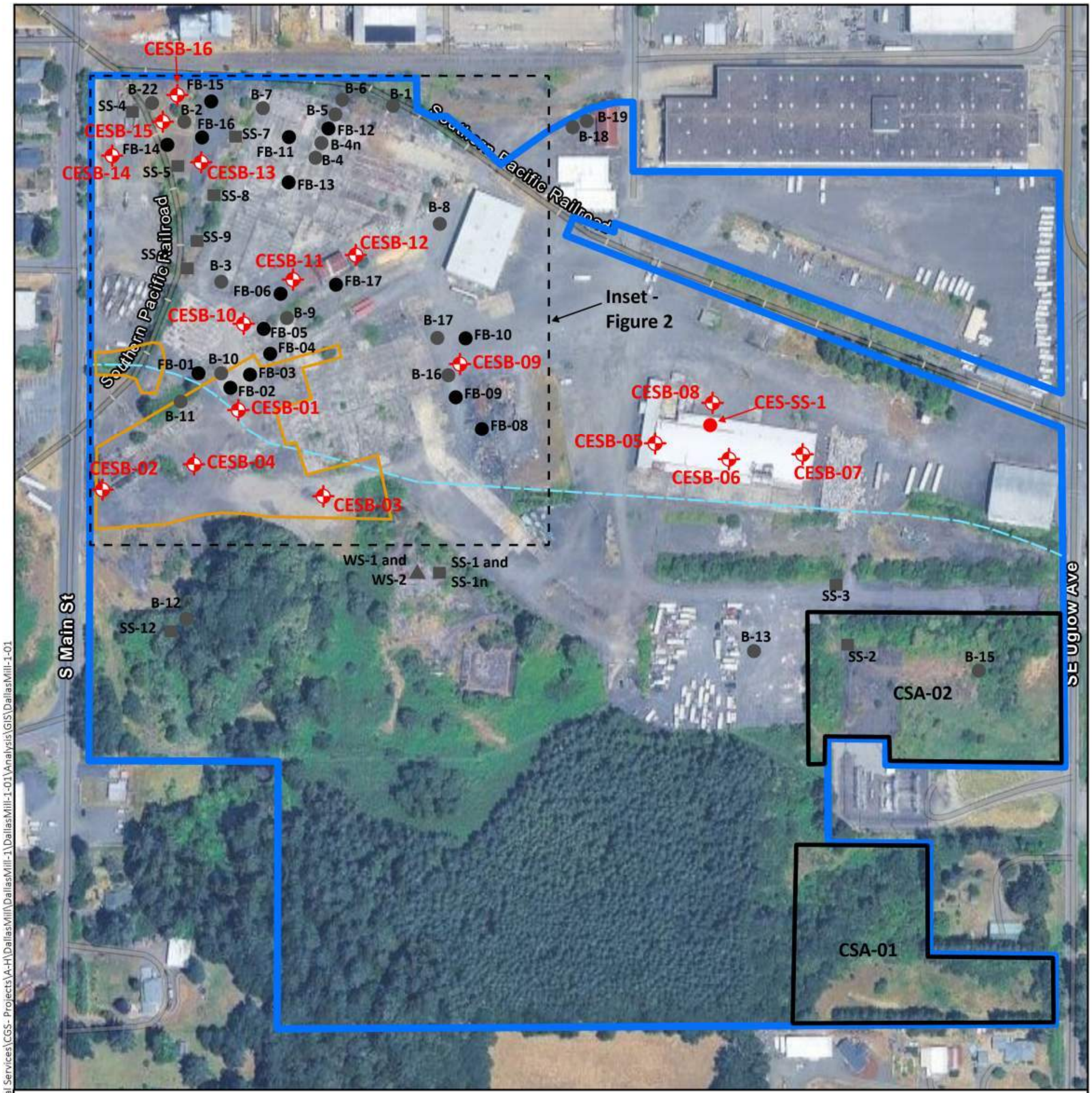
Figures



Legend

- ▭ Approximate Site Boundary
- ● Proposed Surface Sample
- ⌖ Proposed Boring
- ● Soil Boring (PES Environmental, INC., 2011)
- ■ Surface Sample (PES Environmental, INC., 2011)
- ▲ Wipe Sample (PES Environmental, INC., 2011)
- ● Soil Boring (Farallon, 2023)
- - - Ash Creek
- ▭ Former Log Pond
- ▭ Proposed Composite Soil Areas (CSA)

N

0 600 Feet

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DallasMill-1-01

Site Plan

1551 SE Lyle Street, Dallas, OR

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Figure 1

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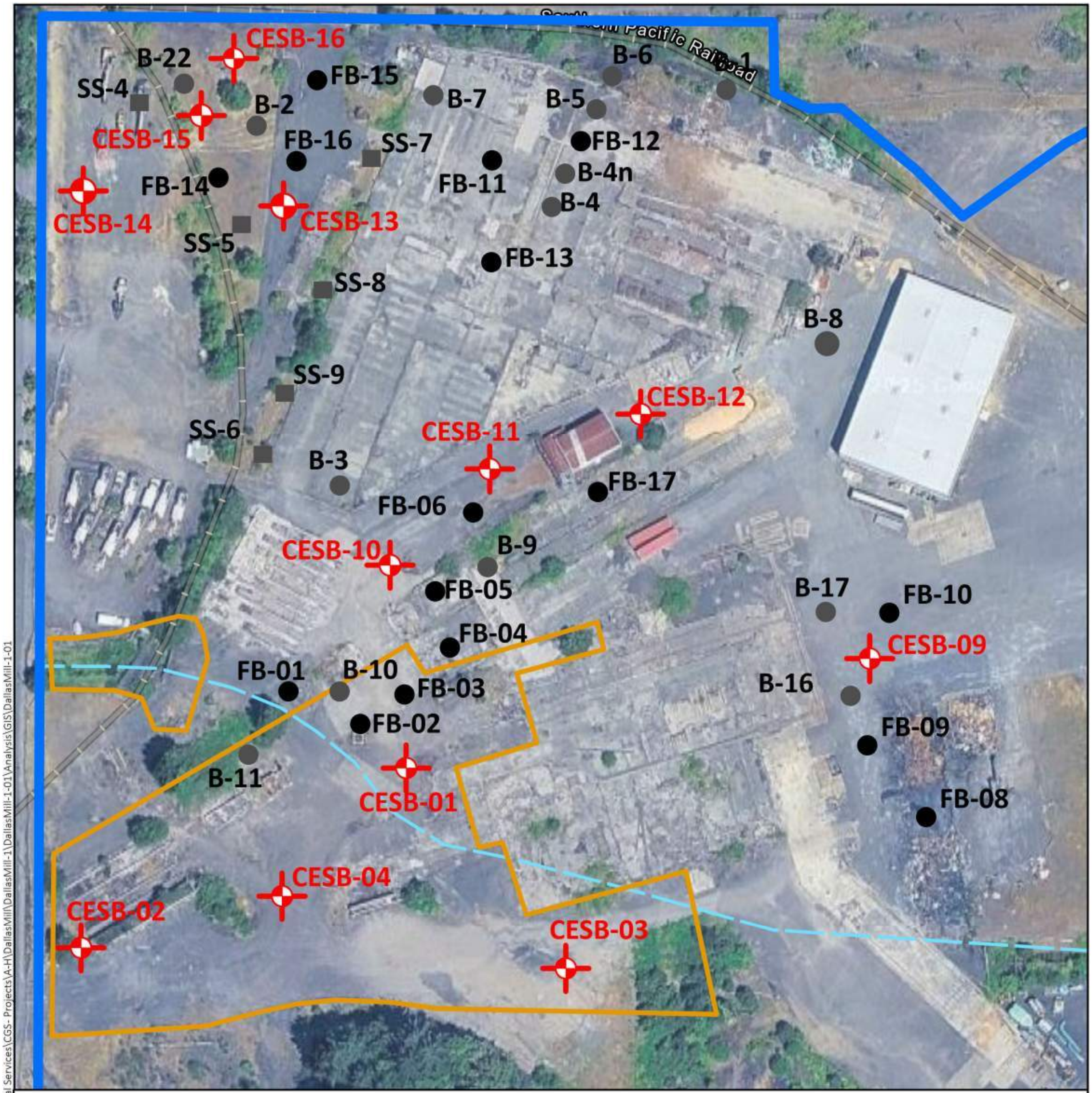

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Legend

▭	Approximate Site Boundary
▭	Former Log Pond
⊕	Proposed Boring
●	Soil Boring (PES Environmental, INC., 2011)
■	Surface Sample (PES Environmental, INC., 2011)
●	Soil Boring (Farallon, 2023)
- -	Ash Creek

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N

0 400 Feet

DallasMill-1-01

Site Plan Inset

1551 SE Lyle Street, Dallas, OR

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Figure 2

CENTRAL
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Historical Aerial Photographs

EDR Aerial Photo Decade Package

02/24/20

Site Name:

1551 SE Lyle Street
1551 SE Lyle Street
Dallas, OR 97338
EDR Inquiry # 5982179.8

Client Name:

Green Environmental Management
P.O Box 2212
Sisters, OR 97759
Contact: Sylvia Downing

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	*Scale*	*Details*	*Source*
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1994	1"=500'	Acquisition Date: May 07, 1994	USGS/DOQQ
1982	1"=500'	Flight Date: July 12, 1982	USDA
1972	1"=500'	Flight Date: May 12, 1972	USGS
1970	1"=500'	Flight Date: July 05, 1970	USGS
1955	1"=500'	Flight Date: July 10, 1955	USGS
1936	1"=500'	Flight Date: January 01, 1936	USDA

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Aerial Photograph

2016

AERIAL PHOTOGRAPH - 2016

1551 SE Lyle Street
Dallas, OR 97338

GEM
Green Environmental Management

Aerial Photograph

2012

AERIAL PHOTOGRAPH - 2012

1551 SE Lyle Street
Dallas, OR 97338

GEM
Green Environmental Management

Aerial Photograph

2009

AERIAL PHOTOGRAPH - 2009

1551 SE Lyle Street
Dallas, OR 97338

Aerial Photograph

2006

AERIAL PHOTOGRAPH - 2006

1551 SE Lyle Street
Dallas, OR 97338

Aerial Photograph

1994

0 Feet 500 1000 2000

AERIAL PHOTOGRAPH - 1994

1551 SE Lyle Street
Dallas, OR 97338

Aerial Photograph

1982

N

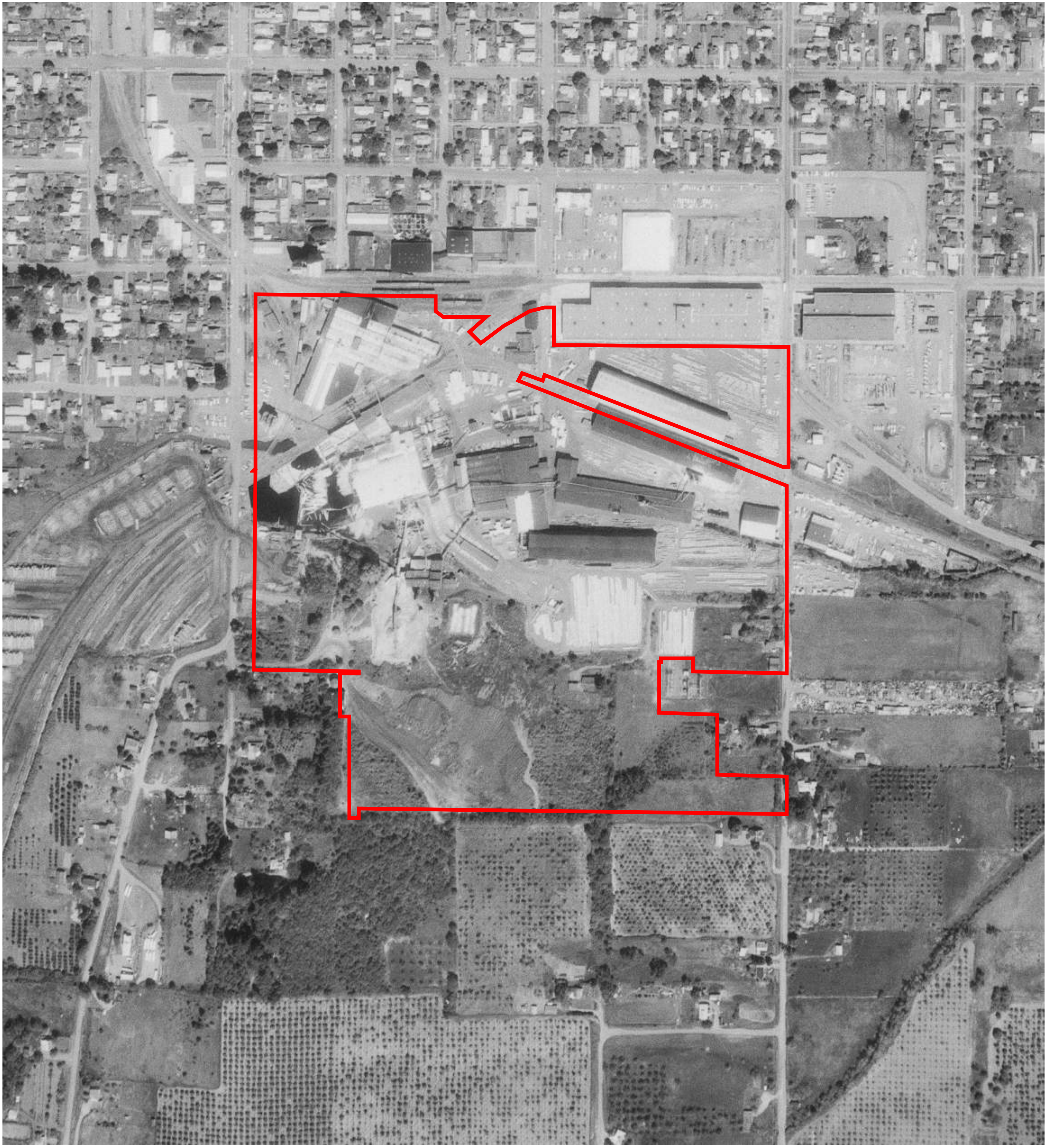
AERIAL PHOTOGRAPH - 1982

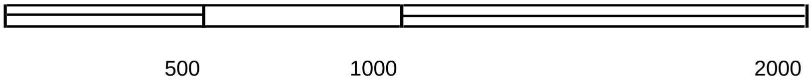
1551 SE Lyle Street
Dallas, OR 97338

GEM
Green Environmental Management

Aerial Photograph

1972





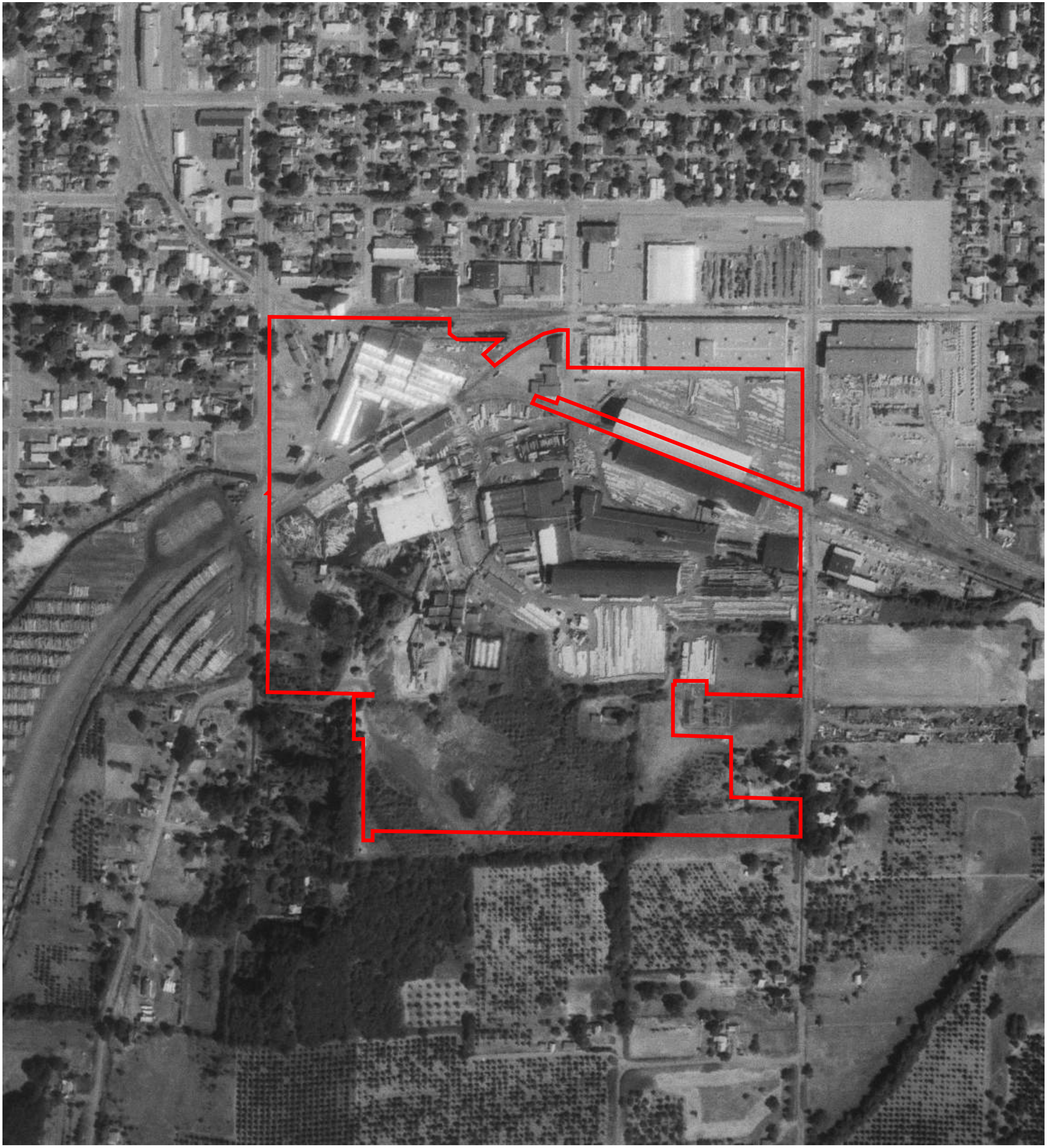
AERIAL PHOTOGRAPH - 1972

1551 SE Lyle Street
Dallas, OR 97338

GEM Green Environmental Management

Aerial Photograph

1970



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AERIAL PHOTOGRAPH - 1970

1551 SE Lyle Street
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GEM
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Aerial Photograph

1955

N

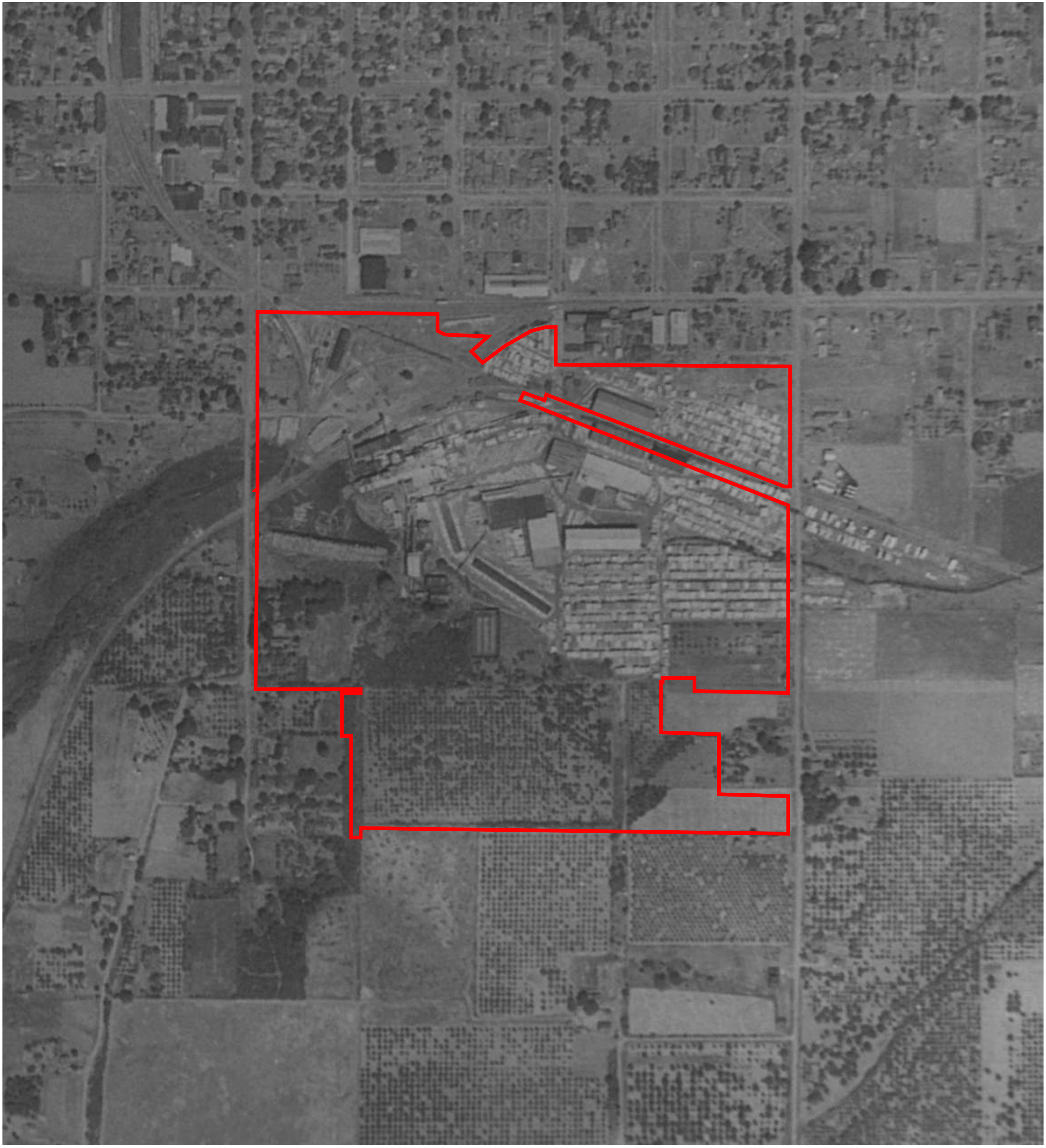
AERIAL PHOTOGRAPH - 1955

1551 SE Lyle Street
Dallas, OR 97338

GEM
Green Environmental Management

Aerial Photograph

1936



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AERIAL PHOTOGRAPH - 1936

1551 SE Lyle Street
Dallas, OR 97338

GEM
Green Environmental Management

CENTRAL
ENGINEERING SERVICES

Safety Data Sheets

SECTION 1 - IDENTIFICATION

PRODUCT IDENTIFIER: MYCOSTAT P20 + DIAMULSE C (Customblend 20+80)

PRODUCT USE: Sapstain Control Product

MANUFACTURER:
Diacon Technologies Ltd.
#135-11960 Hammersmith Way
Richmond BC Canada
V7A 5C9

Phone: 1-888-290-2299
(604) 271-8855
Fax: (604) 271-4266

In Case of a Chemical Emergency Call: CHEMTREC (800) 424-9300 (in the U.S.), CANUTEC (613) 996-6666 (in Canada)

SECTION 2 - HAZARD IDENTIFICATION

HAZARD CLASSIFICATION: Skin corrosion (Category 1), Serious eye damage (Category 1), Acute oral toxicity (Category 4), Reproductive toxicity (Category 2), Acute aquatic toxicity (Category 1).

SIGNAL WORD: Danger.

HAZARD STATEMENT: Causes severe skin burns and eye damage. Harmful if swallowed. Suspected of damaging fertility or the unborn child. Very toxic to aquatic life.

HAZARD SYMBOL: Corrosion, Exclamation mark, Health hazard, Environment.

PRECAUTIONARY STATEMENT:

Prevention: Do not breathe dusts or mists. Wash skin thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid release to the environment.

Response: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. Collect spillage.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with local/state/federal regulations.

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS	CAS NUMBER	% (W/W)
Propiconazole	60207-90-1	4
Dipropylene glycol monomethyl ether	34590-94-8	10 – 20
Alkyldimethylamines	68439-70-3	40 – 50
2-Ethylhexanoic acid	149-57-5	10 – 20

SECTION 4 - FIRST AID MEASURES

EYE CONTACT: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice. Patient should contact an ophthalmologist if photophobia, pain, blinking, tears or redness persist.

SKIN CONTACT: Remove contaminated clothing immediately. Wash with plenty of soap and water. Get medical attention if irritation develops or burns evident. Launder clothing before re-use.

INGESTION: Do not induce vomiting. Promptly drink 1-2 glasses of water. Avoid alcohol. Never give anything by mouth to an unconscious person. Contact a physician or poison control center immediately. Probable mucosal damage may contraindicate the use of gastric lavage.

INHALATION: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

SECTION 5 - FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: Use dry chemical, water fog, carbon dioxide, or chemical foam. Do not use direct jet of water.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL: Combustion products are toxic and may include corrosive vapours, oxides of carbon and nitrogen.

SPECIAL PROTECTIVE ACTIONS FOR FIRE FIGHTERS: Cool fire exposed containers with spray. Use water spray to disperse vapours. Wear full protective equipment and MSHA/NIOSH approved self-contained breathing apparatus. Vapours may be heavier than air and may travel long distances along the ground before igniting and flashing back to the source.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTION: Wear rubber gloves, goggles or safety glasses, other personal protective equipment as required to avoid skin contact. Keep people away from spill/leak.

ENVIRONMENTAL PRECAUTIONS: Do not flush to sewer. This product is toxic to fish. Do not contaminate water when disposing of equipment washwaters. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit, federal, state/provincial and local laws. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Always wear appropriate protective equipment prior to handling hazardous materials. Use a NIOSH approved cartridge respirator if the area is not well ventilated and during clean-up, maintenance and repair activities. Remove ignition sources and ground all equipment before beginning clean-up. Dike and contain spill with inert material (sand, earth, etc.); package and label for legal disposal. For a small spill, absorb onto inert medium such as sand or dry earth; Package in an appropriate container and label for legal disposal. If it is a large spill stop leak if without risk. Contain large spills and pump away excess into a dry container. Absorb remainder with dry earth, sand or other non-combustible material. Prevent entry into sewers, basements or confined areas; dike if needed.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: Handle in accordance with good industrial hygiene practice. Prevent contact with eyes, skin, and clothing. Wash thoroughly after handling. Avoid breathing vapour or spray mist.

CONDITIONS FOR SAFE STORAGE: Store in sealed original container in a cool, dry, ventilated area. Do not mix with incompatible materials. Keep from freezing. Do not contaminate water, food, or feed by storage or disposal.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS:
2-Ethylhexanoic acid:
5 mg/m3 (TLV-TWA)
Dipropylene glycol monomethyl ether:
100 ppm on skin (TLV-TWA), 150 ppm on skin (TLV-STEL)

ENGINEERING CONTROLS: In processes where mists or vapours may be generated, proper ventilation must be provided in accordance with good ventilation practices. General ventilation is normally adequate provided spray mists are contained through negative pressure spraybox design with integrated mist eliminator.

RESPIRATORY PROTECTION: A NIOSH approved cartridge respirator should be worn when in enclosed or poorly ventilated areas.

SKIN PROTECTION: Impervious apron to prevent skin contact. Wear rubber or neoprene gloves.

EYE AND FACE PROTECTION: Chemical goggles, safety glasses or face shield. Do not wear contact lenses.

OTHER: Wear such clothing and footwear as to prevent skin contact. Maintain an eyewash facility and emergency shower.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear pale yellow liquid	VAPOUR PRESSURE: N/Av
ODOUR: Vinegar-like odour	VAPOUR DENSITY: Heavier than air
ODOUR THRESHOLD: N/Av	DENSITY: 0.882 g/mL @ 20°C (7.360 lbs/USgal)
pH: 6 – 7 (5% solution)	SOLUBILITY: Completely miscible in water
FREEZING POINT: <-10°C (<14°F)	n-OCTANOL/WATER PARTION COEFFICIENT: N/Av
BOILING POINT: >200°C (>392°F)	AUTOIGNITION TEMPERATURE: N/Av
FLASH POINT: >100°C (>212°F)	DECOMPOSITION TEMPERATURE: N/Av
EVAPORATION RATE: <0.5 x n-BuOAc	KINEMATIC VISCOSITY: N/Av
UPPER EXPLOSION LIMIT: 14% (V) for Dipropylene glycol monomethyl ether	DYNAMIC VISCOSITY: N/Av
LOWER EXPLOSION LIMIT: 1.1% (V) for Dipropylene glycol monomethyl ether	VOC (%w/w): 25.1% (1.849 lbs/USgal)

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Under recommended storage and use, hazardous reactions will not occur.

CHEMICAL STABILITY: Stable under recommended storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS: May react with strong oxidizers and reducing agents.

CONDITIONS TO AVOID: Extreme heat and cold.

INCOMPATIBLE MATERIALS: Avoid contact with strong oxidizers and reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic vapours of amine, oxides of carbon/nitrogen.

SECTION 11 - TOXICOLOGICAL INFORMATION

ROUTE(S) OF EXPOSURE: Skin, Eyes, Inhalation, Ingestion.

ACUTE TOXICITY:
Alkyldimethylamines:
LD50: 1074 mg/kg (oral, rat)
2-Ethylhexanoic acid:
LD50: 3000 mg/kg (oral, rat)
LD50: 1142 mg/kg (dermal, rabbit)
Mycostat P20:
LD50 >660 mg/kg (oral, rat)
LD50 >2000 mg/kg (dermal, rabbit)
LC50 >5.27 mg/L (4 h, rat)

SKIN CORROSION/IRRITATION: Corrosive to skin.

SERIOUS EYE DAMAGE/IRRITATION: Corrosive to eyes.

RESPIRATORY OR SKIN SENSITIZATION: N/Av

GERM CELL MUTAGENICITY:
N/Av

SECTION 11 - TOXICOLOGICAL INFORMATION (continued)

CARCINOGENICITY: Not listed under IARC, NTP, OSHA.

REPRODUCTIVE TOXICITY:

2-Ethylhexanoic acid: In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Propiconazole: Did not show teratogenic effects in animal experiments (rat, 30 mg/kg).

Dipropylene glycol monomethyl ether: Did not show developmental toxicity effects in animal experiments (rat, NOAEL: 300ppm, F1: 1000 ppm, F2: 1000 ppm)

TERATOGENICITY: N/Av

STOT-SINGLE EXPOSURE: N/Av

STOT-REPEATED EXPOSURE: N/Av

ASPIRATION HAZARD: N/Av

SECTION 12 - ECOLOGICAL INFORMATION

ECOTOXICITY: This product is toxic to fish and shrimp.

Alkyldimethylamines:
LC50 (zebra fish, 96 hr) < 1 mg/L
2-Ethylhexanoic acid:
LC50 (fathead minnow, 96 hr): 70 mg/L
Propiconazole:
LC50 (rainbow trout, 96 h): 4.3 mg/L
Dipropylene glycol monomethyl ether:
LC50 (guppy, 96 h) >1000 mg/L

PERSISTANCE AND DEGRADABILITY:

Propiconazole:
Not readily biodegradable.

BIOACCUMULATIVE POTENTIAL:

Propiconazole:
Bioconcentration factor (BCF): 146

MOBILITY IN SOIL:

Propiconazole:
Moderately mobile in soils.

SECTION 13 - DISPOSAL CONSIDERATIONS

Dispose in accordance with local, state/provincial, and federal regulations.

SECTION 14 - TRANSPORT INFORMATION

CANADIAN TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:

UN 2735, AMINES, LIQUID, CORROSIVE, n.o.s. (alkyldimethylamines), Class 8, Packing Group II

US DOT HAZARDOUS MATERIALS REGULATIONS:

UN 2735, AMINES, LIQUID, CORROSIVE, n.o.s. (alkyldimethylamines), Class 8, Packing Group II

N/Av : Not Available

SECTION 15 - REGULATORY INFORMATION

CANADIAN FEDERAL REGULATIONS:
WHMIS: Class E, D2A
This product has been classified under WHMIS 1998.

UNITED STATES FEDERAL REGULATIONS:
HMIS: Health 3, Flammability 1, Reactivity 0, Personal Protective Equipment X
This product has been classified under 29CFR and the SDS contains information elements required under 29CFR.

SARA SECTION 302 (40CFR355.30), SARA SECTION 304 (40CFR355.40):
This product does not contain any chemicals that require emergency planning based on Threshold Planning Quantities (TPQ) or release reporting based on Reportable Quantities (RQ).

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):
Acute Health Hazard, Chronic Health Hazard

SARA SECTION 313 (40CFR372.65):
This product contains the following toxic chemicals subject to the reporting requirements of the Emergency Planning Community Right-to-Know Act of 1986. This information must be included in all SDS's that are copied and distributed for this material.
Propiconazole CAS #: 60207-90-1 %w/w: 4%

OSHA HAZARD COMMUNICATION STANDARD:
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29CFR 1910.1200.

CALIFORNIA PROPOSITION 65:
This product does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

SECTION 16 – OTHER INFORMATION

PREPARATION DATE: June 8, 2015

PREPARED BY: DIACON Technologies Ltd. - Regulatory Affairs Office

REVISIONS: 150608

NOTICE: Every effort is made to ensure that the data presented herein are current and factual; however, no warranty or any other legal responsibility is to be construed from this document. Numerical data represent nominal and/or typical properties and do not constitute specifications. Any use of the information presented herein must be determined by the user to be in accordance with applicable Federal, State/Provincial and local laws and regulations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

March 22, 2018

Ronald W. Clawson, Jr. Ph.D.
Research and Development Manager
Kop-Coat, Inc.
3040 William Pitt Way
Pittsburgh, PA 15238

Subject: Amended Reregistration Label
Product Name: NP-1 Sapstain Control Chemical
EPA Registration Number: 92617-3
Decision Number: 537994

Dear Mr. Clawson:

The Agency, in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, has completed reviewing all of the information submitted with your application to support the reregistration of the above referenced product in connection with the DDAC RED and Carbamic acid, butyl-, 3-iodo-2-propynyl ester RED, and has concluded that your submission is acceptable. The label referred to above, submitted in connection with registration under FIFRA, as amended, is acceptable.

NOTE: This product is **not** yet being reregistered under section 4(g) of FIFRA.

Please note that the record for this product currently contains the Confidential Statements of Formulation (CSFs) listed below. Any previously dated CSFs are superseded.

- Basic CSF, dated 02/26/1998
- Alternate CSF 1, dated 01/20/1997

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

A copy of your label stamped "Accepted" is enclosed. Products shipped after 12 months from the date of this amendment or the next printing of the label, whichever occurs first, must bear the new revised label. Your release for shipment of the product bearing the amended label constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6.

If you have any questions, you may contact Joe Daniels at (703) 347-8669 or via email at daniels.joseph@epa.gov.

Sincerely,

E. Miederhoff

Eric Miederhoff
Product Manager 31
Regulatory Management Branch I
Antimicrobials Division (7510P)
Office of Pesticide Programs

Enclosure

KOP-COAT

NP-1® Sapstain Control Chemical

U.S. Patent No. 4,950,685 and Foreign Patents

Aids in the control of blue stain, mold and decay of freshly cut lumber when properly used. Effective on softwoods including Douglas fir, White fir, Spruce, Hemlock, the Pines including both the Southern and Western Yellow Pines, Eastern and Western White Pines and many of the hardwoods.

KEEP OUT OF REACH OF CHILDREN

DANGER

EPA Reg. No. 92617-3
EPA Est. No. 60061-MO-1

Read Disclaimer on side panel before buying or using. If such terms are not acceptable, return at once unopened.

ACCEPTED
03/22/2018
Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under
EPA Reg. No. 92617-3

ACTIVE INGREDIENTS	
Didecyl dimethyl ammonium chloride	64.80%
3-Iodo-2-Propynyl Butyl Carbamate	7.60%
OTHER INGREDIENTS	27.60%
TOTAL	100.00%

FIRST AID	
IF IN EYES	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • · Call poison control center or doctor for treatment advice.
IF ON SKIN OR ON CLOTHING	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • ·Call poison control center or doctor for treatment advice.
IF SWALLOWED	• Call poison control center or doctor immediately for treatment advice. • Do not induce vomiting unless told to do so by a poison control center or doctor. • · Do not give anything by mouth to an unconscious person.
IF INHLAED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
HOT LINE NUMBERS	• Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 800-548-0489 for emergency

	medical treatment information. - ·Transportation emergency contact 800-424-9300.
NOTE TO PHYSICIAN	- Probable mucosal damage may contraindicate the use of gastric lavage. Corrosive to eyes and skin.

Kop-Coat, Inc.
Protection Products Division
5137 Southwest Avenue, St. Louis MO 63110
314-772-2200

Net Contents Gallons

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

GENERAL PRECAUTIONS AND RESTRICTIONS

FOR INDUSTRIAL USE

CONSULT SAFETY DATA SHEET BEFORE USING

Do not apply this product in a way that will contact workers or other persons.

Wear synthetic rubber gloves or plastic coated gloves in handling solutions and freshly treated lumber.

DILUTE BEFORE USING

Volumetric Dilution and Retention* on Green Wood Species

Parts NP-1®	Parts H_2O	Retention	Parts NP-1®	Parts H_2O	Retention
1	15	0.0625%	1	160	0.0062%
1	40	0.0244%	1	185	0.0054%
1	60	0.0164%	1	205	0.0049%
1	80	0.0123%	1	225	0.0044%
1	100	0.0099%	1	245	0.0041%
1	120	0.0083%	1	265	0.0038%
1	140	0.0071%	1	285	0.0035%
1	145	0.0068%	1	290	0.0034%
1	150	0.0066%	1	295	0.0034%
1	155	0.0064%	1	300	0.0033%

*-Retention Based on Minimum Gravimetric Uptake on Nominal Wood Density of 30 lb/ft^3

GENERAL INFORMATION

For the best results lumber should be treated immediately after it is sawn. A delay in treatment of 24 hours or more permits stain, mold and decay growth to start which requires a heavier treatment to achieve control of surface growth. Delayed application and log borne infection result in internal stain often under a bright surface. Lumber and logs should be totally immersed or sprayed so as to ensure all surfaces are treated.

Freshly dipped or sprayed lumber should be protected from rain washing. Dip tanks and drip aprons must be roofed, paved and drained to prevent dilution and loss of the anti-stain solution. Antistain treatment concentrations must be geared to achieve protection of the thickest or most valuable item being treated. The concentration of the ready-to-use anti-stain solution must be adjusted to accommodate seasonal changes in the exposure and species being treated. Dip tanks and spray equipment must be properly maintained.

Treated sawdust and other wood wastes should be disposed of properly and should not be used as mulch where it will come into contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

MIXING INSTRUCTIONS

For high pressure spray applications: Thoroughly mix one gallon of NP-1® Sapstain Control Chemical per 15 to 50 gallons of water.

For dip applications: Thoroughly mix one gallon of NP-1® Sapstain Control Chemical per 40 to 300 gallons of water. In all cases, dilution levels will depend upon application methods, lumber species and conditions of lumber storage. Mills should conduct tests to determine treatment requirements for their individual needs. Contact Kop-Coat for further information. When using proportioning pumps for mixing, this product should be maintained at temperatures above 50°F to prevent inaccurate mixing due to viscosity changes. Minor proportioning rate changes can be affected by changing the setting on the pump dial.

NOTE: With normal dip or spray application long term control of decay cannot be achieved. This product is intended to provide decay, mold and blue stain control during storage. Such control would not likely extend to the use site.

Wood treated with didecyl dimethyl ammonium chloride shall not be used in the construction of bee hives.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

Storage: Store in a closed, properly labeled container in a cool place. If static generating conditions exist, provide necessary grounding and bonding. Keep containers closed when not in use.

Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth ensuring at least one complete revolution for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER.

Corrosive. Causes irreversible eye damage. Causes skin burns. May be fatal if swallowed or inhaled. Harmful if absorbed through skin. Do not get in eyes, on skin or on clothing. Wear goggles and if splashing is possible, face shield. Wear barrier laminate, nitrile rubber or Viton gloves. Do not breathe vapor or spray mist. Wear respiratory protection as specified below. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Mixers and loaders using liquid formulation must wear:

1. Coveralls worn over long-sleeved shirt, long pants
2. Chemical resistant footwear plus socks
3. When mixing or loading, wear a chemical-resistant apron
4. Wear goggles and if splashing is possible, face shield
5. Barrier laminate, nitrile rubber or Viton gloves
6. A NOISH approved respirator with an organic vapor (OV) cartridge with a combination N, R or P filter with NIOSH approval number prefix TC-84A; or a NIOSH approved gas mask with a canister with NIOSH approval number prefix TC-14G; or powered air purifying respirator with organic vapor (OV) cartridge and combination HE filter with NIOSH approval number prefix TC-23C.

USER SAFETY REQUIREMENTS

- Follow manufactures instructions for clean/maintaining PPE. If no such instructions exist for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.
- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this products concentrate. Do not reuse them.

USER SAFETY RECOMMEDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

NOTICE

This product contains a chemical known to the State of California to cause cancer and/or to cause birth defects or other reproductive harm.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish. Do not apply directly to water. Do not contaminate water when disposing equipment wastewaters. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Eliminations System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of Environmental Protection Agency.

Treated lumber must be stored under cover, or indoors, or at least 100 feet from any pond, lake, stream, wetland, or river to prevent possible runoff of the product into the water way. Treated lumber stored outdoors within 100 feet of a pond, lake, stream or river must be either covered with plastic or surrounded by berm to prevent surface water runoff into the nearby waterway. If a berm is used around the site, it must consist of impermeable material (clay, asphalt, concrete) and be sufficient height to prevent runoff during heavy rainfall events.

PHYSICAL OR CHEMICAL HAZARDS

COMBUSTIBLE - Do not use, pour, spill, or store near heat or open flame.

IN CASE OF FIRE

Use alcohol foam, dry chemical, carbon dioxide, water spray, fog or foam to extinguish fire.

DISCLAIMER

To the extent consistent with applicable law, seller (whether manufacturer, distributor, or other) makes no warranty express or implied, including the implied warranty of merchantability AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE regarding this product except the composition as set forth in the ingredient statement herein, and shall not be liable for LOST PROFITS, LOST PRODUCTION, LABOR COSTS, TRANSPORTATION CHARGES, OR ANY special, consequential, INCIDENTAL OR DELAY damages, the exclusive remedy being the replacement of the product. To the extent consistent with applicable law, buyer or user assumes all risk of possession, handling or use of this material when such use and/or handling is contrary to label instructions.

12460v1/1B/R01/021216v2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

February 15, 2018

Angie Custer
Regulatory Affairs Specialist
Kop-Coat, Inc.
3040 William Pitt Way
Pittsburgh, PA 15238

Subject: Label Notification per PRN 98-10 –Updating the Warranty & Disclaimer language. Plus; minor formating changes on the master label.
Product Name: Bazooka® Sapstain and Mold Control Product
EPA Registration Number: 92617-12
Application Date: January 23, 2018
Decision Number: 538098

Dear Ms. Custer,

The Agency is in receipt of your Application for Pesticide Notification under Pesticide Registration Notice (PRN) 98-10 for the above referenced product. The Antimicrobials Division (AD) has conducted a review of this request for its applicability under PRN 98-10 and finds that the action requested falls within the scope of PRN 98-10.

The label submitted with the application has been stamped “Notification” and will be placed in our records.

Should you wish to add/retain a reference to the company’s website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product’s label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA’s Office of Enforcement and Compliance.

If you have any questions, you may contact Lorena Rivas at 703-305-5027 or via email at rivas.lorena@epa.gov.

Sincerely,

Registration Risk Manager
Regulatory Management Branch II
Antimicrobials Division (7510P)
Office of Pesticide Programs

Enclose: Notification Stamped Label

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

GENERAL PRECAUTIONS AND RESTRICTIONS:

FOR INDUSTRIAL USE
CONSULT SAFETY DATA SHEET (SDS) BEFORE USING

DILUTE BEFORE USING
Do not apply this product in a way that will contact workers or other persons, either directly or through spray drift. Only protected handlers may be in the area during application.

Wear synthetic rubber gloves or plastic coated gloves in handling solutions and freshly treated lumber.

Treated sawdust and other wood wastes should be disposed of properly and should not be used as mulch where it will come into contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass, and other desirable vegetation.

GENERAL INFORMATION

Freshly dipped or sprayed lumber should be protected from rain-washing. Dip tanks and drip aprons must be roofed, paved, and drained to prevent dilution and loss of the anti-stain solution. Treatment concentrations must be geared to achieve protection of the thickest or most valuable item being treated. The concentration of the ready-to-use solution must be adjusted to accommodate seasonal changes in the exposure, species being treated, dip tanks, and spray equipment must be properly maintained.

MIXING INSTRUCTIONS

For high-pressure spray applications: Thoroughly mix one gallon of Bazooka® Sapstain and Mold Control Product per 2 to 500 gallons of water.

For dip applications: Thoroughly mix one gallon of Bazooka® Sapstain and Mold Control Product per 20 to 1,000 gallons of water. In all cases, dilution levels will depend upon application methods, lumber species, and conditions of lumber storage. Mills should conduct tests to determine treatment requirements for their individual needs. Contact Kop-Coat for further information. When using proportioning pumps for mixing, this product should be maintained at temperatures above 50°F to prevent inaccurate mixing due to viscosity changes. Minor proportioning rate changes can be affected by changing the setting on the pump dial.

Maximum application rate is 0.8% w/w Diiodomethyl-para-Tolyl sulfone for sapstain wood preservation.
Maximum application rate is 0.7 lb Diiodomethyl-para-Tolyl sulfone for pressure treated wood application.

NOTE: With normal dip or spray application long-term control of decay cannot be achieved. This product is intended to provide decay, mold, and blue stain control during storage. Such control would not likely extend to the use site.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.
Storage: Store in a closed, properly labeled container in a cool place. If static generating conditions exist, provide necessary grounding and bonding. Keep containers closed when not in use.
Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.
Container Handling: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth ensuring at least one complete revolution for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available.

KOP-COAT

Bazooka®
Sapstain and Mold Control Product

U.S. Patent Number 6,375,727and 7,056,919. Additional Patents Pending

Aids in the control of blue stain, mold and decay of freshly cut lumber, dry lumber and other wood based products when properly used. Effective on softwoods including Douglas fir, White fir, Spruce, Hemlock, the Pines including both the Southern and Western Yellow Pines, Eastern and Western White Pines and many of the hardwoods.

NOTIFICATION
92617-12
The applicant has certified that no changes, other than those reported to the Agency have been made to the labeling. The Agency acknowledges this notification by letter dated:
02/15/2018

KEEP OUT OF REACH OF CHILDREN

DANGER

EPA Reg. No. 92617-12
EPA Est. No. 60061-MO-1

Read Disclaimer on side panel before buying or using. If such terms are not acceptable, return at once unopened.

ACTIVE INGREDIENTS	
Diiodomethyl-para-Tolyl sulfone	0.95%
(Propiconazole) 1-[[2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl]-methyl-1H-1,2,4-triazole	3.50%
(IPBC) 3-Iodo-2-Propynyl Butyl Carbamate	3.50%
OTHER INGREDIENTS	92.05%
TOTAL	100.00%

FIRST AID	
IF ON SKIN OR ON CLOTHING	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call poison control center or doctor for treatment advice.
IF IN EYES	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call poison control center or doctor for treatment advice.
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
IF SWALLOWED	• Call a poison control center or doctor immediately for treatment advice. • Have a person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
HOT LINE NUMBERS	• Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 800-548-0489 for emergency medical treatment information. • Transportation emergency contact 800-424-9300.
NOTE TO PHYSICIAN	• Probable mucosal damage may contraindicate the use of gastric lavage. • Corrosive to eyes and skin. Continue to flush eyes and skin with water until treatment advice is provided by poison control center or doctor.

Kop-Coat, Inc.
Protection Products Division
5137 Southwest Avenue, St. Louis MO 63110
314-772-2200

Net Contents Gallons

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
DANGER

Corrosive. Causes skin burns. Causes irreversible eye damage. Harmful if swallowed, absorbed through skin, or inhaled. Do not get in eyes, on skin, or clothing. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

1. Coveralls over long-sleeved shirt and long pants
2. Chemical-resistant footwear plus socks
3. Goggles or face shield
4. Chemical-resistant gloves (such as barrier laminate, nitrile rubber, neoprene rubber and viton)

USER SAFETY RECOMMENDATIONS

User must:

- Follow manufactures instructions for clean/maintaining PPE. If no such instructions exist, use detergent and hot water. Keep and wash PPE separately from other laundry.
- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

USER SAFETY INSTRUCTIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove personal protective equipment immediately after handling this product. Wash outside of gloves before removing. As soon as possible wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and aquatic invertebrates. Do not apply directly to water. Do not contaminate water when disposing equipment wastewaters. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of Environmental Protection Agency.

Until product has dried, antisapstain treated lumber must be stored under cover, indoors, or at least 100 feet from any pond, lake, stream, wetland, or river to prevent possible runoff of the product into the waterway. Treated lumber stored within 100 feet of a pond, lake stream, or river must be either covered with plastic or surrounded by a berm to prevent surface water runoff into the nearby waterway. If a berm or curb is used around the site, it should consist of impermeable material (clay, asphalt, concrete) and be of sufficient height to prevent runoff during heavy rainfall events.

PHYSICAL OR CHEMICAL HAZARDS

COMBUSTIBLE - Do not use, pour, spill, or store near heat or open flame.

IN CASE OF FIRE

Use water, fog, foam, carbon dioxide or dry chemical. Cool closed container with water.

DISCLAIMER

To the extent consistent with applicable law, seller (whether manufacturer, distributor, or other) makes no warranty express or implied, including the implied warranty of merchantability AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE regarding this product except the composition as set forth in the ingredient statement herein, and shall not be liable for LOST PROFITS, LOST PRODUCTION, LABOR COSTS, TRANSPORTATION CHARGES, OR ANY special, consequential, INCIDENTAL OR DELAY damages, the exclusive remedy being the replacement of the product. To the extent consistent with applicable law, buyer or user assumes all risk of possession, handling or use of this material when such use and/or handling is contrary to label instructions.

18090/48A/R04/061617

Conforms to HCS 2012 - United States

SAFETY DATA SHEET

Antique Cherry Wood Stain

Section 1. Identification

GHS product identifier : Antique Cherry Wood Stain

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Water-based wood stain.

Manufacturer :
General Finishes
2462 Corporate Circle
East Troy, WI 53120
U.S.A.
Phone no.: 262-642-4545
Toll free no.: 1-800-783-6050
Fax no.: 262-642-4707
Web: GeneralFinishes.com

Emergency telephone number (with hours of operation) : CHEMTREC, U.S. : 1-800-424-9300 International: +1-703-527-3887 (24/7)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN SENSITIZATION - Category 1

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H317 - May cause an allergic skin reaction.

Precautionary statements

Prevention :
P280 - Wear protective gloves.
P261 - Avoid breathing vapor.
P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.

Response :
P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse.
P333 + P313 - If skin irritation or rash occurs: Get medical attention.

Storage : Not applicable.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 2. Hazards identification

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number/other identifiers

CAS number : Not applicable.

Product code : Not available.

Ingredient name	%	CAS number
Propane-1,2-diol Reaction mass of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-Methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	≥3 - ≤5 <0.06	57-55-6 55965-84-9

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash with plenty of soap and water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Section 4. First aid measures

Skin contact	: May cause an allergic skin reaction.
Ingestion	: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	: No known significant effects or critical hazards.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: Adverse symptoms may include the following: irritation redness
Ingestion	: No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	: In case of fire, use water spray (fog), foam, dry chemical or CO_2.
Unsuitable extinguishing media	: None known.
Specific hazards arising from the chemical	: No specific fire or explosion hazard.
Hazardous thermal decomposition products	: Decomposition products may include the following materials: carbon dioxide carbon monoxide
Special protective actions for fire-fighters	: No special measures are required.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Propane-1,2-diol	**AIHA WEEL (United States, 10/2011).** TWA: 10 mg/m³ 8 hours.
Reaction mass of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-Methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 8. Exposure controls/personal protection

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Viscous.]

Color : Brown/Red

Odor : Not available.

Odor threshold : Not available.

pH : 8 to 9

Melting point : Not available.

Boiling point : Not available.

Flash point : Not available.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.02

Solubility : Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : Not available.

Section 9. Physical and chemical properties

Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Not available.
VOC content	: 171.907 g/L

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Protect from freezing.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Propane-1,2-diol	LD50 Dermal LD50 Oral	Rabbit Rat	20800 mg/kg 20 g/kg	- -
Reaction mass of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-Methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	LD50 Oral	Rat	53 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Propane-1,2-diol	Eyes - Mild irritant Eyes - Mild irritant	Rabbit Rabbit	- -	24 hours 500 mg 100 mg	- -

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Section 11. Toxicological information

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Propane-1,2-diol	Acute EC50 >110 ppm Fresh water Acute LC50 1020000 µg/L Fresh water Acute LC50 710000 µg/L Fresh water	Daphnia - Daphnia magna Crustaceans - Ceriodaphnia dubia Fish - Pimephales promelas	48 hours 48 hours 96 hours

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Propane-1,2-diol	-1.07	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.

Section 14. Transport information

Additional information	-	-	-

AERG : Not applicable.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: Poly(oxy-1,2-ethanediyl), α-[4-(1,1,3,3-tetramethylbutyl)phenyl]-ω-hydroxy-; Poly(oxy-1,2-ethanediyl), α-[(1,1,3,3-tetramethylbutyl)phenyl]-ω-hydroxy-

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Commerce control list precursor: 2,2',2''-Nitrilotriethanol

United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 311: Propionic acid; Propylene oxide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

			SARA 302 TPQ		SARA 304 RQ	
Name	**%**	**EHS**	**(lbs)**	**(gallons)**	**(lbs)**	**(gallons)**
Hydrazine	<0.001	Yes.	1000	119.9	1	0.12
Ethylene oxide	<0.1	Yes.	1000	-	10	-
Propylene oxide	<0.1	Yes.	10000	1444.3	100	14.4

SARA 304 RQ : 3958105.4 lbs / 1796979.8 kg [465403.8 gal / 1761744.9 L]

SARA 311/312

Classification : Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Propane-1,2-diol	≥3 - ≤5	No.	No.	No.	Yes.	No.
Reaction mass of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-Methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	<0.06	No.	No.	No.	Yes.	No.

Section 15. Regulatory information

SARA 313

There is no data available.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : The following components are listed: Propane-1,2-diol

Pennsylvania : The following components are listed: Propane-1,2-diol

California Prop. 65

WARNING: This product contains less than 0.1% of a chemical known to the State of California to cause cancer.
WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Hydrazine	Yes.	No.	Yes.	No.
Ethanediol	No.	Yes.	No.	No.
1,4-Dioxane	Yes.	No.	Yes.	No.
Ethylene oxide	Yes.	Yes.	Yes.	Yes.
Propylene oxide	Yes.	No.	No.	No.

Section 16. Other information

Procedure used to derive the classification

Classification	Justification
SKIN SENSITIZATION - Category 1	Calculation method

History

Date of issue mm/dd/yyyy : 06/15/2016

Date of previous issue : 05/30/2014

Version : 2

Prepared by : KMK Regulatory Services Inc.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

APPENDIX B: Site-Specific Health and Safety Plan

CENTRAL
ENGINEERING SERVICES

SITE-SPECIFIC HEALTH AND SAFETY PLAN

PROJECT NO.:	DallasMill-1-02	**START DATE:**	TBD
PROJECT NAME:	Former Weyerhaeuser Dallas Mill	**EXPECTED DURATION:**	TBD
PROJECT ADDRESS, CITY, STATE:	1551 Southeast Lyle Street, Dallas, Oregon 97338	**CLIENT NAME:**	Dallas Mill Properties, LLC

(HASP expires 1 year from start date)

Fieldwork that Central Engineering Services (Central) employees perform is conducted under the Central health and safety program. The program and these plans provide the basis upon which safety decisions should be made by Central personnel to maintain a safe and healthy work environment.

A site-specific Health and Safety Plan (HASP) is created to serve as a tool by which information about a project can be communicated to employees prior to field activities. As allowed under 29 CFR 1910.120(b)(1)(ii)(C), this HASP supplements the Central health and safety program and does not repeat standard operating procedures for safety and health. The information contained in this HASP is site-specific and directly applicable to the proposed scope of work.

Due to the potentially hazardous nature of the site and the activities occurring thereon, it is not possible to discover, evaluate, or provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but does not eliminate, the potential for injury. The health and safety guidelines in this HASP are prepared specifically for this site and its known or suspected conditions, and the HASP must be amended if conditions change.

This HASP has been prepared for the use of Central and its employees. Central personnel working at the job site must review and be responsible for complying with and implementing the provisions in this HASP. Safety briefings at the job site should include discussion of the HASP and Central employees will sign Attachment 1.

PREPARED BY: Taylor Lee
Print name

REVIEWED BY:
Megan Masterson
Project Manager
Signature *Date*

APPROVED BY:

Dan Boileau
Health and Safety Coordinator
Signature *Date*

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1.0 CONTACT AND EMERGENCY INFORMATION

1.1 PROJECT CONTACTS

TITLE NAME	CONTACT INFORMATION	GENERAL PROJECT RESPONSIBILITIES
Site Health and Safety Officer Megan Masterson	Cell: (503) 784-8330	Implements HASP and conducts ongoing inspections of site conditions to identify visible or potential hazards. Initiates actions to mitigate or eliminate hazards. Provides health and safety support to other on-site personnel. Communicates regularly with project management team.
Project Manager Megan Masterson	Cell: (503) 784-8330	Ensures that field personnel have sufficient training and qualifications to perform tasks. Communicates with field team to confirm that identified health and safety protocols are implemented. Provides support for incidents, near misses, and other safety issues.
Health and Safety Coordinator Dan Boileau	Cell: (971) 440-0542	Reviews and approves HASP. Provides support in implementing HASP. Provides support for incidents, near misses, and other safety issues.
Client Contact Peter Cairns	Cell: (503) 586-9715	Provides 1) knowledge of known or suspected site hazards; 2) access to the site; 3) information regarding available emergency supplies or protocols at the site; and 4) known analytical data from work performed by others.

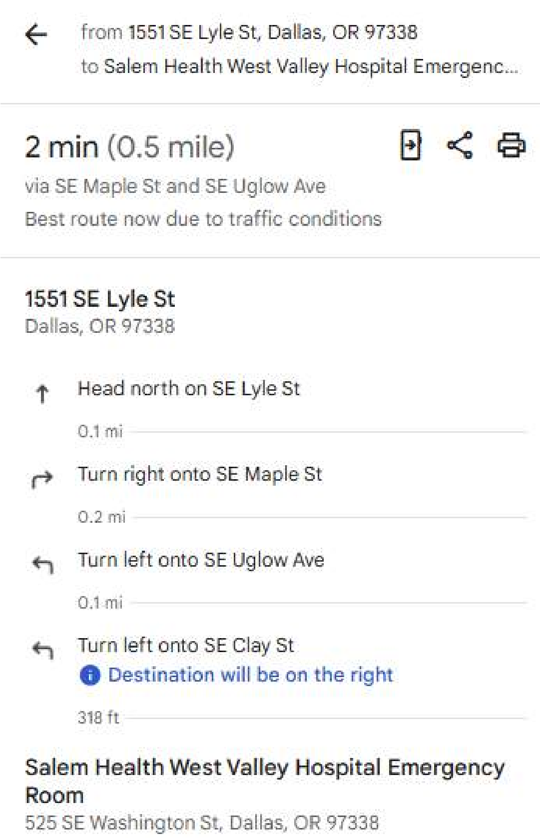
1.2 LOCAL EMERGENCY CONTACT TELEPHONE NUMBERS

EMERGENCY CONTACT	TELEPHONE NO.
Dallas Police Department	**Emergency:** **911** **Non-Emergency:** (503) 831–3516
Dallas Fire Department	**Emergency:** **911** **Non-Emergency:** (503) 831-3533

Poison Control Center .... (800) 222-1222
National Response Center .... (800) 424-8802
Utility Notification Center (Oregon) .... (811) or (800) 332-2344
Oregon Emergency Response System (spill reporting) .... (800) 452-0311

1.3 NEAREST HOSPITAL / EMERGENCY MEDICAL CENTER

Facility Name:	Salem Health West Valley Hospital Emergency Room
Street Address:	525 SE Washington Street
City, State:	Dallas, Oregon 97338
Phone No. :	(503)-623-8301


from 1551 SE Lyle St, Dallas, OR 97338
to Salem Health West Valley Hospital Emergenc...

2 min (0.5 mile)
via SE Maple St and SE Uglow Ave
Best route now due to traffic conditions

1551 SE Lyle St
Dallas, OR 97338

- ↑ Head north on SE Lyle St
  0.1 mi
- ↱ Turn right onto SE Maple St
  0.2 mi
- ↰ Turn left onto SE Uglow Ave
  0.1 mi
- ↰ Turn left onto SE Clay St
  Destination will be on the right
  318 ft

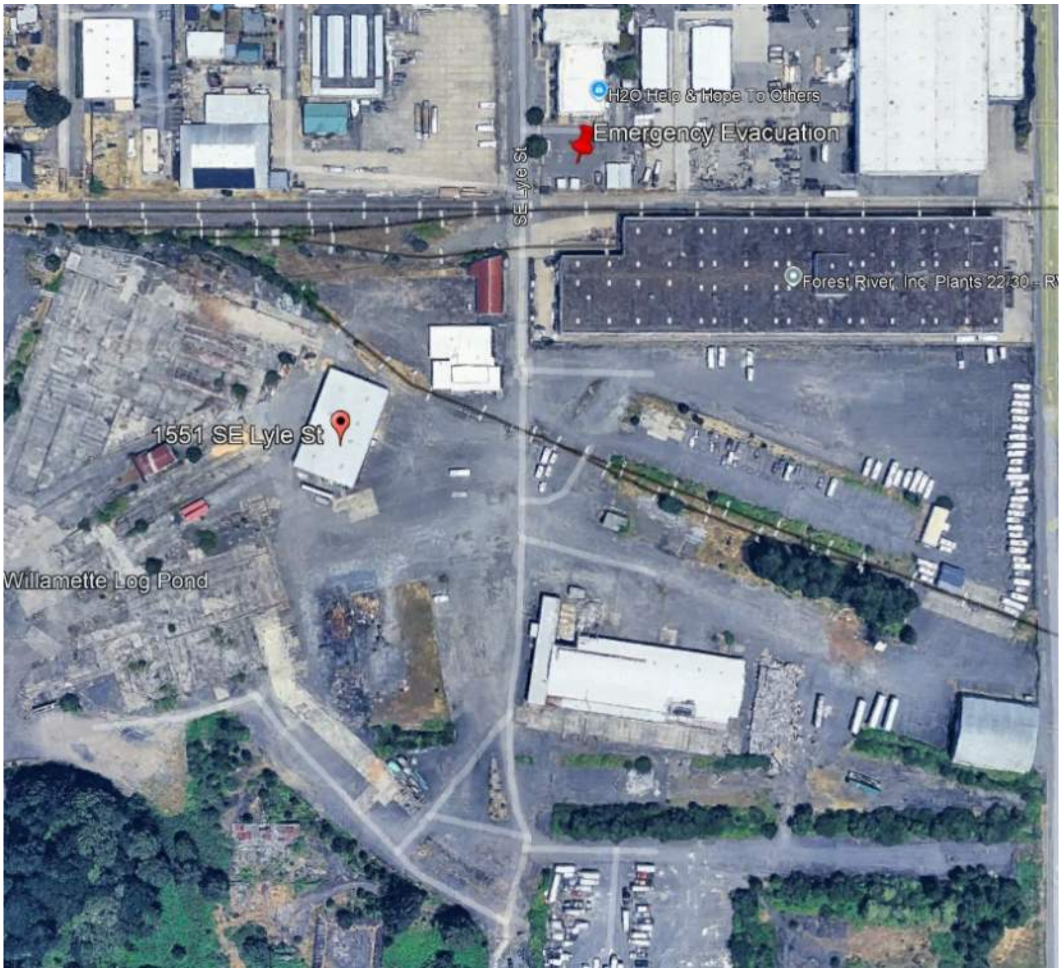
Salem Health West Valley Hospital Emergency Room
525 SE Washington St, Dallas, OR 97338

1.4 EMERGENCY RESPONSE AND EVACUATION PLAN

Central personnel and subcontractors working on the site are to be aware of site-specific emergency and evacuation procedures, including alarm systems and evacuation plans and routes. If an incident occurs that requires emergency response, such as a fire or spill, **CALL 911 and request assistance**. Central staff, subcontractors, and/or others working in an area where an emergency occurs are to evacuate to a safe location away from the incident area, preferably upwind, and take attendance. Central staff, subcontractors, and/or contractors may not reenter the scene of the emergency without specific approval from emergency response personnel.

Subcontractors have the responsibility to account for their own employees and provide requested information to emergency response personnel immediately upon request.

For this project, the emergency evacuation gathering location is in the parking lot of H2O Help & Hope to Others, northeast of the Site (on SE Lyle Street), as marked by the red pin on the figure below.



If the emergency causes the route to be obstructed, Central personnel and subcontractors are to move to an open area upwind of the hazard area, and remain there until instructed by emergency response personnel (e.g., police, fire, ambulance personnel, paramedics) to do otherwise.

2.0 PROJECT INFORMATION

2.1 SITE LOCATION AND CURRENT USE

The Former Weyerhaeuser Dallas Mill property is located at 1551 Southeast Lyle Street, Dallas, Oregon, southeast of the intersection of Main Street and Southwest Birch Street (herein referred to as the Site). Land use in the vicinity of the Site generally consists of commercial businesses, parking, residential housing, undeveloped land, and agricultural land. The property north-adjoining the Site is a railroad, and commercial businesses and residential housing beyond. East-adjoining the Site includes Southeast Uglow Avenue, and beyond includes commercial businesses, equipment storage, residential housing, and undeveloped land. South-adjoining the Site includes undeveloped land, residential housing, and beyond includes agricultural lands. West-adjoining the Site includes South Main Street, and beyond includes commercial businesses, vehicle storage and/or parking, residential housing, and undeveloped land. Currently, the Site consists of vacant buildings and demolished historical mill buildings, which include the former sawmill and former plywood buildings, a former log pond, historical railroad tracks, and more. The North Fork of Ash Creek flows through a culvert and across the Site from west to east.

2.2 SITE HISTORY

The Site historically operated as a sawmill and related operations between at least 1906 until 2009. Prior to closure, the Site manufactured rough and finished lumber, and related activities to include the storage and handling of logs, anti-sapstain surface treatment of lumber, management of production equipment, and more.

To date, subsurface investigations and groundwater monitoring have verified the presence of diesel, oil, and gasoline hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs) in soil and groundwater at the Site. Based on the results of the subsurface investigation, the Site was enrolled into the Oregon Department of Environmental Quality (DEQ) Voluntary Cleanup Program (VCP) in August 2024.

2.3 SCOPE OF WORK

Central's role in the next phase of work is to perform an environmental evaluation for the Site. In general, Central will perform the following field activities:

- Advance sixteen borings (CESB-01 to CESB-16) to a depths ranging between 1 and 20 feet below ground surface (bgs).
- Collect surface and subsurface soil, shallow sediment, soil gas, and reconnaissance groundwater samples.

3.0 JOB HAZARD ANALYSIS

A job hazard analysis (JHA) is a formal process that helps identify the most hazardous tasks at a job site, determine what the hazards and potential consequences of these tasks are, and develop corrective and preventative measures to eliminate or reduce the likelihood of accidents, injuries, and illnesses. A hazard is anything in the workplace that has the potential to cause harm to workers. JHAs should consider physical, chemical, biological, radiological, and other hazards that may be present. Conducting regular JHAs will help reduce worker injuries, illnesses, and unsafe work practices.

3.1 TASK-SPECIFIC HAZARDS

Many of the activities that Central personnel perform at job sites are routine in nature with well-known hazards. Central has prepared JHAs for common activities to support evaluation of site-specific hazards. All Central field work will be performed in accordance with the Standard Job Site Protocols found in Attachment 2.

Additionally, when checked below, the applicable JHAs must be included in Attachment 3 and will be reviewed with Site personnel prior to conducting field work:

Investigation Activities

☐ Environmental drilling with soil sampling
☐ Groundwater sampling – reconnaissance and monitoring wells
☐ Excavation activities
☐ Soil gas and subslab soil gas sampling
☐ Soil sampling with hand tools (no drilling)
☐ Other: Stormwater runoff sampling

Cleanup Activities

☐ Underground storage tank decommissioning
☐ Excavation/construction observation
☐ Remediation systems installation, pilot tests, and operation and maintenance
☐ Remedial injections
☐ Other:

3.2 SITE- OR PROJECT-SPECIFIC HAZARDS

Central has not identified Site- and/or project-specific hazard(s) other than hazards inherent in the work to be performed and described below.

4.0 SITE CONTAMINANTS AND MONITORING REQUIREMENTS

4.1 SITE CONTAMINANTS

The following chemicals or compounds ("Site contaminants") may be present at the Site due to current Site activities or the presence of known or suspected contamination and may pose a risk to workers during performance of the scope of work:

- Total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO);
- PAHs;
- Metals;
- Volatile organic compounds (VOCs);
- Dioxins/furans (D/F);
- Pentachlorophenol (penta);
- Polychlorinated biphenyls (PCBs); and
- Organochlorine pesticides and herbicides.

The table included in Attachment 4 provides health-based and air monitoring information for a variety of contaminants. This table should be reviewed for the identified Site contaminants prior to the start of work and any questions directed to the Site Health and Safety Officer.

4.2 MONITORING REQUIREMENTS

Based on the potential presence of the Site contaminants, the following monitoring protocols will be implemented.

4.2.1 Air Monitoring – Volatile Organic Vapors

As identified in Section 4.1, volatile organic vapors may be present in the breathing zone of Central personnel during field activities, which should be evaluated through air monitoring. Air monitoring equipment will consist of the following:

☒ Photoionization detector (PID)

☐ Colorimetric Detector Tubes; type (fill-in): ____

☐ Air monitoring not required: As applicable, justification for no air monitoring at the project site: ____

The following table provides general protocols for conducting air monitoring in the breathing zone for Central personnel.

Period when monitoring is required	The duration of field activities that can generate and/or sustain volatile organic vapors in the breathing zone of Central personnel.
Monitoring Frequency and Location	Sampling should be continuous during the project while disturbing potentially contaminated soil, uncovering and/or removing tanks and piping, drilling, or managing other contaminated media such as groundwater or soil gas. Breathing zone: take measurements at least every 15 minutes. Exclusion zone boundaries: take measurements every 30 minutes. When collecting soil and groundwater samples, take measurements continuously.
Action Levels if using PID only	10 parts per million (ppm) in breathing zone, sustained for at least 2 minutes: Stop work (including shutting down equipment if warranted), step away from zone for 15 minutes, and then take new readings. If PID measurements remain sustained at 10 ppm or greater, contact the project manager to discuss how to proceed.
Action Levels if using PID and colorimetric detector tubes	10 ppm in breathing zone, sustained for at least 2 minutes: collect a colorimetric detector tube for appropriate contaminant of concern (typically benzene or vinyl chloride are used as indicator chemicals). Stop work if tube indicates > 1 ppm for benzene or vinyl chloride and contact the project manager to discuss how to proceed. Stop work if PID reaches or exceeds 50 ppm above background in breathing zone and there is no discoloration of colorimetric detector tubes.
Respirator Use	If the air monitoring results suggest that the use of respirators is warranted to mitigate hazardous levels of volatile organic vapors in breathing zones, the project manager is responsible for updating this HASP to confirm the type of respirator cartridge, rest intervals, decontamination procedures, and other applicable topics. The use of respirators must be coordinated with Central's medical monitoring program and include yearly respirator fit testing.

Logs for recording air monitoring measurements and air monitoring equipment calibration are found in Attachment 5.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment (PPE) is selected based on the contaminant type(s), concentration(s) in applicable matrix (soil, water, air) and the known route(s) of entry into the human body. Project personnel are not permitted to use lower levels of protection from the specified levels of protection without the prior approval of the Site Health and Safety Officer.

PPE Level:	Modified Level D
Safety Boots:	Required
Hard Hat:	Required when working around heavy equipment or locations where there is risk for head injury
Safety Vest:	Required when personal visibility is necessary
Safety Glasses:	Required
Hearing Protection:	Required when working around loud equipment
Gloves:	Nitrile gloves are used during contact with potentially contaminated media and surfaces
Additional Site-Specific/Client-Requirements:	N/A
Level C PPE (respirator and chemical-resistant clothing):	Not required for this project. If air monitoring readings exceed action levels, this HASP must be modified to reflect requirements for proceeding under more protective PPE.

6.0 UTILITIES

When conducting subsurface or ground disturbing activities, such as drilling or excavation, Central project tasks include overseeing subsurface surveys for underground utilities and structures. This is accomplished by filing a public utility notification request and by hiring a private utility locate service. When Central files the public utility notification, this alerts the underground utilities owners to mark the facilities on public property as required by law. Owners of underground utilities are **not required** to mark existing service laterals or utilities installed by the property owner. Therefore, private utility locate services must be hired to scan for service laterals and other buried utilities (e.g., on-Site electric distribution lines, irrigation pipes) on private property.

Public utility notification can be filed as early as 14 days prior to conducting the work, and typically is required to be filed at least 2 business days before the field work will occur (varies by state).

Please provide the following information:

Public Utility Notification Ticket No.: TBD

Date that **private** utility locate will be performed: TBD

A copy of the public utility notification ticket should be included with paperwork kept on the Site during field activities.

Before starting work, identify and discuss the locations of utility and product line shutoff valves and switches on the job site with other field personnel.

6.1 INVESTIGATION LOCATIONS AND UTILITIES

Central's project team should identify suitable location(s) of borings and other subsurface work through a thorough review of available construction drawings and known utilities, tanks, product lines, and other known or suspected subsurface obstructions.

7.0 INCIDENTS

Central employees are required to report any injury sustained while performing project work or work-related illness to the Project Manager, their Report-To, regardless of the seriousness of the incident. The employee will complete an Incident Report form to report the incident, provided in Attachment 6.

8.0 SITE CONTROLS

8.1 WORK ZONE CONTROL

Central personnel will secure and mark work zones so that the zones are visible to site occupants and visitors and are accessible only to personnel scheduled to be in the work zone. This is intended to prevent undesirable interface between pedestrian traffic and project workers and equipment. Devices to secure zones may include:

- Cones;
- Tubular markers; and
- Barricade tape.

If site conditions, such as hazardous levels of Site contaminants, warrant separate work zones, this HASP must be modified to identify Exclusion (Hot), Contamination Reduction (Warm), and Support (Cold) Zones. Modifications must include decontamination procedures for personnel and equipment.

8.2 TRAFFIC CONTROL

The need for traffic control is not anticipated during field events at the Site. However, if work needs to be conducted in areas in or near parking lots and private roadways/lanes, Central will implement a traffic control plan. In this case, control/warning devices will be placed around the work area as needed to prevent undesirable interface between pedestrian and automotive traffic and project workers and equipment. These devices may include:

- Cones;
- Tubular markers (construction candles);
- Barricades;
- Temporary fencing; and
- Barricade tape.

The traffic control/warning devices will be placed around the work in such a way that traffic access is inhibited (i.e., place cones less than 8 feet apart so cars cannot easily drive through work area without moving a cone). Barricade tape or temporary fencing will be used to inhibit access to the work area in locations where pedestrians will be encountered.

Project work will require Central personnel or subcontractors to enter public rights-of-way, including sidewalks and alleys. When work is to be performed in these areas, traffic control will be implemented. If needed, a Traffic Control Plan will be prepared prior to conducing field work.

8.3 DECONTAMINATION

Central personnel are directed to conduct fieldwork in a manner that minimizes employee contact with hazardous substances or with equipment that has contacted hazardous substances. Typical site decontamination procedures include the use of Alconox or a similar product to clean field equipment prior to and following use at a job site. Central personnel use disposable gloves to minimize cross contamination between sample locations.

9.0 ADDITIONAL ELEMENTS

Information contained in this section is required under OSHA HAZWOPER rule 29 CFR 1910.120.

9.1 EMPLOYEE TRAINING

Central maintains an employee training program for safety-related topics. Employees will be assigned to perform project tasks for which they have been provided training. Employees are encouraged and empowered to speak up if they believe they need training or additional instruction in order to safely perform a task.

Central employees who perform field work at sites that may fall within the definition of 29 CFR 1910.120 will receive training that will include:

- Names of personnel and alternates responsible for Site safety and health;
- Safety, health, and other hazards present on the Site;
- Use of PPE;
- Work practices by which the employee can minimize risks from hazards;
- Safe use of engineering controls and equipment on the Site;
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate overexposure to hazards; and
- Instruction on how to review and implement the Site-specific HASP.

Additional safety training is provided in many venues, including:

- New-hire orientation;
- Annual safety training;
- Project-specific instruction;
- Safety moments during staff meetings; and
- Tailgate safety briefings.

9.2 MEDICAL SURVEILLANCE

Central conducts a medical surveillance program for employees engaged in hazardous waste field operations. The following employees (at a minimum) are covered by the medical surveillance program:

- Employees who are or may be exposed to hazardous substances or health hazards at or above an OSHA Permissible Exposure Level (PEL), or above the published exposure levels for a substance for which there is no PEL, without regard to respirator use, for 30 days or more per year;

- Employees who wear a respirator for 30 days or more per year, or as required by state-specific rules; and
- Employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from a hazardous waste operation.

9.3 CONFINED SPACE ENTRY

A confined space is defined as a space meeting all of the following criteria:

- The space is large enough and arranged so as to allow an employee to fully enter the space and conduct work;
- The space has limited or restricted entry or exit (e.g., tanks, vessels, silos, storage bins, hoppers, vaults, excavations, pits); and
- The space is not designed primarily for human occupancy.

Central personnel occasionally encounter confined-space entry conditions when performing environmental media sample collection from excavations, or when performing in-place underground storage tank closure work. In such situations, the work must be conducted in accordance with Central’s Confined-Space Entry Program, which requires specialized training for employees performing such work.

9.4 DRUM/CONTAINER HANDLING AND SPILL CONTAINMENT

It is Central’s policy to minimize the number of situations in which employees could come into contact with drums or containers that may contain unknown chemicals or substances. Typical situations in which Central field personnel handle drums are waste-handling procedures following boring or monitoring well installation and sampling activities. Soil cuttings, monitoring well purge and development water, and equipment decontamination water typically are placed into drums pending disposal. In these instances, the contaminants and the range of potential concentrations typically are known. The Site-specific HASP, Work Plan, Sampling and Analysis Plan, or Waste Management Plan should present specific procedures for sampling the contents of the drums or containers. In instances where drums or containers having unknown contents are discovered at a site, Central typically hires a subcontractor with expertise in sampling and characterizing drum and container contents.

9.5 WORKPLACE VIOLENCE

Central is committed to providing employees with a safe work environment and does not tolerate any type of workplace violence committed by or against employees or other personnel at a site. Workplace violence is any act or threat of physical violence, harassment, intimidation, or other threatening disruptive behavior that occurs at the work site. It ranges from verbal abuse to physical assaults and even homicide.

If a Central employee feels threatened or unsafe at a project site, the employee should remove themselves from the situation and notify the project manager immediately. Employees who experience actual or threatened violent behavior should immediately report it to the appropriate authorities.

In the event of an active shooter situation, employees are encouraged to follow guidelines provided by the U.S. Department of Homeland Security.

Active Shooter Guidance

1. Run	2. Hide	3. Fight
• Have an escape route and plan in mind. • Leave your belongings behind. • Keep your hands visible.	• Hide in an area out of the active shooter's view. • Block entry to your hiding place and lock the doors.	• As a last resort and only when your life is in imminent danger. • Attempt to incapacitate the active shooter. • Act with physical aggression and throw items at the active shooter.
CALL 911 WHEN IT IS SAFE TO DO SO		

10.0 LIMITATIONS

This Health and Safety Plan has been prepared by and for the sole use of Central and its employees. Use of the information or protocols contained herein by any individual or entity other than the intended user is at the sole risk of that individual or entity. Entities and individuals other than Central and its employees must rely on their own safety programs and Health and Safety Plans. Laws, regulations, and standards pertaining to the information or protocols contained in this Health and Safety Plan may differ for other states or localities and other types of work. Any individuals or entities other than the intended users who consult this Health and Safety Plan are encouraged to independently review the pertinent laws, regulations, and standards. Under no circumstances shall Central, its officers, or employees be liable for any consequential, indirect, special, incidental, or punitive damages arising out of or related to the use of this Health and Safety Plan by anyone other than its intended user(s).

ATTACHMENT 1

Health and Safety Plan Acknowledgement and Agreement Form

HEALTH AND SAFETY PLAN ACKNOWLEDGMENT AND AGREEMENT FORM

(All Central and subcontractor personnel must sign this form prior to commencing work)

Central Employees: In signing this document, you indicate that you have reviewed the contents of this HASP and will work to implement and comply with the requirements in the HASP.

Central Subcontractors and others on the site: In signing this document, you indicate acknowledgement that:

- Non-Central personnel are expected to develop and work under their own safety program.
- The Central HASP provides general information about potential hazards at the job site but does NOT provide information pertaining to all of the hazards that a contractor's employees may be exposed to as a result of their work.
- You are required to coordinate activities and practices with the project Site Health and Safety Officer (SHSO).
- You are required to inform Central of any hazards you are aware of or that your work on the site might possibly pose to Central employees.
- You can be prohibited by the SHSO or other Central personnel from working on this project for unsafe work practices or failure to comply with Central jobsite requirements.

SHSO	Company Name	Name (Print)	Signature	Date

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SHSO	Company Name	Name (Print)	Signature	Date

ATTACHMENT 2

Standard Job Site Protocols

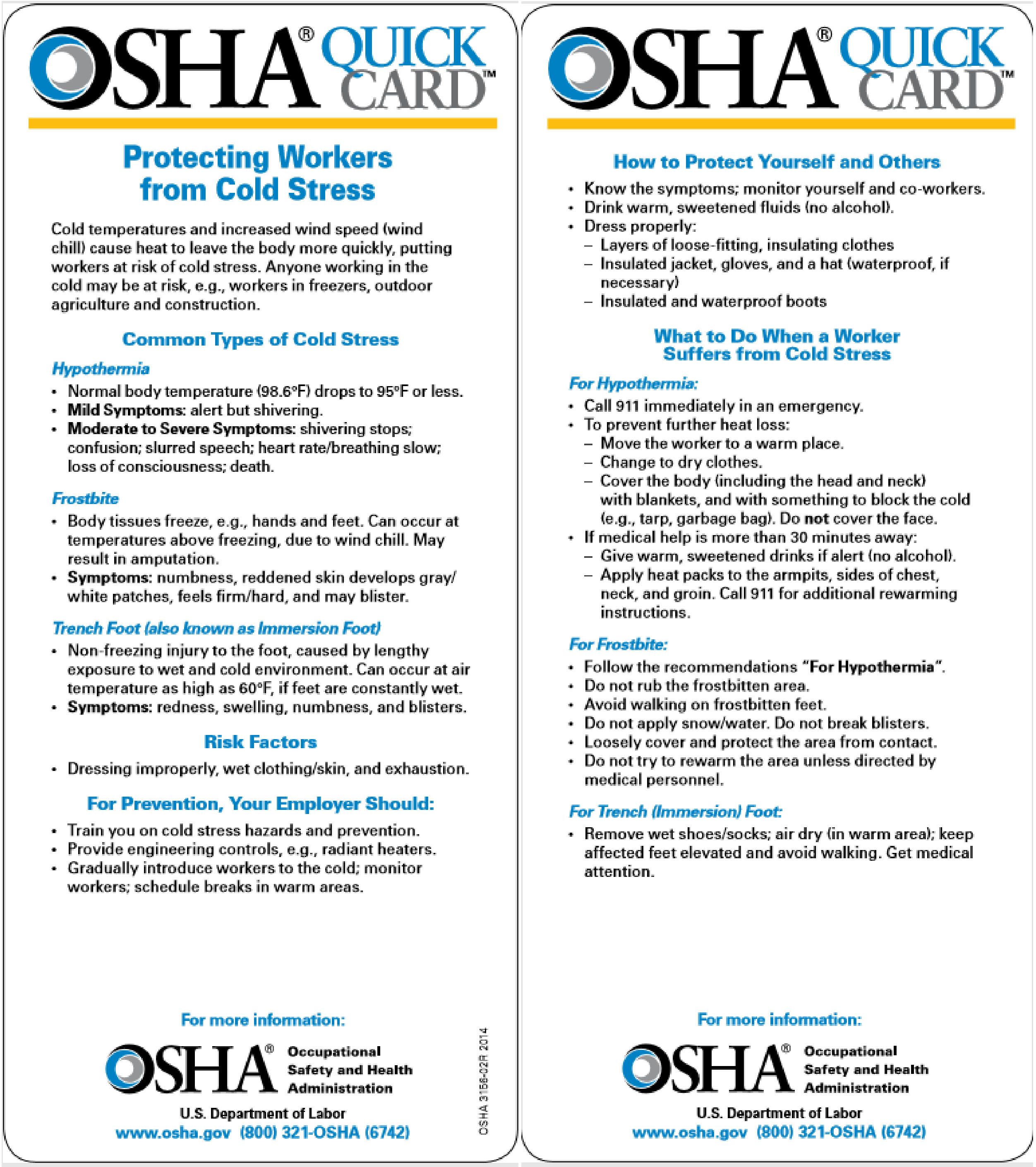
Job Hazard Analysis – Standard Job Site Protocols
Issued September 23, 2020

Central developed this Job Hazard Analysis to address typical hazards associated with performing field work. Central expects each employee to be safety-focused and to consider safety the top priority when working at a job site.

Safety Briefing	A safety briefing will be held at the job site at the beginning of each day and documented in field notes. On multiple-day projects on the same job site, a safety briefing is required each day.

The following hazards may be present at any type of Central job site:

Potential Hazards	Preventive Measures
Inclement weather (e.g., hard rain, snow, ice, high winds, electrical storms, extreme temperatures)	• Check weather reports daily. Evaluate appropriateness of proceeding with field work during inclement weather. • Before driving, be sure that all windows of vehicles are clear of snow and other debris or obstructions. • Drive at the speed limit or less, as needed, to keep a safe distance from any vehicles ahead. Allow enough space between vehicles for braking and slowing. • Stop work and shut down the job site if high winds, lightning, or other adverse weather conditions may pose a risk to site workers.
Exposure to chemicals and contaminants	• Wash hands before eating, drinking, using tobacco products, or otherwise touching one's face. • Before beginning the project, evaluate whether it is safe to wear contact lenses. Most hazards related to eye protection require personal protective equipment upgrades regardless of contact lens use. • Before conducting field work, evaluate whether respirators may be used, to determine whether facial hair may need to be removed so it does not interfere with proper respirator fit.
Cold stress	• See page 2 for OSHA Quick Card.
Heat stress	• See page 3 for OSHA Quick Card.
Lone worker	• During HASP preparation, evaluate risks of working alone at a job site. Implement measures to mitigate risks. • Use the buddy system or re-evaluate tasks if the threat of personal harm cannot be mitigated. • Carry a cell phone or radio on person at all times. • Carry a whistle or other noise-making device if necessary. • In remote areas, carry a GPS-enabled beacon (set up reporting in office prior to field work). • Know the route to the closest hospital.
Plants and insects	• Be aware of poisonous plants. • Apply insect repellant. • Carry first-aid ointment or barrier cream. • Do not wear cologne or other scented products. • Avoid eating in areas where bees or wasps are located.



OSHA® QUICK CARD™

Protecting Workers from Cold Stress

Cold temperatures and increased wind speed (wind chill) cause heat to leave the body more quickly, putting workers at risk of cold stress. Anyone working in the cold may be at risk, e.g., workers in freezers, outdoor agriculture and construction.

Common Types of Cold Stress

Hypothermia

- Normal body temperature (98.6°F) drops to 95°F or less.
- **Mild Symptoms:** alert but shivering.
- **Moderate to Severe Symptoms:** shivering stops; confusion; slurred speech; heart rate/breathing slow; loss of consciousness; death.

Frostbite

- Body tissues freeze, e.g., hands and feet. Can occur at temperatures above freezing, due to wind chill. May result in amputation.
- **Symptoms:** numbness, reddened skin develops gray/white patches, feels firm/hard, and may blister.

Trench Foot (also known as Immersion Foot)

- Non-freezing injury to the foot, caused by lengthy exposure to wet and cold environment. Can occur at air temperature as high as 60°F, if feet are constantly wet.
- **Symptoms:** redness, swelling, numbness, and blisters.

Risk Factors

- Dressing improperly, wet clothing/skin, and exhaustion.

For Prevention, Your Employer Should:

- Train you on cold stress hazards and prevention.
- Provide engineering controls, e.g., radiant heaters.
- Gradually introduce workers to the cold; monitor workers; schedule breaks in warm areas.

For more information:

OSHA® Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

OSHA 3156-02R 2014

OSHA® QUICK CARD™

How to Protect Yourself and Others

- Know the symptoms; monitor yourself and co-workers.
- Drink warm, sweetened fluids (no alcohol).
- Dress properly:
  - Layers of loose-fitting, insulating clothes
  - Insulated jacket, gloves, and a hat (waterproof, if necessary)
  - Insulated and waterproof boots

What to Do When a Worker Suffers from Cold Stress

For Hypothermia:

- Call 911 immediately in an emergency.
- To prevent further heat loss:
  - Move the worker to a warm place.
  - Change to dry clothes.
  - Cover the body (including the head and neck) with blankets, and with something to block the cold (e.g., tarp, garbage bag). Do **not** cover the face.
- If medical help is more than 30 minutes away:
  - Give warm, sweetened drinks if alert (no alcohol).
  - Apply heat packs to the armpits, sides of chest, neck, and groin. Call 911 for additional rewarming instructions.

For Frostbite:

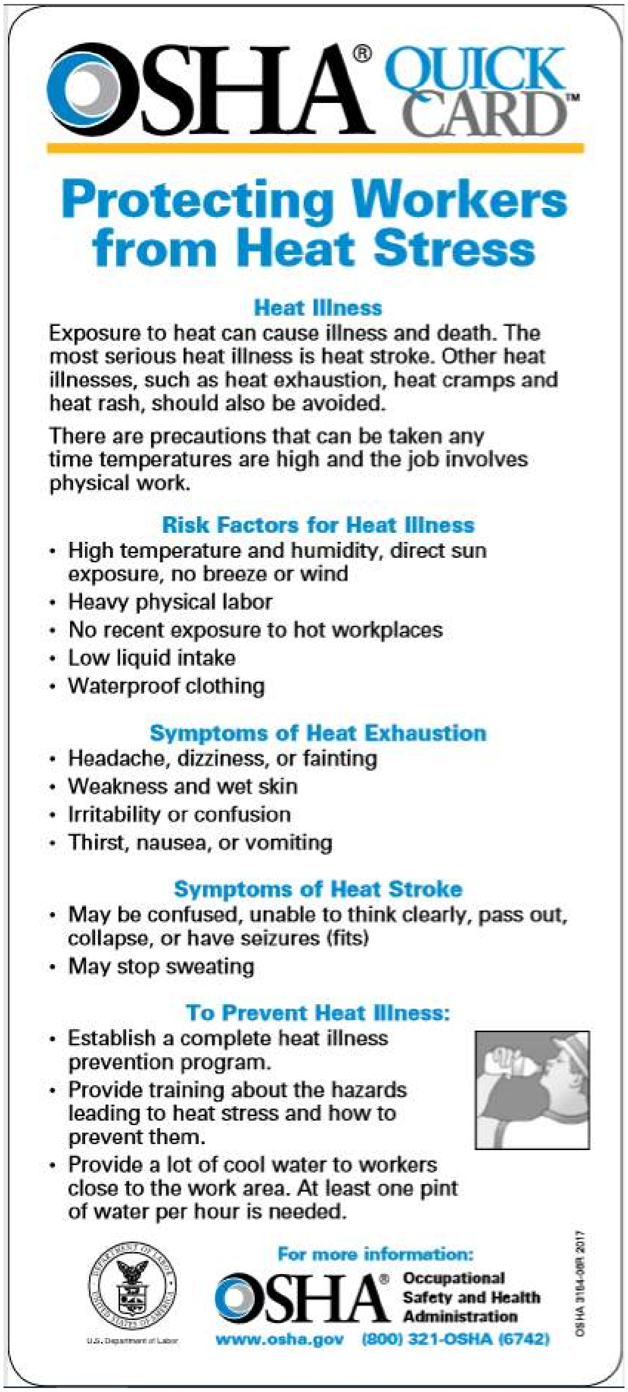
- Follow the recommendations "**For Hypothermia**".
- Do not rub the frostbitten area.
- Avoid walking on frostbitten feet.
- Do not apply snow/water. Do not break blisters.
- Loosely cover and protect the area from contact.
- Do not try to rewarm the area unless directed by medical personnel.

For Trench (Immersion) Foot:

- Remove wet shoes/socks; air dry (in warm area); keep affected feet elevated and avoid walking. Get medical attention.

For more information:

OSHA® Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)



OSHA® QUICK CARD™

Protecting Workers from Heat Stress

Heat Illness

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided.

There are precautions that can be taken any time temperatures are high and the job involves physical work.

Risk Factors for Heat Illness

- High temperature and humidity, direct sun exposure, no breeze or wind
- Heavy physical labor
- No recent exposure to hot workplaces
- Low liquid intake
- Waterproof clothing

Symptoms of Heat Exhaustion

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

Symptoms of Heat Stroke

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
- May stop sweating

To Prevent Heat Illness:

- Establish a complete heat illness prevention program.
- Provide training about the hazards leading to heat stress and how to prevent them.
- Provide a lot of cool water to workers close to the work area. At least one pint of water per hour is needed.

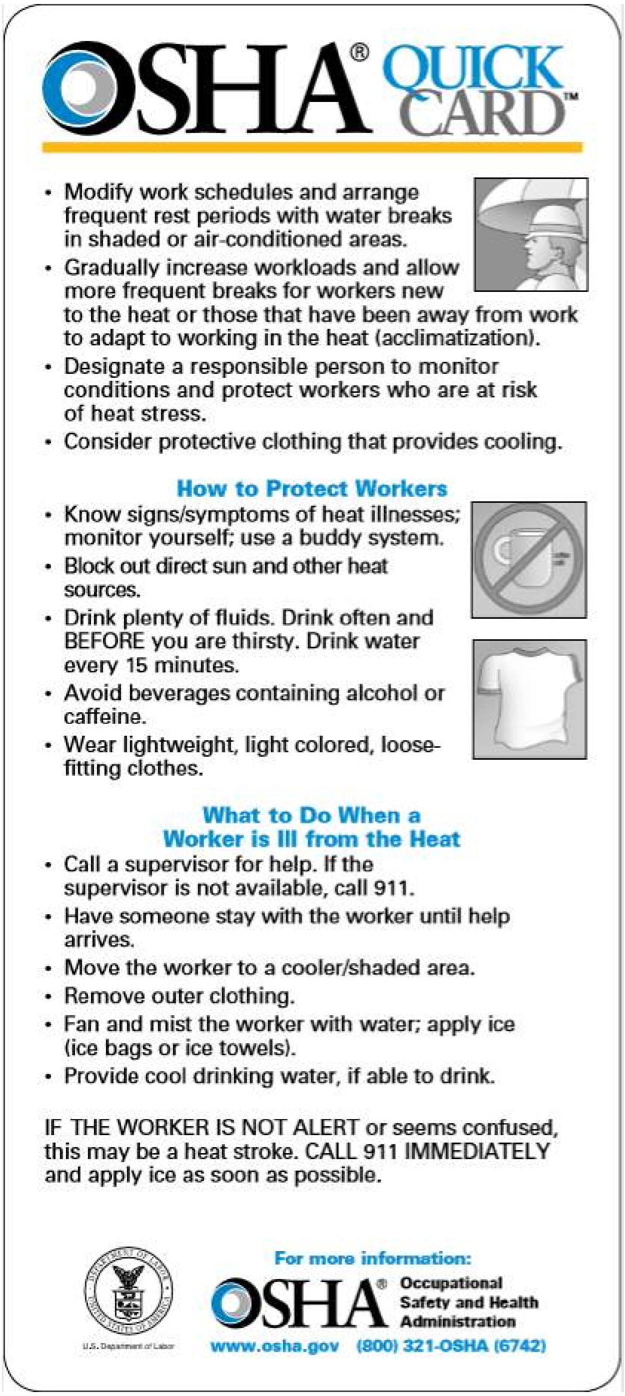
For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3154-06R 2017



OSHA® QUICK CARD™

- Modify work schedules and arrange frequent rest periods with water breaks in shaded or air-conditioned areas.
- Gradually increase workloads and allow more frequent breaks for workers new to the heat or those that have been away from work to adapt to working in the heat (acclimatization).
- Designate a responsible person to monitor conditions and protect workers who are at risk of heat stress.
- Consider protective clothing that provides cooling.

How to Protect Workers

- Know signs/symptoms of heat illnesses; monitor yourself; use a buddy system.
- Block out direct sun and other heat sources.
- Drink plenty of fluids. Drink often and BEFORE you are thirsty. Drink water every 15 minutes.
- Avoid beverages containing alcohol or caffeine.
- Wear lightweight, light colored, loose-fitting clothes.

What to Do When a Worker is Ill from the Heat

- Call a supervisor for help. If the supervisor is not available, call 911.
- Have someone stay with the worker until help arrives.
- Move the worker to a cooler/shaded area.
- Remove outer clothing.
- Fan and mist the worker with water; apply ice (ice bags or ice towels).
- Provide cool drinking water, if able to drink.

IF THE WORKER IS NOT ALERT or seems confused, this may be a heat stroke. CALL 911 IMMEDIATELY and apply ice as soon as possible.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

ATTACHMENT 3

Task-Specific Job Hazard Analyses

ATTACHMENT 4

Health-Based and Monitoring Information for Potential Site Contaminants

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Central job sites may contain one or more of the chemicals or compounds provided in the following table. These substances may be present due to historical site use, current Site activities, or the presence of contamination from unknown sources. This table should be reviewed prior to the start of work and questions directed to the Site Health and Safety Officer. Air monitoring may be required at a Site based on the scope of work for the project. Refer to the site-specific Health and Safety Plan to determine whether air or personnel monitoring will be required for the scope of work.

Chemical (or Class)	**OSHA PEL ACGIH TLV**	**Other Pertinent Limits**	**Properties**	**Routes of Exposure or Irritation**	**Acute Health Effects**	**Chronic Health Effects/ Target Organs**
Petroleum Compounds and Petroleum Additives						
Benzene	PEL – 1 ppm TLV – 0.5 ppm (skin)	PEL STEL – 5 ppm IDLH – 500 ppm	Characteristic benzene odor.	Inhalation; dermal; ingestion; eye contact.	Skin (dermatitis); eye, respiratory tract irritant; headache; dizziness; nausea.	Carcinogen; CNS; eye damage; bone marrow; blood; skin; leukemia.
Coal tar pitch volatiles (aka polycyclic aromatic hydrocarbons pyrene, phenanthrene, chrysene, anthracene, and benzo[a]pyrene)	PEL – 0.2 mg/m^3	NIOSH REL – 0.1 mg/m^3 (cyclohexane-extractable fraction) IDLH – 80 mg/m^3	Black or dark-brown amorphous residue.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, skin; nose, throat irritation that may cause difficulty breathing.	Skin and lung cancer; damage to the reproductive system; thickening and darkening of the skin.
Ethylbenzene	PEL – 100 ppm TLV – 100 ppm	PEL STEL – 125 ppm TLV STEL – 125 ppm NIOSH REL – 100 ppm REL STEL – 125 ppm IDLH – 800 ppm	Pungent, aromatic odor.	Inhalation; dermal; ingestion; eye contact.	Skin, eye, mucous membrane irritant; headache; dizziness; drowsiness.	Eyes; respiratory tract; skin; CNS; blood; kidneys; liver.
2-Methylnaphthalene	Not established. 2-Methylnaphthalene is part of the naphthalenes family, but is not considered as hazardous as naphthalene. Limits for naphthalene should be used as a conservative approach.		Normally crystalline.	Inhalation; dermal; ingestion; eye contact.	Intoxication is most common following ingestion, but can occur after dermal or inhalation exposure. Eye irritant; conjunctivitis; superficial injury to cornea; diminished visual acuity; dermatitis; hypersensitivity; nausea and vomiting; skin irritation; headache; vomiting; fever; photosensitization; restlessness; lethargy; acute renal failure possible.	Anorexia; hemolysis; methemoglobinemia; hyperkalemia; anemia; cataracts. Seizures, coma may develop in severe intoxications.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
Methyl tertiary-butyl ether (MTBE)	No PEL established. TLV – 40 ppm	AIHA WEEL – 100 ppm	Flammable liquid with a distinctive, disagreeable odor.	Inhalation; dermal; ingestion.	Irritated nose, throat; headache; dizziness; nausea; sleepiness.	CNS, liver, kidney, gastrointestinal damage; potential carcinogen.
Naphthalene	PEL – 10 ppm TLV – 10 ppm	TLV STEL – 15 ppm NIOSH REL – 10 ppm REL STEL – 15 ppm IDLH – 250 ppm	Mothball-like odor.	Inhalation; dermal; ingestion; eye contact.	Skin, eye, mucous membrane irritant, nausea.	Eyes, blood, skin, liver, kidney, RBC, CNS.
Toluene	PEL – 200 ppm TLV – 50 ppm	NIOSH REL – 100 ppm TWA; 150 ppm STEL ILDH – 500 ppm	Sweet, pungent, benzene-like odor.	Eye contact.	Skin (dermatitis); eye, respiratory tract irritant; headache; dizziness; weakness; fatigue.	CNS; liver; kidneys; skin.
Xylenes	PEL – 100 ppm TLV – 100 ppm	TLV STEL – 500 ppm NIOSH REL – 100 ppm NIOSH REL STEL – 100 ppm IDLH – 900 ppm	Aromatic odor.	Inhalation; dermal; ingestion; eye contact.	Throat, skin irritant (dermatitis); headache; nausea; drowsiness; fatigue.	CNS, liver, kidneys, skin, gastrointestinal damage; eye damage.
Chlorinated Volatile Organic Compounds						
Carbon Tetrachloride	PEL – 10 ppm C – 25 ppm TLV – 5 ppm	IDLH – 300 ppm	Colorless liquid with a characteristic ether-like odor.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation to eyes and skin; CNS depression; nausea, vomiting; liver and kidney injury; drowsiness, dizziness, incoordination.	Cancerous – liver. Liver and/or kidney damage. CNS, eyes, lungs, liver, kidneys, skin.
Chloroethane	PEL – 1,000 ppm TLV – 1,000 ppm	IDLH – 3,800 ppm	Colorless gas or liquid (below 54°F) with a pungent, ether-like odor.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Incoordination, inebriation, abdominal cramps.	Cardiac arrhythmias, cardiac arrest, liver and/or kidney damage. Liver, kidneys, respiratory system, CVS, CNS.
Chloroform	PEL – 2 ppm C – 50 ppm TLV – 10 ppm	IDLH – 500 ppm	Colorless liquid with a pleasant odor.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation to eyes and skin, dizziness, mental dullness, nausea, confusion, headache, lassitude, anesthesia.	Cancerous – liver and kidneys. Anesthesia, damage to liver, damage to kidneys. Liver, kidneys, heart, eyes, skin, CNS.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
1,4-Dichlorobenzene	PEL – 75 ppm (450 mg/m^3) TLV – 10 ppm	IDLH – 1,000 ppm	Colorless or white crystalline solid with a mothball-like odor. Reacts to strong oxidizers.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Eye irritation, swelling periorbital, profuse rhinitis, headache, anorexia, nausea, vomiting, weight loss, jaundice, cirrhosis.	Cancerous – liver and kidney. Liver and/or kidney damage. Liver, respiratory system, eyes, kidneys, and skin.
Dichlorodifluoromethane	PEL – 1,000 ppm TLV – 1,000 ppm	IDLH – 15,000 ppm	Colorless gas with an ether-like odor at extremely high concentrations.	Inhalation, skin and/or eye contact.	Dizziness, tremor, asphyxia, unconsciousness, cardiac arrhythmias, cardiac arrest, frostbite.	CVS, peripheral nervous system.
1,1-Dichloroethane	PEL – 100 ppm (400 mg/m^3) TLV – 100 ppm	IDLH – 3,000 ppm	Colorless, oily liquid with a chloroform-like odor.	Inhalation, ingestion, skin and/or eye contact.	Irritation to skin, CNS depression, liver damage, kidney damage, lung damage.	Liver, kidney, and/or lung damage. Skin, liver, kidneys, lungs, CNS.
1,2-Dichloroethane	PEL TWA – 50 ppm C – 100 ppm TLV – 10 ppm	IDLH – 1,000 ppm	Colorless liquid with a pleasant, chloroform-like odor. Decomposes slowly, becomes acidic and darkens in color.	Inhalation, ingestion, skin absorption, skin and/or eye contact.	Irritation to eyes, corneal opacity, CNS depression, nausea, vomiting, dermatitis.	Liver, kidney, and/or CVS damage. Eyes, skin, kidneys, liver, CNS, CVS.
1,1-Dichloroethene (vinylidene chloride)	No PEL TLV – 5 ppm	NIOSH considers this compound to be a carcinogen.	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.	Inhalation; skin absorption; ingestion; eye contact.	Irritation to eyes, skin, throat; dizziness; headache; nausea; dyspnea (breathing difficulty).	Liver, kidney dysfunction; pneumonitis; potential occupational liver and kidney carcinogen. **Target Organs:** Eyes, skin, respiratory system, CNS, liver, kidneys.
1,2-Dichloroethene (dichloroethylene)	PEL – TWA 200 ppm TLV – TWA 200 ppm	IDLH – 1,000 ppm	Solvent odor.	Inhalation; skin absorption; ingestion; eye contact.	Typical solvent symptoms.	Liver, kidney, CNS symptoms.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
Methylene chloride	PEL – 25 ppm TLV – 50 ppm	NIOSH considers methylene chloride to be a carcinogen.	Colorless liquid with a chloroform-like odor.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, skin; fatigue; weakness; somnolence (sleepiness, unnatural drowsiness); lightheadedness; numbness; tingling limbs; nausea.	Potential occupational carcinogen. **Target Organs:** Eyes, skin, CVS, CNS.
Tetrachloroethene (perchloroethylene)	PEL – 100 ppm TLV – 25 ppm	PEL C – 200 ppm TLV STEL – 100 ppm IDLH – 150 ppm NIOSH considers this compound to be a carcinogen.	Colorless liquid with a mild, chloroform-like odor.	Inhalation; skin absorption; ingestion; eye contact.	Irritation to eyes, skin, nose, throat, respiratory system; nausea; flushed face, neck; vertigo (an illusion of movement); dizziness; lack of coordination; headache; skin erythema (redness).	Somnolence (sleepiness, unnatural drowsiness); liver damage; potential occupational liver carcinogen. **Target Organs:** Eyes, skin, respiratory system, liver, kidneys, CNS.
1,1,1-Trichloroethane (methyl chloroform)	PEL – TWA 350 ppm TLV – 350 ppm STEL – 450 ppm	NIOSH C – 350 ppm	Colorless liquid with a mild, chloroform-like odor.	Inhalation; skin absorption; ingestion; eye contact.	Irritation to eyes, skin; headache; CNS depressant; poor equilibrium; lassitude (weakness, exhaustion); depression; dermatitis.	Cardiac arrhythmias; liver damage. **Target Organs:** Eyes, skin, CNS, CVS, liver.
1,1,2-Trichloroethane	PEL TWA – 10 ppm (45 mg/m^3) (skin) TLV – 10 ppm	NIOSH considers this compound to be a carcinogen. REL TWA – 10 ppm (45 mg/m^3) (skin)	Colorless liquid with a sweet, chloroform-like odor.	Inhalation; skin absorption; ingestion; eye contact.	Irritation to eyes, nose; CNS depressant; depression; dermatitis.	Liver, kidney damage; potential occupational liver carcinogen. **Target Organs**: Eyes, respiratory system, CNS, liver, kidneys.
Trichloroethene (trichloroethylene)	PEL – 100 ppm TLV – 50 ppm	PEL C – 200 ppm NIOSH considers trichloroethylene to be a carcinogen.	Colorless liquid (unless dyed blue) with a chloroform-like odor.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, skin; headache; vertigo (an illusion of movement); visual disturbance; fatigue; giddiness; tremor; nausea; somnolence (sleepiness, unnatural drowsiness); vomiting; dermatitis.	Cardiac arrhythmias; paresthesia; liver injury; potential occupational carcinogen of liver, kidney.
Vinyl chloride	PEL – 1 ppm TLV – 1 ppm	NIOSH considers this material to be a carcinogen.	Liquid with a pleasant odor at high concentrations.	Inhalation; dermal; eye contact.	Weakness; abdominal pain; pallor or cyanosis of extremities; liquid frostbite.	Gastrointestinal bleeding; enlarged liver; potential occupational liver carcinogen; damage to CNS, blood, respiratory system, lymphatic system.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
Other Organic Compounds						
Acetone	PEL – 1000 ppm TLV – 500 ppm	NIOSH REL – 250 ppm TLV STEL – 750 ppm IDLH – 2,500 ppm	Fragrant, mint-like odor.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, nose, throat; headache; dizziness; dermatitis.	CNS depressant; depression; liver, kidney damage.
Benzo(a)pyrene equivalent	PEL – TWA 0.2 mg/m^3	N/A	Solid powder, dark-yellow, aromatic	Inhalation; ingestion; dermal; eye contact	Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing	Carcinogen
Bromoform	PEL – 0.5 ppm (5 mg/m^3) TLV – 0.5 ppm	IDLH – 850 ppm	Colorless to yellow liquid with a chloroform-like odor.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation to eyes, skin, and respiratory system; CNS depression; liver and kidney damage.	Liver and/or kidney damage. Eyes, skin, respiratory system, CNS, liver, and kidneys.
2-Butanone (methyl ethyl ketone)	PEL – 200 ppm TLV – 200 ppm	NIOSH REL – 200 ppm REL STEL – 300 ppm TLV STEL – 300 ppm	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, skin, nose; headache; dizziness; vomiting; dermatitis.	Eyes; skin; respiratory system; CNS.
Carbon disulfide	PEL – 20 ppm TLV – 10 ppm	PEL C – 30 ppm	Colorless to faint yellow liquid with a sweet ether-like odor.	Inhalation; dermal; ingestion; eye contact.	Dizziness; headache; poor sleep; fatigue; nervousness; eye, skin burns; dermatitis.	Anorexia; weight loss; ocular changes; psychosis; polyneuropathy; Parkinson-like syndrome; coronary heart disease; gastritis; kidney, liver injury; reproductive effects.
Dioxins and Furans	**OSHA and other health monitoring organizations have not established health-based action levels.** 2,3,7,8-tetrachloro-p-dibenzo-dioxin (2,3,7,8 TCDD) is considered the most toxic of the dioxins and furans group of compounds and is the indicator compound.		Colorless to white crystalline solid.	Inhalation; dermal; ingestion; eye contact.	Irritation eyes; allergic dermatitis, chloracne; porphyria; gastrointestinal disturbance.	Possible reproductive or teratogenic effects.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
2-Hexanone (methyl n-butyl ketone)	PEL – 100 ppm TLV – 5 ppm	TLV STEL – 10 ppm NIOSH REL – 1 ppm IDLH – 1,600 ppm	Colorless liquid with an acetone-like odor.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, nose; dermatitis; headache; drowsiness.	Damages to eyes, skin, respiratory system, CNS, peripheral nervous system (peripheral neuropathy: weakness, paresthesia).
Pentachlorophenol (PCP)	PEL – 0.5 mg/m^3	NIOSH REL – 0.5 mg/m^3 IDLH – 2.5 mg/m^3	Colorless to white crystalline solid with a benzene-like odor.	Inhalation; skin absorption; ingestion; skin, eye contact.	Irritation to eyes, nose, throat; sneezing; cough; lassitude (weakness, exhaustion); anorexia; weight loss; sweating; headache; dizziness; nausea; vomiting; dyspnea (breathing difficulty); chest pain; high fever; dermatitis.	Eyes; skin; respiratory system; CNS; CVS; liver; kidneys.
Per- and polyfluoroalkyl substances (PFAS)	**OSHA and other health monitoring organizations have not established health-based action levels.** Perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), and hexafluoropropylene oxide dimer acid hexafluoropropylene oxide (HFPO) are indicator compounds for the PFAS group of compounds.		Found in various forms.	Inhalation; dermal; eye; ingestion.	Irritation to eyes, skin, respiratory tract.	Possible carcinogen.
Polychlorinated biphenyls (PCBs)	PEL 0.5 – 1 mg/m^3 TLV 0.5 – 1 mg/m^3, depending on the species	NIOSH REL – 0.001 mg/m^3 NIOSH considers this material to be a carcinogen. IDLH – 5 mg/m^3	Pale or dark yellow odorless liquid.	Inhalation; dermal; ingestion. Skin absorption is a significant mode of exposure.	Irritation to eyes, skin, respiratory tract; chloroacne.	May cause reproductive, CNS, CVS, skin, eye, liver effects; cancer (leukemia).
Styrene	PEL – 100 ppm TLV – 20 ppm	PEL C – 200 ppm TLV STEL – 40 ppm NIOSH REL – 50 ppm	Colorless to yellow oily liquid with a sweet, floral odor.	Inhalation; dermal; ingestion; eye contact.	Irritation to eyes, nose, respiratory system; headache; fatigue; dizziness; confusion; malaise (vague feeling of discomfort); drowsiness; weakness; unsteady gait; narcosis.	Defatting dermatitis; possible liver injury; reproductive effects.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
2,4,6-Trinitrotoluene (TNT)	PEL 1.5 mg/m^3 TWA		Colorless to pale yellow, odorless solid or crushed flakes.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation to skin and mucous membranes; liver damage/jaundice; cyanosis; sneezing; cough and/or sore throat; peripheral neuropathy; muscle pain; kidney damage; cataract; sensitization dermatitis; leukocytosis (increased blood leukocytes); anemia; cardiac irregularities.	Eyes, skin, respiratory system, blood, liver, cardiovascular system, CNS, kidneys.
Pesticides and Herbicides						
Dieldrin	PEL – 0.25 mg/m^3 TWA – 0.25 mg/m^3	IDLH – 50 mg/m^3	Insecticide, colorless to light tan crystals with a mild, chemical odor.	Inhalation, skin absorption, ingestion, skin and eye contact.	Headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb jerks; clonic-tonic convulsions; coma.	CNS, liver, kidneys, skin.
Metals and Other Inorganic Materials						
Arsenic	PEL – 0.010 mg/m^3	NIOSH REL – CA C 0.002 mg/m^3 [15-minutes]	Metal: Silver-gray or tin-white, brittle, odorless solid.	Inhalation; skin absorption; skin and/or eye contact; ingestion.	Ulceration of nasal septum; peripheral neuropathy; gastrointestinal disturbances; dermatitis; respiratory irritation; hyperpigmentation of skin (potential occupational carcinogen).	Lung and lymphatic cancer; liver; kidneys; skin; lungs; lymphatic system.
Asbestos	Per Part 1910.1001 of Title 29 of the Code of Federal Regulations and NIOSH: PEL and REL – 0.1 fiber per cubic centimeter of air (0.1 fiber/cm^3)	OSHA considers asbestos to be a carcinogen.	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite) fibrous, odorless solids.	Inhalation; ingestion; skin, eye contact.	Eye irritation; breathing difficulty; gastrointestinal issues.	Eye irritation; asbestosis; mesothelioma; lung cancer; dyspnea; cancer of the gastrointestinal tract. **Target Organs**: Respiratory system, eyes.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Beryllium	PEL – 0.0002 mg/m^3 STEL – 0.002 mg/m^3 TLV – 0.002 mg/m^3	IDLH – 4 mg/m^3	Metal – hard, brittle, gray-white solid.	Inhalation, skin and/or eye contact.	Irritation to eyes, dermatitis.	Cancerous – lung. Berylliosis: anorexia, weight loss, lassitude, chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency. Eyes, skin, respiratory system.
Barium	PEL – 0.5 mg/m^3 TLV – 0.5 mg/m^3	IDLH – 50 mg/m^3	White, colorless solid.	Inhalation, ingestion, skin and/or eye contact.	Irritation to eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasms.	Slow pulse, extrasystoles, hypokalemia. Eyes, skin, respiratory system, heart, CNS.
Cadmium	PEL – 0.005 mg/m^3		Odorless, yellow-brown, finely divided particulate dispersed in air.	Inhalation.	Pulmonary edema; dyspnea (breathing difficulty); cough; chest tightness; substernal (occurring beneath the sternum) pain; headache; chills; muscle aches; nausea; vomiting; diarrhea; emphysema; proteinuria; anosmia (loss of the sense of smell); mild anemia; potential occupational carcinogen.	Prostate and lung cancer; respiratory system; kidneys; blood.
Chromium	PEL – 1 mg/m^3 TLV – 0.5 mg/m^3	IDLH – 250 mg/m^3	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.	Inhalation, ingestion, skin and/or eye contact.	Irritation to eyes and skin.	Lung fibrosis. Eyes, skin, respiratory system.
Cobalt	PEL – 0.1 mg/m^3 TLV – 0.05 mg/m^3	IDLH – 20 mg/m^3	Odorless, silver-gray to black solid.	Inhalation, ingestion, skin and/or eye contact.	Cough, dyspnea, wheezing, decreased pulmonary function, weight loss, dermatitis.	Diffuse nodular fibrosis, respiratory hypersensitivity, asthma. Skin, respiratory system.
Copper	PEL – 1 mg/m^3 TLV – 1 mg/m^3	IDLH – 100 mg/m^3	Reddish, lustrous, malleable, odorless solid.	Inhalation, ingestion, skin and/or eye contact.	Irritation to eyes, nose, and pharynx, nasal septum perforation; metallic taste; dermatitis.	Lung, liver, and/or kidney damage; anemia. Eyes, skin, respiratory system, liver, kidneys.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Cyanide (as CN)	PEL – 5 mg/m3	NIOSH REL – 5 mg/m3	Usually joined with other chemicals, ranging from colorless gas to a white solid. Faint to bitter almond-like odor.	Inhalation; dermal; ingestion; eye contact.	Headache, lightheadedness, dizziness, nausea, vomiting, agitation, drowsiness, and irritation of the eyes, nose, throat, and respiratory tract, and rapid breathing with a sense of suffocation.	Nose bleeds and sores; thyroid function
Lead	PEL – 0.05 mg/m^3 TLV – 0.05 mg/m^3	IDLH – 100 mg/m^3	A heavy, flexible, soft, gray solid.	Inhalation; dermal; ingestion; eye contact.	Lassitude (weakness, exhaustion); abdominal pain; gingival lead line; tremor; irritation to eyes; hypotension.	Insomnia; facial pallor; anorexia; weight loss; malnutrition; constipation; colic; anemia; paralysis of wrist, ankles; kidney disease; encephalopathy; potential for damage to eyes, gastrointestinal tract, CNS, kidneys, blood, gingival tissue.
Mercury	PEL – 0.1 mg/m^3	NIOSH REL – Mercury vapor: TWA – 0.05 mg/m^3 [skin] Other: C – 0.1 mg/m^3 [skin]	Metal: Silver-white, heavy, odorless liquid. "Other" mercury compounds include all inorganic and aryl mercury compounds except (organo) alkyls.	Inhalation; skin absorption; ingestion; skin and/or eye contact.	Irritation to eyes, skin; cough; chest pain; dyspnea (breathing difficulty); bronchitis; pneumonitis; tremor; lassitude (weakness, exhaustion); insomnia; irritability; indecision; headache; stomatitis; salivation; gastrointestinal disturbance; anorexia; weight loss; proteinuria.	Eyes; skin; respiratory system; CNS; kidneys.
Nickel	PEL – 1 mg/m^3 TLV – 1 mg/m^3	IDLH – 10 mg/m^3	Metal: lustrous, silvery, odorless solid.	Inhalation, ingestion, skin and/or eye contact.	Sensitization dermatitis, allergic asthma.	Cancerous – Lung and nasal. Pneumonitis. Nasal cavities, lungs, skin.
Selenium	PEL – 0.2 mg/m^3 TLV – 0.2 mg/m^3	IDLH – 1 mg/m^3	Amorphous or crystalline, red to gray solid.	Inhalation, ingestion, skin and/or eye contact.	Irritation to eyes, skin, nose, throat; visual disturbance; headache; shills, fever; dyspnea, bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye and skin burns.	Anemia, liver necrosis, cirrhosis, kidney and/or spleen damage. Eyes, skin, respiratory system, liver, kidneys, blood, spleen.

HEALTH-BASED AND MONITORING INFORMATION FOR POTENTIAL SITE CONTAMINANTS

Vanadium	C – 0.5 mg/m^3 TLV – 0.05 mg.m^3	IDLH – 35 mg/m^3	Yellow-orange powder.	Inhalation, ingestion, skin and/or eye contact.	Irritation to eyes, skin, throat; green tongue; metallic taste; eczema; cough; wheezing; fine rales.	Bronchitis, dyspnea. Eyes, skin, respiratory system.

ATTACHMENT 5

Air Monitoring Log
Calibration/Check Log – Air Monitoring Equipment

AIR MONITORING LOG

Date	Time	Location	Source/Area/ Breathing Zone	Instrument	Concentration/Units	Sampled by

CALIBRATION/CHECK LOG – AIR MONITORING EQUIPMENT

Date	Instrument/ Model No.	Serial No.	Battery Check OK?	Zero Adjust OK?	Calibration Gas (ppm)	Reading (ppm)	Leak Check	Performed By	Comments

ATTACHMENT 6

Incident Report Form

CENTRAL
ENGINEERING SERVICES

7662 SW Mohawk Street
Tualatin, Oregon 97062
(503) 616-9419
www.centralengr.com

INCIDENT REPORT FORM

Use this form to report accidents, injuries, medical situations, criminal activities, traffic incidents, or student behavior incidents. If possible, a report should be completed within 24 hours of the event.

Date of Report: ______________________________

PERSON INVOLVED

Full Name: ____ DOB: _____________________

Address: ____

Identification: ☐ Driver's License No. ________________________ ☐ Passport No.________________

☐ Other: ________________________________

Phone: ____-E-Mail: ____________________________________

THE INCIDENT

Date of Incident: ____________________________ Time: __________________________☐ AM ☐ PM

Location: ____

Describe the Incident In detail: ____

____

INJURIES

Was anyone injured? ☐ Yes ☐ No

If yes, describe the injuries: ____

____

WITNESSES

Were there witnesses to the incident? ☐ Yes ☐ No

If yes, enter the witnesses' names and contact info: ______________________________

____.

POLICE / MEDICAL SERVICES

Police Notified? ☐ Yes ☐ No If yes, was a report filed? ☐ Yes ☐ No Was medical treatment provided? ☐ Yes ☐ No ☐ Refused

If yes, where was medical treatment provided? ☐ On site ☐ Hospital ☐ Other:

Name of Doctor: ______________________________

Doctors contact information: ______________________________

Hospital OR on-site name: ______________________________

If refused, why did you refuse medical treatment? ______________________________

____

Additional Information:

PERSON FILING REPORT

Signature: ______________________ Date: ______________

Print Name: ______________________

OFFICE USE ONLY

Report received by: ______________________ Date: ______________

Supervisor name: ______________________ Date: ______________

Supervisor Signature: ______________________

Follow-up action taken:

Action Taken:

CENTRAL
ENGINEERING SERVICES

APPENDIX C: Sampling and Analysis Plan

Appendix C: Sampling and Analysis Plan

1.0 INTRODUCTION

This sampling and analysis (SAP) presents the field and sampling procedures and the analytical testing program that will be used to complete the field and analytical work during the VCP Work Plan activities proposed for the Former Weyerhaeuser Dallas Mill property at 1551 Southeast Lyle Street in Dallas, Oregon. Quality assurance and quality control (QA/QC) procedures discussed in this appendix are consistent with the QA/QC requirements outlined in the Oregon Department of Environmental Quality (DEQ) Quality Assurance Project Plan for PA/SI Investigations (dated August 2012) and the DEQ Guidance for Assessing and Remediating Vapor Intrusion in Buildings (dated March 2010).

2.0 FIELD AND SAMPLING PROCEDURES

The scope of work for the site investigation includes soil, groundwater, soil vapor and sediment sampling. Data from these activities will be used to assess the potential for unacceptable risks posed to human health and the environment and assess the effectiveness of the interim vapor control measure.

The field and sampling procedures include the following:

- Subsurface explorations using push-probe drilling techniques;
- Soil gas probe installation;
- Field screening;
- Collection of soil, groundwater, soil gas, and sediment samples;
- Sample management (e.g., containers, storage, and shipment);
- Decontamination procedures; and
- Handling of investigation-derived waste (IDW).

Standard Operating Procedures (SOPs) for fieldwork are provided in Attachment 1 to this SAP.

2.1 SOIL, GROUNDWATER, SOIL GAS, AND SEDIMENT SAMPLING

Sixteen proposed explorations will be completed to an approximate depth ranging between 1 and 20 feet below ground surface (bgs) using push-probe drilling techniques. The actual depth of the explorations may vary based on field conditions.

2.1.1 Field Screening

Central will perform field screening of soil and sediment in accordance with SOP EQ-02. These methods are described in general below.

Field screening will consist of visual and olfactory observations and collecting volatile organic compound (VOC) measurements of soil at least once every 5 feet using a photoionization detector (PID). The PID is generally used to detect benzene, toluene, ethylbenzene, and xylenes (BTEX) and high-concentration chlorinated VOCs. During operation, the sample stream flows through the detector's reaction chamber where it is continuously irradiated with high energy ultraviolet light. When compounds are present that have a lower ionization potential than that of the irradiation energy (10.2 electron volts with standard lamp) they are ionized. The ions formed are collected in an electrical field, producing an ion current that is proportional to compound concentration. Field screening with the PID will be conducted per SOP SL-01.

2.1.2 Sample Collection

Soil, groundwater, soil gas and sediment samples are shown on Work Plan Tables 1 through 4, respectively. Samples to be collected are described by medium as follows:

- **Soil samples** will be collected in accordance with SOP SL-01. The collected soil samples will be evaluated based on field screening results and depth of sample relative to the groundwater table or native soils.
- **Reconnaissance groundwater samples** will be collected using low-flow sampling equipment with dedicated tubing for each sample. If the rate of water generated by the exploration is sufficient to maintain a reasonable flow rate and is of sufficient clarity for the low-flow flow cell to be effective, reconnaissance groundwater samples will be collected in general accordance with SOP GW-04. If the volume or clarity of the water is insufficient, then the water samples will be collected directly into sample containers at the maximum rate achievable.
- **Soil gas samples** will be collected from the Former Log Pond AOPC and the Railroad Spur AOPC. The samples will be collected above the groundwater table, at an anticipated depth of 3-5 feet bgs. Soil gas samples collected from the Former Log Pond AOPC will be collected in accordance with SOP AIR-04 for a temporary shallow push-in point. The soil gas sample collected from the Railroad Spur AOPC will be installed using a direct-push drill rig and Post-Run-Tubing Method. Leak detection tests and other sampling protocols will follow SOP AIR-04.
- **Sediment samples** will be collected to evaluate Ash Creek and representative connected catch basins. Sediment samples will be collected in accordance with SOP SD-01.

2.2 SAMPLE MANAGEMENT

Soil, Groundwater, and Sediment Sample Containers. Clean sample containers will be provided by the analytical laboratory ready for sample collection, including preservative if required. Specific container requirements for samples that will undergo multiple analyses will be discussed with the analytical laboratory prior to sample collection. Water sample containers will be fully filled, leaving no headspace. Lids will be equipped with Teflon® liners to reduce the loss of volatile compounds.

Soil Gas Containers. Clean sample containers will be provided by the analytical laboratory ready for sample collection. Each container will be filled so that residual vacuum is between 1 and 5 inches of mercury.

Labeling Requirements. A sample label will be affixed to each sample container before sample collection. Containers will be marked with the project name, a sample number, date of collection, and time of collection.

Sample Storage and Shipment. Soil and groundwater samples will be stored in a cooler chilled with ice or blue ice to 4 degrees Celsius (°C). Soil gas samples will be stored at ambient temperatures. If necessary, the samples will be sent via overnight courier to the analytical laboratory for chemical analysis. Otherwise, Central will transport the containers to the laboratory. Chain of custody will be maintained and documented.

2.3 DECONTAMINATION PROCEDURES

Personnel Decontamination. Personnel decontamination procedures depend on the level of protection specified for a given activity. The Health & Safety Plan (HASP) (Work Plan Appendix B) identifies the appropriate level of protection for the type of work and expected field conditions involved in this project. In general, clothing and other protective equipment can be removed from the investigation area. Field personnel should thoroughly wash their hands and faces at the end of each day and before taking any work breaks.

Sampling Equipment Decontamination. To prevent cross-contamination between sampling events, clean, dedicated sampling equipment will be used when possible for each sampling event and will be discarded after use. Cleaning of non-disposable items will consist of washing in a detergent (Alconox®) solution, followed by a deionized (DI) water rinse. Decontamination water will be collected and handled in accordance with Section 2.4, Handling of Investigation-Derived Waste (below). Equipment decontamination will be followed in accordance with SOP EQ-01.

Drilling Equipment and Materials. Decontamination procedures are designed to remove trace-level contaminants from drilling equipment to prevent the cross-contamination of exploration locations and samples. Drilling equipment shall be decontaminated using high-pressure washing, steam cleaning, or cleaning with detergent before use and between locations. Decontamination water from the drill tooling will be collected and handled in accordance with Section 2.4, Handling of Investigation-Derived Waste.

2.4 HANDLING OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) will consist of soil cuttings from the explorations, decontamination water, and purge water. IDW will be placed in Department of Transportation (DOT)-approved drums. Each drum will be labeled with the general contents, date, project address, and on-site project manager contact information.

The drummed IDW will be left on Site pending pickup/disposal by the IDW subcontractor. Composite samples from the soil and water IDW drum(s) will be collected for the purpose of waste profiling. Arrangement with a waste disposal subcontractor will be made to dispose of the IDW after chemical analysis results have been received.

Disposable items, such as sample tubing, disposable bailers, bailer line, gloves, protective overalls (e.g., Tyvek®), paper towels, etc., will be placed in plastic bags after use and deposited in trash receptacles for disposal.

3.0 ANALYTICAL TESTING PROGRAM

An analytical testing program will be performed to assess the chemical quality of samples collected as part of this project. Analytical laboratory QA/QC procedures are discussed in Section 5 of this appendix.

Tables C-1a through C-1d list the proposed analytical methods, detection limit goals, and lists the anticipated number of soil, groundwater, soil gas, and sediment samples. Specific container and storage requirements for samples will be discussed with the analytical laboratory prior to sample collection and will be in accordance with the container requirements presented in Table C-2.

Each soil and groundwater sample collected for chemical analyses will be placed in a cooled ice chest for temporary field storage and will be transported to the analytical laboratory. Each vapor sample will be transported to the analytical laboratory at ambient temperature. Chain of custody will be maintained and documented.

Soil Samples. Soil samples will be analyzed for one or more of the following:

- Diesel-range organics (DRO) and oil-range organics (ORO) by Method NWTPH-Dx;
- Polycyclic aromatic hydrocarbons (PAHs) by U.S. Environmental Protection Agency (EPA) Method 8270E low-level;
- Waste oil metals (cadmium, chromium, lead) by Method 6020B;
- Dioxins/furans (D/F) by Method 1613;
- Pentachlorophenol (penta) by Method 8270E;
- Formaldehyde by Method 8315A;

- Propiconazole by Method 8321;
- Organochlorine pesticides by Method 8081B (shallow soil samples collected from borings CESB-01 through CESB-04 only);
- Organochlorine herbicides by method 8321B (shallow soil samples collected from borings CESB-01 through CESB-04 only); and
- Agricultural metals (lead, arsenic, cadmium and mercury) by Method 6020B.

Samples for D/F and penta (from CESB-01 to CESB-04) analysis will be submitted to the analytical laboratory on HOLD pending results of the composite soil sample.

Groundwater Samples. Groundwater samples will be analyzed for one or more of the following:

- DRO and ORO by Method NWTPH-Dx;
- PAHs by EPA Method 8270E low-level;
- Waste oil metals by Method 6020B;
- Penta by Method 8270E; and
- D/F by Method 1613.

Groundwater samples collected at CESB-01 to CESB-04 will be submitted to the laboratory on HOLD pending the results of the soil samples and two samples will be analyzed.

Soil Gas Samples. Soil gas samples will be analyzed for one or more of the following:

- Method by American Society of Testing and Material (ASTM) Method D1946;
- GRO and VOCs by EPA Method TO-15; and
- DRO by EPA Method TO-17.

Sediment Samples. Shallow sediment samples will be analyzed for one or more of the following:

- DRO and ORO by Method NWTPH-Dx;
- PAHs by EPA Method 8270E low-level;
- Polychlorinated biphenyls (PCBs) by Method 8082A;
- Waste oil metals by Method 6020B;
- D/F by Method 1613; and
- Penta by Method 8270E.

4.0 FIELD QUALITY ASSURANCE PROGRAM

A chain-of-custody form will be used to record possession of a sample and to document analyses requested. Each time the sample bottles or samples are transferred between individuals, both the sender and receiver sign and date the chain-of-custody form. When a sample shipment is transported to the laboratory, a copy of the chain-of-custody form is included in the transport container (e.g., ice chest).

5.0 LABORATORY QUALITY CONTROL

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries, and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. QA/QC requirements outlined in the DEQ Underground Storage Tanks (UST) Program Quality Assurance Project Plan (dated September 8, 2010) will be included as minimum requirements in the laboratory bid process and subcontract.

Table C-1a
Soil Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Anticipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	South Willamette Background Metals Concentration in Soil[3]	DEQ RBCs[1]					EPA RSLs[2]
								Soil Ingestion, Dermal Contact and Inhalation			Soil Volatilization to Outdoor Air	Soil Leaching to Groundwater	Industrial Soil
								Occupational	Construction Worker	Excavation Worker	Occupational	Occupational	TR=1E-06; THQ=1.0
Metals													
Cadmium	19	EPA 6020B	mg/kg	0.100	0.0500	1.6	1.6	1,100	350	9,700	--	--	NA
Chromium	13	EPA 6020B	mg/kg	0.500	0.250	100	100	--	530,000	--	--	--	NA
Lead	19	EPA 6020B	mg/kg	0.100	0.0500	28	28	800	800	800	--	30	NA
Arsenic	6	EPA 6020B	mg/kg	0.500	0.250	1.9	18	1.9	15	420	--	--	NA
Mercury	6	EPA 6020B	mg/kg	0.0400	0.0100	0.07	0.07	350	110	2,900	--	--	NA
TPH													
Diesel Range Organics	13	NWTPH-Dx	mg/kg	20.0	10.0	4,600	--	14,000	4,600	--	--	--	NA
Oil Range Organics	13	NWTPH-Dx	mg/kg	40.0	20.0	4,600	--	14,000	4,600	--	--	--	NA
PAHs													
Acenaphthene	5	EPA 8270E	mg/kg	0.00267	0.00133	21,000	--	70,000	21,000	590,000	--	--	NA
Acenaphthylene	5	EPA 8270E	mg/kg	0.00267	0.00133	--	--	--	--	--	--	--	NA
Anthracene	5	EPA 8270E	mg/kg	0.00267	0.00133	110,000	--	350,000	110,000	--	--	--	NA
Benzo(a)anthracene	5	EPA 8270E	mg/kg	0.00267	0.00133	21	--	21	170	4,800	--	--	NA
Benzo(a)pyrene	5	EPA 8270E	mg/kg	0.00400	0.00200	2.1	--	2.1	17	490	--	--	NA
Benzo(b)fluoranthene	5	EPA 8270E	mg/kg	0.00400	0.00200	21	--	21	170	4,900	--	--	NA
Benzo(g,h,i)perylene	5	EPA 8270E	mg/kg	0.00267	0.00133	--	--	--	--	--	--	--	NA
Benzo(k)fluoranthene	5	EPA 8270E	mg/kg	0.00400	0.00200	210	--	210	1700	49,000	--	--	NA
Carbazole	5	EPA 8270E	mg/kg	0.00400	0.00200	--	--	--	--	--	--	--	NA
Chrysene	5	EPA 8270E	mg/kg	0.00267	0.00133	2100	--	2,100	17,000	490,000	--	--	NA
Dibenzo(a,h)anthracene	5	EPA 8270E	mg/kg	0.00267	0.00133	2.1	--	2.1	17	490	--	--	NA
Dibenzofuran	5	EPA 8270E	mg/kg	0.00267	0.00133	--	--	--	--	--	--	--	NA
Fluoranthene	5	EPA 8270E	mg/kg	0.00267	0.00133	10,000	--	30,000	10,000	280,000	--	--	NA
Fluorene	5	EPA 8270E	mg/kg	0.00267	0.00133	14,000	--	47,000	14,000	390,000	--	--	NA
Indeno(1,2,3-cd)pyrene	5	EPA 8270E	mg/kg	0.00267	0.00133	21	--	21	170	4,900	--	--	NA
1-Methylnaphthalene	5	EPA 8270E	mg/kg	0.00533	0.00267	--	--	--	--	--	--	--	NA
2-Methylnaphthalene	5	EPA 8270E	mg/kg	0.00533	0.00267	--	--	--	--	--	--	--	NA
Naphthalene	5	EPA 8270E	mg/kg	0.00533	0.00267	0.34	--	23	580	16,000	83	0.34	NA
Phenanthrene	5	EPA 8270E	mg/kg	0.00267	0.00133	--	--	--	--	--	--	--	NA
Pyrene	5	EPA 8270E	mg/kg	0.00267	0.00133	7,500	--	23,000	7,500	210,000	--	--	NA
Dioxins/Furans													
2,3,7,8-TCDD	10	EPA 1613	mg/kg	0.00000100	0.000000333	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDD	10	EPA 1613	mg/kg	0.00000500	0.00000333	--	--	--	--	--	--	--	--
OCDD	10	EPA 1613	mg/kg	0.0000100	0.000000333	--	--	--	--	--	--	--	--
2,3,7,8-TCDF	10	EPA 1613	mg/kg	0.00000100	0.00000167	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
2,3,4,7,8-PeCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--

Please see notes at end of table.

Table C-1a
Soil Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Anticipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	South Willamette Background Metals Concentration in Soil[3]	DEQ RBCs[1]					EPA RSLs[2]
								Soil Ingestion, Dermal Contact and Inhalation			Soil Volatilization to Outdoor Air	Soil Leaching to Groundwater	Industrial Soil
								Occupational	Construction Worker	Excavation Worker	Occupational	Occupational	TR=1E-06; THQ=1.0
1,2,3,6,7,8-HxCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	10	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--	--
OCDF	10	EPA 1613	mg/kg	0.0000100	0.00000333	--	--	--	--	--	--	--	--
2,3,7,8-TCDD TEQ	10	EPA 1613	mg/kg	0.00000100	0.000000333	0.000016	--	0.000016	0.00017	0.0048	0.13	0.000031	NA
Phenols													
Pentachlorophenol	5	EPA 8270E	mg/kg	0.0267	0.0133	0.17	--	4	34	960	-	0.17	NA
Organochlorine Pesticides													
4,4'-DDD	10	EPA 8081B	mg/kg	0.00200	0.00100	2.6	--	12	9.7	270	--	2.6	NA
4,4'-DDE	10	EPA 8081B	mg/kg	0.00200	0.00100	7.5	--	8.2	66	1,800	--	7.5	NA
4,4'-DDT	10	EPA 8081B	mg/kg	0.00200	0.00100	8.5	--	8.5	66	1,800	--	70	NA
Aldrin	10	EPA 8081B	mg/kg	0.00200	0.00100	0.1	--	0.13	1.1	30	--	0.1	NA
Alpha-BHC	10	EPA 8081B	mg/kg	0.00200	0.00100	0.023	--	0.36	3	83	--	0.023	NA
Beta-BHC	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Delta-BHC	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Gamma-BHC (Lindane)	10	EPA 8081B	mg/kg	0.00200	0.00100	0.13	--	2.1	17	470	--	0.13	NA
Chlordane (Technical)	10	EPA 8081B	mg/kg	0.0600	0.0300	2.1	--	7.4	61	1,700	--	2.1	NA
cis-Chlordane	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
trans-Chlordane	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Dieldrin	10	EPA 8081B	mg/kg	0.00200	0.00100	0.03	--	0.14	1.2	33	--	0.03	NA
Endosulfan I	10	EPA 8081B	mg/kg	0.00200	0.00100	1,600	--	4,900	1,600	45,000	--	--	NA
Endosulfan II	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Endosulfan Sulfate	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Endrin	10	EPA 8081B	mg/kg	0.00200	0.00100	80	--	250	80	2,200	--	--	NA
Endrin Aldehyde	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Endrin Ketone	10	EPA 8081B	mg/kg	0.00200	0.00100	--	--	--	--	--	--	--	NA
Heptachlor	10	EPA 8081B	mg/kg	0.00200	0.00100	0.048	--	0.45	4	110	230	0.048	NA
Heptachlor Epoxide	10	EPA 8081B	mg/kg	0.00200	0.00100	0.016	--	0.24	2	56	--	0.016	NA
Methoxychlor	10	EPA 8081B	mg/kg	0.00600	0.00300	--	--	--	--	--	--	--	NA
Toxaphene	10	EPA 8081B	mg/kg	0.0600	0.0300	0.93	--	2.1	17	470	--	0.93	NA
Chlorinated Herbicides													
2,4-D	6	EPA 8321B	mg/kg	0.00500	0.00125	16	--	8,200	2,700	74,000	--	16	--
2,4-DB	6	EPA 8321B	mg/kg	0.0100	0.00250	--	--	--	--	--	--	--	--
2,4,5-T	6	EPA 8321B	mg/kg	0.00500	0.00125	--	--	--	--	--	--	--	--
2,4,5-TP	6	EPA 8321B	mg/kg	0.00500	0.00125	--	--	--	--	--	--	--	--
Dalapon	6	EPA 8321B	mg/kg	0.0100	0.00250	--	--	--	--	--	--	--	--
Dicamba	6	EPA 8321B	mg/kg	0.00500	0.00125	--	--	--	--	--	--	--	--
Dichlorprop	6	EPA 8321B	mg/kg	0.00500	0.00125	--	--	--	--	--	--	--	--
Dinoseb	6	EPA 8321B	mg/kg	0.0100	0.00250	--	--	--	--	--	--	--	--
MCPA	6	EPA 8321B	mg/kg	0.00500	0.00125	0.61	--	410	130	3,700	--	0.61	--
MCPP	6	EPA 8321B	mg/kg	0.00500	0.00125	--	--	--	--	--	--	--	--

Please see notes at end of table.

Table C-1a
Soil Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Anticipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	South Willamette Background Metals Concentration in Soil[3]	DEQ RBCs[1]					EPA RSLs[2]
								Soil Ingestion, Dermal Contact and Inhalation			Soil Volatilization to Outdoor Air	Soil Leaching to Groundwater	Industrial Soil
								Occupational	Construction Worker	Excavation Worker	Occupational	Occupational	TR=1E-06; THQ=1.0
Other													
Formaldehyde	2	EPA 8315A	mg/kg	0.4	0.25	0.0086	--	64	1,600	44,000	630	0.0086	NA
Propiconazole	2	EPA 8321	mg/kg	0.013	--	82,000	--	--	--	--	--	--	82,000

Notes:
EPA = United States Environmental Protection Agency
RSLs = Regional Screening Levels
DEQ = Oregon Department of Environmental Quality
RBCs = Risk-Based Concentrations
mg/kg = milligrams per kilogram
TPH = total petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
DDT = dichloro-diphenyl-trichloroethane
MRL = minimum reporting limit
MDL = method detection limit
NA = Screening level is not applicable. DEQ RBCs supersede EPA RSLs when available.
TR = target cancer risk
THQ = target hazard quotient
TEQ = Toxicity equivalents
-- = Value is not available.

[1] Oregon DEQ RBCs for Individual Chemicals (revised August 2023).

[2] EPA RSLs Generic Tables (updated November 2024).

[3] South Willamette Background Metals Concentrations in Soil from the Development of Oregon Background Metals Concentrations in Soil (March 2013).

Table C-1b
Groundwater Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Antcipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	DEQ RBCs[1]		
							Ingestion & Inhalation from Tapwater	Groundwater Volatilization to Outdoor Air	Groundwater in Excavation
							Occupational	Occupational	Construction & Excavation Worker
Metals									
Cadmium	12	EPA 6020B	µg/L	0.200	0.100	160	160	--	130,000
Chromium	12	EPA 6020B	µg/L	2.00	1.00	250,000	250,000	--	--
Lead	12	EPA 6020B	µg/L	0.200	0.110	15	15	--	--
TPH									
Diesel Range Organics	12	NWTPH-Dx	µg/L	0.200	0.100	430	430	--	--
Oil Range Organics	12	NWTPH-Dx	µg/L	0.400	0.200	430	430	--	--
PAHs									
Acenaphthene	12	EPA 8270E	µg/L	0.0200	0.0100	2,500	2,500	--	--
Acenaphthylene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Anthracene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Benz(a)anthracene	12	EPA 8270E	µg/L	0.0200	0.0100	0.38	0.38	--	--
Benzo(a)pyrene	12	EPA 8270E	µg/L	0.0300	0.0150	0.47	0.47	--	--
Benzo(b)fluoranthene	12	EPA 8270E	µg/L	0.0300	0.0150	--	--	--	--
Benzo(k)fluoranthene	12	EPA 8270E	µg/L	0.0300	0.0150	--	--	--	--
Benzo(g,h,i)perylene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Chrysene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Dibenz(a,h)anthracene	12	EPA 8270E	µg/L	0.0200	0.0100	0.47	0.47	--	--
Fluoranthene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Fluorene	12	EPA 8270E	µg/L	0.0200	0.0100	1,300	1,300	--	--
Indeno(1,2,3-cd)pyrene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
1-Methylnaphthalene	12	EPA 8270E	µg/L	0.0400	0.0200	--	--	--	--
2-Methylnaphthalene	12	EPA 8270E	µg/L	0.0400	0.0200	--	--	--	--
Naphthalene	12	EPA 8270E	µg/L	0.0400	0.0200	0.72	0.72	16,000	500
Phenanthrene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Pyrene	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Carbazole	12	EPA 8270E	µg/L	0.0300	0.0150	--	--	--	--
Dibenzofuran	12	EPA 8270E	µg/L	0.0200	0.0100	--	--	--	--
Dioxins/Furans									
2,3,7,8-TCDD	12	EPA 1613	µg/L	0.0000100	0.00000333	--	--	--	--
1,2,3,7,8-PeCDD	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,4,7,8-HxCDD	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,6,7,8-HxCDD	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,7,8,9-HxCDD	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,4,6,7,8-HpCDD	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,4,7,8,9-HpCDD	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
OCDD	12	EPA 1613	µg/L	0.000100	0.0000333	--	--	--	--
2,3,7,8-TCDF	12	EPA 1613	µg/L	0.0000100	0.00000333	--	--	--	--
1,2,3,7,8-PeCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
2,3,4,7,8-PeCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,4,7,8-HxCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,6,7,8-HxCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,7,8,9-HxCDF	12	EPA 1613	µg/L	0.0001000	0.0000167	--	--	--	--

Please see notes at end of table.

Table C-1b
Groundwater Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Antcipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	DEQ RBCs[1]		
							Ingestion & Inhalation from Tapwater	Groundwater Volatilization to Outdoor Air	Groundwater in Excavation
							Occupational	Occupational	Construction & Excavation Worker
2,3,4,6,7,8-HxCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,4,6,7,8-HpCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
1,2,3,4,7,8,9-HpCDF	12	EPA 1613	µg/L	0.0000500	0.0000167	--	--	--	--
OCDF	12	EPA 1613	µg/L	0.0000500	0.0000333	--	--	--	--
2,3,7,8-TCDD TEQ	12	EPA 1613	µg/L	0.0000100	0.00000333	0.00000042	0.00000042	0.11	0.00045
Phenols									
Pentachlorophenol	12	EPA 8270E	µg/L	0.200	0.100	0.12	0.12	--	53

Notes:
DEQ = Oregon Department of Environmental Quality
RBCs = Risk-Based Concentrations
µg/L = micrograms per liter
TPH = total petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
MRL = minimum reporting limit
MDL = method detection limit
-- = Value is not available.
[1] Oregon DEQ RBCs for Individual Chemicals (revised August 2023).

Table C-1c
Soil Gas Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Antcipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	DEQ RBCs[1] Commercial Soil Vapor Chronic
Fixed Gases							
Methane	1	ASTM D1946	%	0.000210	0.0000693	--	--
TPH							
Diesel Range Organics	1	TO-17	µg/m^3	3,300	--	14,000	14,000
VOCs/TPH	1						
1,1,1-Trichloroethane	1	TO-15	µg/m^3	2.73	0.928	730,000	730,000
1,1,2,2-Tetrachloroethane	1	TO-15	µg/m^3	3.43	1.17	7.1	7.1
1,1,2-Trichloroethane	1	TO-15	µg/m^3	2.73	0.928	26	26
1,1-Dichloroethane	1	TO-15	µg/m^3	2.02	0.688	260	260
1,1-Dichloroethene	1	TO-15	µg/m^3	1.98	0.674	580	580
1,2,4-Trichlorobenzene	1	TO-15	µg/m^3	14.8	4.97	290	290
1,2,4-Trimethylbenzene	1	TO-15	µg/m^3	2.46	0.836	8,800	8,800
1,2-Dibromoethane (EDB)	1	TO-15	µg/m^3	3.84	1.31	0.68	0.68
1,2-Dichlorobenzene	1	TO-15	µg/m^3	3.01	1.02	29,000	29,000
1,2-Dichloroethane	1	TO-15	µg/m^3	2.02	0.688	16	16
1,2-Dichloropropane	1	TO-15	µg/m^3	2.31	0.786	110	110
1,3,5-Trimethylbenzene	1	TO-15	µg/m^3	2.46	0.836	8,800	8,800
1,3-Butadiene	1	TO-15	µg/m^3	1.11	0.376	14	14
1,3-Dichlorobenzene	1	TO-15	µg/m^3	3.01	1.02	--	--
1,4-Dichlorobenzene	1	TO-15	µg/m^3	3.01	1.02	37	37
1,4-Dioxane	1	TO-15	µg/m^3	3.6	1.19	82	82
2,2,4-Trimethylpentane	1	TO-15	µg/m^3	2.34	0.794	--	--
2-Butanone (MEK)	1	TO-15	µg/m^3	5.9	1.98	730,000	730,000
2-Hexanone	1	TO-15	µg/m^3	8.2	2.75	4,400	4,400
2-Propanol	1	TO-15	µg/m^3	4.92	1.65	29,000	29,000
3-Chloropropene	1	TO-15	µg/m^3	1.57	0.532	68	68
4-Ethyltoluene	1	TO-15	µg/m^3	2.46	0.836	--	--
4-Methyl-2-pentanone (MIBK)	1	TO-15	µg/m^3	2.05	0.696	440,000	440,000
Acetone	1	TO-15	µg/m^3	11.9	3.97	--	--
alpha-Chlorotoluene	1	TO-15	µg/m^3	2.59	0.88	8.3	8.3
Benzene	1	TO-15	µg/m^3	1.6	0.543	52	52
Bromodichloromethane	1	TO-15	µg/m^3	3.35	1.14	11	11
Bromoform	1	TO-15	µg/m^3	5.17	1.76	370	370
Bromomethane	1	TO-15	µg/m^3	3.88	1.28	730	730
Carbon disulfide	1	TO-15	µg/m^3	6.23	2.09	100,000	100,000
Carbon tetrachloride	1	TO-15	µg/m^3	3.15	1.07	68	68
Chlorobenzene	1	TO-15	µg/m^3	2.3	0.783	7,300	7,300
Chloroethane	1	TO-15	µg/m^3	5.28	1.77	580,000	580,000

Table C-1c
Soil Gas Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Antcipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	DEQ RBCs[1] Commercial Soil Vapor Chronic
Chloroform	1	TO-15	μg/m^3	2.44	0.83	18	18
Chloromethane	1	TO-15	μg/m^3	10.3	3.45	13,000	13,000
cis-1,2-Dichloroethene	1	TO-15	μg/m^3	1.98	0.674	5,800	5,800
cis-1,3-Dichloropropene	1	TO-15	μg/m^3	2.27	0.772	--	--
Cumene	1	TO-15	μg/m^3	2.46	0.836	58,000	58,000
Cyclohexane	1	TO-15	μg/m^3	1.72	0.585	880,000	880,000
Dibromochloromethane	1	TO-15	μg/m^3	4.26	1.45	--	--
Ethanol	1	TO-15	μg/m^3	9.42	3.15	--	--
Ethylbenzene	1	TO-15	μg/m^3	2.17	0.738	160	160
Freon 11	1	TO-15	μg/m^3	2.81	0.955	--	--
Freon 113	1	TO-15	μg/m^3	3.83	1.3	730,000	730,000
Freon 12	1	TO-15	μg/m^3	2.47	0.841	15,000	15,000
Freon-114	1	TO-15	μg/m^3	3.5	1.19	--	--
Heptane	1	TO-15	μg/m^3	2.05	0.697	58,000	58,000
Hexachlorobutadiene	1	TO-15	μg/m^3	21.3	7.15	19	19
Hexane	1	TO-15	μg/m^3	1.76	0.599	100,000	100,000
m,p-Xylene	1	TO-15	μg/m^3	4.34	1.43	15,000	15,000
Methyl tert-butyl ether	1	TO-15	μg/m^3	7.21	2.42	1,600	1,600
Methylene Chloride	1	TO-15	μg/m^3	3.47	1.15	41,000	41,000
Naphthalene	1	TO-15	μg/m^3	5.24	0.891	12	12
o-Xylene	1	TO-15	μg/m^3	2.17	0.738	15,000	15,000
Propylbenzene	1	TO-15	μg/m^3	2.46	0.836	150,000	150,000
Styrene	1	TO-15	μg/m^3	2.13	0.724	150,000	150,000
Tetrachloroethene	1	TO-15	μg/m^3	3.39	1.15	1,600	1,600
Tetrahydrofuran	1	TO-15	μg/m^3	1.47	0.501	290,000	290,000
Toluene	1	TO-15	μg/m^3	3.77	1.24	730,000	730,000
TPH (Gasoline) C3-C12	1	TO-15	μg/m^3	50	16.7	40,000	40,000
trans-1,2-Dichloroethene	1	TO-15	μg/m^3	1.98	0.674	5,800	5,800
trans-1,3-Dichloropropene	1	TO-15	μg/m^3	2.27	0.772	--	--
Trichloroethene	1	TO-15	μg/m^3	2.69	0.914	100	100
Vinyl chloride	1	TO-15	μg/m^3	1.28	0.435	93	93

Notes:
DEQ = Oregon Department of Environmental Quality
RBCs = Risk-Based Concentrations
μg/m^3 = micrograms per cubic meter
TPH = total petroleum hydrocarbons
MRL = minimum reporting limit
MDL = method detection limit
ASTM = American Society for Testing and Materials
-- = Value is not available.
[1] Oregon DEQ RBCs for Vapor Intrusion (revised March 2025).

Table C-1d
Sediment Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

							DEQ RBCs for Sediment[1]	**DEQ RBCs[2]**				
								Soil Ingestion, Dermal Contact and Inhalation			**Soil Volatilization to Outdoor Air**	**Soil Leaching to Groundwater**
Analyte	**Anticipated Number of Samples**	**Method**	**Unit**	**MRL**	**MDL**	**Detection Limit Goal**	**Freshwater**	**Occupational**	**Construction Worker**	**Excavation Worker**	**Occupational**	**Occupational**
Metals												
Cadmium	4	EPA 6020B	mg/kg	0.100	0.0500	0.6	0.6	1100	350	9700	--	--
Chromium	4	EPA 6020B	mg/kg	0.500	0.250	37	37	--	530,000	--	--	--
Lead	4	EPA 6020B	mg/kg	0.100	0.0500	30	35	800	800	800	--	30
TPH												
Diesel Range Organics	4	NWTPH-Dx	mg/kg	20.0	10.0	4,600	--	14,000	4,600	--	--	--
Oil Range Organics	4	NWTPH-Dx	mg/kg	40.0	20.0	4,600	--	14,000	4,600	--	--	--
PAHs												
Acenaphthene	4	EPA 8270E	mg/kg	0.00267	0.00133	21,000	--	70,000	21,000	590,000	--	--
Acenaphthylene	4	EPA 8270E	mg/kg	0.00267	0.00133	--	--	--	--	--	--	--
Anthracene	4	EPA 8270E	mg/kg	0.00267	0.00133	110,000	--	350,000	110,000	--	--	--
Benzo(a)anthracene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.032	0.032	21	170	4,800	--	--
Benzo(a)pyrene	4	EPA 8270E	mg/kg	0.00400	0.00200	0.032	0.032	2.1	17	490	--	--
Benzo(b)fluoranthene	4	EPA 8270E	mg/kg	0.00400	0.00200	21	--	21	170	4,900	--	--
Benzo(g,h,i)perylene	4	EPA 8270E	mg/kg	0.00267	0.00133	--	0.3	--	--	--	--	--
Benzo(k)fluoranthene	4	EPA 8270E	mg/kg	0.00400	0.00200	0.027	0.027	210	1700	49,000	--	--
Carbazole	4	EPA 8270E	mg/kg	0.00400	0.00200	--	0.14	--	--	--	--	--
Chrysene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.057	0.057	2,100	17,000	490,000	--	--
Dibenzo(a,h)anthracene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.033	0.033	2.1	17	490	--	--
Dibenzofuran	4	EPA 8270E	mg/kg	0.00267	0.00133	--	5.1	--	--	--	--	--
Fluoranthene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.111	0.111	30,000	10,000	280,000	--	--
Fluorene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.077	0.077	47,000	14,000	390,000	--	--
Indeno(1,2,3-cd)pyrene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.017	0.017	21	170	4,900	--	--
1-Methylnaphthalene	4	EPA 8270E	mg/kg	0.00533	0.00267	--	--	--	--	--	--	--
2-Methylnaphthalene	4	EPA 8270E	mg/kg	0.00533	0.00267	--	--	--	--	--	--	--
Naphthalene	4	EPA 8270E	mg/kg	0.00533	0.00267	0.176	0.176	23	580	16,000	83	0.34
Phenanthrene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.042	0.042	--	--	--	--	--
Pyrene	4	EPA 8270E	mg/kg	0.00267	0.00133	0.053	0.053	23,000	7,500	210,000	--	--
PCBs												
Aroclor 1016	4	EPA 8082A	mg/kg	0.0100	0.00500	--	--	--	--	--	--	--
Aroclor 1221	4	EPA 8082A	mg/kg	0.0100	0.00500	--	--	--	--	--	--	--
Aroclor 1232	4	EPA 8082A	mg/kg	0.0100	0.00500	--	--	--	--	--	--	--
Aroclor 1242	4	EPA 8082A	mg/kg	0.0100	0.00500	--	--	--	--	--	--	--
Aroclor 1248	4	EPA 8082A	mg/kg	0.0100	0.00500	0.021	0.021	--	--	--	--	--
Aroclor 1254	4	EPA 8082A	mg/kg	0.0100	0.00500	0.007	0.007	--	--	--	--	--
Aroclor 1260	4	EPA 8082A	mg/kg	0.0100	0.00500	--	--	--	--	--	--	--
Total PCBs	4	EPA 8082A	mg/kg	0.0100	0.00500	0.034	0.034	0.59	4.9	140	--	1.1

Please see notes at end of table

Table C-1d
Sediment Analytical Methods, Detection Limit Goals, and Anticipated Number of Samples
Dallas Mill Work Plan

Analyte	Anticipated Number of Samples	Method	Unit	MRL	MDL	Detection Limit Goal	DEQ RBCs for Sediment[1]	DEQ RBCs[2]				
								Soil Ingestion, Dermal Contact and Inhalation			Soil Volatilization to Outdoor Air	Soil Leaching to Groundwater
							Freshwater	Occupational	Construction Worker	Excavation Worker	Occupational	Occupational
Dioxins/Furans												
2,3,7,8-TCDD	1	EPA 1613	mg/kg	0.00000100	0.000000333	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDD	1	EPA 1613	mg/kg	0.00000500	0.00000333	--	--	--	--	--	--	--
OCDD	1	EPA 1613	mg/kg	0.0000100	0.000000333	--	--	--	--	--	--	--
2,3,7,8-TCDF	1	EPA 1613	mg/kg	0.00000100	0.00000167	--	--	--	--	--	--	--
1,2,3,7,8-PeCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
2,3,4,7,8-PeCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	1	EPA 1613	mg/kg	0.00000500	0.00000167	--	--	--	--	--	--	--
OCDF	10	EPA 1613	mg/kg	0.0000100	0.00000333	--	--	--	--	--	--	--
2,3,7,8-TCDD TEQ	1	EPA 1613	mg/kg	0.00000100	0.000000333	0.000016	NA	0.000016	0.00017	0.0048	0.13	0.000031
Phenols												
Pentachlorophenol	1	EPA 8270E	mg/kg	0.0267	0.0133	0.17	NA	4	34	960	--	0.17

Notes
DEQ = Oregon Department of Environmental Quality
RBCs = Risk-Based Concentrations
mg/kg = milligrams per kilogram
TPH = total petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
MRL = minimum reporting limit
MDL = method detection limit
NA = Sediment sample will be collected from a stormwater retention basin and freshwater sediment RBCs are not applicable.
-- = Value is not available.

[1] Oregon DEQ RBCs for Sediment, Table 3 (September 2020).

[2] Oregon DEQ RBCs for Individual Chemicals (revised August 2023).

Table C-2
Container and Storage Requirements
Dallas Mill Work Plan

Analysis	Method	Container	Preservative	Storage Requirement
Soil				
Metals	EPA 6020B	8 oz. jar	None	0-6°C
TPH	NWTPH-Dx	16 oz. jar	None	0-6°C
PAHs	EPA 8270E		None	0-6°C
Phenols	EPA 8270E		None	0-6°C
Dioxins/Furans	EPA 1613	8 oz. jar	None	0-6°C
Organochlorine Pesticides	EPA 8081B	8 oz. jar	None	0-6°C
Chlorinated Herbicides	EPA 8321B		None	0-6°C
Formaldehyde	EPA 8315A	8 oz. jar	None	0-6°C
Propiconazole	EPA 8321	8 oz. jar	None	0-6°C
Groundwater				
Metals	EPA 6020B	125 mL plastic	HNO_3 to pH <2	None; 0-6°C recommended
TPH	NWTPH-Dx	1 L amber glass	HCl to pH <2	0-6°C
PAHs	EPA 8270E	1 L amber glass	None	0-6°C
Dioxins/Furans	EPA 1613	1 L amber glass	None	0-6°C
Phenols	EPA 8270	1 L amber glass	None	0-6°C
Soil Gas				
Methane	ASTM D1946	1 L Summa	None	None
Gasoline Range Organics/VOCs	TO-15	1 L Summa	None	None
Diesel Range Organics	TO-17	1 L Summa	None	None
Sediment				
Metals	EPA 6020B	8 oz. jar	None	0-6°C
TPH	NWTPH-Dx	16 oz. jar	None	0-6°C
PAHs	EPA 8270E		None	0-6°C
Phenols	EPA 8270E		None	0-6°C
PCBs	EPA 8082A		None	0-6°C
Dioxins/Furans	EPA 1613	8 oz. jar	None	0-6°C

Notes:
°C = degrees Celsius
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
EPA = United States Environmental Protection Agency
TPH = total petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
HCl = hydrochloric acid
HNO_3 = nitric acid
L = liter
mL = milliliter
oz. = ounce
ASTM = American Society for Testing and Materials

CENTRAL
ENGINEERING SERVICES

Attachment 1: Standard Operating Procedures

STANDARD OPERATING PROCEDURE (SOP) AIR-04

SOIL GAS WELL INSTALLATION AND SAMPLING

PURPOSE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to provide field personnel with the information necessary to install soil gas sampling wells and to collect representative soil gas samples while accurately documenting the data collection process. This SOP applies to both temporary shallow push-in sampling points and permanent or nested soil gas wells installed in protective flush-mount boxes.

Soil gas sampling should not be performed during a significant rainfall event (i.e., more than 0.5 inch of rainfall within a 24-hour period). If feasible, sampling should be conducted only after 5 days without a significant rainfall event. Infiltration of rainwater in the vicinity of the sampling Point may temporarily affect subsurface vapor conditions and may yield biased or non-representative results.

The step-by-step guidelines presented here must be followed by personnel installing soil gas wells and collecting soil gas samples.

EQUIPMENT AND SUPPLIES/REAGENTS

The following equipment and supplies are required to properly install soil gas wells and conduct soil gas sampling:

- Shroud (Central custom acrylic or laboratory-provided), equipped with 0.25-inch access ports and a foam mat floor seal.
- Analytical-grade helium detector (e.g., MGD-2002 or equivalent).
- Analytical-grade helium in suitable cylinders for leak-testing.
- New 0.25-inch-outside-diameter Teflon tubing and compatible Swagelok compression fittings.
- Subcontracted driller to hand-auger or drill boreholes to required depth (for deep or nested wells).

- Push-in tools or direct-push rods (for shallow temporary points).
- Clean #3 sand for filter pack.
- Granular and/or hydrated bentonite for transition seals and annular sealing.
- Traffic-rated flush-mount well boxes (for permanent wells).
- Sufficient number of 1-L Summa canisters with dedicated laboratory-provided manifolds (filters, gauges, valves, and flow controllers set at ≤200 mL/min).
- Lung box, Tedlar bags, and low-volume pump or syringe for helium leak testing.
- Appropriate tools for manifold installation and tubing connections.
- Patch and restoration materials for surface completion (pavement, concrete, soil, etc.).
- Laboratory shipping containers for canisters.
- Field notebook and Central standard forms for documenting sampling procedures and parameters

DECONTAMINATION

Use new, dedicated tubing and fittings at each sampling location.
Any reusable equipment that may contact soil during installation should be cleaned before arrival onsite, between locations as required, and upon demobilization, following standard Central Engineering Services decontamination procedures.

PROCEDURES

This section presents the procedures to be implemented for the building inspection and the indoor and outdoor ambient air sampling. Procedures include preparation for sampling, sampling methodology, post-sampling procedures, and analysis.

Preparation for Sampling

Prior to collecting indoor air samples inside a building, building inspection is necessary to identify potential sources of contamination. The purpose of the building inspection is to assess building construction characteristics; heating, ventilating, and air conditioning (HVAC) systems; and sources of possible chemical contaminants that may influence the results of indoor air sampling at each sampling location. Document the presence of any chemical products used and will evaluate whether these products contain the target compounds for the indoor air sampling. Central Engineering Services will complete the Indoor Air Building Survey and Sampling Form prior to initiating sampling.

The building owner/operators will be notified in advance of the sampling, and necessary access agreements and tenant notifications will be executed. It is important that tenants, custodial personnel, and others present in the sampling area be made aware of the sensitivity of the sampling and that the sampling devices must not be tampered with during the sampling process. If necessary, a Central Engineering Services representative will remain on the Site for the duration of the sampling to ensure the security and integrity of the samples. At a minimum, Central

Engineering Services will periodically visit each sampling location for the duration of the sampling to observe and document sampling conditions such as changes in weather, building/tenant space use, HVAC system operation, and other activities that could affect sampling results.

Central Engineering Services will identify potential sources of volatile organic compounds (VOCs) in the building by visual observation and using a PID or similar air monitoring device to screen for the presence of VOCs in the building. If possible, Central Engineering Services will properly seal any chemicals present or remove them from the building prior to the sampling event. If source materials are removed from the building, sampling will be delayed for a minimum of 24 hours and the spaces to be sampled will be ventilated to exchange the air present when the source materials were in the building with fresh air using either the HVAC system or other means of ventilation such as opening doors and/or windows.

During the building inspection process Central Engineering Services will also document potential outdoor sources of contamination and weather conditions that could influence indoor ambient air concentrations.

Sampling Methodology

Time-integrated indoor and outdoor ambient air samples will be collected using 6-liter Summa canisters, prepared under negative pressure and laboratory-certified to be clean for the compounds of interest for the site. The Summa canisters will be equipped with dedicated flow regulators for collection of a sample over an 8-hour period. The instructions below are to be followed for the indoor and outdoor ambient air sampling:

- Several days before sampling, check the Summa canisters for leaks to ensure that each canister is under sufficient vacuum pressure to obtain a representative sample. Ensure that documentation of the laboratory certification for the canisters is included on a tag attached to the canister and in the paperwork accompanying the canister shipment from the laboratory.
- Confirm that the sampling canister valves are closed (the knob is tightened clockwise).
- Attach the manifold to the canister, including the filter, flow controller, and pressure gauge.
- Confirm that a brass cap is secured at the inlet of the manifold/flow controller, creating an air-tight sampling train.
- Quickly open and close the sample canister valve and observe the gauge reading. If the initial gauge reading is less than the laboratory-recommended value, discontinue the leak testing for that canister. Repeat the testing for each canister.
- If the initial vacuum pressure is within acceptable limits, continue to monitor the gauge to check for leaks in the manifold and at the connections to the Summa canister. Observe the gauge for 5 minutes. If the needle on the gauge drops, indicating a loss of pressure, the sampling train is not airtight. In this situation, refit and/or tighten the connections until the needle holds steady. If leakage is still indicated, use an alternate manifold/flow

controller to confirm that the initial manifold/flow controller requires replacement. Obtain replacement equipment and repeat the testing.

- Ensure that the owner and/or operator and other parties present in the sampling space are aware that testing is being performed and that the sampling devices must not be disturbed. Document the conditions in the sampling space, including work activities, potential chemical use, persons wearing dry-cleaned clothing, carpet cleaning, painting, and any change noted from the time the building was inspected before the sampling event.
- Note the HVAC operational settings, including but not limited to whether the HVAC system is operational, heating or cooling mode, temperature, and any nonstandard HVAC ventilation or heating methods (e.g., use of a fan or space heater, an open window or door).
- Verify that the selected sampling locations remain valid under current conditions (e.g., a change in weather conditions may necessitate altering the ambient outdoor air sampling location, a recent spill or use of a cleaning product may eliminate a room initially selected for sampling). Contact the Project Manager immediately to discuss any condition potentially necessitating a change in sampling location.
- Verify that the number engraved on each Summa canister matches the number listed on the certified-clean tag attached to the canister to ensure that the canister was properly decontaminated.
- Set up the Summa canisters in the selected sampling locations approximately 3 to 4 feet above the floor to collect indoor ambient air samples.
- Outdoor ambient air samples typically are collected near a building undergoing indoor air sampling. For outdoor ambient air samples, select collection points for outdoor ambient air samples such that the intake point for the sampler is a minimum of 6 feet above the ground surface and upwind of the building undergoing indoor air sampling.
- Verify that the Summa canister valve is tightly closed, then remove the threaded cap at the top of the canister.
- Attach the flow regulator/pressure gauge to the top of the canister and use a wrench to gently tighten it.
- Open the valve and record the pressure on the gauge as "initial pressure" in the field notes and on the sample tag attached to the canister.
- Complete the sample tag attached to the canister and record the following sample information in the Field Report form:
    - Sample identification
    - Sample start date
    - Sample start time
    - Location of sample: distance from walls and floor shown on the site plan
    - Initial pressure of the canister
    - Canister number
- Once sampling has begun and the canisters have been verified to be operating correctly, leave the canisters to fill.

- Return after approximately 6 to 7 hours to confirm that the canisters are operating properly. Depending on site activities, it may be necessary to be on the site during the entire sampling period, or to return periodically to document site conditions during sampling. Consult the Project Manager to determine the specific monitoring frequency required for the sampling location. Check the canister pressure before the end of the anticipated 8-hour sampling period, as the accuracy of the flow regulators can vary slightly, causing a canister to fill more quickly or slowly than anticipated. **The final pressure at the end of sampling should be approximately 5 to 6 inches of mercury.**
- If the pressure is above 6 inches of mercury, leave the canister to fill for the full 8-hour sampling period. If the pressure is below 5 inches of mercury, close the canister and contact the Project Manager immediately. The Project Manager will confer with the laboratory to establish whether sampling must be repeated using a new canister, or sufficient vacuum is present to obtain valid laboratory data.
- Upon completion of sampling, record the time and the exact pressure of the canister on the sample tag for that canister, on the Chain of Custody form, and in the field notes. Record any other condition that could affect sampling results (e.g., site activities, HVAC use, weather).
- Close the sample canister valve, disconnect it from the manifold, and replace and tighten the brass cap on the canister inlet.

Post-Sampling Procedures

Ensure that each of the sample containers is labeled with the following information:

- Sample identification;
- Date and time of sample collection;
- Starting and ending canister pressure;
- Site name; and
- Central Engineering Services.

Record this information and the ending time of sample collection in the field notes and transfer pertinent information to the Chain of Custody form. Pack each of the Summa canisters in its original shipping container, seal it with a custody seal, and return it to the laboratory as soon as possible for analysis. The hold time for the analysis to be performed as described herein is 30 days.

Analysis

The indoor air samples should be analyzed using U.S. Environmental Protection Agency Method TO-15, with low-level analysis using Selective Ion Mode to obtain method detection and reporting limits that are sufficiently low to meet or exceed the target cleanup levels for the project. The air samples collected in the Summa canisters have a 30-day hold time.

DOCUMENTATION

Document field activities and environmental and building conditions on standard Central Engineering Services forms and in the field notes and provide other sampling documentation such as photos or video recordings. Documentation provided electronically will be recorded, labeled, and transferred to the corresponding project folder.

REFERENCES

Air Toxics LTD. No Date. *Guide to Air Sampling and Analysis, Canisters and Tedlar Bags.* Fourth Edition. Folsom, California. www.airtoxics.com.

Massachusetts Department of Environmental Protection. 2002. *Indoor Air Sampling and Evaluation Guide.* Boston, Massachusetts. April.

U.S. Environmental Protection Agency. 1999a. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition.* Method TO-14A. EPA/625/R-96/010b. January

———. 1999b. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition.* Method TO-15. EPA/625/R-96/010b. January.

STANDARD OPERATING PROCEDURE EQ-01

EQUIPMENT DECONTAMINATION PROCEDURES

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the methodology for decontaminating sampling equipment during various field activities. The step-by-step guidelines provided in this SOP are to be followed by the field crew during all site visits, as applicable.

EQUIPMENT AND SUPPLIES/REAGENTS

The following equipment is necessary to properly decontaminate field equipment during various field tasks:

- Rinse water or distilled water.
- Deionized water.
- Liquinox or other phosphate-free detergent.
- Paper towels.
- Labeled squirt bottles.
- Long-handled hard-bristle brushes (for sediment and soil).
- Cotton swabs.
- Plastic sheeting, garbage bags, and aluminum foil (for sediment and soil).
- Core liner caps or plastic wrap and rubber bands (for sediment and soil).
- Extension arm for cleaning core liners (for sediment and soil).
- Plastic 5-gallon bucket.
- U.S. Department of Transportation-approved drum(s) for decontamination water unless other water-handling arrangements have been made. Separate drums are needed for liquid and solid wastes (see SOP WM-01, Field-Handling of Investigation- Derived Waste). Liquid wastes should not be added to drums containing solid wastes.

Dilute Liquinox with distilled water in a squirt bottle in accordance with the instructions on the Liquinox package, and label the bottle. Fill another squirt bottle with distilled water, and label the bottle.

FIELD EQUIPMENT TO BE DECONTAMINATED AFTER USE

Decontaminate the following field equipment at the conclusion of field work each day, in accordance with the procedures outlined in this SOP:

- Water-level meter.
- Horiba/YSI multiparameter probe.
- Bladder pump.
- Submersible pump.
- Sediment and soil collection and processing equipment.

WATER-LEVEL METER DECONTAMINATION

Decontaminate the water-level meter after measuring the water level at a monitoring well before moving to a new monitoring well, using the following procedures:

- Spray the bottom half of a paper towel with the diluted Liquinox solution, and the upper half with deionized water.
- Grip the measuring tape of the water-level meter with the paper towel in one hand with the Liquinox side down toward the monitoring well casing.
- Begin slowly reeling up the water-level meter while maintaining firm contact between the measuring tape and the paper towel.
- Ensure that no debris or contamination remains on the measuring tape of the water-level meter once it has been reeled up.
- Use a clean new paper towel for each successive decontamination of the measuring tape of the water-level meter.

HORIBA/YSI MULTIPARAMETER PROBE DECONTAMINATION

Decontaminate the Horiba/YSI multiparameter probe at the end of each workday or after sampling a monitoring well with high concentrations of contamination, using the following procedures:

- Remove the multiparameter probe from the flow-through cell, and thoroughly spray each component with deionized water.
- Use a cotton swab to gently clean around each sensor probe, ensuring that all contaminated water and material has been washed away.
- Refill the protective dissolved oxygen and pH probe caps with deionized water, and replace prior to storage.
- Once the multiparameter probe has been adequately cleaned, replace the protective shield, and return the probe to the case. If the device appears to be overly wet, allow it to air-dry with the case open.

- Do not use Liquinox to clean any probes on the Horiba multiparameter probe, as it may damage the device.

BLADDER PUMP DECONTAMINATION

Decontaminate the bladder pump after sampling a well and at the end of each workday, using the following procedures:

- After extracting the bladder pump from the well, break down the pump, remove and dispose of the used bladder, and spray each component with the diluted Liquinox solution, followed by deionized water.
- Wipe away any visible contamination or debris with a paper towel.
- Capture cleaning water in a liquid waste drum for proper disposal in accordance with Central Engineering's SOP WM-01, Field-Handling of Investigation-Derived Waste.
- Ensure that all contamination and Liquinox solution is washed off all components before reassembling the device, installing a new bladder, and moving to sample a new well.

SUBMERSIBLE PUMP DECONTAMINATION

Decontaminate the submersible pump after purging water from any well, using the following procedures:

- After extracting the submersible pump from the well, thoroughly spray down the pump with the diluted Liquinox solution, followed by deionized water.
- Wipe away any visible contamination or debris with a paper towel.
- Purge clean water through the pump and tubing to ensure that contaminated water has been cleared from all lines.
- Capture cleaning water in a liquid waste drum for proper disposal in accordance with Central SOP WM-01, Field-Handling of Investigation-Derived Waste.

SEDIMENT AND SOIL SAMPLING AND PROCESSING EQUIPMENT DECONTAMINATION

Decontaminate sampling equipment used to collect and process sediment and soil samples, using the following procedures:

- Place contaminated equipment and decontamination tools on plastic sheeting.
- Thoroughly rinse all used equipment with distilled water in a 5-gallon bucket to remove excess sediment or soil.
- Pour one capful of Liquinox solution into a 5-gallon bucket filled with tap water or distilled water.
- Using a long-handled hard-bristle brush, thoroughly scrub the equipment with the Liquinox solution until no sediment or soil particles remain.

- Holding the equipment over a 5-gallon bucket, double-rinse the equipment with distilled water until no Liquinox solution remains. Do not allow clean equipment to come into contact with a contaminated surface.
- Drain the equipment and place it in a clean, dry place to prevent recontamination.
- If decontaminated equipment will not be re-used immediately, wrap stainless steel equipment (e.g., bowls, spoons) in aluminum foil with the dull side facing the equipment. Seal polycarbonate core liners with core caps or cellophane plastic. Rubber-band ends to ensure a proper seal.
- After decontamination has been completed, place disposable items into a garbage bag, and store decontamination water in a drum in accordance with Central SOP WM-01, Field-Handling of Investigation-Derived Waste.

STANDARD OPERATING PROCEDURE EQ-02

PHOTOIONIZATION DETECTOR CALIBRATION AND OPERATION

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the information needed to properly use, operate, and handle Mini RAE Photoionization Detector (PID) Models 2000 and 3000. The PID is used as a field-screening instrument for measurement of total volatile organic (TVO) concentrations in air. Typical uses include air monitoring of the breathing zone for health and safety purposes, screening of groundwater and soil for TVO emissions, and monitoring of the headspace of a monitoring well. The PID is a highly sensitive instrument. MiniRAE Models 2000 and 3000 have a potential operating range of 0.1 to 15,000 parts per million (ppm) isobutylene equivalents, depending on the lamp used. The detection limit is 0.1 ppm hexane or isobutylene, with a response time of less than 3 seconds.

Operation and maintenance manuals specific to this equipment should be referenced as necessary. Two user manuals are kept in Central's PID case: the *MiniRAE 3000 Pocket Reference;* and the *MiniRAE 3000 User's Guide*. These manuals should always be stored in the PID case so they are available for reference.

The step-by-step guidelines provided in this SOP are to be followed by the field crew when monitoring concentrations of TVO compounds in the breathing zone, a soil sample, a water sample, or the headspace of a monitoring well.

EQUIPMENT

The following equipment is necessary to calibrate and operate the PID:

- The PID instrument;
- A calibration gas regulator and silicon tubing;
- Calibration gas containing approximately 100 ppm isobutylene; and
- A 110-volt battery charger.

PID CALIBRATION CHECK

PID calibration should be checked at the beginning of the day, and as needed if drift occurs (see “PID Drift or Other Change” section below). The instructions below are to be followed to check PID calibration (refer to pages 17 and 18 of the *MiniRAE 3000 User's Guide* for information regarding the connection between buttons and control functions):

- Turn on the PID by pressing [MODE]. Wait for the PID to proceed to the default display, and allow the instrument to warm up for 10 minutes in accordance with the manufacturer's instruction. The initial reading should be 0 or 0.1 part per million volume (ppmv).
- Connect the regulator to the gas cylinder, and connect the tubing to the regulator.

- Start the gas flow by pushing in the regulator knob and turning 90 degrees. Some gas will begin to escape.
- Connect the tubing from the regulator to the PID sensor tip. The PID reading should climb to 99 to 101 ppmv.
- When the PID reading reaches the maximum level displayed, turn off the regulator and disconnect the sensor tip. The reading should return to zero.
- If any of the readings predicted above do not occur, re-calibrate the PID or arrange for repair.

PID CALIBRATION

The instructions below are to be followed to perform a zero (fresh air) calibration and a span calibration on the PID (refer to pages 35 through 46 of the MiniRAE 3000 User's Guide for information regarding calibrations):

Zero Calibration (a zero calibration always should be performed prior to a span calibration):

- Turn the unit on by pressing [MODE] for approximately 1 second.
- Press and hold [MODE] and [N/-] simultaneously until you see the Password Screen.
- Input the password:
    - The default password is 0000.
    - Use the [Y/+] to increase the number value from 0 through 9.
    - Use the [N/-] to move the cursor to a different number slot.
    - Press [MODE] once you have input the password.
- Select "Calibration" by using [Y/+].
- Select "Zero Calib" by using [Y/+].
- Apply a fresh air source to the unit. Clean ambient air without detectable contaminants may be used as a fresh air source.
- Press [Y/+] to start the zero calibration. The zero calibration will take approximately 30 seconds to complete.
- The display screen will return to the Calibration menu when the zero calibration is complete.
- Record the values read by the PID in a calibration book or in the Log Field Book.

Once the zero calibration is complete, the unit automatically returns to the Calibration menu.

If the PID does not read 0.0 ppmv following the zero calibration, repeat the zero-calibration procedure. If the PID fails both attempts to zero-calibrate, move on to span calibration.

SPAN CALIBRATION

- Press [N/-] to scroll down to “Span Calib.”
- Press [Y/+] to select “Span Calib.”
- Select the proper calibration gas. Ensure that the calibration gas and the span value on the unit’s display screen have the same TVO concentration.
- Connect the regulator to the gas cylinder, and connect the tubing to the regulator.
- Press [Y/+] to begin the span calibration.
- Immediately apply the correct calibration gas to the unit’s probe by turning the regulator knob 90º in either direction. The span calibration will take approximately 30 seconds.
- The calibrated value should be +/- 2 percent of the concentration indicated on the calibration gas canister. Once the span calibration is complete, the unit will automatically return to the calibration menu.
- If the calibrated value is 2 percent greater than the concentration indicated on the calibration gas canister, repeat the span calibration procedure.
- Press [MODE] twice to navigate back to the main display.
- When calibrating the PID with isobutylene, record values read by the PID in a calibration book or in the Log Field Book.
- If the PID did not initially calibrate using the zero calibration mode, re-attempt to calibrate the PID using fresh air.

If the PID does not calibrate using the span calibration gas, call and update the Project Manager on the status.

PID DRIFT OR OTHER CHANGE

PID drift commonly is a failure of the instrument to return to zero after TVO concentrations dissipate. A failure to return to zero usually reflects inaccuracy at the upper end of the instrument’s detection range. Several situations can cause drift, including soil or water in the tip of the probe, soil or water in the sensor filter, or a change such as tightening or loosening the probe tip assembly since the instrument was last calibrated. The degree of drift from the initial daily calibration can be checked by exposing the PID to the calibration gas (see the “PID Calibration” section above). Re-calibration serves little purpose until the cause of the drift is determined.

If you determine that PID drift is occurring, complete the following actions:

- Unscrew the probe from the PID unit;
- Inspect the probe and the top of the unit for soil or moisture;
- Carefully remove any soil or moisture from the probe and/or unit by air drying;

- Replace the sensor filter on the probe with a new, unused sensor filter;
- Screw the probe back on the unit; and
- Apply Span Calibration gas to test the accuracy of the PID unit.

PID OPERATION

The instructions below are to be followed for PID use to screen soil and groundwater for TVO concentrations, to monitor the breathing zone for health and safety purposes, and to monitor monitoring well headspace:

- Connect the PID sample probe with filter to the PID hand-held air monitor.
- Turn on the PID by pressing [MODE]. Wait for the PID to proceed to the default display, and allow the instrument to warm up for 10 minutes in accordance with the manufacturer's instructions.
- **CAUTION!** Do not seal the soil in a plastic bag for longer than 5 minutes when conducting soil screening to avoid false readings due to moisture build-up (in wet situations, use the filter on the end of the sensor tip). Pierce the plastic bag with a clean tool, and immediately insert the sensor tip, quickly establishing a tight seal. The meter should react rapidly. Record the maximum value displayed within 30 seconds.
- To monitor groundwater and soil for TVO emissions, place the probe inlet near the groundwater or soil surface, and read the meter display showing detected concentrations. Do not allow water or soil to be sucked into the instrument.
- To monitor the breathing zone for health and safety purposes, allow the PID to monitor air quality at the breathing zone, chest, or face level, and read the meter display showing detected concentrations.
- Monitor the headspace of a monitoring well directly after the well has been opened. Place the probe inlet directly above the polyvinyl chloride well casing or tubing that is associated with a dedicated pump in the well. Read the meter display showing detected concentrations.
- Ensure that the PID is kept dry while in use. Humidity or moisture from rain can cause large fluctuations in PID readings, and can damage the instrument.
- If the PID displays erratic readings, it is possible that either moisture or dirt is in the probe, or dirt has collected in the filter. If this occurs, clean and dry the sample probe (possibly by placing it near a running heater in a vehicle), and replace the filter if necessary.

DOCUMENTATION

Document the PID measurements for all monitoring events on field forms and in a detailed field notebook, and record observations of varying weather conditions such as temperature and humidity fluctuations.

REFERENCES

PE Photovac Air Monitor/Portable Photoionization Detector Model 2000/3000 Manuals. RAE Systems. 2010. *MiniRAE 3000 Pocket Reference.* PN: 059-4030-000-D. August.

———. 2010. *MiniRAE 3000 User's Guide.* P/N 059-4020-000. August.

STANDARD OPERATING PROCEDURE GW-04

LOW-FLOW GROUNDWATER SAMPLING PROCEDURES

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the methodology for collecting and documenting groundwater samples from monitoring wells using U.S. Environmental Protection Agency (EPA) low-flow groundwater sampling procedures (EPA 1996, 2017) for chemical analysis to ensure consistent and representative sampling. The step-by-step guidelines provided in this SOP are to be followed by the field crew conducting groundwater sampling.

EQUIPMENT AND SUPPLIES/REAGENTS

The following equipment is necessary to properly purge and sample a monitoring well:

- Monitoring well key, hand drill, socket set, padlock key, or other monitoring well-access equipment.
- Electronic water-level meter long enough to reach the bottom of the monitoring well, calibrated to 0.01 foot. Alternatively, to measure for light nonaqueous-phase liquid thickness in addition to groundwater, use an oil-water interface probe.
- Monitoring well purging and sampling equipment:
    - Submersible pump (bladder or Grundfos): the pump, control box, and power source (typically a portable generator or a 12-volt battery); or
    - Peristaltic pump: the pump with pump head, silicone tubing, tubing connectors (as needed), and power source (typically a 12-volt battery).
- Sample tubing of project- and site-specific type and length.
- Bailer, if a pump is not used, or if light nonaqueous-phase liquid requires removal.
- Sufficient number of 55-gallon drums, including lids, gaskets, and fasteners, to contain all purge water, unless other water-handling arrangements have been made.
- Flow-through water-quality meter(s) to measure temperature, pH, specific conductivity, dissolved oxygen, oxidation-reduction potential (ORP), and turbidity.
- Air-space monitoring equipment if required (photoionization detector or multi-gas meter).
- Decontamination equipment and supplies (e.g., buckets, scrub brushes, deionized or distilled water, potable water, Liquinox detergent).
- Materials necessary to provide required documentation, (e.g., sample labels, Field Report forms, Low-Flow Well Purging and Sampling Data form, Chain of Custody form, Waste Inventory Tracking Sheet).

- Sample containers with the chemical preservatives appropriate for the samples, as described in project-specific plans, or as required by the analytical laboratory at a minimum.
- Personal protective equipment as described in the site-specific Health and Safety Plan (HASP).
- Sampling-support equipment (e.g., sample coolers, ice, bubble wrap, clear tape, duct tape, resealable plastic bags, garbage bags, paper towels, distilled water, nitrile gloves, shipping supplies).
- U.S. Department of Transportation-approved drum(s) for purge water, unless other water-handling arrangements have been made. Separate drums are needed for liquid and solid wastes (Refer to Central Engineering SOP WM-01, Field Handling of Investigation-Derived Waste). Liquid wastes should not be added to drums containing solid wastes.

DECONTAMINATION

Before arrival at the site, upon relocation at the site, and upon demobilization from the site, decontaminate reusable equipment that will come into contact with the monitoring well(s) and/or be used to acquire samples, in accordance with Central Engineering SOP EQ-01, Equipment Decontamination Procedures.

PROCEDURES FOR LOW-FLOW GROUNDWATER SAMPLING

Low-flow groundwater sampling procedures have been developed for monitoring wells with a dedicated pump (dedicated monitoring wells) and for monitoring wells without a dedicated pump (non-dedicated monitoring wells). Setup, purging, sample collection, and post-sampling procedures for dedicated and non-dedicated monitoring wells are presented below.

Setup

Setup procedures differ slightly for dedicated versus non-dedicated monitoring wells. Follow the instructions below for the monitoring wells as indicated:

- Calibrate the water-quality meter for the field parameters specified in the project-specific plans. At a minimum, collect temperature, pH, and specific conductivity during purging and prior to sampling. Record on the Field Report form the equipment calibration and maintenance performed. Decontaminate the water-quality meter between monitoring wells by rinsing with distilled or deionized water. Manage the rinsate water used in collecting these measurements in the same manner as for purge water, as defined in project-specific plans, and in accordance with Central Engineering SOP WM-01, Field Handling of Investigation-Derived Waste.
- Don appropriate personal protective equipment as described in the site-specific HASP, including nitrile gloves for activities that might involve contact with groundwater or equipment. Change gloves between each monitoring well at a minimum, or when

contaminants could be introduced into a monitoring well or onto decontaminated equipment.

- Brush away soil and/or vegetation, and pump standing water away from the monitoring well opening. If necessary, place a plastic drop cloth around the monitoring wellhead to prevent sampling equipment from contacting the ground surface.
- Inspect the condition of the monitoring well (e.g., locked monitoring well cap, tightness of monitoring well cap, well-marked measuring point on casing, disturbance of surface casing, straightness of monitoring well casing, condition of concrete pad). Indicate the monitoring well condition on the Low-Flow Well Purging and Sampling Data form.
- Open the monitoring well cap. If the site-specific HASP identifies organic compounds as potential contaminants of concern, screen the monitoring well headspace and the breathing zone headspace (if specified in the HASP) for organic vapors using the appropriate field monitoring instrument (e.g., photoionization detector, multi-gas meter).
- Measure and record the depth to water using a decontaminated water-level meter in accordance with Central Engineering SOP GW-03, Groundwater Level Measurements in Monitoring Wells.
- If light nonaqueous-phase liquid may be present (see site-specific plans), obtain a sample from the monitoring well using a bailer (if a dedicated pump is not in use), as specified in Central Engineering SOP GW-03, Groundwater Level Measurements in Monitoring Wells. Alternatively, measure free-floating product thickness using an oil-water interface probe.
- Calculate the monitoring well casing volume as follows:

  Monitoring well casing volume in gallons = $(\pi * r^2) * h$(7.48 gallons/cubic foot) Where:

  r = radius of the inside of the monitoring well casing in feet

  h = length of the water column in the monitoring well casing (i.e., the depth to the bottom of the monitoring well minus the depth to water, both measured from the mark at the top of the monitoring well casing), in feet
- **For monitoring wells with dedicated pumps and tubing**: Set up a flow-through cell in preparation for purging. Connect dedicated tubing from the monitoring well to the flow-through cell. Set tubing and/or pump to the correct water depth in accordance with the constituents being sampled for, as described in project-specific plans. **DO NOT IMMERSE water-quality probes or meters in purge water containing nonaqueous-phase liquids, which could damage the probes.** Turn the pump controller to its lowest setting, set the memory in the flow-through cell to record readings every 3 minutes, and turn on the pump. Begin purging slowly (i.e., less than 500 milliliters per minute [ml/min]) to prevent drawing down the water table.
- **For monitoring wells with non-dedicated pumps**: Connect dedicated silicon tubing to the peristaltic pump. Place the tubing intake at the midpoint of the screen, or at the depth

pre-determined in the project-specific plans. If using a bladder pump, insert the bladder pump and attach the dedicated polyethylene tubing so the pump intake is at the approximate midpoint of the screened interval, or set the pump intake to the depth pre-determined in the project-specific plans.

Purging Procedures

The purging instructions below are to be followed for dedicated and non-dedicated monitoring wells:

- Begin purging, and initiate water-quality testing for temperature, pH, specific conductivity, dissolved oxygen, ORP, and turbidity. Purge monitoring wells using a peristaltic or bladder pump, and dedicated polyethylene and silicon tubing. Record water-quality parameters every 3 minutes.
- Record water levels every 3 minutes, as possible. It is imperative that the water level not drop by more than 0.33 foot during the low-flow purging process. If the water level drops more than 0.33 foot during purging, reduce the flow rate on the pump. Recommended purge rates generally are less than 500 ml/min. Actual purge rates will vary based on aquifer material and monitoring well construction. If the water level continues to drop by more than 0.33 foot during the low-flow purging at a rate less than 100 ml/min, notify and consult with the Project Manager on how to proceed.
- Record flow rates every 3 minutes. Ensure that the flow rate does not exceed 500 ml/min during the low-flow purging process.

Purging Requirements

Continue purging at a constant rate until the water-quality parameters have stabilized for three successive measurements according to the stability criteria provided in the table below. Before samples can be collected from each monitoring well, the groundwater must stabilize according to following criteria:

- Drawdown is no greater than 0.33 foot for low-flow sampling, and
- The water-quality parameters should stabilize according to the criteria specified below:

Water-Quality Parameter	Stability Criterion
Turbidity (if required)	10% for values greater than 5 NTU or three consecutive values < 5 NTU
Dissolved oxygen	10% for values greater than 0.5 mg/l, or three consecutive values <0.5 mg/l
Specific conductivity	3%
Oxidation-reduction potential	+/- 10 millivolts
pH	+/- 0.1 unit
Temperature	3%

Notes:
mg/l = milligrams per liter
NTU = nephelometric turbidity unit

Although under some circumstances a monitoring well may not stabilize according to the above criteria, the monitoring well can still be sampled if the monitoring well does not meet stability criteria due to the instrument accuracy, or the water level drops below the minimum value using low-flow sampling procedures. For example, a fluctuation in ORP greater than 10 millivolts does not meet the stability criterion. However, because the accuracy range of the ORP instrument is ± 20 millivolt, the stability criterion would be considered satisfied and within the range of instrument accuracy. Consult the manual for the instrument to determine the accuracy range.

Also, if the water level drops below the minimum value using low-flow sampling procedures (i.e., the pump intake, or the top of the screen if the aquifer is confined) during purging and one monitoring well volume of groundwater has been removed from the monitoring well, or the monitoring well runs dry during the purging procedure, sample the monitoring well as soon as the water level has recovered sufficiently to allow collection of the volume of groundwater necessary for all samples. Use the following equation to determine the minimum volume of groundwater to remove before sampling:

Minimum purge volume = 2*[500 milliliters + M*(length of tubing in feet)]

Where: M = volume (in milliliters) contained in a 1-foot length of tubing The

value of M is provided below for the inner diameters of tubing listed:

Inner Diameter (inches)	M (milliliters)
0.125	2.4
0.25	9.7
0.5	39

Record on the Field Report form and the Low-Flow Well Purging and Sampling Data form if any monitoring well did not meet the drawdown and stability criteria and explain the rationale for sampling the monitoring well at the time it was sampled. If stability criteria have not been achieved following completion of all entries in the Low-Flow Well Purging and Sampling Data form, notify and consult with the Project Manager whether to continue purging until stability criteria have been achieved or begin sample collection.

Sample Collection

During low-flow sampling, do not stop pumping once the purging requirements have been met. Turn down the flow rate on the pump so the water flow is minimal, but maintain sufficient pressure in the system to prevent water from the tubing or flow-through cell from flowing back into the monitoring well. Disconnect the pump discharge hose from the flow-through cell, or cut the tubing just before the connection to the flow-through cell. It is imperative not to lower the water table or disturb the water column. Fill pre-cleaned laboratory-supplied sample containers directly from the pump discharge tube into the proper sample container, and fill to capacity. Place a bucket beneath the sampling tube to catch any unsampled water between filling the sample jars. When collecting groundwater samples for multiple analyses, collect the samples in the order listed below per the EPA (1992) groundwater sampling technical guidance:

- Volatile organic compounds (VOCs);
- Dissolved gases and total organic carbon;
- Semi-volatile organic compounds;
- Metals and cyanide;
- Major water quality cations and anions;
- Radionuclides; and
- Dissolved (filtered) inorganics (if required).

When collecting samples for VOCs, adjust the flow rate as low as possible without introducing air bubbles into the system. When filling the VOC containers, hold the cap in hand to minimize contamination, and direct the flow from the pump discharge tubing down the side of the sample container to minimize aeration. Fill all VOC sample containers to the top, ensuring a positive meniscus when the cap is screwed down on the container. Tap the filled VOC container, and invert several times to ensure no air bubbles are present in the sample container. If an air bubble is present, the VOC sample must be recollected using a fresh VOC sample container. If sampling for other analytes, the flow rate may be increased.

If dissolved inorganics are required, attach a new disposable 0.45-micrometer filter cartridge to the discharge line. Collect filtered samples last. Pre-rinse the disposable filter cartridges by running a minimum of 0.25 gallon of groundwater through them (collecting the groundwater into a waste bucket) prior to collecting the samples directly into the sample container. Alternate field filtration methods may be specified in the project-specific plans. Remove the pump and/or tubing from the monitoring well.

Post-Sampling

- Record the depth to water of well to determine whether the water level changed from the original reading.
- Close and lock the monitoring well or tap and record any monitoring well integrity concerns on the Field Report form and the Low-Flow Well Purging and Sampling Data form.

- Transfer purge, wash, and rinse water into a U.S. Department of Transportation-approved drum(s) and label. Separate drums are needed for liquid and solid wastes, in accordance with SOP WM-01, Field Handling of Investigation-Derived Waste. Do not add liquid wastes to drums containing solid wastes.

PROCEDURES FOR RECONNAISSANCE GROUNDWATER SAMPLING

Collect reconnaissance groundwater samples from borings using direct-push or hollow-stem auger drilling methods and 0.75- or 2-inch-inside-diameter temporary monitoring well casing and 0.010-inch slotted screen. In some cases, alternate well casing diameters or screen slot sizes may be appropriate based on the drilling equipment or project-specific requirements. Follow the instructions below for reconnaissance groundwater sample collection:

- Withdraw the drill casing when the desired sampling depth has been reached, so the temporary monitoring well screen is exposed to water-bearing material.
- Insert disposable polyethylene tubing to the approximate midpoint of the temporary monitoring well screen. Attach the appropriate length of pre-cleaned disposable silicon tubing from the polyethylene tubing to connect with the peristaltic or bladder pump.
- Set up the peristaltic or bladder pump in preparation for purging. Turn the pump to its lowest setting and turn on the pump. Begin purging slowly to prevent drawing down the water table.
- Purge each temporary monitoring well point using a peristaltic or bladder pump until visual turbidity is as low as possible, or until the temporary monitoring well is purged dry of water.
- Purge a minimum of 1 to 2 liters before sample collection, if possible. If the temporary monitoring well is completely dewatered during purging, collect samples when sufficient recharge has occurred to allow filling of the sample containers.
- Slow the pumping rate to less than 500 ml/min to reduce the potential for volatilization of chemicals during sample collection.
- Collect the sample as described above.

If insufficient groundwater is available to collect a sample using a peristaltic or bladder pump (i.e., the boring pumps dry or cannot maintain a sufficient flow of less than 100 ml/min) or if the depth to groundwater exceeds the maximum practicable limit for sampling using a peristaltic or bladder pump, use a disposable polyethylene bailer lowered into the monitoring well screen to collect a groundwater sample from the screened interval, if possible.

DOCUMENTATION

Document the monitoring well purging and sampling activities on the Low-Flow Well Purging and Sampling Data form and on the Field Report form. Track samples on a Chain of Custody form. Track waste generated during groundwater sampling on a Waste Inventory Tracking Sheet.

REFERENCES

U.S. Environmental Protection Agency (EPA). 1992. *RCRA Ground-Water Monitoring: Draft Technical Guidance.* Office of Solid Waste. November.

———. 1996. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures.* EPA/540/S-95/504. April.

———. 2017. *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells.* EQASOP-GW4. September.

STANDARD OPERATING PROCEDURE SD-01
SURFACE SEDIMENT SAMPLING

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field staff with the methodology for collecting surface sediment samples from freshwater or marine environments for chemical, biological, and/or physical testing to ensure that representative samples are collected. For the purposes of this SOP, sediments are defined as mineral and organic materials beneath an aqueous layer of variable depth that has been present for a minimum of 6 consecutive weeks. The aqueous layer may be static water such as lakes, ponds, and impoundments; or flowing water such as rivers and streams. In tidally influenced bodies of water, sediments are present at or below the ordinary high-water mark.

Surface sediments typically are defined as sediments collected from the sediment-water interface to a depth of 10 centimeters below. The actual definition of surface sediments depends on the purpose of the sediment investigation, and any applicable regulatory criteria the data will be compared against.

The methodologies discussed in this SOP are applicable to collection of exposed surface sediment samples and collection of surface sediment samples in both flowing or standing water using a surface sediment sampling device (e.g., grab sampler). This SOP is generic in nature, and may be modified in whole or in part to meet the handling and analytical requirements of the contaminants of concern, and any constraints presented by site conditions or equipment limitations. Modifications to this SOP will be approved by the Project Manager, and documented in a site or field logbook. Modifications also will be discussed in reports summarizing the field activities

EQUIPMENT AND SUPPLIES

Sediment samples may be collected using a variety of methods and equipment, depending on the depth of the aqueous layer, the type of sample required (e.g., disturbed versus undisturbed), contaminants present, and sediment type. Some of the supplies listed below may be provided by the vessel subcontractor. Consult project-specific plans for additional equipment and supplies that may be required. A general list of equipment and supplies typically required for sediment sampling is provided below:

SAMPLING DEVICE

- For in-water sediments: Stainless steel hydraulic grab sampler, van Veen grab sampler, Ekman grab sampler, or Ponar grab sampler (refer to project-specific plans to select the most-appropriate grab sampler).
- For exposed sediments: Stainless steel shovel or trowel and stainless-steel spoons.

MINIMUM EQUIPMENT/SUPPLIES

- Lines and pulleys for raising and lowering the sampler (if not provided by the sampling vessel).
- Differential global positioning system (GPS) unit.

- Weighted measuring tape or lead line (tape must be long enough to measure the depth from the water surface to the sediment surface, with sufficient weight attached to resist the pull of the water current).
- Flexible siphon hoses and stainless steel baster.
- Stainless steel ruler.
- Stainless steel bowls, trowels, and spoons (large and small).
- Decontamination supplies (e.g., three high-density polyethylene tubs or buckets, scrub brushes, Liquinox detergent, distilled/deionized water, small spray bottles, large garden sprayer, aluminum foil).
- Certified pre-cleaned sample containers, and sample labels.
- Camera, white board, and markers.
- First aid kit, cell phone, and personal protective equipment as described in the site Health and Safety Plan; nitrile gloves, safety goggles, and steel-toed boots are required as a minimum.
- Materials necessary to provide required documentation (e.g., project plans, waterproof Field Report forms, waterproof Surface Sediment Sampling Field Log forms, Chain of Custody forms, indelible black or blue ink pens).
- Sample shipping and transport supplies (e.g., sample shipping forms, thick resealable plastic bags [smaller bags for sample jars, and I- to 2-gallon bags for ice], bubble wrap, coolers, large garbage bags to line the coolers, ice, permanent markers, strapping tape, clear tape and tape gun, custody seals).
- Other support equipment as needed (e.g., boat or flotation device, waders, sample coolers, duct tape, razor knives, garbage bags, paper towels, additional weights for lead line, marker buoy with weight and line).

DECONTAMINATION

Reusable equipment that will come into contact with sediment or be used to acquire sediment samples will consist of inert materials, and is to be decontaminated upon arrival at the site, between sediment samples collected, upon relocation at the site, and upon demobilization from the site, in accordance with SOP EQ-01.

SAMPLING PROCEDURES

COLLECTION OF IN-WATER SEDIMENTS

Several types of grab samplers are available for collection of surface sediment samples. It is important to choose a grab sampler that is capable of consistently collecting undisturbed sediment samples to the project-specific depth below the sediment surface without compromising the sample material. The grab sampler must create a minimal bow wake when descending, enclose the sample material with minimal disturbance, form a leak-proof seal during retrieval, and allow easy internal access to the sample from the top of the device. Although stainless steel grab samplers are preferred, grab samplers may be constructed of other contaminant-free materials such as aluminum, or may be treated with a non-contaminating coating such as Teflon. Grab samplers constructed of galvanized (zinc) or cadmium-plated steel should be used only when sediments will not be analyzed for metals, or when the presence of zinc or cadmium will not affect subsequent tests (e.g., benthic invertebrate enumeration). Record the specific sediment sampling equipment used at the site on the Surface Sediment Sampling Field Log form and the Field Report form.

Attach the grab sampler to a hydraulic or hand-powered winch, depending on the water depth and the weight of the grab sampler. Follow the procedures listed below for grab sample collection:

- Before the sampling vessel is maneuvered by the contracted vessel crew to the first target location, ensure that the field staff who will use the sampling equipment are familiar with the procedures and safety issues associated with its operation. Practice several deployments and retrievals as needed until field staff are familiar with the equipment and procedures.
- Decontaminate the grab sampler in accordance with SOP EQ-01 and project-specific plans.
- The contracted vessel crew will maneuver the sampling vessel to within 3 meters (or other project-specific distance requirement) of the target location using the vessel's navigation system. The vessel operator needs to maintain station positioning throughout the deployment and retrieval of the grab sampler, which can be achieved by "holding" the boat on station throughout sampler deployment and retrieval, or by anchoring the vessel using a three-point anchoring array.
- Prepare the grab sampler for deployment. If the grab sampler is manually operated, release the safety pin on the sampling arm for the jaw assembly as soon as the grab sampler is clear of the sampling vessel.
- Lower the grab sampler at a controlled speed of approximately 3 feet per second, with the winch line/hydro wire extending down from the top of the frame in a straight line. Water should pass freely through the closed upper screened doors of the sampling device upon its descent to minimize bow wake. Slow the descent of the grab sampler to 1 foot per second as it nears the bottom of the water body to minimize disturbance of surface sediments. **Never let the grab sampler free-fall** to the bottom, which could result in premature triggering, excessive bow wake, and disturbed surface sediments; or improper device orientation upon contact with the bottom sediment.
- As soon as the grab sampler reaches the bottom of the sediment surface, slowly close the jaws, and slowly raise the grab sampler off the bottom to ensure proper closure of the jaws, and to minimize spillage. Record the time, water depth, and differential GPS sample location coordinates on the Surface Sediment Sampling Field Log form. Once the grab sampler is clear of the bottom, its ascent speed can be increased to 3 feet per second. Maintain continuous retrieval of the grab sampler, minimizing disturbance, until the device is secured on board the vessel.
- Once the grab sampler has been secured on board the vessel, open its upper doors and examine the sample for acceptability, demonstrated by the following criteria:

  - The grab sampler exhibits minimal water leakage.
  - The grab sampler is not overfilled (i.e., sediment is not in contact with the upper doors of the grab sampler).
  - Overlying water is present.
  - The turbidity of overlying water is not excessive.
  - The sediment surface appears to be relatively undisturbed.
  - No anthropogenic (i.e., man-made) debris is present in the grab sampler.
  - The desired sample depth was achieved.

- If the above criteria have been met, carefully siphon off most of the overlying water using the flexible siphon hose, taking care to not siphon off any overlying fine-grained sediments. After most of the overlying water has been removed, use the stainless steel baster to remove any remaining overlying water, being careful not to contact the sediment surface.
- Take a photograph of the sediment in the grab sampler, including in the photograph notations on a white board documenting the station number, sample identifier, and time and date of collection.
- Use a decontaminated stainless-steel ruler to measure the grab sampler penetration depth and desired sampling depth from the deepest portion of the grab sampler along the sidewall. Enter the penetration depth and any observations of sediment surface conditions on the Surface Sediment Sampling Field Log form.
- To prevent potential cross-contamination, do not collect sediments that have come into contact with the sidewalls of the grab sampler.
- If volatile organic compound (VOC) or sulfide compound analysis is required, immediately remove sample material for either of these analyses upon removing overlying water from the grab sampler, prior to homogenizing the sediment. Follow the procedures listed below for collection of VOC and/or sulfide discrete samples:

  - VOCs: With minimal disturbance to the sediment, use a decontaminated stainless steel spoon to collect samples by placing a representative amount of surface sediment from the desired sample depth into the laboratory-supplied VOC container with no headspace, and seal it tightly. For plunger-type VOC samplers, follow the sample collection guidelines specified by the manufacturer or the analytical laboratory. Seal the samples immediately upon collection to reduce volatilization.
  - Sulfides: With minimal disturbance to the sediment, use a decontaminated stainless steel spoon to collect approximately 50 grams of sediment into a laboratory- supplied 120-milliliter (ml) glass container. Immediately pipet 5 ml of laboratory- supplied 2N zinc acetate preservative over the top of the sample, place the cap on the container, and shake vigorously. Ensure that the sample label indicates the addition of 2N zinc acetate preservative.

- Once VOC and sulfide subsamples have been collected, use decontaminated stainless steel utensils to remove remaining sediment from the desired sample depth from the grab sampler, and transfer to a stainless steel mixing bowl, taking care to not collect sediment that has come into contact with the sidewalls of the grab sampler.

- Take a photograph of the sediment in the stainless steel mixing bowl, including in the photograph notations on a white board documenting the station number, sample identifier, and time and date of collection.
- Document on the Surface Sediment Sampling Field Log form any additional observations and characteristics of the sediment depth interval collected.
- Homogenize the sediment in accordance with the procedures detailed in the Sample Homogenization section below.
- Refer to project-specific plans for procedures pertaining to disposal of any remaining sediment from the sample.
- Decontaminate the grab sampler before moving to the next sampling location.

COLLECTION OF EXPOSED SEDIMENTS

It may be necessary or more convenient to collect some surface sediment samples by land when they are exposed (e.g., low-tide) or if the project requires collection of sediment bank samples. Follow the instructions below for exposed surface sediment sample collection:

- Use the differential GPS to locate the target sampling location. Take care to approach the target location so as to not disturb the area of sediment to be sampled.
- Describe and characterize the undisturbed surface of the target sample location, including surrounding features that may impact the quality of sediment at the target location (e.g., debris, large rocks, sediment seeps). Note undisturbed surface characteristics on the Surface Sediment Sampling Field Log form. If sediment is not present at the target location, expose the sediment surface by clearing an approximately I-foot-square area of large rocks, debris, and organic material (e.g., seaweed, plant matter) from the surface, if possible. Document any material removed from the target location on the Surface Sediment Sampling Field Log form.
- Excavate the sediment to a depth of 10 centimeters (or to the surface sediment depth specified in the project-specific plans) using a decontaminated stainless steel shovel, trowel, or large spoon.
- Use a decontaminated stainless steel ruler to confirm that the appropriate sampling interval is exposed.
- Take a photograph of the sediment from the test, including in the photograph notations on a white board documenting the station number, sample identifier, and time and date of collection.
- If volatile organic or sulfide compound analysis is required, remove sample material for either of these analyses immediately upon exposing the sediment depth interval for collection, prior to homogenizing the sediment. Follow the procedures listed below for collection of VOC and/or sulfide discrete samples:
    - VOCs: With a minimum of disturbance to the sediment, use a decontaminated stainless-steel spoon to collect the samples by placing a representative amount of surface sediment

  - from the desired sample depth into the laboratory-supplied VOC container with no headspace, and seal it tightly. For plunger-type VOC sample devices, follow the sample collection guidelines specified by the manufacturer or the analytical laboratory. Seal the samples immediately after collection to prevent volatilization.
  - Sulfides: With minimal disturbance to the sediment, use a decontaminated stainless-steel spoon to collect approximately 50 grams of sediment into a laboratory- supplied 120-ml glass container. Immediately pipet 5-ml of laboratory-supplied 2N zinc acetate preservative over the top of the sample, place the cap on the container, and shake vigorously. Ensure that the sample label indicates the addition of 2N zinc acetate preservative.

- Once volatile and sulfide subsamples have been collected, remove the remaining undisturbed sediment from the desired sample depth using decontaminated stainless-steel utensils, and transfer to a stainless-steel mixing bowl.
- Take a photograph of the sediment in the stainless-steel mixing bowl, including in the photograph notations on a white board documenting the station number, sample identifier, and time and date of collection.
- Document on the Surface Sediment Sampling Field Log form any additional observations and characteristics of the sediment depth interval collected.
- Homogenize the sediment according to the procedures presented in the following section.
- Refer to the project specific plans for procedures pertaining to disposal of any remaining sediment sample material.
- Decontaminate the sample-collection equipment prior to moving to the next sampling location.

Once a sufficient amount of sediment has been collected in the decontaminated stainless steel mixing bowl, thoroughly mix the sediment using a decontaminated stainless steelstainless-steel spoon until it is uniform in color and texture throughout.

If grain-size analysis is required, transfer an aliquot of the homogenized sediment directly into a laboratory-supplied sample jar for grain-size determination prior to removing any large rocks from the homogenized sediment. Once the grain-size sample has been collected, remove from the homogenized sediment any rocks greater than 0.5 inch in diameter, noting on the Field Report form the general characteristics, and the percentage contribution to the homogenized soil volume. Take a photograph of the larger material removed, if required by the project-specific sampling plan.

Fill the remaining laboratory-supplied certified pre-cleaned sampling containers with sediment. Fill the sample containers to just below the lip or shoulder, and tightly seal the container. If samples are to be frozen, leave approximately 1 inch of headspace in the sampling containers. Label the sample containers, place each into a resealable plastic bag, and place into a sampling cooler with ice. Record the sample information on a Chain of Custody form.

Record on the Field Report form any deviations from the project-specified sampling procedures or this SOP, or any obstacles encountered.

DOCUMENTATION

Document the sediment sampling activities on the Surface Sediment Sampling Field Log form, the Chain of Custody form, and the Field Report form.

REFERENCES

U.S. Environmental Protection Agency. 1997. *Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound.* Region 10. April.

STANDARD OPERATING PROCEDURE WM-01

FIELD HANDLING OF INVESTIGATION-DERIVED WASTE

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the methodology for containerizing, labeling, and tracking investigation-derived waste (IDW), and for exchanging information with the Project Manager. IDW may include soil cuttings, purge water, development water, and/or decontamination water. This SOP has been developed in compliance with Washington State Dangerous Waste Regulations (Chapter 173-303 of the Washington Administrative Code), Oregon Hazardous Waste Management Rules (Division 100 of Chapter 340 of the Oregon Administrative Record), Environmental Health Standards for the Management of Hazardous Waste (Division 4.5 of Title 22 of the California Code of Regulations), and the U.S. Environmental Protection Agency Resource Conservation and Recovery Act (Parts 239 through 282 of Title 40 of the Code of Federal Regulations).

EQUIPMENT AND SUPPLIES/REAGENTS

The following equipment is necessary to properly containerize, label, and track IDW:

- U.S. Department of Transportation-approved drum(s) constructed of a material that does not react with the contaminants of concern for the project. Central Engineering typically uses lined open-top steel drums. Use a polyethylene drum for a material suspected to be corrosive.
- Labels appropriate to the characteristics of the IDW as indicated by the Project Manager:
    - Non-Hazardous Waste Labels: For IDW known to be nonhazardous based on previous data and waste profiles.
    - Hazardous Waste or Washington State Dangerous Waste Labels: For IDW known to be hazardous/dangerous based on previous data and waste profiles.
    - On Hold Pending Analysis Labels: For waste not previously characterized, pending receipt of analytical results. On Hold Pending Analysis labels are temporary, and should be replaced with the applicable waste label once the waste has been characterized.
    - Major risk labels associated with the waste characteristics.
- Waste Inventory Tracking Sheet.
- Grease marking pencil or paint pen.
- Indelible ink pen.
- Crescent wrench, speed wrench, socket wrench, or other hand tool to seal the drum(s).
- Sampling supplies, if needed, including:
    - Stainless steel or plastic bowls and spoons for homogenizing soil and/or solids samples, depending on the analysis to be performed;

  - Glass or stainless steel container for homogenizing liquid samples, depending on the analysis to be performed; and
  - Stainless steel hand-auger or a glass tube, depending on the medium being sampled (i.e., soil/solids or liquid).

PROCEDURES

Follow the instructions below to inspect, label, and inventory IDW drums, and to containerize IDW:

- Inspect new drums brought to the site to ensure that they do not have dents or corrosion, and are in good condition. Lined or coated drums are preferred.
- Inspect drums remaining at the site from previous project work. Notify the Project Manager if a drum is leaking, damaged, or improperly labeled.
- Place soil and solids into separate drums from those containing liquids such as purge water, development water, and decontamination water. Do not add liquid IDW to drums containing soil or solids. Do not fill drums containing liquid IDW above 85 percent capacity, particularly in areas known to reach freezing temperatures.
- Discuss with the Project Manager whether chlorinated solvents or other contaminants of concern detected in areas of the site would cause IDW from that area to be characterized as hazardous/dangerous waste. Hazardous/dangerous waste should be drummed separate from nonhazardous/dangerous waste, where possible, to minimize the amount of hazardous/dangerous waste generated.
- Use a grease pencil or paint pen to clearly mark the lid and the label of each drum with a unique identifier such as a number or a letter. Verify that no two drums have the same identifier marked on the lid or label, including drums remaining from previous project work.
- Inventory each Central-generated drum and its contents on a Waste Inventory Tracking Sheet.
- Track any waste added to an existing drum on a Waste Inventory Tracking Sheet.
- Label each drum with a completed Non-Hazardous Waste, Hazardous Waste/Washington State Dangerous Waste, On Hold Pending Analysis, or other appropriate waste label. List the client's name as the Shipper or Generator, and the accumulation start date as the date when waste was first placed into the drum. If waste was added to an existing drum, add that date to the accumulation dates on the drum label. If the waste in the drum has been designated as hazardous/dangerous, add a major risk label(s) pertaining to the waste characteristics associated with that designation (e.g. flammable, reactive, corrosive, toxic). Consult the Project Manager with questions about appropriate major risk labels. All labels should be placed with the top of the label toward the top of the drum. Do not place a drum label sideways or upside down.

Use care when drumming, labeling, and tracking IDW. Mistakes in the disposal of waste can result in serious legal and financial repercussions for Central and the client.

DRUM SAMPLING

Sampling and analysis of wastes for hazardous/dangerous waste characterization purposes is to be conducted in accordance with U.S. Environmental Protection Agency Publication No. SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. Samples collected in California for hazardous waste characterization are to adhere to the requirements specified in California Code of Regulations Sections 66261.21 to 66261.24 of Title 22, Characteristics of Hazardous Waste. Discuss with the Project Manager the specific analyses to be performed prior to sample collection. The instructions below are to be followed for drum sampling, using composite sampling techniques to sample soil, solids, and liquid wastes:

- Collect soil/solids samples from various locations and depths in the drum using a hand-auger or other decontaminated apparatus. Place all samples into a single decontaminated stainless steel bowl using decontaminated stainless steel tools, or into a plastic bowl using plastic spoons, depending on the analyses to be performed. Homogenize the samples in the bowl.
- Place samples of the homogenized soil/solids from the bowl into sample jars for analysis.
- Collect liquid samples from the drum using a glass sampling tube. Insert the tube to the base of the drum to fill the entire tube with liquid. Place the liquid into sample jars for analysis.

DRUM STORAGE

Follow the instructions below for drum storage:

- Label and store the drums in an area approved by the client.
- Store hazardous/dangerous waste drums in a secured area.
- Place hazardous/dangerous waste drums to be stored outside on secondary containment and under cover.

DOCUMENTATION

Document IDW drums on the Waste Inventory Tracking Sheet as described above. Provide the original Waste Inventory Tracking Sheet and the original field notes to the Project Manager.

REFERENCE

U.S. Environmental Protection Agency. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. Publication No. SW-846. Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015).