MAUL FOSTER ALONGI
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October 24, 2025
Project No. M0232.17.105

Oregon Department of Environmental Quality
700 NE Multnomah St., Suite 600
Portland, OR 97232

Re: Basin 1 Subarea Stormwater Improvements Project – Environmental Management Plan

Dear Oregon Department of Environmental Quality:

Maul Foster & Alongi, Inc. (MFA) has prepared this Environmental Management Plan (EMP) in accordance with the requirements of the Port of Portland (the Port) National Pollutant Discharge Elimination System (NPDES) 1200-CA Stormwater Discharge Permit issued by the State of Oregon Department of Environmental Quality (DEQ). The EMP was prepared to address areas of known or potential per-and polyfluoroalkyl substances (PFAS) associated with historical operations that may be encountered during the above-noted project at the Portland International Airport (PDX).

Applicability

The construction activities will be conducted on a portion of PDX which is assigned in the Your DEQ Online (YDO) public information database as YDO No. 3324.

The primary components of this submittal include the following:

- Contaminated Media Management Plan (CMMP; Attachment A). Please note that Section 4.1 of the CMMP includes a discussion of unanticipated contamination. Suspect soil will be field screened for volatile organic compounds (VOCs).
- Temporary Erosion and Sediment Control Plans (Attachment B).
- Groundwater Discharge, Treatment, and Monitoring Management Plan (Attachment C).
- EMP Review Application (Attachment D).

The EMP will be considered a component of the Erosion and Sediment Control Plan. The construction contractor is required to perform daily erosion, sediment, and pollution control inspections in compliance with the project's Erosion Control Plan, the Port's 1200-CA permit, and the Port's Construction Master Specifications. The contractor must also become familiar with the conditions of this EMP and assist Port staff with implementation and compliance when needed. Port Construction and Environmental staff will perform periodic site inspections to verify compliance with all requirements of this EMP. A construction completion report will be prepared and submitted to the DEQ following project completion.

CHECKLIST ITEMS

Section III of the EMP review applications requests a variety of information presented on a map. Each of the requested items can be found at the locations below:

- DEQ ECSI site number (if applicable)
    - YDO/ECSI 3324.
- A list or table of all known contaminants with lab tests results showing concentration and depth
    - See CMMP in Attachment A.
- A list of all disposal locations
    - See CMMP in Attachment A, Section 4.1.
- Notice of approval from local jurisdiction if discharge is to public storm system
    - Not applicable.
- A map with sample locations
    - See CMMP figures in Attachment A.
- Temporary Erosion and Sediment Control Plans specific to contaminated soils
    - See Attachment B for erosion control drawings. These drawings present the necessary controls to ensure that contaminated media will not be released during the construction activities.
- Plans for off-site disposal of contaminated soils
    - See CMMP in Attachment A.
- Any relevant (related) portions of erosion and sediment control plan that address the management of contaminated and potentially contaminated construction stormwater and dewatering program (if applicable)
    - See Attachment B.
- The dewatering plan (if applicable)
    - See Groundwater Discharge, Treatment, and Monitoring Management Plan in Attachment C.
- All proposed point(s) of discharge to receiving waterbodies
    - The primary approach will be to discharge treated water to the land surface for infiltration. Discharge to the stormwater system may also occur. The point of discharge to receiving water bodies will be through stormwater infrastructure in Basin 1.
- All soil types within areas to be disturbed
    - See CMMP in Attachment A.
- All area of earth disturbance
    - See Attachment B for erosion control drawings.
- Sufficient indication of topography to indicate where stormwater flows
    - See Attachment B for erosion control drawings.

- Schematic drawing of the proposed treatment system
    - See Groundwater Discharge, Treatment, and Monitoring Management Plan in Attachment C.

Sincerely,

Maul Foster & Alongi, Inc.

Michael Whitson, RG
Project Geologist

Michael Pickering, RG
Principal Geologist

Attachments

Limitations

A—CMMP

B—Temporary Erosion and Sediment Control Plans

C—Groundwater Discharge, Treatment, and Monitoring Management Plan

D—EMP Review Application

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Attachment A

CMMP

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Contaminated Media Management Plan

Basin 1 Subarea Stormwater Improvements Project
Portland International Airport

Prepared for:

Port of Portland

October 24, 2025
Project No. M0232.17.105

Prepared by:

Maul Foster & Alongi, Inc.
3140 NE Broadway, Portland, OR 97232

MAUL FOSTER ALONGI

Contaminated Media Management Plan

Basin 1 Subarea Stormwater Improvements Project
Portland International Airport

The material and data in this report were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.

~~EXPIRES: 1/1/2026~~
This digital seal certifies the signatory and document content.

Michael Pickering, RG
Principal Geologist

Michael Whitson, RG
Project Geologist

Contents

Abbreviations

BMPs	best management practices
CFR	Code of Federal Regulations
CMMP	contaminated media management plan
COPC	contaminants of potential concern
DEQ	Oregon Department of Environmental Quality
EMP	Environmental Management Plan
EPA	U.S. Environmental Protection Agency
ESCP	erosion and sediment control plan
HASP	health and safety plan
MDL	method detection limit
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligrams per kilogram
MRL	method reporting limit
OAR	Oregon Administrative Rules
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PFAS	per- and polyfluoroalkyl substances (PFAS)
Port	Port of Portland
RCRA	Resource Conservation and Recovery Act
the Site	Basin 1 Subarea Stormwater Improvements Project
TPH	total petroleum hydrocarbons
TCLP	toxicity characteristic leaching procedure
VOC	volatile organic compound
YDO	Your DEQ Online

1 Introduction

This contaminated media management plan (CMMP) (the "Plan") was prepared for the Port of Portland (Port) Basin 1 Subarea Stormwater Improvements Project site (the "Site") at the Portland International Airport (PDX). The Site is presented on drawing PDX 2025-513 Sheet C1.001 in Attachment B of the Environmental Management Plan (EMP). The project activities will include stormwater utility improvements to replace infrastructure, as well as reduce the infiltration of per- and polyfluoroalkyl substances (PFAS) from the adjacent fire training pit into the stormwater system. Petroleum hydrocarbons and PFAS are known to be present in soil and groundwater within project work areas. The project work period is expected to occur from May through September 2026 (i.e., during predominantly dry weather). Pre-construction sampling detected contaminants of potential concern (COPCs) including petroleum hydrocarbons and PFAS in soil and shallow groundwater. This Plan includes measures for managing soil and groundwater with COPCs.

1.1 Purpose

The purpose of this CMMP is to provide guidelines for assessing and managing contaminated media (soil and groundwater) that may be encountered during construction activities at the Site. This CMMP identifies COPCs, soil-management procedures, waste characterization and disposal considerations, and construction dewatering measures to be addressed and implemented during construction activities.

Oregon's Environmental Quality Commission recently adopted rules to include six PFAS in the definition of hazardous substances in Oregon Administrative Rules, which allows DEQ the ability to require investigation and remediation of releases of those compounds. The project scope and guidelines outlined in this CMMP are not intended to remediate existing contamination. Rather, they are designed to ensure that construction activities do not exacerbate existing conditions or increase risks to human health or the environment.

The guidelines and procedures outlined in this CMMP are to be followed during any subsurface-soil-disturbing or dewatering activities on the Site.

2 Background

2.1 Site Description

The Site is located in the northwest portion of PDX. Portions of the Site have been used for aviation firefighting training since the 1960s. Training activities have taken place at three locations: the "Original" and "Former" fire training pits, and the "Current" fire training pit. The airport historically used aqueous film forming foam (AFFF), which contained certain PFAS compounds, in accordance with Federal Aviation Administration (FAA) requirements for aircraft rescue and firefighting operations.

The Original Facility was used from approximately 1963 until the early to mid-1970s. Following that, the Former Facility was used for training exercises until 1989. The locations of these two historical facilities are shown on the figures in Appendix A.

The Current Facility was developed in 1990 and located east of the former training areas. Unlike the Original and Former facilities, which were unlined during their periods of use, the Current Facility was constructed with a liner system to reduce the potential for chemical migration into the subsurface.

2.2 Site History

Multiple historical investigations and remedial actions have been conducted at the Site. Previous investigations indicate that various chemical substances, such as used oil, gasoline, diesel fuel, JP-4 fuel, acetone, and solvents, were sprayed onto the ground surface and mock aircraft and subsequently ignited during firefighting training exercises.

A historical remedial investigation and cleanup for the Original and Former fire training pits was conducted under DEQ oversight (ECSI 3324). Remedial action was implemented to prevent contact with liquid-phase petroleum hydrocarbons and soils with chemical concentrations that exceed levels protective of human health (specifically utility and trench workers). This remedial action consisted of the construction of a protective cap that consisted of a demarcation layer and approximately 8 inches of compacted crushed aggregate or cement treated aggregate. Historical figures presenting the details of the protective cap are included in Appendix A.

The investigation of the nature and extent of PFAS from Port fire training and fire suppression activities began in 2017 and is being conducted with oversight from the DEQ in accordance with the Voluntary Cleanup Agreement between the DEQ and the Port (ECSI 3324).

PFAS associated with Port firefighting and training activities were identified in soil, groundwater, and stormwater at PDX. The highest concentrations associated with Port firefighting operations are localized in the shallow soil and groundwater in the vicinity of the Port's fire training facilities. PFAS concentrations in shallow groundwater beneath the Site are shown in Appendix B. No decisions have been made to date regarding site risks from PFAS and whether remediation is necessary.

2.3 Project Background

The stormwater infrastructure at PDX is divided into twelve stormwater Basins. Basin 1 is the largest and westernmost drainage basin. The basin is comprised of both piped and channelized conveyances which eventually outfall into three main open channel networks that converge at the Urban Flood Safety & Water Quality District pump station #2. The water is then pumped into the Columbia Slough. During the deicing season, stormwater may be diverted and pumped to the Columbia River.

The stormwater piping within the project area of Basin 1 is past its useful life and is no longer functioning as intended. This project involves replacing leaking stormwater infrastructure near the fire training area that has been impacted by elevated PFAS levels in shallow groundwater. It also includes filling Ditch A and installing stormwater infrastructure adjacent to the filled ditch to reduce wildlife hazards to aviation and further prevent PFAS from entering the stormwater system. New stormwater infrastructure includes pipes, manholes, and catch basins. The new infrastructure will be impervious to groundwater and drains will be adjusted or removed to prevent PFAS from entering the stormwater system. Construction will impact wetlands and ditches within the 100-year flood zone.

The planned stormwater infrastructure improvements and filling of Ditch A will require soil excavation and may also require dewatering. To facilitate the management of PFAS-impacted media, soil and groundwater samples were collected as described in Section 2.4.

2.4 Site Assessment

In March 2025, soil samples were collected from five locations (B-1, B-4, B-7, B-8, and B-10) and groundwater samples were collected from one location (B-4) within the project area and analyzed for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), PFAS, and metals (soil only). In April 2025, additional groundwater samples were collected from monitoring wells MW-8, MW-11, and MW-12 and analyzed for TPH, lead, VOCs, PAHs, and PFAS. In May 2025, two additional soil borings (SC-01 and SC-02) were completed to fill data gaps for PFAS in soil from the March 2025 activities. A figure showing the sample locations is presented in Appendix B. The compiled tables from the sampling activities are presented in Appendix C and boring logs are presented in Appendix D.

VOCs and PCBs were not detected in soil above the method reporting limit (MRL). TPH was detected in soil from 0 to 6 feet bgs in boring B-7, but concentrations were below the DEQ Clean Fill Criteria, and PAHs were not detected above the MRL in the follow-up analysis for this boring. Metals detected in soil were consistent with naturally occurring background levels, except for one detection above the DEQ Clean Fill Criteria from 0 to 5 feet bgs in boring B-10. None of the detected TPH, lead, or VOCs exceeded the DEQ Risk-Based Concentrations (RBCs) for groundwater in an excavation. PCBs and PAHs were not detected above the MRL in groundwater.

PFAS were detected in both soil and groundwater at all sample locations. The highest soil and groundwater concentrations were detected in borings B-1 and B-7 and monitoring well MW-12 which are closest to the fire training area.

The PFAS data for soil are screened against the criteria from Section 2.4 in a table presented in Appendix D. While the primary objective of this plan is to ensure that construction activities do not worsen existing conditions or increase risks to human health or the environment, and not to remediate PFAS contamination prior to cleanup decisions, the project applies a "hot spots" concept, borrowed from DEQ cleanup regulations, to determine which soils the Port will reuse on Site pending future cleanup decisions. For human health, hot spot levels under DEQ's Cleanup Program are defined as 10 times the acceptable risk level for non-carcinogens and 100 times the acceptable risk level for carcinogens. The relevant exposure scenario at the Site is occupational direct contact. Site-specific exposure scenarios, a risk assessment, and cleanup levels for soil have not yet been developed for the Site. Therefore, to facilitate interim decision making for this project, potential targeted removal levels were estimated by applying the hot spot factors to the EPA Industrial Soil RSLs. This plan refers to this calculated value as "targeted removal level." The target removal levels are presented in the table in Appendix D.

2.5 Distribution of Contaminated Media Management Plan

The Port will provide this CMMP to all contractors performing activities on the Site where disturbance and/or direct contact with contaminated soil or groundwater could occur. The Port or its contractor will be responsible for ensuring that all contaminated-media-handling activities have been properly planned and that additional investigations are completed as necessary before a project is implemented.

3 Distribution of Contaminants of Potential Concern

3.1 Site Contaminants

COPCs include TPH as diesel, TPH as oil, VOCs, and PFAS compounds.

3.2 Nature and Extent of Contamination

PFAS were detected in both soil and groundwater at all sample locations. The highest soil and groundwater concentrations were detected in borings B-1 and B-7 and monitoring well MW-12 which are closest to the current, original, and former fire training areas.

The shallow groundwater beneath the Site where petroleum hydrocarbons and PFAS are present is not used for drinking water and will not be used for drinking water in the future. The U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) for tap water (EPA, 2024) and EPA Maximum Contaminant Levels (MCLs) are not directly relevant for shallow groundwater beneath the site, provided that PFAS are not entering the drinking water supply. However, as a precautionary measure and to increase disposal options, drinking water standards will be used as a metric to determine treatment system performance prior to discharge to land or stormwater.

None of the other COPCs detected drive decisions regarding soil handling, reuse, or disposal with the exception of mercury detected above the DEQ Clean Fill Criteria in a single composite sample collected from 0 to 5 feet bgs in boring B-10.

4 Protocols for Soil-Disturbing Activities

The following protocols shall be followed for any activities that penetrate the ground surface and result in disturbance of or exposure to Site soil. The protocols shall apply to all individuals in the construction areas during soil-disturbing activities.

This project will be assigned a Port construction inspector and Port environmental inspector. The Port inspectors work together and serve as the liaison between the construction contractor, Port project managers and Port environmental subject matter experts. All soil-disturbing activities during the project period shall be completed under the general oversight of the Port inspectors.

4.1 Description of Soil-Disturbing Activities

The construction activities at the Site include stormwater utility improvements. Ditch A will be replaced with a piped utility in a parallel alignment. The remaining stormwater utilities at the Site will be replaced.

The construction activities may encounter areas of unknown contamination that are discovered based on visual and olfactory evidence. Any activities that disturb Site soils must be conducted in accordance with this CMMP and shall be performed by qualified personnel as described in Section 4.2 and under the general oversight of the Port inspectors. It is the responsibility of the contractor, per signed contract documents, and Port inspectors to be responsive to and manage observations of unanticipated contamination identified during construction activities. All soils requiring excavation and suspected of containing unknown contaminants must be characterized and managed under the protocols defined in Section 4.

4.2 Health and Safety

All activities that have the potential to disturb contaminated Site soil or groundwater shall be completed with appropriate protections defined by a project-specific, approved HASP. It is likely that workers who will contact known contaminated media will need to have completed 40 hours of Occupational Safety and Health Administration (OSHA)-approved hazardous waste operations and emergency response (HAZWOPER) training-before beginning work. The HASP shall, at a minimum, set forth requirements and protections for working in areas of chemical contamination, and shall address the following subject matters:

- COPCs/site background
- Personal protective equipment
- Personal hygiene/decontamination protocols
- Requirements for medical surveillance
- Identification of physical and chemical hazards
- Hazard communication and site control

5 Management of Contaminated Soil

5.1 Procedures for Identification and Response to Unanticipated Soil Contamination

As discussed above, the potential exists to encounter unanticipated contaminated media on the Site. Soil with the following characteristics should be reported to the Port immediately:

- Unusual or chemical-like odor.
- Unusual staining.
- The presence of light nonaqueous-phase liquid.
- Creates a sheen when in contact with water.

If suspected contaminated media are encountered, the contractors should:

- Stop work in the immediate area where the suspected contaminated media was observed.

- Immediately notify the Port.
- Secure the area until notified by the Port that work may continue.
- The contractors are responsible for removing staff from the area. The contractor may continue work on unaffected areas.
- Suspected contaminated media that has been excavated will be characterized, stockpiled, and handled per the following sections.
- Suspected contaminated media in stockpiles and in excavations will be characterized on a case-by-case basis.

In the event that unanticipated contamination is encountered DEQ will be notified by the Port within 48 hours. If warranted, the CMMP will be updated and resubmitted for DEQ approval.

5.2 Waste Characterization

5.2.1 Unanticipated Contaminated Soil

Soil encountered during excavation may contain unanticipated contamination. Consequently, any areas of unanticipated contamination will be adequately characterized and managed as described below.

The specific sampling and analysis approach should be established and approved by the planned disposal facility to ensure that excavated soils are adequately characterized for waste profiling and disposal. Based on knowledge of historical uses of the Site, if unanticipated contamination is encountered, characterization will include the following COPCs: TPH as diesel, TPH as oil, VOCs, PFAS, and metals.

The sampling regimen will be established based on site-specific conditions with the following general guidance: each stockpile up to 500-cubic-yards in size should be sampled using a five-point composite sampling approach (varying discrete sample locations and depths). Each composite sample should be tested for one or more of the contaminant classes listed in the preceding paragraph. The analytical results should be evaluated against the criteria under 40 Code of Federal Regulations (CFR) 261.24, the Toxicity Characteristics for hazardous wastes.

If waste soil does not exhibit the toxicity characteristic and does not otherwise contain residue defined in Oregon Administrative Rules (OAR) 340-101-0033(2),[1] it can be managed and disposed of as solid waste. If contaminant levels meet DEQ clean fill criteria (DEQ 2019), the soil can be used in accordance with DEQ clean fill criteria.

5.2.2 Screening/Handling

Mechanical screening methods, if conducted in a manner that minimizes dust generation, may be employed to separate contaminated soil from inert, oversized material (e.g., rocks and concrete). Contaminated soil must be managed as described in Section 5.3, but oversized rocks and concrete can be used for on-site fill or crushed and used as aggregate. Other oversized debris (wood, metal, solid waste) will be transported off site and disposed of appropriately. If any on-site or off-site recycling options are identified for other inert materials during final design or construction, the

[1] OAR 340-101-0033(2) does not apply unless specific evidence is discovered regarding the presence of discarded commercial chemical products, off-specification species, container residues and residues thereof meeting the criteria specified in OAR 340-101-0033(2) and 40 CFR 261.33(e) and (f).

contractor conducting the work will coordinate with and seek approval from the Port before completing such recycling.

5.2.3 Stockpiling

No long-term stockpiling of soil is planned. Any suspected contaminated soil will require temporary stockpiling in a manner that minimizes erosion and contact with stormwater runoff, prevents placement near structures, and avoids workers coming in direct contact with the stockpiled soil. Temporary soil stockpiles of suspected contaminated soil shall be placed on an impervious surface or on 10-mil plastic sheeting (or similar material) with a berm around the perimeter of the stockpile to restrict runoff. The berm may be constructed by laying the bottom plastic over straw bales, Jersey Barriers or ecology blocks, or by equivalent methods. When not active, stockpiles shall be covered with plastic and secured with sandbags or equivalent alternative. Stockpiles shall be covered with plastic sheeting and secured at the end of each workday to prevent erosion, dust generation, vapor exposure, and direct contact. The plastic sheeting that covers the stockpiles must be regularly inspected to ensure that it remains functional and protective of human health and the environment. Temporary stockpiles of contaminated soil must be properly disposed of off-site within 180 days of completion of excavation work. Once a stockpile has been sampled, no soil shall be added to that stockpile.

Following the stockpile removal, the area beneath the separation material shall be inspected, and any remaining stockpile soil shall be scraped, swept, or otherwise removed and properly disposed of.

A designated area for the temporary stockpile of contaminated soil and the required best management practices (BMPs) is included in the project erosion and sediment control plan (ESCP; Attachment B of the EMP).

5.3 Disposition of Excavated Soil

Soil will be managed in one of two ways: in areas where soil exceeds the target removal threshold, it will be disposed of off-site at a regulated landfill. Soil that is below the removal threshold and meets structural fill criteria will be reused solely as project fill material within the site where possible and excess soil will be disposed of off-site at a regulated landfill. The figures from the ESCP showing the stormwater alignments (Alignment A through F) have been modified to indicate soil that will require landfill disposal (red hashed line type), soil that can be considered for reuse (blue hashed line type), and soil that requires additional chemical testing to verify suitability for reuse (black hashed line type). These are presented in Appendix B.

- Landfill Disposal – Portions of Alignment B, C, and F
- Soil Reuse as Project Fill – Alignment A and portions of Alignment B and Alignment C
- Additional Testing Required – Alignments D and E

5.3.1 Replacement on Site as Project Fill Material

Soil from Alignments A and portions of Alignment C does not exceed the removal threshold and will be re-used as backfill within the project. If there is excess soil, it will go off-site to a landfill per Section 5.3.2. The majority of the work areas are currently unpaved and will be restored to their original unpaved condition after construction. Paved areas will likewise be returned to their original paved condition. In unpaved areas, a demarcation layer will be installed above backfilled soil, followed by the placement of a 6-inch layer of clean imported fill. This is intended to prevent erosion of any underlying contaminated materials into surface water drainages or storm drain systems, and to eliminate potential exposure pathways for site workers.

5.3.2 Additional Chemical Testing Required

Results for mercury in soil from boring B-10 were above DEQ clean fill criteria. No source of mercury is known to occur within the project area and mercury results for all other borings met clean fill criteria. Additional soil samples will be collected along Alignments D and E (near boring B-10) and analyzed for mercury to inform soil handling decisions. Composite soil samples will be collected from soil stockpiles or along each alignment from in situ sampling (e.g., potholing). If the laboratory analytical results for mercury do not exceed the DEQ clean fill criteria, the soil can be reused as backfill per Section 5.3.1. If mercury exceeds the DEQ clean fill criteria, the soil will go off-site to a landfill per Section 5.3.3.

5.3.3 Off-Site Disposal

Portions of Alignments B, C, and F exceed the target removal threshold. The figure in Appendix B presents the material from this area that will be transported off-site to a regulated landfill for disposal. Soil that is to be disposed of off-site and that is not a hazardous waste as determined by a toxicity characteristic leaching procedure (TCLP) analysis will be taken to a solid waste landfill regulated under Resource Conservation and Recovery Act (RCRA) Subtitle D. Waste soil with detected PFAS concentrations will be disposed at a Subtitle C or Subtitle D landfill (with liner and leachate collection system) based on landfill acceptance criteria and approval.

Soil that is to be disposed of off-site that exhibits the characteristics of hazardous waste will be disposed of at a hazardous waste landfill regulated under RCRA Subtitle C, unless it is treated (either on-site or off-site) to render it nonhazardous. Management of soil classified as hazardous waste under either the federal or state hazardous waste regulations must comply with current regulations. Regulations will be reviewed and standard waste profiling and disposal contracting processes will be followed to ensure regulatory compliance.

Off-site management of soil will adhere to the following procedures:

- Obtain waste acceptance and disposal agreements from the landfill for the soil.
- Minimize spillage of soil onto the ground during truck loading. Scrape, clean up, and dispose of any spilled soil.
- Remove excess soil from truck and truck tires prior to leaving the soil-loading area.
- Ensure that there are no free liquids in the soil contained in trucks.
- Cover all trucks hauling soil prior to leaving the Site.
- Soil shall be transported in accordance with appropriate Department of Transportation regulations.

6 Construction Dewatering

Construction dewatering may be required in areas where utilities are installed near the depth of the shallow water table. It is anticipated that where dewatering is required, it will be conducted using a localized approach (e.g., sump pump) to help minimize the volume of water requiring management. Groundwater removed by dewatering will be filtered using activated media suitable for PFAS and other COPCs and will be discharged to the land surface or stormwater infrastructure in the vicinity of

the work area. A Groundwater Discharge, Treatment, and Monitoring Plan further describing this process is included in Attachment C of the EMP.

7 Cap Restoration

A historical remedial action for the Original and Former Fire Training Pits was implemented to prevent contact with liquid-phase petroleum hydrocarbons and soils with chemical concentrations that exceed levels protective of human health (specifically utility and trench workers). Where the protective cap is disturbed as part of the project activities it must be restored to match the historical specifications.

The cap reportedly consists of a demarcation layer and approximately 8 inches of compacted crushed aggregate or cement treated aggregate. Portions of the cap expected to receive greater surface traffic included a cement treated gravel base or asphalt-concrete pavement layer. Appendix A includes a figure and cross-sections showing the location and details of each cap type.

8 Reporting

A letter report summarizing the implementation of this CMMP shall be prepared at the end of the project and shared with the DEQ. The letter report shall include the results of any sampling, chemical analysis, and disposition of soils and any water treatment performed. At a minimum, the letter report shall include:

- A site plan showing soil sample locations and locations of soil reuse.
- Summary tables of analytical results.
- Copies of field sampling data sheets.
- Discussion of field observations and results.
- Cap restoration details.
- Documentation of quantities and final disposition of soil and other media.
- Documentation of any observation, management, and disposal of “unexpected contamination” or conditions.
- Copies of soil disposal receipts, if applicable.
- Analytical laboratory reports.
- A site plan showing areas where dewatering and land application occurred.
- Dates dewatering and discharge occurred.
- Photo documentation of work.

References

DEQ. 2019. *Clean Fill Determinations.* https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf. February 21.

EPA. 2024. *EPA Regional Screening Levels.* https://www.epa.gov/risk/regional-screening-levels-rsls. November 13.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

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Appendix A

Historical Figures

MAUL
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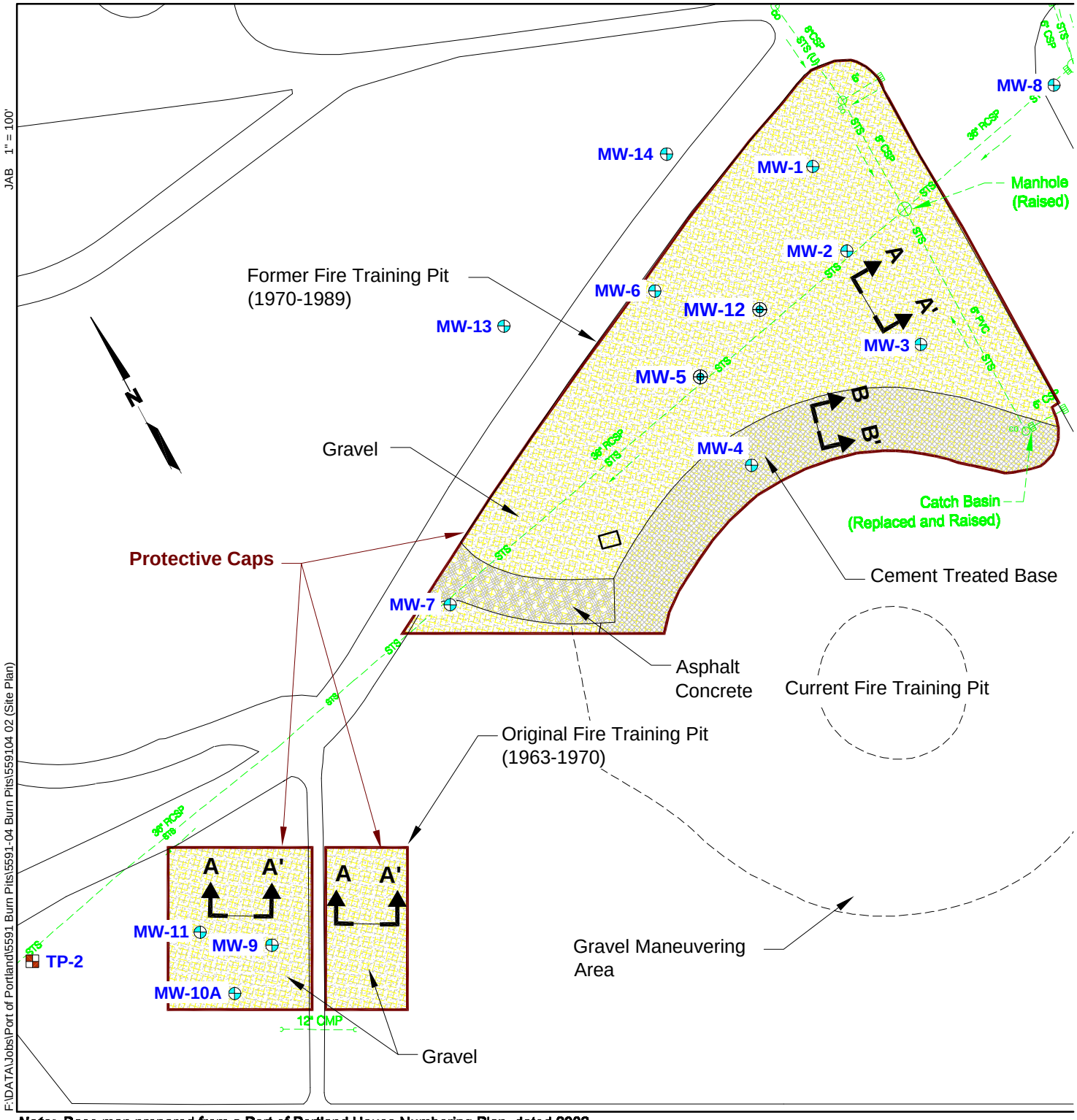
Site Plan
Original and Former Fire Training Pits Closure Report
Portland International Airport, Portland, Oregon



Note: Base map prepared from a Port of Portland House Numbering Plan, dated 2002.

0 100 200

Approximate Scale in Feet

Legend:

MW-5	Monitoring Well Location and Number (Top of Casing Lowered)
MW-11	Monitoring Well Location and Number (Top of Casing Raised)
TP-2	Test Pit Location and Number (May 2001)
	Underground Storm Sewer Pipeline

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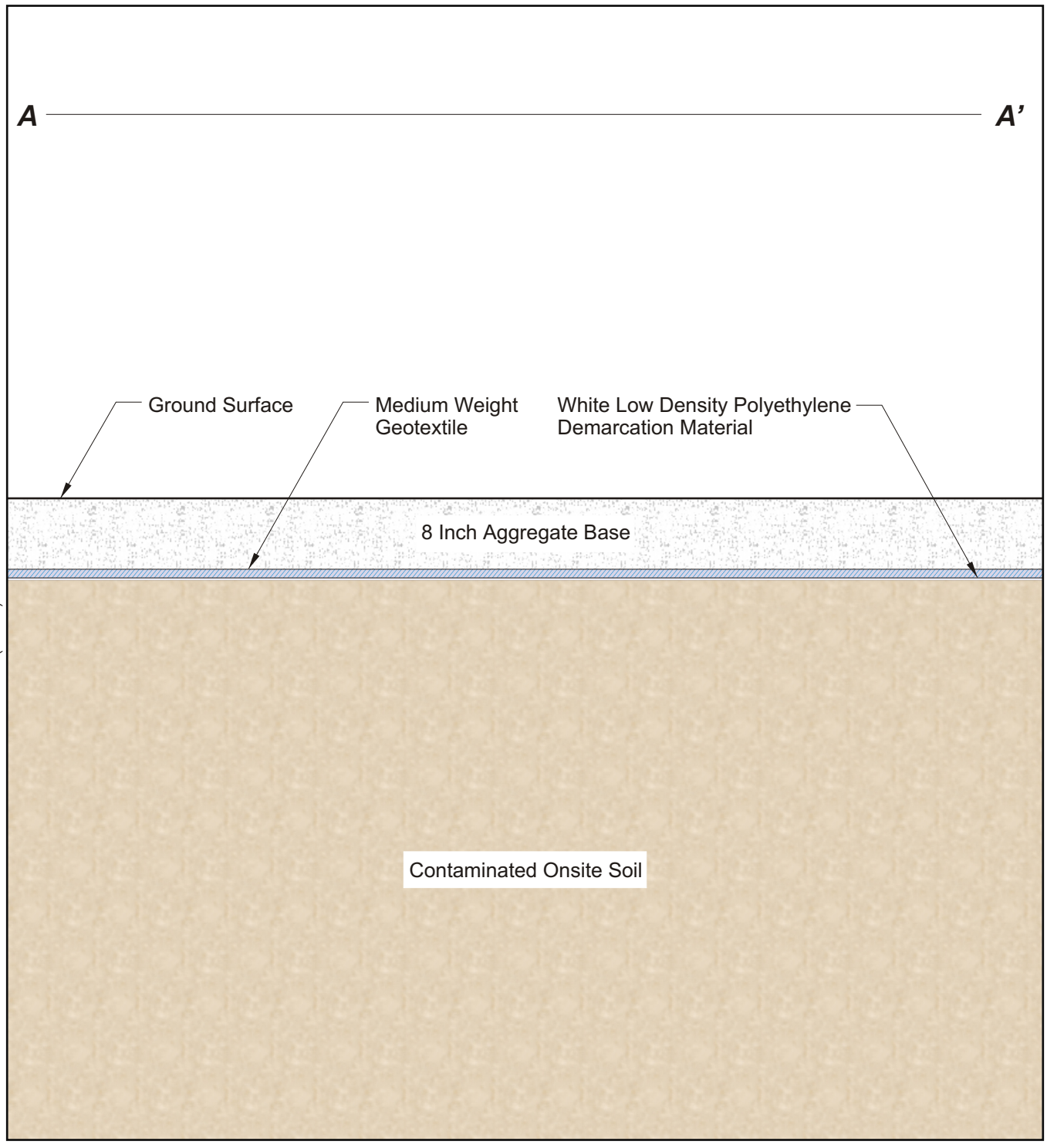
5591-04 ***11/02***

Figure 2

Schematic Cross Section A-A'

Original and Former Fire Training Pits Closure Report
Portland International Airport, Portland, Oregon



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Not to Scale

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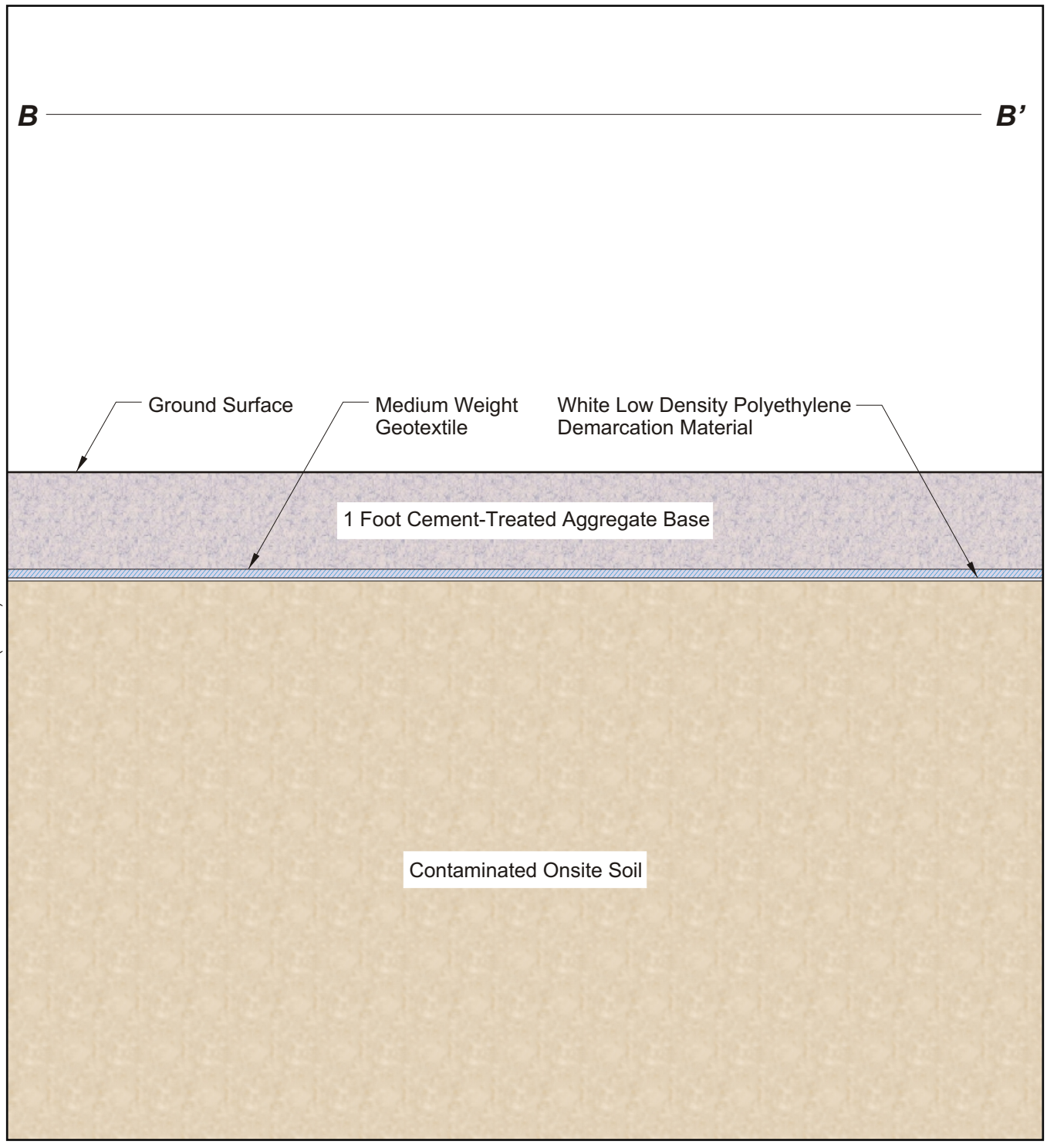
5591-04 *11/02*
Figure 3

Schematic Cross Section B-B'
Original and Former Fire Training Pits Closure Report
Portland International Airport, Portland, Oregon



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Not to Scale

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5591-04 *11/02*

Figure 4

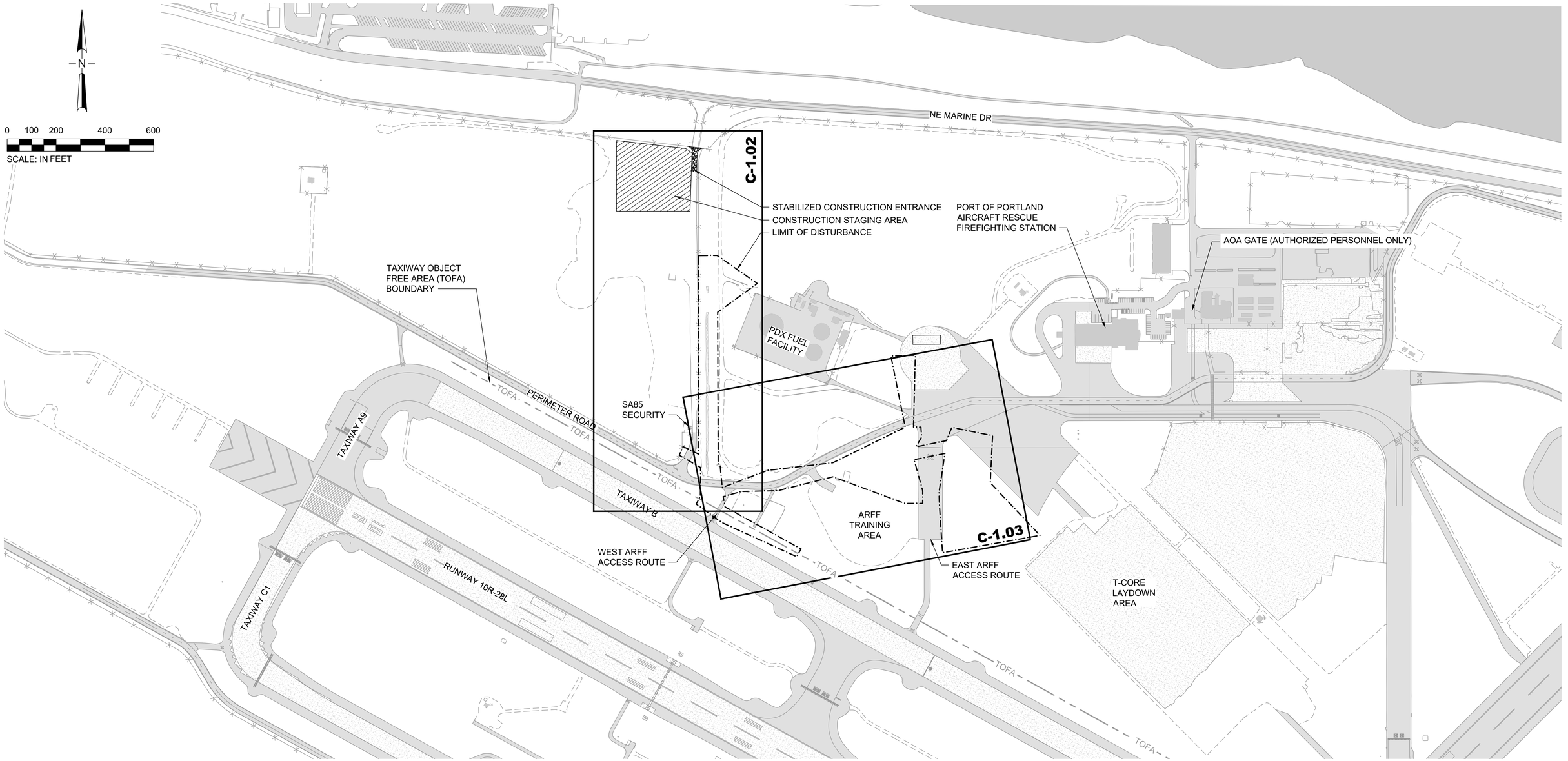
Appendix B

Port Figures

MAUL FOSTER ALONGI

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

light grey
dark grey
black



1 ESCP SHEET LAYOUT PLAN
SCALE: 1" = 200'

#	DATE	BY	REVISION	APP

#	DATE	BY	REVISION	APP

Port of Portland

1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER

102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91102
OREGON
JANUARY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25
PRELIMINARY

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL
SHEET LAYOUT PLAN

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	JULY 2025
SHEET NO.	16
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C-1.01

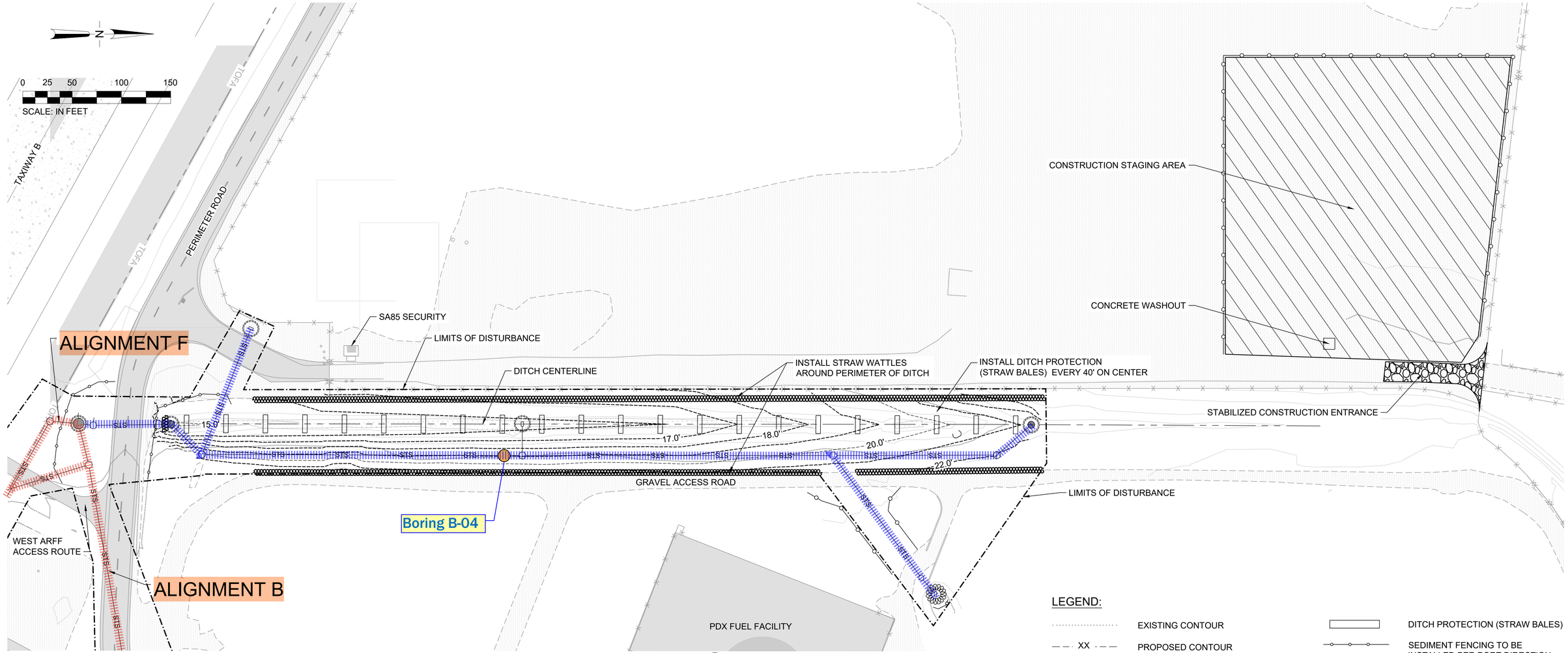
GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

PRINTED: 8/1/2025 3:01:55 PM SAY74946 c:\users\say74946\appdata\local\projectwise\workdir\mott-use-pw-10\dms83014\erosion and sediment control - sheet layout plan.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.



1 PLAN
SCALE: 1" = 50'

NOTES:

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AT THE DITCH AREA PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
2. THE DITCH SHALL REMAIN AS AN ACTIVE STORMWATER CONVEYANCE DEVICE WHILE THE ADJACENT NEW 48-INCH STORM SEWER PIPE IS INSTALLED. AFTER THE NEW 48-INCH STORM SEWER IS INSTALLED AND ACTIVE, CONSTRUCTION TO FILL IN THE DITCH CAN COMMENCE. DURING THE WORK WITHIN THE DITCH, DEWATERING MEASURES WITH FILTER MEDIA OR FILTER BAGS SHALL BE INSTALLED TO ADDRESS GROUNDWATER AND STORMWATER RUNOFF FROM IMPACTING THE WORK AREA. IN ADDITION, STRAW WATTLES AND DITCH PROTECTION SHALL BE INSTALLED WITHIN THE DITCH DURING CONSTRUCTION TO HELP CONTROL SEDIMENTS FROM ENTERING THE DOWNSTREAM DRAINAGE SYSTEMS AND ATTENUATE STORMWATER RUNOFF ENTERING THE DITCH. AFTER COMPLETION OF FINAL GRADING AND CONSTRUCTION ACTIVITIES WITHIN THE DITCH, THE DITCH SHALL BE PERMANENTLY VEGETATED WITH A PROPER SEED/GRASS MIXTURE.
3. AT COMPLETION OF FINAL GRADING OF THE DITCH, REMOVE WATTLES AND THREE OUT OF EVERY FOUR STRAW BALES IN DITCH. LEAVE SEDIMENT FENCE AND INLET PROTECTION UNTIL ESTABLISHMENT OF VEGETATION.

LANDFILL SOIL DISPOSAL

SOIL REUSE AS PROJECT FILL

ADDITIONAL SAMPLING AND ANALYSIS REQUIRED

Modified by Maul Foster & Alongi, Inc. (10/2/2025) to present the locations of borings and monitoring wells reference in EMP. Colored shading added to storm sewer alignments to denote soil handling.

LEGEND:

- EXISTING CONTOUR
- XX PROPOSED CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- TOFA TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- INLET PROTECTION BAG INSERT, SEE DETAIL SHEET C-1.04
- STRAW WATTLES
- DITCH PROTECTION (STRAW BALES)
- SEDIMENT FENCING TO BE INSTALLED PER PORT DIRECTION. THE PORT MAY NOT REQUIRE ALL FENCING TO BE INSTALLED PER PLAN.
- CONSTRUCTION STAGING AREA
- LIMITS OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE

#	DATE	BY	REVISION	APP

#	DATE	BY	REVISION	APP

Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91101
OREGON
JANUARY 10, 2016
ANDREW JEFFREY
RENEWS: 07/01/25
PRELIMINARY

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL PLAN
ALIGNMENT A

SUBMITTED BY	SHERYL WALSH		
DESIGN BY	K.NOLLSTADT		
DRAWN BY	E. VIGLIOROLO		
CHECKED BY	A. JEFFREY		
DATE	JULY 2025		
SHEET NO.	17	TYPE:	CD
DRAWING NO.	PDX 2025-513	DISC. SHT. NO.	C1.02

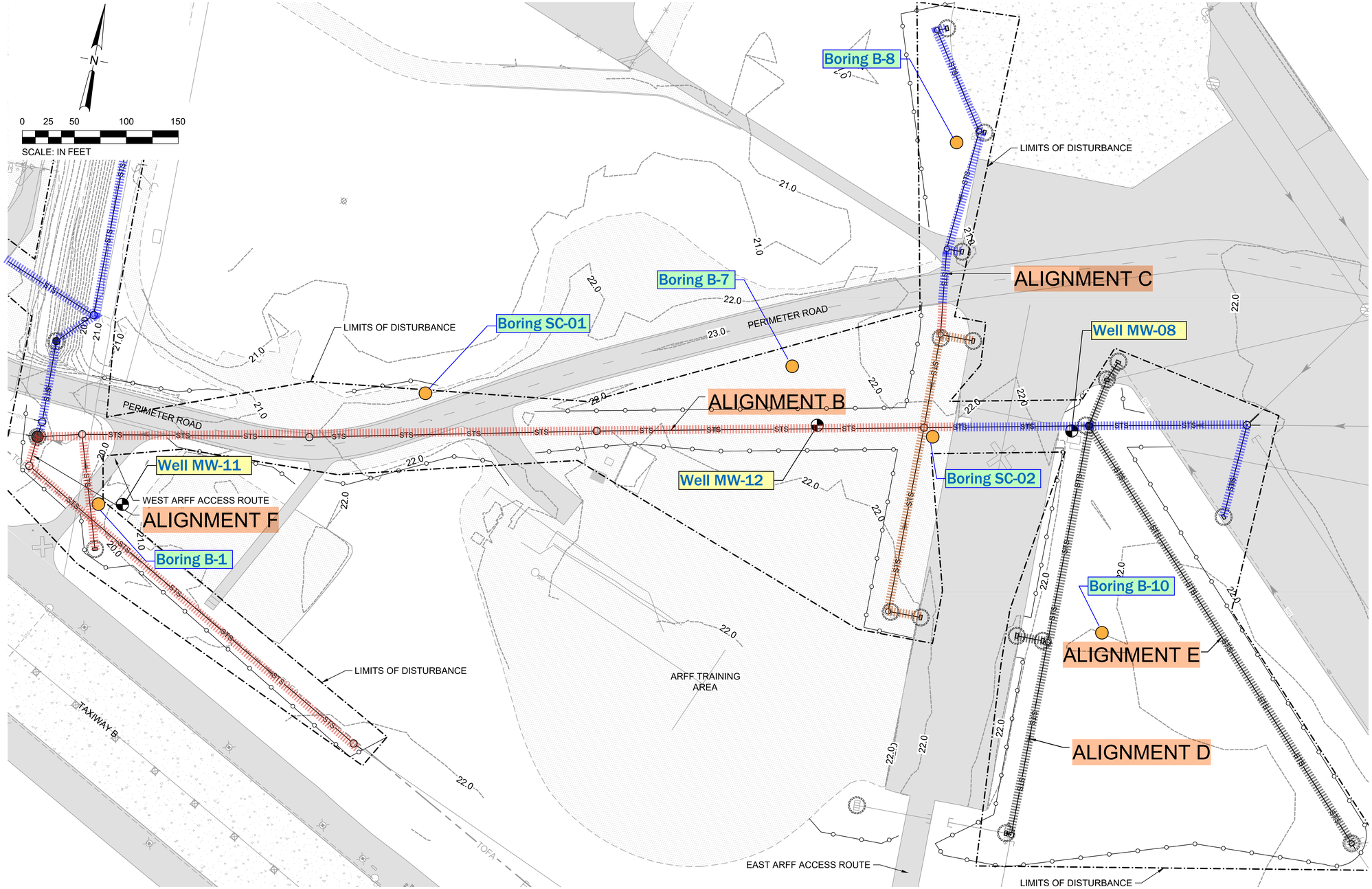
GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

PRINTED: 8/1/2025 2:57:48 PM SAY74946 c:\users\say74946\appdata\local\projectwise\workdir\mott-use-pw-10\dms83014\erosion and sediment control plan - alignment a.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.



1 PLAN
SCALE: 1" = 50'

LEGEND:

- EXISTING CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- TOFA — TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- INLET PROTECTION BAG INSERT, SEE DETAIL SHEET C-1.04
- SEDIMENT FENCING TO BE INSTALLED PER PORT DIRECTION. THE PORT MAY NOT REQUIRE ALL FENCING TO BE INSTALLED PER PLAN.
- LIMITS OF DISTURBANCE
- LANDFILL SOIL DISPOSAL
- SOIL REUSE AS PROJECT FILL
- ADDITIONAL SAMPLING AND ANALYSIS REQUIRED

NOTES:

1. FOR MANHOLES WITH SLOTTED GRATE COVER, CONTRACTOR MAY CHOOSE BETWEEN INSTALLING INLET PROTECTION INSERTS OR INSTALLING STRAW WATTLES AROUND THE STRUCTURE FOR SOIL EROSION AND SEDIMENT CONTROL.
2. FINAL GRADING TO MATCH EXISTING, ISOLATE DISTURBED AREAS.

Modified by Maul Foster & Alongi, Inc. (10/2/2025) to present the locations of borings and monitoring wells reference in EMP. Colored shading added to storm sewer alignments to denote soil handling.

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

#	DATE	BY	REVISION	APP

#	DATE	BY	REVISION	APP

Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

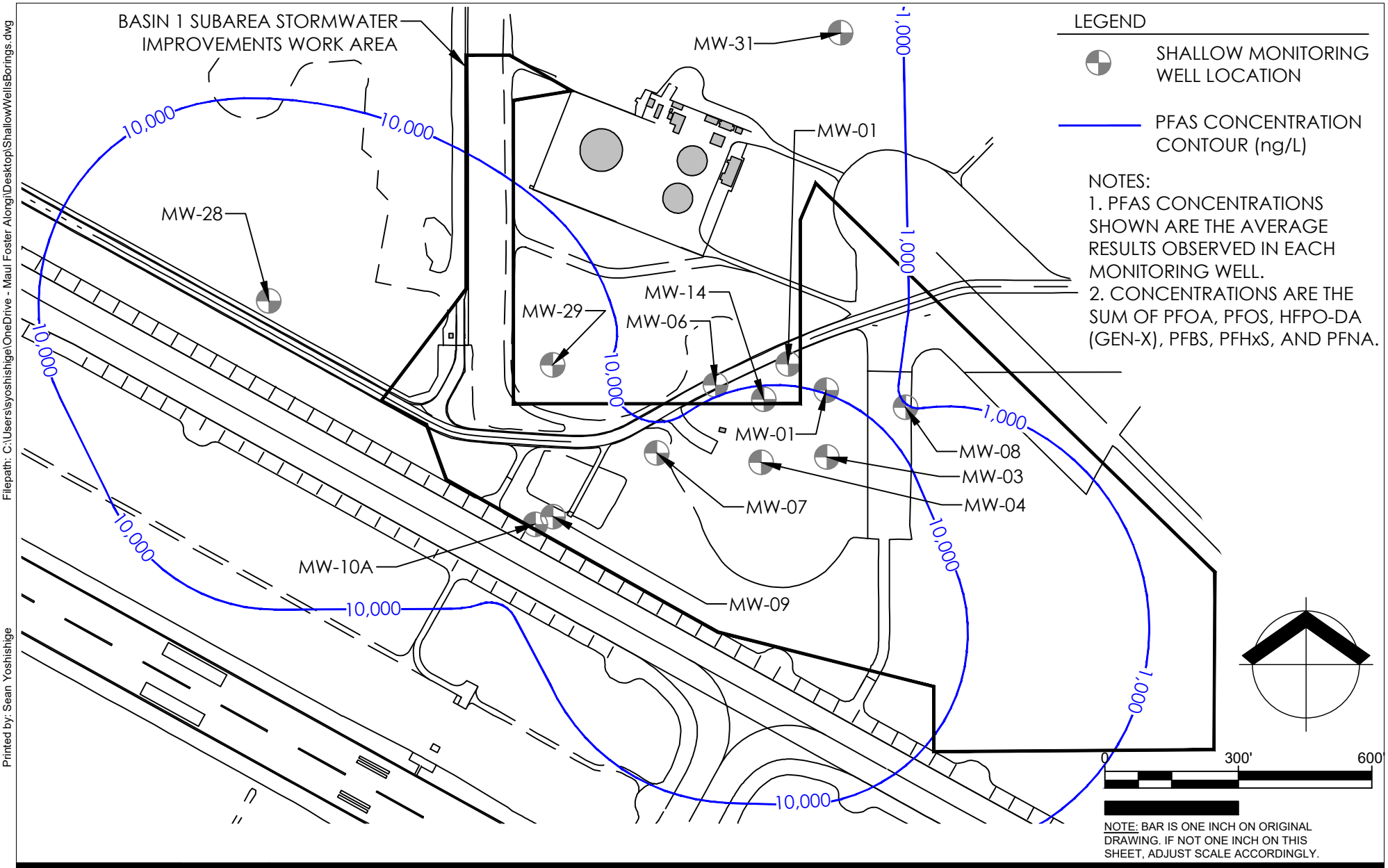
REGISTERED PROFESSIONAL ENGINEER
91163
OREGON
JANUARY 10, 2016
ANDREW JEFFREY
RENEWS: 07/01/25
PRELIMINARY

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL PLAN
ALIGNMENT B, ALIGNMENT C, ALIGNMENT D,
ALIGNMENT E, AND ALIGNMENT F

SUBMITTED BY	SHERYL WALSH		
DESIGN BY	K.NOLLSTADT		
DRAWN BY	E. VIGLIOROLO		
CHECKED BY	A. JEFFREY		
DATE	JULY 2025		
SHEET NO.	18	TYPE:	CD
DRAWING NO.	PDX 2025-513	DISC. SHT. NO.	C-1.03



Filepath: C:\Users\syoshishige\OneDrive - Maul Foster Alongi\Desktop\ShallowWellsBorings.dwg

Printed by: Sean Yoshishige

Date: 10/22/2025 3:56:25 PM

MFA JOB #:	M0232.17.105
ISSUE DATE:	10/22/2025
CHECKED:	M. PICKERING
DRAWN:	S. YOSHISHIGE

MAUL FOSTER ALONGI
3140 NE BROADWAY STREET
PORTLAND, OR 97232
PHONE: 971.544.2139
www.maulfoster.com

CONTAMINATED MEDIA MANAGEMENT PLAN
BASIN 1 SUBAREA STORMWATER IMPROVEMENTS PROJECT
SHALLOW GROUNDWATER PFAS PLUME
PORTLAND INTERNATIONAL AIRPORT
PORT OF PORTLAND

EXHIBIT X

Appendix C

Investigation Tables

MAUL FOSTER ALONGI

Table 1
Soil Analytical Results for Total Petroleum Hydrocarbons, Polycyclic Aromatic Hydrocarbons, and Polychlorinated Biphenyls
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-1			B-4			B-7			B-8			B-10			DEQ Clean Fill Criteria	DEQ RBCs				
																	Soil Ingestion, Dermal Contact, and Inhalation			Volatilization to Outdoor Air	Soil Leaching to Groundwater
Sample ID	B-1-0-3	B-1-3-8	B-1-8-20	B-4-0-4	B-4-4-8	B-4-8-15	B-7-0-6	B-7-6-10	B-7-10-15	B-8-0-6	B-8-6-11	B-8-11-15	B-10-0-5	B-10-5-10	B-10-10-15						
Sample Depth (feet bgs)	0-3	3-8	8-20	0-4	4-8	8-15	0-6	6-10	10-15	0-6	6-11	11-15	0-5	5-10	10-15		Occupational	Construction Worker	Excavation Worker	Occupational	Occupational
Sample Date	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025						
Concentrations in mg/kg																					
TPH with Silica Gel Cleanup by NWTPH-Dx																					
Diesel Range Organics	<19.3	<21.5	<28.9	<20.1	<25.6	<26.9	**251** F-11	<25.2	<27.5	<19.8	<28.7	<26.4	<22.7	<27.3	<26.8	1,100	14,000	4,600	--	--	--
Oil Range Organics	<38.5	<43.0	<57.7	<40.1	<51.2	<53.8	**594** F-03	<50.4	<55.0	<39.5	<57.4	<52.7	<45.4	<54.6	<53.7	1,100	14,000	4,600	--	--	--
PAHs by EPA Method 8270E																					
Acenaphthene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	0.25	70,000	21,000	590,000	--	--
Acenaphthylene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	120	--	--	--	--	--
Anthracene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	6.8	350,000	110,000	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	0.73	21	170	4,800	--	--
Benzo(a)pyrene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	0.11	2.1	17	490	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	1.1	21	170	4,900	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	25	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	11	210	1,700	49,000	--	--
Carbazole	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	79	--	--	--	--	--
Chrysene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	3.1	2,100	17,000	490,000	--	--
Dibenzo(a,h)anthracene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	0.11	2.1	17	490	--	--
Dibenzofuran	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	0.002	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	10	30,000	10,000	280,000	--	--
Fluorene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	3.7	47,000	14,000	390,000	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	1.1	21	170	4,900	--	--
1-Methylnaphthalene	--	--	--	--	--	--	<0.506	--	--	--	--	--	--	--	--	0.36	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	<0.506	--	--	--	--	--	--	--	--	11	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	<0.506	--	--	--	--	--	--	--	--	0.077	23	580	16,000	83	0.34
Phenanthrene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	5.5	--	--	--	--	--
Pyrene	--	--	--	--	--	--	<0.253	--	--	--	--	--	--	--	--	10	23,000	7,500	210,000	--	--
PCBs by EPA Method 8082A																					
Aroclor 1016	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	1.1	--	--	--	--	--
Aroclor 1221	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.0048	--	--	--	--	--
Aroclor 1232	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.0048	--	--	--	--	--
Aroclor 1242	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.041	--	--	--	--	--
Aroclor 1248	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.0073	--	--	--	--	--
Aroclor 1254	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.041	--	--	--	--	--
Aroclor 1260	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.24	--	--	--	--	--
Total PCBs	<0.00934	<0.0111	<0.0136	<0.0102	<0.0128	<0.0138	<0.0105	<0.0125	<0.0140	<0.00965	<0.0137	<0.0139	<0.0110	<0.0135	<0.0138	0.23	0.59	4.9	140	--	1.1

Notes:

bgs - below ground surface
mg/kg - milligrams per kilogram
Results in **bold** denote concentrations above the laboratory minimum reporting limit.
-- denotes sample was not analyzed or screening level is not available.
EPA - United States Environmental Protection Agency
TPH - Total Petroleum Hydrocarbons
PAHs - Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated Biphenyls
F-03 - The result for this hydrocarbon range is elevated due to the presence of individual analyte peaks in the quantitation range that are not representative of the fuel pattern reported.
F-11 - The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.

DEQ Clean Fill Criteria from the Clean Fill Determinations, Table 2: Clean fill screening levels for organics and other selected constituents (February 21, 2019).
DEQ RBCs - Oregon Department of Environmental Quality (DEQ) Risk-Based Concentrations (RBCs) for Individual Chemicals (May 2018, revised August 2023).

Table 2
Soil Analytical Results for Metals
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-1			B-4			B-7			B-8			B-10			Portland Basin Background Metals	DEQ Clean Fill Criteria	DEQ RBCs			
																		Soil Ingestion, Dermal Contact, and Inhalation			Soil Leaching to Groundwater
Sample ID	B-1-0-3	B-1-3-8	B-1-8-20	B-4-0-4	B-4-4-8	B-4-8-15	B-7-0-6	B-7-6-10	B-7-10-15	B-8-0-6	B-8-6-11	B-8-11-15	B-10-0-5	B-10-5-10	B-10-10-15						
Sample Depth (feet bgs)	0-3	3-8	8-20	0-4	4-8	8-15	0-6	6-10	10-15	0-6	6-11	11-15	0-5	5-10	10-15			Occupational	Construction Worker	Excavation Worker	Occupational
Sample Date	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025						
Total Metals by EPA 6020B in mg/kg																					
Arsenic	**1.78**	**3.91**	**2.98**	**2.15**	**4.31**	**2.99**	**1.59**	**4.10**	**2.36**	<1.12	**3.15**	**2.24**	**6.19**	**4.75**	**2.51**	8.8	8.8	1.9	15	420	--
Barium	**81.6**	**119**	**155**	**79.3**	**142**	**106**	**77.9**	**148**	**175**	**37.6**	**115**	**176**	**166**	**166**	**168**	790	790	220,000	69,000	--	--
Cadmium	<0.217	<0.272	<0.338	<0.248	<0.317	**0.342**	<0.240	<0.299	<0.334	<0.224	<0.352	<0.331	**0.432**	**0.368**	<0.326	0.63	0.63	1,100	350	9,700	--
Chromium	**8.71**	**13.7**	**19.5**	**9.18**	**19.8**	**17.1**	**9.15**	**17.2**	**24.3**	**4.10**	**14.5**	**23.5**	**15.0**	**21.3**	**22.9**	76	76	--	530,000	--	--
Lead	**6.26**	**13.0**	**8.05**	**7.93**	**13.7**	**7.06**	**6.04**	**21.5**	**9.58**	**3.63**	**8.06**	**9.89**	**20.9**	**16.9**	**8.00**	79	28	800	800	800	30
Mercury	<0.0869	<0.109	<0.135	<0.0992	<0.127	<0.127	<0.0961	<0.120	<0.134	<0.0895	<0.141	<0.132	**0.503**	**0.174**	<0.131	0.23	0.23	350	110	2,900	--
Selenium	<1.09	<1.36	<1.69	<1.24	<1.59	<1.59	<1.20	<1.50	<1.67	<1.12	<1.76	<1.65	<1.31	<1.48	<1.63	0.71	0.71	--	--	--	--
Silver	<0.217	<0.272	<0.338	<0.248	<0.317	<0.319	<0.240	<0.299	<0.334	<0.224	<0.352	<0.331	<0.263	<0.296	<0.326	0.82	0.82	5,800	1,800	49,000	--
TCLP Metals by EPA Method 1311/6020B in mg/L																					
Lead	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	--	--	--	--	--	--

Notes:

bgs - below ground surface
mg/kg - milligrams per kilogram
mg/L - milligrams per liter
Results in **bold** denote concentrations above the laboratory minimum reporting limit.
Shaded values indicate exceedance of the background metals concentration and another applicable screening level (DEQ Clean Fill Criteria or DEQ RBC).
-- denotes screening level is not available.
EPA - United States Environmental Protection Agency
TCLP - Toxicity Characteristic Leaching Procedure
Portland Basin Background Metals from Oregon DEQ Development of Oregon Background Metals Concentrations in Soil (March 2013).
DEQ Clean Fill Criteria from the Clean Fill Determinations Table 1: Province specific and background metals Clean Fill Screening Levels (February 21, 2019).
DEQ RBCs - Oregon Department of Environmental Quality (DEQ) Risk-Based Concentrations (RBCs) for Individual Chemicals (May 2018, revised August 2023).

Table 3
Soil Analytical Results for Volatile Organic Compounds
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

								DEQ RBCs				
Sample Location	**B-1**		**B-4**	**B-7**	**B-8**	**B-10**	DEQ Clean Fill Criteria	Soil Ingestion, Dermal Contact, and Inhalation			Volatilization to Outdoor Air	Soil Leaching to
Sample ID	B-1-9.0	B-1-14.5	B-4-10.0	B-7-8.0	B-8-5.0	B-10-8.0						
Sample Depth	9.0	14.5	10.0	8.0	5.0	8.0		Occupational	Construction Worker	Excavation Worker	Occupational	Occupational
Sample Date	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025						
Concentrations in mg/kg												
VOCs by EPA Method 8260D												
Acetone	<1.29	<1.58	<2.63	<3.16	<1.50	<2.47	1.2	--	--	--	--	--
Acrylonitrile	<0.129	<0.158	<0.263	<0.316	<0.150	<0.247	0.00036	4.0	40	1,100	5.8	0.0017
Benzene	<0.0129	<0.0158	<0.0263	<0.0316	<0.0150	<0.0247	0.023	37	380	11,000	50	0.10
Bromobenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	2.5	--	--	--	--	--
Bromochloromethane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	1.3	--	--	--	--	--
Bromodichloromethane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.002	15	230	6,300	11	0.0088
Bromoform	<0.129	<0.158	<0.263	<0.316	<0.150	<0.247	0.046	260	2700	74,000	360	0.22
Bromomethane	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	0.083	750	370	10,000	700	0.40
2-Butanone (Methyl Ethyl Ketone)	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	72	--	--	--	--	--
n-Butylbenzene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	190	--	--	--	--	--
sec-Butylbenzene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	350	--	--	--	--	--
tert-Butylbenzene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	96	--	--	--	--	--
Carbon Disulfide	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	0.81	--	--	--	--	--
Carbon Tetrachloride	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.013	34	320	8,900	65	0.058
Chlorobenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	2.4	8,700	4,700	130,000	--	27
Chloroethane	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	310	--	--	--	--	1,300
Chloroform	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.0034	26	410	11,000	17	0.015
Chloromethane	<0.322	<0.395	<0.658	<0.791	<0.374	<0.617	2.2	25,000	25,000	700,000	--	9.1
2-Chlorotoluene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	14	--	--	--	--	--
4-Chlorotoluene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	14	--	--	--	--	--
Dibromochloromethane	<0.129	<0.158	<0.263	<0.316	<0.150	<0.247	0.0024	17	210	5,800	14	0.011
1,2-Dibromo-3-chloropropane	<0.322	<0.395	<0.658	<0.791	<0.374	<0.617	0.0000084	--	--	--	--	--
1,2-Dibromoethane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.00012	0.73	9.0	250	0.65	0.00056
Dibromomethane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.13	--	--	--	--	--
1,2-Dichlorobenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.92	36,000	20,000	560,000	--	160
1,3-Dichlorobenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.74	--	--	--	--	--
1,4-Dichlorobenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.057	64	1,300	36,000	36	0.25
Dichlorodifluoromethane	<0.129	<0.158	<0.263	<0.316	<0.150	<0.247	18	--	--	--	--	--
1,1-Dichloroethane	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.044	260	3,200	89,000	240	0.20
1,2-Dichloroethane	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.0028	16	200	5,600	15	0.013
1,1-Dichloroethene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	6.7	29,000	13,000	370,000	--	32
cis-1,2-Dichloroethene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.63	2,300	710	20,000	--	4.5
trans-1,2-Dichloroethene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	7	23,000	7,100	200,000	--	51
1,2-Dichloropropane	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.017	--	--	--	--	--
1,3-Dichloropropane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	7.8	--	--	--	--	--
2,2-Dichloropropane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	--	--	--	--	--	--
1,1-Dichloropropene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	--	--	--	--	--	--
cis-1,3-Dichloropropene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.01	--	--	--	--	--
trans-1,3-Dichloropropene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.01	--	--	--	--	--
Ethylbenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.22	150	1,700	49,000	160	0.9
Hexachlorobutadiene	<0.129	<0.158	<0.263	<0.316	<0.150	<0.247	0.016	--	--	--	--	--
2-Hexanone	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	0.36	--	--	--	--	--
Isopropylbenzene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	96	57,000	27,000	750,000	--	--
p-Isopropyltoluene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	--	--	--	--	--	--
Methylene Chloride	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	0.14	1,600	2,100	58,000	--	2.4
4-Methyl-2-Pentanone (MIBK)	<0.644	<0.791	<1.32	<1.58	<0.749	<1.23	9.7	--	--	--	--	--
Methyl tertiary butyl ether (MTBE)	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.11	1,100	12,000	320,000	1,500	0.54
Naphthalene	<0.129	<0.158	<0.263	<0.316	<0.150	<0.247	0.077	23	580	16,000	83	0.34
n-Propylbenzene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	72	--	--	--	--	--
Styrene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	1.2	130,000	56,000	--	--	800
1,1,1,2-Tetrachloroethane	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.013	--	--	--	--	--
1,1,2,2-Tetrachloroethane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.0018	--	--	--	--	--
Tetrachloroethene (PCE)	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.18	1,000	1,800	50,000	--	1.9
Toluene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	23	88,000	28,000	770,000	--	490
1,2,3-Trichlorobenzene	<0.322	<0.395	<0.658	<0.791	<0.374	<0.617	1.3	--	--	--	--	--
1,2,4-Trichlorobenzene	<0.322	<0.395	<0.658	<0.791	<0.374	<0.617	0.2	--	--	--	--	--
1,1,1-Trichloroethane	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	190	870,000	470,000	--	--	880
1,1,2-Trichloroethane	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.0063	26	54	1,500	24	0.029
Trichloroethene (TCE)	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.013	51	130	3,700	96	0.087
Trichlorofluoromethane	<0.322	<0.395	<0.658	<0.791	<0.374	<0.617	52	130,000	69,000	--	--	280
1,2,3-Trichloropropane	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	0.000019	--	--	--	--	--
1,2,4-Trimethylbenzene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	10	6,900	2,900	81,000	--	48
1,3,5-Trimethylbenzene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	11	6,900	2,900	81,000	--	53
Vinyl Chloride	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	0.00057	4.4	34	950	89	0.01
m,p-Xylene	<0.0644	<0.0791	<0.132	<0.158	<0.0749	<0.123	11	25,000	20,000	560,000	--	100
o-Xylene	<0.0322	<0.0395	<0.0658	<0.0791	<0.0374	<0.0617	1					

Notes:

bgs - below ground surface

mg/kg - milligrams per kilogram

Results in **bold** denote concentrations above the laboratory minimum reporting limit.

-- denotes screening level is not available.

EPA - United States Environmental Protection Agency

DEQ - Oregon Department of Environmental Quality

VOCs - Volatile Organic Compounds

DEQ Clean Fill Criteria from the Clean Fill Determinations, Table 2: Clean fill screening levels for organics and other selected constituents (February 21, 2019).

DEQ RBCs - Oregon Department of Environmental Quality (DEQ) Risk-Based Concentrations (RBCs) for Individual Chemicals (May 2018, revised August 2023).

Table 4
Soil Analytical Results for Per- and Polyfluoroalkyl Substances
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-1			B-4			B-7			B-8			B-10		
Sample ID	B-1-0-3	B-1-3-8	B-1-8-20	B-4-0-4	B-4-4-8	B-4-8-15	B-7-0-6	B-7-6-10	B-7-10-15	B-8-0-6	B-8-6-11	B-8-11-15	B-10-0-5	B-10-5-10	B-10-10-15
ple Depth (feet bgs)	0-3	3-8	8-20	0-4	4-8	8-15	0-6	6-10	10-15	0-6	6-11	11-15	0-5	5-10	10-15
Sample Date	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025
	Concentrations in ng/g														
PFAS by EPA Method 1633															
PFBA	<0.795	<0.798	**0.177**	<0.796	<0.796	<0.798	**0.404**	<0.798	**0.205**	<0.799	<0.801	<0.799	**0.258**	<0.797	<0.801
PFPeA	**0.0820 I**	**0.111 I**	**0.554**	**0.120 I**	<0.397	<0.397	**0.983**	**0.411**	**0.746**	**0.239**	**0.319**	**0.319**	**0.957**	**0.181 I**	<0.399
PFHxA	<0.198	**0.351**	**1.05**	**0.104**	<0.199	<0.199	**3.10**	**0.323**	**0.644**	**0.131**	**0.277**	**0.280**	**0.467**	**0.260**	<0.200
PFHpA	**0.0910**	**0.184**	**0.197**	**0.0710**	<0.199	<0.199	**0.462**	**0.317**	**0.365**	**0.129**	**0.201**	**0.0700**	**0.501**	**0.248**	<0.200
PFOA	**1.85**	**17.6**	**9.26**	**0.186**	<0.199	**0.151**	**84.7**	**4.10**	**3.85**	**0.636**	**2.83**	**1.25**	**0.431**	**0.373**	<0.200
PFNA	**0.170**	<0.199	<0.199	**0.0830**	<0.199	<0.199	**0.913**	**0.626**	**0.178**	**2.38**	**0.289**	<0.200	**0.215**	<0.199	<0.200
PFDA	**0.235**	<0.199	<0.199	<0.199	<0.199	<0.199	**0.573**	**0.142**	<0.199	**0.206**	<0.200	<0.200	<0.199	<0.199	<0.200
PFUnA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	**0.736**	**0.147**	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
PFDoA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	**0.112**	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
PFTrDA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	<0.200	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
PFTeDA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	<0.200	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
PFBS	<0.176	<0.176	<0.176	<0.176	<0.176	<0.176	**0.131**	<0.176	**0.0870**	<0.177	<0.177	<0.177	<0.176	<0.176	<0.177
PFPeS	<0.187	<0.187	<0.187	<0.187	<0.187	<0.187	**0.124**	**0.171**	**0.195**	<0.188	<0.188	<0.188	<0.187	<0.187	<0.188
PFHxS	**0.0980**	**0.979**	**0.327**	<0.182	<0.182	<0.182	**1.68**	**5.34**	**3.30**	**0.108**	**0.479**	<0.183	<0.182	**0.116**	<0.183
PFHpS	<0.189	<0.189	<0.189	<0.189	<0.189	<0.189	**0.700**	**0.531**	**0.184**	<0.190	<0.190	<0.190	<0.189	<0.189	<0.190
PFOS	**2.97**	**1.07**	<0.185	**1.22**	**0.372**	**0.245**	**870**	**53.8**	**21.5**	**1.91**	**1.68**	<0.186	**0.924**	**0.128**	<0.186
PFNS	<0.191	<0.191	<0.191	<0.191	<0.191	<0.191	**1.18**	**0.388**	<0.191	<0.192	<0.192	<0.192	<0.191	<0.191	<0.192
PFDS	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	**2.23**	<0.192	<0.192	<0.193	<0.193	<0.193	<0.192	<0.192	<0.193
PFDoS	<0.193	<0.193	<0.193	<0.193	<0.193	<0.193	**1.59**	<0.193	<0.193	<0.194	<0.194	<0.194	<0.193	<0.193	<0.194
4:2 FTS	<0.744	<0.747	<0.745	<0.745	<0.746	<0.747	<0.750	<0.747	<0.745	<0.748	<0.750	<0.748	<0.745	<0.747	<0.750
6:2 FTS	<0.753	<0.756	<0.754	<0.754	<0.754	<0.756	**3.49**	**2.99**	**3.03**	<0.757	**0.314**	<0.757	<0.754	<0.756	<0.759
8:2 FTS	<0.762	<0.765	<0.763	<0.763	<0.763	<0.765	**55.0**	**8.05**	**2.87**	<0.766	<0.768	<0.766	<0.763	<0.764	<0.768
PFOSA	**1.04 I**	<0.199	<0.199	<0.199	<0.199	<0.199	**5.37**	**1.92**	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
MeFOSA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	<0.200	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
EtFOSA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	<0.200	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
MeFOSAA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	<0.200	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
EtFOSAA	<0.198	<0.199	<0.199	<0.199	<0.199	<0.199	**0.143**	<0.199	<0.199	<0.200	<0.200	<0.200	<0.199	<0.199	<0.200
MeFOSE	<1.98	<1.99	<1.99	<1.99	<1.99	<1.99	<2.00	<1.99	<1.99	<2.00	<2.00	<2.00	<1.99	<1.99	<2.00
EtFOSE	<1.98	<1.99	<1.99	<1.99	<1.99	<1.99	<2.00	<1.99	<1.99	<2.00	<2.00	<2.00	<1.99	<1.99	<2.00
HFPO-DA	<0.829	<0.832	<0.830	<0.830	<0.830	<0.832	<0.835	<0.831	<0.829	<0.833	<0.835	<0.833	<0.830	<0.831	<0.835
ADONA	<0.784	<0.787	<0.785	<0.785	<0.785	<0.787	<0.790	<0.787	<0.785	<0.788	<0.790	<0.788	<0.785	<0.786	<0.790
PFMPA	<0.397	<0.399	<0.398	<0.398	<0.398	<0.398	<0.400	<0.398	<0.397	<0.399	<0.400	<0.399	<0.397	<0.398	<0.400
PFMBA	<0.397	<0.399	<0.398	<0.398	<0.398	<0.398	<0.400	<0.398	<0.397	<0.399	<0.400	<0.399	<0.397	<0.398	<0.400
NFDHA	<0.397	<0.399	<0.398	<0.398	<0.398	<0.398	<0.400	<0.398	<0.397	<0.399	<0.400	<0.399	<0.397	<0.398	<0.400
9Cl-PF3ONS	<0.774	<0.777	<0.775	<0.775	<0.775	<0.777	<0.780	<0.777	<0.775	<0.778	<0.780	<0.778	<0.775	<0.776	<0.780
11Cl-PF3OUdS	<0.784	<0.787	<0.785	<0.785	<0.785	<0.787	<0.790	<0.787	<0.785	<0.788	<0.790	<0.788	<0.785	<0.786	<0.790
PFEESA	<0.353	<0.355	<0.354	<0.354	<0.354	<0.355	<0.356	<0.354	<0.354	<0.355	<0.356	<0.355	<0.354	<0.354	<0.356
3:3 FTCA	<0.992	<0.997	<0.994	<0.994	<0.994	<0.996	<1.00	<0.996	<0.993	<0.998	<1.00	<0.998	<0.993	<0.995	<1.00
5:3 FTCA	<4.96	<4.98	<4.97	<4.97	<4.97	<4.98	<5.00	<4.98	<4.97	<4.99	<5.00	<4.99	<4.97	<4.98	<5.00
7:3 FTCA	<4.96	<4.98	<4.97	<4.97	<4.97	<4.98	<5.00	<4.98	<4.97	<4.99	<5.00	<4.99	<4.97	<4.98	<5.00

Notes:
bgs - below ground surface
ng/g - nanograms per gram
Results in **bold** denote concentrations above the laboratory minimum reporting limit.
-- denotes screening level is not available.
PFAS - Per- and Polyfluoroalkyl Substances

Table 4
Soil Analytical Results for Per- and Polyfluoroalkyl Substances
Basin 1 Stormwater Improvements

Notes:
bgs - below ground surface
ng/g - nanograms per gram
Results in **bold** denote concentrations above the laboratory minimum reporting limit.
PFAS - Per- and Polyfluoroalkyl Substances

PFAS Abbreviations

Perfluoroalkyl carboxylic acids

PFBA	375-22-4	Perfluorobutanoic acid
PFPeA	2706-90-3	Perfluoropentanoic acid
PFHxA	307-24-4	Perfluorohexanoic acid
PFHpA	375-85-9	Perfluoroheptanoic acid
PFOA	335-67-1	Perfluorooctanoic acid
PFNA	375-95-1	Perfluorononanoic acid
PFDA	335-76-2	Perfluorodecanoic acid
PFUnA	2058-94-8	Perfluoroundecanoic acid
PFDoA	307-55-1	Perfluorododecanoic acid
PFTrDA	72629-94-8	Perfluorotridecanoic acid
PFTeDA	376-06-7	Perfluorotetradecanoic acid

Perfluoroalkyl sulfonic acids

PFBS	375-73-5	Perfluorobutanesulfonic acid
PFPeS	2706-91-4	Perfluoropentanesulfonic acid
PFHxS	355-46-4	Perfluorohexanesulfonic acid
PFHpS	375-92-8	Perfluoroheptanesulfonic acid
PFOS	1763-23-1	Perfluorooctanesulfonic acid
PFNS	68259-12-1	Perfluorononanesulfonic acid
PFDS	335-77-3	Perfluorodecanesulfonic acid
PFDoS	79780-39-5	Perfluorododecanesulfonic acid
Fluorotelomer sulfonic acids		
4:2 FTS	757124-72-4	1H,1H,2H,2H-Perfluorohexane sulfonic acid
6:2 FTS	27619-97-2	1H,1H,2H,2H-Perfluorooctane sulfonic acid
8:2 FTS	39108-34-4	1H,1H,2H,2H-Perfluorodecane sulfonic acid

Perfluorooctane sulfonamides

PFOSA	754-91-6	Perfluorooctanesulfonamide
MeFOSA	31506-32-8	N-methyl perfluorooctanesulfonamide
EtFOSA	4151-50-2	N-ethyl perfluorooctanesulfonamide
Perfluorooctane sulfonamidoacetic acids		
MeFOSAA	2355-31-9	N-methyl perfluorooctanesulfonamidoacetic acid
EtFOSAA	2991-50-6	N-ethyl perfluorooctanesulfonamidoacetic acid
Perfluorooctane sulfonamide ethanols		
MeFOSE	24448-09-7	N-methyl perfluorooctanesulfonamidoethanol
EtFOSE	1691-99-2	N-ethyl perfluorooctanesulfonamidoethanol
Per- and Polyfluoroether carboxylic acids		
HFPO-DA	13252-13-6	Hexafluoropropylene oxide dimer acid (GenX)
ADONA	919005-14-4	4,8-Dioxa-3H-perfluorononanoic acid
PFMPA	377-73-1	Perfluoro-3-methoxypropanoic acid
PFMBA	863090-89-5	Perfluoro-4-methoxybutanoic acid
NFDHA	151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid

Ether sulfonic acids

9Cl-PF3ONS	756426-58-1	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B major)
11Cl-PF3OUd	763051-92-9	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B minor)
PFEESA	113507-82-7	Perfluoro(2-ethoxyethane)sulfonic acid
Fluorotelomer carboxylic acids		
3:3 FTCA	356-02-5	3-Perfluoropropyl propanoic acid
5:3 FTCA	914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid
7:3 FTCA	812-70-4	3-Perfluoroheptyl propanoic acid

Table 5
Groundwater Analytical Results for Total Petroleum Hydrocarbons and Polycyclic Aromatic Hydrocarbons
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-4
Sample ID	B-4-030725
Sample Date	3/7/2025
TPH with	
Diesel Range Organics	<222
Oil Range Organics	<444
PAHs by EPA Method 8270E	
Acenaphthene	<0.0355
Acenaphthylene	<0.0355
Anthracene	<0.0355
Benzo(a)Anthracene	<0.0177
Benzo(a)Pyrene	<0.0177
Benzo(b)Fluoranthene	<0.0177
Benzo(g,h,i)Perylene	<0.0355
Benzo(k)Fluoranthene	<0.0177
Chrysene	<0.0177
Dibenzo(a,h)Anthracene	<0.0177
Dibenzofuran	<0.0355
Fluoranthene	<0.0355
Fluorene	<0.0355
Indeno(1,2,3-cd)Pyrene	<0.0177
1-Methylnaphthalene	<0.0709
2-Methylnaphthalene	<0.0709
Naphthalene	<0.0709
Phenanthrene	<0.0709
Pyrene	<0.0355

Notes:

µg/L - micrograms per liter

Results in **bold** denote concentrations above the laboratory minimum reporting limit.

-- denotes screening level is not available.

EPA - United States Environmental Protection Agency

TPH - Total Petroleum Hydrocarbons

PAHs - Polycyclic Aromatic Hydrocarbons

Table 6
Groundwater Analytical Results for Metals
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-4
Sample ID	B-4-030725
Sample Date	3/7/2025
Total Metals by EPA 6020B	
Arsenic	**18.8**
Barium	**983**
Cadmium	**1.98**
Chromium	**88.0**
Lead	**48.3**
Mercury	**0.141**
Selenium	**1.91**
Silver	**0.325**

Notes:

µg/L - micrograms per liter

Results in **bold** denote concentrations above the laboratory minimum reporting limit.

EPA - United States Environmental Protection Agency

Table 7
Groundwater Analytical Results for Volatile Organic Compounds
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-4
Sample ID	B-4-030725
Sample Date	3/7/2025
VOCs by EPA Method 8260D	
Acetone	**25.0**
Acrylonitrile	<2.00
Benzene	<0.200
Bromobenzene	<0.500
Bromochloromethane	<1.00
Bromodichloromethane	<1.00
Bromoform	<1.00
Bromomethane	<5.00
2-Butanone (Methyl ethyl ketone)	<10.0
n-Butylbenzene	<1.00
Sec-Butylbenzene	<1.00
Tert-Butylbenzene	<1.00
Carbon Disulfide	<10.0
Carbon Tetrachloride	<1.00
Chlorobenzene	<0.500
Chloroethane	<10.0
Chloroform	<1.00
Chloromethane	<5.00
2-Chlorotoluene	<1.00
4-Chlorotoluene	<1.00
Dibromochloromethane	<1.00
1,2-Dibromo-3-chloropropane	<5.00
1,2-Dibromoethane	<0.500
Dibromomethane	<1.00
1,2-Dichlorobenzene	<0.500
1,3-Dichlorobenzene	<0.500
1,4-Dichlorobenzene	<0.500
Dichlorodifluoromethane	<1.00
1,1-Dichloroethane	<0.400
1,2-Dichloroethane	<0.400
1,1-Dichloroethene	<0.400
cis-1,2-Dichloroethene	<0.400
trans-1,2-Dichloroethene	<0.400
1,2-Dichloropropane	<0.500
1,3-Dichloropropane	<1.00
2,2-Dichloropropane	<1.00
1,1-Dichloropropene	<1.00
cis-1,3-Dichloropropene	<1.00
trans-1,3-Dichloropropene	<1.00
Ethylbenzene	<0.500
Hexachlorobutadiene	<5.00
2-Hexanone	<10.0
Isopropylbenzene	<1.00
p-Isopropyltoluene	<1.00

Table 7
Groundwater Analytical Results for Volatile Organic Compounds
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-4
Sample ID	B-4-030725
Sample Date	3/7/2025
Methylene Chloride	<10.0
4-Methyl-2-Pentanone (MIBK)	<10.0
Methyl tertiary butyl ether (MTBE)	<1.00
Naphthalene	<5.00
n-Propylbenzene	<0.500
Styrene	<1.00
1,1,1,2-Tetrachloroethane	<0.400
1,1,2,2-Tetrachloroethane	<0.500
Tetrachloroethene (PCE)	<0.400
Toluene	<1.00
1,2,3-Trichlorobenzene	<2.00
1,2,4-Trichlorobenzene	<2.00
1,1,1-Trichloroethane	<0.400
1,1,2-Trichloroethane	<0.500
Trichloroethene (TCE)	<0.400
Trichlorofluoromethane	<2.00
1,2,3-Trichloropropane	<1.00
1,2,4-Trimethylbenzene	<1.00
1,3,5-Trimethylbenzene	<1.00
Vinyl Chloride	<0.200
m,p-Xylene	<1.00
o-Xylene	<0.500

Notes:
µg/L - micrograms per liter
Results in **bold** denote concentrations above the laboratory minimum reporting limit.
-- denotes screening level is not available.
EPA - United States Environmental Protection Agency
VOCs - Volatile Organic Compounds

Table 8
Groundwater Analytical Results for Per- and Polyfluoroalkyl Substances
Basin 1 Stormwater Improvements
Portland, Oregon
Central Project Number: MottMac-4-01

Sample Location	B-4	
Sample ID	B-4-030725	EB-030725
Sample Date	3/7/2025	3/4/2025
PFAS by EPA Method 1633		
PFBA	**14.7**	<6.45
PFPeA	**27.1**	<3.22
PFHxA	**24.9**	<1.61
PFHpA	**14.9**	<1.61
PFOA	**62.8**	<2.02
PFNA	**19.1**	<1.61
PFDA	<1.64	<1.61
PFUnA	<1.64	<1.61
PFDoA	<1.64	<1.61
PFTrDA	<1.64	<1.61
PFTeDA	<1.64	<1.61
PFBS	**2.69**	<1.43
PFPeS	**3.44**	<1.51
PFHxS	**58.3**	<1.47
PFHpS	**2.05**	<1.53
PFOS	**237**	<1.50
PFNS	<1.58	<1.55
PFDS	<1.58	<1.55
PFDoS	<1.59	<1.56
4:2 FTS	<6.16	<6.05
6:2 FTS	<6.23	<6.12
8:2 FTS	<6.31	<6.19
PFOSA	<1.64	<1.61
MeFOSA	<1.64	<1.61
EtFOSA	<1.64	<1.61
MeFOSAA	<1.64	<1.61
EtFOSAA	<1.64	<1.61
MeFOSE	<16.4	<16.1
EtFOSE	<16.4	<16.1
HFPO-DA	<6.86	<6.73
ADONA	<6.49	<6.37
PFMPA	<3.29	<3.22
PFMBA	<3.29	<3.22
NFDHA	<3.29	<3.22
9Cl-PF3ONS	<6.41	<6.29
11Cl-PF3OUdS	<6.16	<6.05
PFEESA	<2.93	<2.87
3:3 FTCA	<8.22	<8.06
5:3 FTCA	<41.1	<40.3
7:3 FTCA	<41.1	<40.3
Hazard Index (unitless)[1]	**7.74**	0

Notes:

ng/L - nanograms per liter (parts per trillion, ppt)

Results in **bold** denote concentrations above the laboratory minimum reporting limit.

EPA - United States Environmental Protection Agency

PFAS - Per- and Polyfluoroalkyl Substances

[1]Hazard Index (HI) is calculated for mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS by adding the ratio of the water concentration to a Health-Based Water Concentration (HBWC). Per EPA guidance, the HBWCs used to calculate the HI are 10 ppt for HFPO-DA, 2,000 ppt for PFBS, 10 ppt for PFNA, and 10 ppt for PFHxS.

Table 1
Groundwater Analytical Results
Port of Portland

Location:	RBC, Groundwater in Excavation[1]	MW-8	MW-11	MW-12
Sample Name:		MW-8-GW-04042025	MW-11-GW-04042025	MW-12-GW-04042025
Sample Date:	Con. & Exc. Worker	04/04/2025	04/04/2025	04/04/2025
TPH with Silica Gel Cleanup (ug/L)				
Diesel-range hydrocarbons	NV	198 U	**348**	**3,490**
Motor oil-range hydrocarbons	NV	396 U	**946**	385 U
Total Metals (ug/L)				
Lead	NV	0.400 U	**1.75**	**0.402 J+**
PCBs (ug/L)				
Aroclor 1016	NV	0.103 U	0.105 U	0.0990 U
Aroclor 1221	NV	0.103 U	0.105 U	0.0990 U
Aroclor 1232	NV	0.103 U	0.105 U	0.0990 U
Aroclor 1242	NV	0.103 U	0.105 U	0.0990 U
Aroclor 1248	NV	0.103 U	0.105 U	0.0990 U
Aroclor 1254	NV	0.103 U	0.105 U	0.0990 U
Aroclor 1260	NV	0.103 U	0.105 U	0.0990 U
Total PCBs[a]	30	0.103 UT	0.105 UT	0.0990 UT
VOCs (ug/L)				
1,1,1,2-Tetrachloroethane	NV	0.400 U	0.400 U	0.400 U
1,1,1-Trichloroethane	1,100,000	0.400 U	0.400 U	0.400 U
1,1,2,2-Tetrachloroethane	NV	0.500 U	0.500 U	1.500 U
1,1,2-Trichloroethane	49	0.500 U	0.500 U	0.500 U
1,1-Dichloroethane	10,000	0.400 U	0.400 U	0.400 U
1,1-Dichloroethene	44,000	0.400 U	0.400 U	0.400 U
1,1-Dichloropropene	NV	1.00 U	1.00 U	1.00 U
1,2,3-Trichlorobenzene	NV	2.00 U	2.00 U	2.00 U
1,2,3-Trichloropropane	NV	1.00 U	1.00 U	1.00 U
1,2,4-Trichlorobenzene	NV	2.00 U	2.00 U	2.00 U
1,2,4-Trimethylbenzene	6,300	1.00 U	1.00 U	1.00 U
1,2-Dibromo-3-chloropropane	NV	5.00 U	5.00 U	5.00 U
1,2-Dibromoethane	27	0.500 U	0.500 U	0.500 U
1,2-Dichlorobenzene	37,000	0.500 U	0.500 U	0.500 U
1,2-Dichloroethane	630	0.400 U	0.400 U	0.400 U
1,2-Dichloropropane	NV	0.500 U	0.500 U	0.500 U
1,3,5-Trimethylbenzene	7,500	1.00 U	1.00 U	1.00 U
1,3-Dichlorobenzene	NV	0.500 U	0.500 U	0.500 U
1,3-Dichloropropane	NV	1.00 U	1.00 U	1.00 U
1,4-Dichlorobenzene	1,500	0.500 U	0.500 U	0.500 U
2,2-Dichloropropane	NV	1.00 U	1.00 U	1.00 U
2-Butanone	NV	10.0 U	10.0 U	**10.5**

Table 1
Groundwater Analytical Results
Port of Portland

Location:	RBC, Groundwater in Excavation[1]	MW-8	MW-11	MW-12
Sample Name:		MW-8-GW-04042025	MW-11-GW-04042025	MW-12-GW-04042025
Sample Date:	Con. & Exc. Worker	04/04/2025	04/04/2025	04/04/2025
2-Chlorotoluene	NV	1.00 U	1.00 U	1.00 U
2-Hexanone	NV	10.0 U	10.0 U	10.0 U
4-Chlorotoluene	NV	1.00 U	1.00 U	1.00 U
4-Isopropyltoluene	NV	1.00 U	1.00 U	1.00 U
4-Methyl-2-pentanone	NV	10.0 U	10.0 U	10.0 U
Acetone	NV	20.0 U	20.0 U	**38.9**
Acrylonitrile	250	2.00 U	2.00 U	2.00 U
Benzene	1,800	0.200 U	0.200 U	**0.450**
Bromobenzene	NV	0.500 U	0.500 U	0.500 U
Bromodichloromethane	450	1.00 U	1.00 U	1.00 U
Bromoform	14,000	1.00 U	1.00 U	1.00 U
Bromomethane	1,200	5.00 U	5.00 U	5.00 U
Carbon disulfide	NV	10.0 U	10.0 U	10.0 U
Carbon tetrachloride	1,800	1.00 U	1.00 U	1.00 U
Chlorobenzene	10,000	0.500 U	0.500 U	0.500 U
Chlorobromomethane	NV	1.00 U	1.00 U	1.00 U
Chloroethane	2,400,000	5.00 U	5.00 U	5.00 U
Chloroform	720	1.00 U	1.00 U	1.00 U
Chloromethane	22,000	5.00 U	5.00 U	5.00 U
cis-1,2-Dichloroethene	18,000	0.400 U	0.400 U	**0.540**
cis-1,3-Dichloropropene	NV	1.00 U	1.00 U	1.00 U
Dibromochloromethane	610	1.00 U	1.00 U	1.00 U
Dibromomethane	NV	1.00 U	1.00 U	1.00 U
Dichlorodifluoromethane (Freon 12)	NV	1.00 U	1.00 U	1.00 U
Ethylbenzene	4,500	0.500 U	0.500 U	0.500 U
Hexachlorobutadiene	NV	5.00 U	5.00 U	5.00 U
Isopropylbenzene	51,000	1.00 U	1.00 U	1.00 U
m,p-Xylene	NV	1.00 U	1.00 U	1.00 U
Methyl tert-butyl ether	63,000	1.00 U	1.00 U	1.00 U
Methylene chloride	79,000	10.0 U	10.0 U	10.0 U
Naphthalene	500	5.00 U	5.00 U	5.00 U
n-Butylbenzene	NV	1.00 U	1.00 U	1.00 U
n-Propylbenzene	NV	0.500 U	0.500 U	0.500 U
o-Xylene	NV	0.500 U	0.500 U	0.500 U
sec-Butylbenzene	NV	1.00 U	1.00 U	1.00 U
Styrene	170,000	1.00 U	1.00 U	1.00 U
tert-Butylbenzene	NV	1.00 U	1.00 U	1.00 U
Tetrachloroethene (PCE)	5,600	0.400 U	0.400 U	0.400 U

Table 1
Groundwater Analytical Results
Port of Portland

Location:	RBC, Groundwater in Excavation[1]	MW-8	MW-11	MW-12
Sample Name:		MW-8-GW-04042025	MW-11-GW-04042025	MW-12-GW-04042025
Sample Date:	Con. & Exc. Worker	04/04/2025	04/04/2025	04/04/2025
Toluene	220,000	1.00 U	1.00 U	1.00 U
trans-1,2-Dichloroethene	180,000	0.400 U	0.400 U	0.400 U
trans-1,3-Dichloropropene	NV	1.00 U	1.00 U	1.00 U
Trichloroethene (TCE)	430	0.400 U	0.400 U	0.400 U
Trichlorofluoromethane (Freon 11)	160,000	2.00 U	2.00 U	2.00 U
Vinyl chloride	960	0.200 U	0.200 U	0.200 U
Xylenes (total)[b]	23,000	1.00 UT	1.00 UT	1.00 UT
PAHs (ug/L)				
1-Methylnaphthalene	NV	0.0938 UJ	0.212 UJ	1.61 U
2-Methylnaphthalene	NV	0.0938 UJ	0.225 UJ	2.85 U
Acenaphthene	NV	0.0469 UJ	0.0400 UJ	0.807 U
Acenaphthylene	NV	0.0469 UJ	0.0400 UJ	0.807 U
Anthracene	NV	0.0469 UJ	0.0687 UJ	0.807 U
Benzo(a)anthracene	NV	0.0235 UJ	0.0312 UJ	0.403 U
Benzo(a)pyrene	NV	0.0235 UJ	0.0200 UJ	0.403 U
Benzo(b)fluoranthene	NV	0.0235 UJ	0.0200 UJ	0.403 U
Benzo(ghi)perylene	NV	0.0469 UJ	0.0400 UJ	0.807 U
Benzo(k)fluoranthene	NV	0.0235 UJ	0.0200 UJ	0.403 U
Chrysene	NV	0.0235 UJ	0.0200 UJ	0.403 U
Dibenzo(a,h)anthracene	NV	0.0235 UJ	0.0200 UJ	0.403 U
Dibenzofuran	NV	0.0469 UJ	0.0400 UJ	0.807 U
Fluoranthene	NV	0.0469 UJ	0.0400 UJ	0.807 U
Fluorene	NV	0.0469 UJ	0.250 UJ	0.807 U
Indeno(1,2,3-cd)pyrene	NV	0.0235 UJ	0.0200 UJ	0.403 U
Naphthalene	500	0.0938 UJ	0.387 UJ	4.06 U
Phenanthrene	NV	0.0938 UJ	0.0800 UJ	1.61 U
Pyrene	NV	0.0469 UJ	0.0400 UJ	0.807 U
PFAS (ng/L)				
11Cl-PF3OUdS (F-53B Minor)	NV	6.12 U	6.1 U	300 U
PFBA	NV	**215**	**40.2**	**428**
PFMPA	NV	3.26 U	3.25 U	160 U
3:3 FTCA	NV	8.15 U	8.14 U	400 U
PFPeA	NV	**429**	**133**	**1,140**
PFMBA	NV	3.26 U	3.25 U	160 U
4:2 FTSA	NV	6.12 U	6.1 U	300 U
NFDHA	NV	3.26 U	3.25 U	160 U
PFBS	NV	**80.4**	**52.2**	**137**
PFHxA	NV	**472**	**329**	**2,120**

Table 1
Groundwater Analytical Results
Port of Portland

Location:	RBC, Groundwater in Excavation[1]	MW-8	MW-11	MW-12
Sample Name:		MW-8-GW-04042025	MW-11-GW-04042025	MW-12-GW-04042025
Sample Date:	Con. & Exc. Worker	04/04/2025	04/04/2025	04/04/2025
HFPO-DA (GenX)	NV	6.81 U	6.79 U	334 U
PFEESA	NV	2.9 U	2.9 U	143 U
5:3 FTCA	NV	40.8 U	40.7 U	2,000 U
PFHpA	NV	**142**	**120**	**998**
PFPeS	NV	**24.8**	**36.9**	**182**
ADONA	NV	6.44 U	6.43 U	316 U
6:2 FTSA	NV	**62.6**	6.17 U	**1,630**
PFOA	NV	**341**	**4,720 J**	**80,500**
PFHxS	NV	**198**	**611**	**3,530**
7:3 FTCA	NV	40.8 U	40.7 U	2,000 U
PFNA	NV	**8.33**	**17.5**	**574**
PFHpS	NV	**3.78**	**2.48**	**1,020**
8:2 FTSA	NV	6.26 U	6.25 U	**2,430**
PFDA	NV	1.63 U	**6.99**	80 U
MeFOSAA	NV	1.63 U	1.63 U	80 U
PFOS	NV	**190**	**196**	**109,000**
EtFOSAA	NV	1.63 U	1.63 U	80 U
PFUnA	NV	1.63 U	1.63 U	80 U
9Cl-PF3ONS (F-53B Major)	NV	6.36 U	6.35 U	312 U
PFNS	NV	1.57 U	1.57 U	**78.7**
PFDoA	NV	1.63 U	1.63 U	80 U
PFDS	NV	1.57 U	1.57 U	77 U
PFOSA	NV	1.63 U	**1.93**	**225**
PFTrDA	NV	1.63 U	1.63 U	80 U
PFTeDA	NV	1.63 U	1.63 U	80 U
PFDoS	NV	1.58 U	1.58 U	77.5 U
MeFOSE	NV	16.3 U	16.3 U	800 U
MeFOSA	NV	1.63 U	1.63 U	80 U
EtFOSE	NV	16.3 U	16.3 U	800 U
EtFOSA	NV	1.63 U	1.63 U	80 U

Table 1
Groundwater Analytical Results
Port of Portland

Notes

Bold text indicates a concentration was detected above the method reporting limit.

Data was reviewed by a chemist and appropriate data qualification was added to the results.

Data summation rules are as follows: non-detect results are multiplied by one-half when used for sums. When all results are non-detect, the highest reporting limit is provided as the sum.

Detected results were compared with screening criteria. There were no exceedances.

Con. = construction.

DEQ = Oregon Department of Environmental Quality.

Exc. = excavation.

J = result is estimated.

J+ = result is estimated, but the result may be biased high.

ng/L = nanograms per liter.

NV = no value.

PAH = polycyclic aromatic hydrocarbon.

PCB = polychlorinated biphenyl.

PFAS = per- and polyfluoroalkyl substances.

RBC = risk-based concentration.

T = result is calculated.

TPH = total petroleum hydrocarbons.

U = result is non-detect at the method reporting limit.

ug/L = micrograms per liter.

UJ = result is non-detect with an estimated reporting limit.

VOC = volatile organic compound.

[a]Total PCBs is the sum of all PCB Aroclors.

[b]Total xylenes is the sum of m,p-xylene and o-xylene.

Reference

[1]DEQ. 2023. Table: *Risk-Based Concentrations for Individual Chemicals.* Oregon Department of Environmental Quality, Environmental Cleanup Program. August.

Table 1
Summary of Soil Analytical Results
PDX Basin 1 Construction Soil Sampling
Port of Portland

Location:	SC-01	SC-01	SC-01	SC-02	SC-02	SC-02
Sample Name:	SC-01-COMP-0-3	SC-01-COMP-3-8	SC-01-COMP-8-15	SC-01-COMP-0-5	SC-01-COMP-5-10	SC-01-COMP-10-15
Collection Date:	5/27/2025	5/27/2025	5/27/2025	5/27/2025	5/27/2025	5/27/2025
Collection Depth (ft bgs):	0 to 3	3 to 8	8 to 15	0 to 5	5 to 10	10 to 15
PFAS (ng/g)						
PFBA	0.799 U	0.801 U	0.799 U	0.794 U	0.801 U	0.799 U
PFMPA	0.399 U	0.400 U	0.399 U	0.397 U	0.400 U	0.399 U
3:3 FTCA	1.00 U	1.00 U	0.998 U	0.992 U	1.00 U	0.997 U
PFPeA	0.398 U	0.399 U	0.398 U	**0.936**	**1.30**	**2.18**
PFMBA	0.399 U	0.400 U	0.399 U	0.397 U	0.400 U	0.399 U
4:2 FTS	0.748 U	0.750 U	0.749 U	0.744 U	0.750 U	0.748 U
NFDHA	0.399 U	0.400 U	0.399 U	0.397 U	0.400 U	0.399 U
PFBS	0.177 U	0.177 U	0.177 U	0.176 U	0.177 U	**0.247**
PFHxA	0.200 U	**0.212**	**0.201**	**0.789**	**1.10**	**2.10**
HFPO-DA	0.833 U	0.835 U	0.833 U	0.828 U	0.835 U	0.833 U
PFEESA	0.355 U	0.356 U	0.355 U	0.353 U	0.356 U	0.355 U
5:3 FTCA	4.99 U	5.00 U	4.99 U	4.96 U	5.00 U	4.99 U
PFHpA	0.200 U	0.200 U	0.200 U	**0.489**	**0.589**	**0.940**
PFPeS	0.188 U	0.188 U	0.188 U	0.186 U	0.188 U	**0.767**
ADONA	0.788 U	0.790 U	0.788 U	0.783 U	0.790 U	0.788 U
6:2 FTS	0.757 U	0.759 U	0.758 U	**13.3**	**18.4**	**23.9**
PFOA	**17.0**	**13.7**	**4.29**	**3.47**	**2.42**	**13.9**
PFHxS	**0.482**	**0.323**	**0.690**	**1.82**	**1.83**	**14.0**
7:3 FTCA	4.99 U	5.00 U	4.99 U	4.96 U	5.00 U	4.99 U
PFNA	**0.211**	**0.246**	**0.205**	**1.23**	**0.922**	**0.407**
PFHpS	0.190 U	0.190 U	0.190 U	**0.195**	0.190 U	**1.55**
8:2 FTS	0.766 U	0.768 U	0.767 U	**53.9**	**35.0**	**3.80**
PFDA	**1.26**	**0.363**	0.200 U	**2.16**	**1.08**	0.199 U
MeFOSAA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U
PFOS	**2.26**	**3.90**	**1.57**	**151**	**86.0**	**110**
EtFOSAA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U
PFUnA	0.200 U	0.200 U	0.200 U	**0.237**	0.200 U	0.199 U
9Cl-PF3ONS	0.778 U	0.780 U	0.779 U	0.773 U	0.780 U	0.778 U
PFNS	0.192 U	0.192 U	0.192 U	**0.726**	**0.280**	0.191 U
PFDoA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U
PFDS	0.193 U	0.193 U	0.193 U	**0.838**	0.193 U	0.192 U
PFOSA	0.200 U	0.200 U	0.200 U	**3.84**	0.200 U	0.199 U
PFTrDA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U
11Cl-PF3OUdS	0.788 U	0.790 U	0.788 U	0.783 U	0.790 U	0.788 U
PFTeDA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U
PFDoS	0.194 U	0.194 U	0.194 U	**0.445**	0.194 U	0.193 U
MeFOSE	2.00 U	2.00 U	2.00 U	1.98 U	2.00 U	1.99 U
MeFOSA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U
EtFOSE	2.00 U	2.00 U	2.00 U	1.98 U	2.00 U	1.99 U
EtFOSA	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U

Notes

bold = detected above the method detection limit.

Data was reviewed by a chemist and appropriate data qualification was added to the results.

-- = no value.

ft bgs = feet below ground surface.

ng/g = nanograms per gram.

PFAS = per- and polyfluoroalkyl substances.

U = result is non-detect at the method detection limit.

Appendix D

Boring Logs

MAUL FOSTER ALONGI

CENTRAL ENGINEERING SERVICES

Exploration and Soil Classification Key

rev. 051624

Relative Density - Coarse-Grained Soil

Term	SPT (140-lb Hammer)*	D&M Sampler (140-lb Hammer)*	D&M Sampler (300-lb Hammer)*
Very-loose	0-4	0-11	0-4
Loose	4-10	11-26	4-10
Medium-dense	10-30	26-74	10-30
Dense	30-50	74-120	30-47
Very-dense	>50	>120	>47

Consistency - Fine-Grained Soil

Term	SPT (140-lb Hammer)*	Sampler (140-lb Hammer)*	Sampler (300-lb Hammer)*	Pocket Pen (tsf)	Torvane (tsf)
Very-soft	0-2	0-3	0-2	<0.25	<0.13
Soft	2-4	3-6	2-5	0.25-0.5	0.13-0.25
Medium-stiff	4-8	6-12	5-9	0.5-1	0.25-0.5
Stiff	8-15	12-25	9-19	1.0-2.0	0.5-1.0
Very-stiff	15-30	25-65	19-31	2.0-4.0	1.0-2.0
Hard	>30	>65	>31	>4.0	>2.0

SPT N-value correlation based off ASTM D1586

Unified Soil Classification System (USCS)

USCS Symbols	Graph	Typical Descriptions
GP		Poorly graded GRAVEL, <5% fines
GP-GM/GP-GC		Poorly graded GRAVEL w/ silt/clay, 5 to 12% fines
GM		silty GRAVEL, over 12% fines
GC		clayey GRAVEL, over 12% fines
GW		well graded GRAVEL, <5% fines
SP		poorly graded SAND, <5% fines
SP-SM/SP-SC		poorly graded SAND w/ silt/clay, 5 to 12% fines
SM		silty SAND, over 12% fines
SC		clayey SAND, over 12% fines
SW		well graded SAND, <5% fines
ML		SILT, low plasticity
MH		SILT, high plasticity
CL		CLAY, low plasticity
CH		CLAY, high plasticity
OL		ORGANIC SILT, low plasticity
OH		ORGANIC CLAY, medium to high plasticity
PT		PEAT

ADDITIONAL CONSTITUENTS

Silt/Clay in:			Sand/Gravel in:		
Percent*	Fine-Grained	Coarse-Grained	Percent*	Fine-Grained	Coarse-Grained
<5	trace	trace	<5	trace	trace
5-12	minor	with	5-15	minor	minor
>12	some	silty/clayey	15-30	with	with
			>30	sandy/gravelly	with

GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits
CBR	California Bearing Ratio
CON	Consolidation
DD	Dry Density
DS	Direct Shear
HYD	Hydrometer Gradation
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
MC	Moisture Content
MD	Moisture-Density
NP	Non-Plastic
OC	Organic Content
P	Pushed Sample
PP	Pocket Penetrometer
Passing No.200	Percent Passing U.S. Std. No.200 Sieve
RES	Resilient Modulus
SIEV	Sieve Gradation
TOR	Torvane
UC	Unconfined Compressive Strength
VS	Vane Shear

CONTACT LINES

	Distinct contact between soil strata (approximate location)
	Approximate contact between soil strata

WATER LEVELS

▽	Water Level at Time of Drilling, or as labeled
▼	Water Level at End of Drilling, or as labeled
▼	Static Water Level, or as labeled

Moisture (ASTM D2488)

Dry	Very low moisture, dry to touch
Moist	Damp, without visible moisture
Wet	Visible free water, usually saturated

ADDITIONAL MATERIALS

AC	ASPHALT CONCRETE
CC	CEMENT CONCRETE
CR	CRUSHED ROCK
SOD	SOD/FOREST DUFF
FILL	FILL

SYMBOL	SAMPLER DESCRIPTIONS	SYMBOL	SAMPLER DESCRIPTIONS
	Location of grab sample (GS)		Location of sample collected using Standard Penetration Test with recovery (SS)
	No Recovery		Location of sample collected using Shelby tube/Geoprobe sample with recovery (ST)
	Location of rock coring interval (RC)		Location of sample collected using Dames & Moore sampler or pushed with recovery (D&M)

Central Engineering Services
7662 SW Mohawk Street
Tualatin, OR 97062
Telephone: (503) 616-9419

Project No:
MottMac-4-01

BORING LOG B-1E

Client: Mott MacDonald
Project: Basin 1 Stormwater Improvements
Location: NE Marine Drive, Portland, OR

Date Started: 3/7/25
Date Completed: 3/7/25

Approximate Ground Elevation:
Groundwater at time of drilling: 14.70 ft
Groundwater at end of drilling: ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	COMPOSITE SAMPLE INTERVAL	LABORATORY SAMPLE ID	PID (ppm)	RECOVERY (%)	REMARKS
0							
1		Medium-stiff, brown, SILT with sand (ML), moist, sand is fine (2-inch-thick root zone) (FILL)		**CS B-1-0-3**	0.1		
2							
2.0		Loose, brown-gray, SAND (SP), trace silt, moist, sand is fine to medium (FILL)				90%	
3				**CS B-1-3-8**			
4					0.1		
4.5		Loose to medium-dense, brown-gray, SAND with silt (SP-SM), moist, sand is fine to medium					
5							
6					0.3		
6.5		Stiff to very-stiff, sandy SILT (ML), moist, sand is fine				90%	
7							
8		Grades to soft at 8.0 feet bgs.		**CS B-1-8-20**			
9				**DS B-1-9.0**	0.5		
10							
11					0.4		
12							
13		Woody fragments at 13.0 feet bgs.				100%	
14					0.4		
15				**DS B-1-14.5**		▽	
16							
17							
18						100%	
19							
20							
20.0							

Completed at 20.0 feet bgs.
Groundwater observed at 14.5 feet bgs in boring during drilling.
Groundwater observed at 8.5 feet bgs in MW-11.

Operator: AEC Drilling
Equipment: GeoProbe 7822 **Rig Number:** D102
Drilling Method: 1.75" ID Direct Push

Logged By: Megan M.
Checked By: Zane R.

Approximate Location Coordinates:
Lat: Long:

Remarks:
CS = Composite Soil Sample
DS = Discreet Soil Sample
Bold = Sample Analyzed

Central Engineering Services
7662 SW Mohawk Street
Tualatin, OR 97062
Telephone: (503) 616-9419

Project No:
MottMac-4-01

BORING LOG B-4E

Client: Mott MacDonald
Project: Basin 1 Stormwater Improvements
Location: NE Marine Drive, Portland, OR

Date Started: 3/7/25
Date Completed: 3/7/25

Approximate Ground Elevation:
Groundwater at time of drilling: 10.00 ft
Groundwater at end of drilling: 8.50 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	COMPOSITE SAMPLE INTERVAL	LABORATORY SAMPLE ID	PID (ppm)	RECOVERY (%)	REMARKS
0							
1		Soft to medium-stiff, brown, SILT (ML), trace sand, moist, sand is fine (2-inch-thick root zone) (FILL)		**CS B-4-0-4**	0.1		
2					0.1		
2.5						80%	
3		Loose, brown-gray, SAND (SP), trace silt, moist, sand is fine to medium (FILL)					
4							
5				**CS B-4-4-8** **DS B-4-10.0**	0.2		
5.5							
6		Very-soft to soft, gray, SILT (ML), trace to minor sand, moist to wet, sand is fine					
7							
8						80%	
8.5				**CS B-4-8-15**	0.2		
9		Very-loose, brown-gray, SAND with silt (SP-SM), wet, sand is fine					
10							
11					0.1		
12							
12.0							
13		Very-soft, gray, sandy SILT (ML), wet, sand is fine				100%	
14							
15					0.1		
15.0							

Completed at 15.0 feet bgs.
Groundwater observed at 10.0 feet bgs in boring during drilling.
Groundwater observed at 8.5 feet bgs several hours after drilling.
Collected grab groundwater sample B-4-030725.

Operator: AEC Drilling
Equipment: GeoProbe 7822 **Rig Number:** D102
Drilling Method: 1.75" ID Direct Push

Logged By: Megan M.
Checked By: Zane R.

Approximate Location Coordinates:
Lat: Long:

Remarks:
CS = Composite Soil Sample
DS = Discreet Soil Sample
Bold = Sample Analyzed

Central Engineering Services
7662 SW Mohawk Street
Tualatin, OR 97062
Telephone: (503) 616-9419

Project No:
MottMac-4-01

BORING LOG B-7E

Client: Mott MacDonald
Project: Basin 1 Stormwater Improvements
Location: NE Marine Drive, Portland, OR

Date Started: 3/7/25
Date Completed: 3/7/25

Approximate Ground Elevation:
Groundwater at time of drilling: 8.00 ft
Groundwater at end of drilling: ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	COMPOSITE SAMPLE INTERVAL	LABORATORY SAMPLE ID	PID (ppm)	RECOVERY (%)	REMARKS
0							
0.5		Medium-dense, GRAVEL with silt and sand (GP-GM) (CRUSHED ROCK)		CS B-7-0-6	0.2		
1							
2		Soft to medium-stiff, gray, SAND (SP), minor silt, moist, sand is fine (FILL)			0.4	80%	
2.5							
3		Loose, gray, SAND (SP), trace silt, moist sand is fine (FILL)					
4							
5							
6							
6.5		Grades to wet at 6.0 feet bgs.		CS B-7-6-10	0.7		
7		Very-soft to soft, gray, SILT with sand (ML), wet, sand is fine				100%	
8				DS B-7-8.0	1.1		
9		Grades to brown-gray, stratified layers of sand in silt at 9.0 feet bgs.					
10				CS B-7-10-15			
11					0.2		
12						80%	
13					0.3		
14							
15							
15.0							

Completed at 15.0 feet bgs.
Groundwater observed at 8.0 feet bgs in boring during drilling.
Groundwater observed at 7.5 feet bgs in MW-12.

Operator: AEC Drilling
Equipment: GeoProbe 7822 **Rig Number:** D102
Drilling Method: 1.75" ID Direct Push

Logged By: Megan M.
Checked By: Zane R.

Approximate Location Coordinates:
Lat: Long:

Remarks:
CS = Composite Soil Sample
DS = Discreet Soil Sample
Bold = Sample Analyzed

Central Engineering Services
7662 SW Mohawk Street
Tualatin, OR 97062
Telephone: (503) 616-9419

Project No:
MottMac-4-01

BORING LOG B-8E

Client: Mott MacDonald
Project: Basin 1 Stormwater Improvements
Location: NE Marine Drive, Portland, OR

Date Started: 3/7/25
Date Completed: 3/7/25

Approximate Ground Elevation:
Groundwater at time of drilling: 5.00 ft
Groundwater at end of drilling: 7.50 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	COMPOSITE SAMPLE INTERVAL / LABORATORY SAMPLE ID	PID (ppm)	RECOVERY (%)	REMARKS
0						
		Loose, gray, SAND (SP), trace silt, moist, sand is fine to medium (FILL)	**CS B-8-0-6**	0.1	80%	
5.5		Grades to wet at 5.0 feet bgs.	**DS B-8-5.0**	0.2		
		Loose, gray, SAND with silt (SP-SM), wet, sand is fine (FILL)	**CS B-8-6-11**			
7.0		Very-soft to soft, gray, SILT (ML), trace sand, moist to wet, sand is fine		0.2	100%	
		Grades to minor sand at 9.0 feet bgs.		0.1		
			CS B-8-11-15	0.1		
		Grades to trace sand at 12.0 feet bgs.			100%	
				0.3		
			DS B-8-14.0			
15.0						

Completed at 15.0 feet bgs.
Groundwater observed at 5.0 feet bgs in boring during drilling.
Groundwater observed at 7.5 feet bgs after drilling.

Operator: AEC Drilling
Equipment: GeoProbe 7822 **Rig Number:** D102
Drilling Method: 1.75" ID Direct Push

Logged By: Megan M.
Checked By: Zane R.

Approximate Location Coordinates:
Lat: Long:

Remarks:
CS = Composite Soil Sample
DS = Discreet Soil Sample
Bold = Sample Analyzed

Central Engineering Services
7662 SW Mohawk Street
Tualatin, OR 97062
Telephone: (503) 616-9419

Project No:
MottMac-4-01

BORING LOG B-10E

Client: Mott MacDonald
Project: Basin 1 Stormwater Improvements
Location: NE Marine Drive, Portland, OR

Date Started: 3/7/25
Date Completed: 3/7/25

Approximate Ground Elevation:
Groundwater at time of drilling: 8.00 ft
Groundwater at end of drilling: 9.00 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	COMPOSITE SAMPLE INTERVAL	LABORATORY SAMPLE ID	PID (ppm)	RECOVERY (%)	REMARKS
0		Soft to medium-stiff, brown, SILT (ML), minor sand, moist, sand is fine (3-inch-thick root zone)		**CS B-10-0-5**	0		
2		Grades to with sand at 2.0 feet bgs.				80%	
3.5		Loose, brown-gray, silty SAND (SM), moist to wet, sand is fine		DS B-10-3.0	0.1		
5				**CS B-10-5-10**	0.1		
7.5		Grades to wet at 7.0 feet bgs.				95%	
8		Very-soft to soft, brown with gray mottles, SILT (ML), minor sand, moist to wet, sand is fine		**DS B-10-8.0**	0.3		
10		Grades to with sand at 10.0 feet bgs.		**CS B-10-10-15**	0		
12		Grades to minor sand at 12.0 feet bgs.				100%	
14				DS B-10-14.0	0.1		
15.0							

Completed at 15.0 feet bgs.
Groundwater observed at 8.0 feet bgs in boring during drilling.
Groundwater observed at 9.0 feet bgs in boring after drilling.

Operator: AEC Drilling
Equipment: GeoProbe 7822 **Rig Number:** D102
Drilling Method: 1.75" ID Direct Push

Logged By: Megan M.
Checked By: Zane R.

Approximate Location Coordinates:
Lat: Long:

Remarks:
CS = Composite Soil Sample
DS = Discreet Soil Sample
Bold = Sample Analyzed

SOIL BORING: SC-01

Project Number: M0232.17.109
Project Name: Basin 1
Client: Port of Portland
Address: PDX Airport
Drilling Date: 05/27/2025

Drilling Company: Holt
Equipment Type: Geoprobe 7822DT
Drilling Method: Direct Push
Logged By: C. Anderson
Total Depth: 15 feet
Borehole Diameter: 2.25 inches

Coordinates: -, -
Surface Elevation: N/A

Depth (feet)	Water Levels	Soil Description and Remarks	Graphic Log	Samples: % Recovery	Samples: Sample ID	Samples: PID (ppm)
1		0 to 1.0 foot: SILTY SAND (SM); brown; 30% fines; 70% sand, fine to medium grained; grass roots present, mica present; no odor; dry.		72	SC-01-COMP-0-3	
2		1 to 1.5 feet: SILTY SAND (SM); brown; 20% fines; 80% sand, fine to medium grained; no sheen, mica present; no odor; dry.				
3		1.5 to 3.6 feet: SAND (SP); grayish brown; 100% sand, fine to coarse grained, subangular to subrounded; no sheen; no odor; dry.			SC-01-COMP-3-8	0.3
4		3.6 to 5.0 feet: NO RECOVERY.				
5		5 to 6.9 feet: SAND (SP); Same as above 1.5 to 3.6 feet.		86		
6						0
7	▽	@ 6.2 feet: wet to 6.9 feet.				
8		@ 6.9 feet: slight hydrocarbon-like odor to 9.3 feet			SC-01-COMP-8-15	0.6
9		6.9 to 9.3 feet: SILT WITH SAND (ML); gray; 80% fines, low plasticity; 20% sand, fine to medium grained; no sheen; wet. @ 7.7 feet: moist to 9.3 feet.				
10		9.3 to 10.0 feet: NO RECOVERY.				
11		10 to 12.5 feet: SILT WITH SAND (ML); Same as above 6.9 to 9.3 feet.		64		
12						0.1
13		12.5 to 13.2 feet: SAND WITH SILT (SW-SM); gray; 10% fines; 90% sand, fine to coarse grained, subangular to subrounded; no sheen; no odor; wet.				0.3
14		13.2 to 15.0 feet: NO RECOVERY.				
15						

1. Depths are relative to feet below ground surface. bgs = below ground surface. 3. ID = identification.
4. PID = photoionization detector. 5. ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet bgs: 2.25-inch borehole.

Borehole Abandonment Details
0.0 to 15.0 feet: Borehole backfilled with Bentonite chips hydrated with potable water.

Notes

Groundwater Data

Graphic	Date	Time	Depth	Notes
▽			6.9'	First encountered @ 6.9'

SOIL BORING: SC-02

Project Number: M0232.17.109
Project Name: Basin 1
Client: Port of Portland
Address: PDX Airport
Drilling Date: 05/27/2025

Drilling Company: Holt
Equipment Type: Geoprobe 7822DT
Drilling Method: Direct Push
Logged By: C. Anderson
Total Depth: 15 feet
Borehole Diameter: 2.25 inches

Coordinates: -, -
Surface Elevation: N/A

Depth (feet)	Water Levels	Soil Description and Remarks	Graphic Log	Samples: % Recovery	Samples: Sample ID	Samples: PID (ppm)
1		0 to 0.9 foot: GRAVEL FILL (GW); gray; trace fines; 30% sand, fine to medium grained; 70% gravel, fine to coarse, subangular to subrounded; no sheen; no odor; dry.		72	SC-02-COMP-0-5	
2		0.9 to 1.4 feet: SILTY GRAVEL WITH SAND (GM); brown; 20% fines; 30% sand, fine to medium grained; 50% gravel, fine to coarse, subangular to subrounded; no sheen; no odor; dry.				0.8
3		1.4 to 2.2 feet: SANDY SILT (ML); brown; 60% fines, low plasticity; 30% sand, fine to medium grained; 10% gravel, fine to coarse, subangular to subrounded; no sheen; no odor; dry.				1.2
4		2.2 to 3.2 feet: SAND (SP); gray/brown; 100% sand, fine to coarse grained; subangular to subrounded; no sheen; no odor; dry.				
5		3.2 to 5.0 feet: NO RECOVERY;				
6		5 to 7.4 feet: SLOUGH; Same as above 0 to 0.9 feet.		86	SC-02-COMP-5-10	
7						0.7
8		7.4 to 7.7 feet: SAND (SP); brown/gray; 100% sand, fine to coarse grained; subangular to subrounded; no odor; dry.				
9		7.7 to 9.6 feet: SILTY SAND (SM); 40% fines; 60% sand, fine to medium grained, subangular to subrounded; no sheen; no odor; dry.				0.5
10		9.6 to 10.0 feet: NO RECOVERY.		64	SC-02-COMP-10-15	
11		10 to 10.9 feet: SLOUGH; Same as above 0 to 0.9 feet.				
12		10.9 to 12.3 feet: SANDY SILT (ML); dark gray/brown; 70% fines, low plasticity; 30% sand, fine to medium grained; no sheen; no odor; moist.				0.4
13		12.3 to 14.3 feet: SILT WITH SAND (ML); gray; 80% fines, low plasticity; 20% sand, fine to medium grained; no sheen; no odor; moist.				
14						0.2
15		14.3 to 14.6 feet: SAND (SP); gray; 100% sand, fine to coarse grained, subangular to subrounded; no sheen; no odor; moist.				
		14.6 to 15.0 feet: NO RECOVERY.				

1. Depths are relative to feet below ground surface. bgs = below ground surface. 3. ID = identification.
4. PID = photoionization detector. 5. ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet bgs: 2.25-inch borehole.

Borehole Abandonment Details
0.0 to 15.0 feet: Borehole backfilled with Bentonite chips hydrated with potable water.

Notes	Groundwater Data				
	Graphic	Date	Time	Depth	Notes

Appendix E

PFAS Screening Table

MAUL FOSTER ALONGI

Table
PFAS in Soil (micrograms per kilogram, µg/kg)
PDX Basin 1

Analyte and CAS Number		Data Source	Additional Basin 1 Source Control Design Sampling						Basin 1 Source Control Design													
		Sample ID	SC-01-COMP-0-3	SC-01-COMP-3-8	SC-01-COMP-8-15	SC-02-COMP-0-5	SC-02-COMP-5-10	SC-02-COMP-10-15	B-1-0-3	B-1-3-8	B-1-8-20	B-4-0-4	B-4-4-8	B-4-8-15	B-7-0-6	B-7-6-10	B-7-10-15	B-8-0-6	B-8-6-11	B-8-11-15	B-10-0-5	B-10-5-10	B-10-10-15
		Sample Date	5/27/2025	5/27/2025	5/27/2025	5/27/2025	5/27/2025	5/27/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025	3/7/2025
		Sample Depth (ft bgs)	0-3	3-8	8-15	0-5	5-10	10-15	0-3	3-8	8-20	0-4	4-8	8-15	0-6	6-10	10-15	0-6	6-11	11-15	0-5	5-10	10-15
		Screening Levels (µg/kg)																					
		Targeted Removal Level	Concentration in µg/kg						Concentration in µg/kg														
PFDoA	307-55-1	410,000	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.112	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
PFDA	335-76-2	16	1.26	0.363	0.200 U	2.16	1.08	0.199 U	0.235	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.573	0.142	0.199 U	0.206	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
PFNA	375-95-1	25,000	0.211	0.246	0.205	1.23	0.922	0.407	0.170	0.199 U	0.199 U	0.0830	0.199 U	0.199 U	0.913	0.626	0.178	2.38	0.289	0.200 U	0.215	0.199 U	0.200 U
PFOA	335-67-1	7.8	17.0	13.7	4.29	3.47	2.42	13.9	1.85	17.6	9.26	0.186	0.199 U	0.151	84.7	4.10	3.85	0.636	2.83	1.25	0.431	0.373	0.200 U
PFHpA	375-85-9		0.200 U	0.200 U	0.200 U	0.489	0.589	0.940	0.0910	0.184	0.197	0.0710	0.199 U	0.199 U	0.462	0.317	0.365	0.129	0.201	0.0700	0.501	0.248	0.200 U
PFHxA	307-24-4	4,100,000	0.200 U	0.212	0.201	0.789	1.10	2.10	0.198 U	0.351	1.05	0.104	0.199 U	0.199 U	3.10	0.323	0.644	0.131	0.277	0.280	0.467	0.260	0.200 U
PFPeA	2706-90-3		0.398 U	0.399 U	0.398 U	0.936	1.30	2.18	0.0820 I	0.111 I	0.554	0.120 I	0.397 U	0.397 U	0.983	0.411	0.746	0.239	0.319	0.319	0.957	0.181 I	0.399 U
PFBA	375-22-4	12,000,000	0.799 U	0.801 U	0.799 U	0.794 U	0.801 U	0.799 U	0.795 U	0.798 U	0.177	0.796 U	0.796 U	0.798 U	0.404	0.798 U	0.205	0.799 U	0.801 U	0.799 U	0.258	0.797 U	0.801 U
PFBS	375-73-5	2,500,000	0.177 U	0.177 U	0.177 U	0.176 U	0.177 U	0.247	0.176 U	0.176 U	0.176 U	0.176 U	0.176 U	0.176 U	0.131	0.176 U	0.0870	0.177 U	0.177 U	0.177 U	0.176 U	0.176 U	0.177 U
PFPeS	2706-91-4		0.188 U	0.188 U	0.188 U	0.186 U	0.188 U	0.767	0.187 U	0.187 U	0.187 U	0.187 U	0.187 U	0.187 U	0.124	0.171	0.195	0.188 U	0.188 U	0.188 U	0.187 U	0.187 U	0.188 U
PFHxS	355-46-4	160,000	0.482	0.323	0.690	1.82	1.83	14.0	0.0980	0.979	0.327	0.182 U	0.182 U	0.182 U	1.68	5.34	3.30	0.108	0.479	0.183 U	0.182 U	0.116	0.183 U
PFHpS	375-92-8		0.190 U	0.190 U	0.190 U	0.195	0.190 U	1.55	0.189 U	0.189 U	0.189 U	0.189 U	0.189 U	0.189 U	0.700	0.531	0.184	0.190 U	0.190 U	0.190 U	0.189 U	0.189 U	0.190 U
PFOS	1763-23-1	580	2.26	3.90	1.57	151	86.0	110	2.97	1.07	0.185 U	1.22	0.372	0.245	870 D	53.8	21.5	1.91	1.68	0.186 U	0.924	0.128	0.186 U
PFNS	68259-12-1		0.192 U	0.192 U	0.192 U	0.726	0.28	0.191 U	0.191 U	0.191 U	0.191 U	0.191 U	0.191 U	0.191 U	1.18	0.388	0.191 U	0.192 U	0.192 U	0.192 U	0.191 U	0.191 U	0.192 U
PFDS	335-77-3		0.193 U	0.193 U	0.193 U	0.838	0.193 U	0.192 U	0.192 U	0.192 U	0.192 U	0.192 U	0.192 U	0.192 U	2.23	0.192 U	0.192 U	0.193 U	0.193 U	0.193 U	0.192 U	0.192 U	0.193 U
PFDoS	79780-39-5		0.194 U	0.194 U	0.194 U	0.445	0.194 U	0.193 U	0.193 U	0.193 U	0.193 U	0.193 U	0.193 U	0.193 U	1.59	0.193 U	0.193 U	0.194 U	0.194 U	0.194 U	0.193 U	0.193 U	0.194 U
6:2 FTS	27619-97-2		0.757 U	0.759 U	0.758 U	13.3	18.4	23.9	0.753 U	0.756 U	0.754 U	0.754 U	0.754 U	0.756 U	3.49	2.99	3.03	0.757 U	0.314	0.757 U	0.754 U	0.756 U	0.759 U
8:2 FTS	39108-34-4		0.766 U	0.768 U	0.767 U	53.9	35.0	3.80	0.762 U	0.765 U	0.763 U	0.763 U	0.763 U	0.765 U	55.0	8.05	2.87	0.766 U	0.768 U	0.766 U	0.763 U	0.764 U	0.768 U
NEtFOSAA	2991-50-6		0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.143	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
PFOSA	754-91-6		0.200 U	0.200 U	0.200 U	3.84	0.200 U	0.199 U	1.04 I	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	5.37	1.92	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
PFUnA	2058-94-8	2,500,000	0.200 U	0.200 U	0.200 U	0.237	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.736	0.147	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
11Cl-PF3OUdS	763051-92-9		0.788 U	0.790 U	0.788 U	0.783 U	0.79 U	0.788 U	0.784 U	0.787 U	0.785 U	0.785 U	0.785 U	0.787 U	0.790 U	0.787 U	0.785 U	0.788 U	0.790 U	0.788 U	0.785 U	0.786 U	0.790 U
3:3 FTCA	356-02-5		0.998 U	1.00 U	0.998 U	0.992 U	1.00 U	0.997 U	0.992 U	0.997 U	0.994 U	0.994 U	0.994 U	0.996 U	1.00 U	0.996 U	0.993 U	0.998 U	1.00 U	0.998 U	0.993 U	0.995 U	1.00 U
4:2 FTS	757124-72-4		0.748 U	0.750 U	0.749 U	0.744 U	0.750 U	0.748 U	0.744 U	0.747 U	0.745 U	0.745 U	0.746 U	0.747 U	0.750 U	0.747 U	0.745 U	0.748 U	0.750 U	0.748 U	0.745 U	0.747 U	0.750 U
5:3 FTCA	914637-49-3		4.99 U	5.00 U	4.99 U	4.96 U	5.00 U	4.99 U	4.96 U	4.98 U	4.97 U	4.97 U	4.97 U	4.98 U	5.00 U	4.98 U	4.97 U	4.99 U	5.00 U	4.99 U	4.97 U	4.98 U	5.00 U
7:3 FTCA	812-70-4		4.99 U	5.00 U	4.99 U	4.96 U	5.00 U	4.99 U	4.96 U	4.98 U	4.97 U	4.97 U	4.97 U	4.98 U	5.00 U	4.98 U	4.97 U	4.99 U	5.00 U	4.99 U	4.97 U	4.98 U	5.00 U
9Cl-PF3ONS	756426-58-1		0.778 U	0.7800 U	0.779 U	0.773 U	0.780 U	0.778 U	0.774 U	0.777 U	0.775 U	0.775 U	0.775 U	0.777 U	0.780 U	0.777 U	0.775 U	0.778 U	0.780 U	0.778 U	0.775 U	0.776 U	0.780 U
ADONA	919005-14-4		0.788 U	0.7900 U	0.788 U	0.783 U	0.790 U	0.788 U	0.784 U	0.787 U	0.785 U	0.785 U	0.785 U	0.787 U	0.790 U	0.787 U	0.785 U	0.788 U	0.790 U	0.788 U	0.785 U	0.786 U	0.790 U
HFPO-DA	13252-13-6	35,000	0.833 U	0.835 U	0.833 U	0.828 U	0.835 U	0.833 U	0.829 U	0.832 U	0.830 U	0.830 U	0.830 U	0.832 U	0.835 U	0.831 U	0.829 U	0.833 U	0.835 U	0.833 U	0.830 U	0.831 U	0.835 U
NEtFOSA	4151-50-2		0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.200 U	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
NEtFOSE	1691-99-2		2.00 U	2.00 U	2.00 U	1.98 U	2.00 U	1.99 U	1.98 U	1.99 U	1.99 U	1.99 U	1.99 U	1.99 U	2.00 U	1.99 U	1.99 U	2.00 U	2.00 U	2.00 U	1.99 U	1.99 U	2.00 U
NFDHA	151772-58-6		0.399 U	0.400 U	0.399 U	0.397 U	0.400 U	0.399 U	0.397 U	0.399 U	0.398 U	0.398 U	0.398 U	0.398 U	0.400 U	0.398 U	0.397 U	0.399 U	0.400 U	0.399 U	0.397 U	0.398 U	0.400 U
NMeFOSAA	2355-31-9		0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.200 U	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
NMeFOSA	31506-32-8		0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.200 U	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
NMeFOSE	24448-09-7		2.00 U	2.00 U	2.00 U	1.98 U	2.00 U	1.99 U	1.98 U	1.99 U	1.99 U	1.99 U	1.99 U	1.99 U	2.00 U	1.99 U	1.99 U	2.00 U	2.00 U	2.00 U	1.99 U	1.99 U	2.00 U
PFEESA	113507-82-7		0.355 U	0.356 U	0.355 U	0.353 U	0.356 U	0.355 U	0.353 U	0.355 U	0.354 U	0.354 U	0.354 U	0.355 U	0.356 U	0.354 U	0.354 U	0.355 U	0.356 U	0.355 U	0.354 U	0.354 U	0.356 U
PFMBA	863090-89-5		0.399 U	0.400 U	0.399 U	0.397 U	0.400 U	0.399 U	0.397 U	0.399 U	0.398 U	0.398 U	0.398 U	0.398 U	0.400 U	0.398 U	0.397 U	0.399 U	0.400 U	0.399 U	0.397 U	0.398 U	0.400 U
PFMPA	377-73-1		0.399 U	0.400 U	0.399 U	0.397 U	0.400 U	0.399 U	0.397 U	0.399 U	0.398 U	0.398 U	0.398 U	0.398 U	0.400 U	0.398 U	0.397 U	0.399 U	0.400 U	0.399 U	0.397 U	0.398 U	0.400 U
PFTeDA	376-06-7	8,200,000	0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.200 U	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U
PFTrDA	72629-94-8		0.200 U	0.200 U	0.200 U	0.198 U	0.200 U	0.199 U	0.198 U	0.199 U	0.199 U	0.199 U	0.199 U	0.199 U	0.200 U	0.199 U	0.199 U	0.200 U	0.200 U	0.200 U	0.199 U	0.199 U	0.200 U

Notes:

1. ft bgs: feet below ground surface
2. Qualifiers
   - D = Dilution
   - I = Ion transition ratio is outside of the acceptance criteria; value shown is estimated
   - U = Not detected at Reporting Limit shown
3. Definition of Screening Results:
   - Exceeds Targeted Removal Level
4. Screening Level Sources:
   - Leaching to Groundwater Screening Level: U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) increased by a factor of 60 to account for differences in assumed attenuation factors between the EPA and the Oregon Department of Environmental Quality (DEQ)
   - Industrial Direct Contact Screening Level: EPA RSLs for industrial direct contact
   - Potential Hot Spot Screening Level: Industrial direct contact screening levels multiplied by 10 for non-carcinogens and 100 for carcinogens (based on DEQ cleanup rules for hot spots).

Attachment B

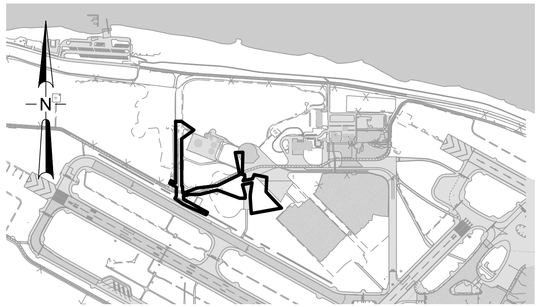
Temporary Erosion and Sediment Control Plans

MAUL FOSTER ALONGI

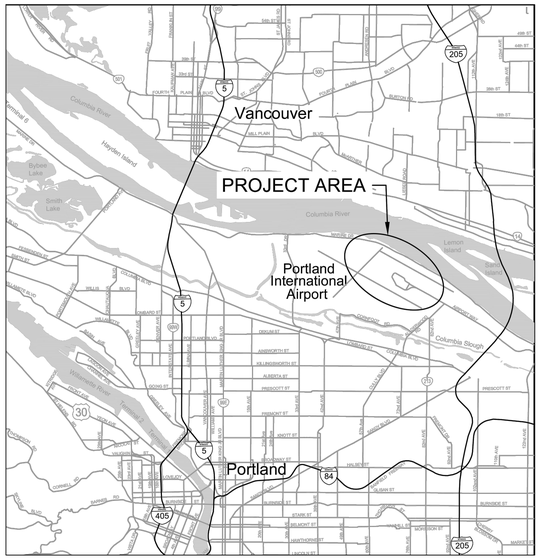
CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

light gray
dark gray
black

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS EROSION AND SEDIMENT CONTROL PLANS:



SITE MAP
SCALE: N.T.S.



VICINITY MAP
SCALE: N.T.S.

PROJECT LOCATION:

PROJECT ADDRESS:
5000 NE MARINE DR
PORTLAND, OR 97218

ACTUAL LOCATION:
BASIN 1 SUBAREA, WEST OF AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) STATION

ACCESS TO SITE: VIA NE MARINE DR.
LATITUDE = N45°35'57.92", W122°36'54.72"

RAIN GAUGE:
NEAREST RAIN GAUGE ID: PDX POST OFFICE PUMP STATION
LOCATION: 7700 NE AIRPORT WAY, PORTLAND, OR
RAIN GAUGE LINK:
HTTPS://AQUARIUS.PORTLANDOREGON.GOV/DATA/LOCATION/SUMMARY/LOCATION/HYDRA-159/INTERVAL/LATEST

PROPERTY DESCRIPTION:
TAX LOT: 1N2E06 -00300

ATTENTION EXCAVATORS:
OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER, AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL (800) 332-2344 OR 811.

DEVELOPER:
PORT OF PORTLAND
CONTACT: MAHSA ESHGHI
7200 NE AIRPORT WAY
PORTLAND, OR 97218
PHONE: (503) 415-6597
EMAIL: mahsa.eshghi@portofportland.com

ENGINEER
MOTT MACDONALD
CONTACT: ANDY JEFFREY
1050 SW 6TH AVE, SUITE 1010
PORTLAND, OR 97204
PHONE: (503) 243-5001
EMAIL: andy.jeffrey@mottmac.com

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS:
EXISTING CONDITIONS INCLUDE STORMWATER DITCH, PIPES, MANHOLES, CATCH BASINS, AND CLEANOUTS, AND EXISTING PAVEMENT ON PERIMETER ROAD AND ARFF ACCESS ROUTES.

DEVELOPED CONDITIONS:
FILLING AND GRADING DITCH, NEW STORMWATER PIPES, MANHOLES, AND CATCHBASINS, AND PAVEMENT RESTORATION.

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE:
PROJECT BID DATE: DECEMBER 2025
CONSTRUCTION: JUNE 2026 - SEPTEMBER 2026

PROJECT INVOLVES DITCH REGRADING, ASPHALT PAVING, UTILITIES, AND EROSION CONTROL MEASURES.
- ALL PAVED LOCATIONS WITHIN THE PROJECT ARE EXISTING ASPHALT OR CONCRETE PAVEMENT AND ARE BEING REHABILITATED WITH PAVEMENT IN-KIND.
- PROJECT DOES DISTURB PERVIOUS SURFACES IN FIELDS, SO PERMANENT STABILIZATION WILL BE REQUIRED.

PROJECT INVOLVES:
TOTAL SITE AREA = 8.61 AC
TOTAL DISTURBED AREA = 1.94 AC
EXISTING IMPERVIOUS AREA = 0.23 AC
NEW IMPERVIOUS AREA = N/A

SITE SOIL CLASSIFICATION
COLUMBIA RIVER SAND WITH LAYERS OF SANDY LOAM. ON-SITE SOILS HAVE A MODERATE EROSION POTENTIAL. FILL SHALL BE PROVIDED FROM ON-SITE EXCAVATION AND APPROVED IMPORT BORROW SITES. ENGINEERED SOILS WILL BE USED WITHIN DEEP SOIL MIXING LIMITS.

RECEIVING WATER BODIES WITHIN 1 MILE:
STORMWATER DIRECTLY DRAINS TO THE COLUMBIA SLOUGH WHICH FEEDS INTO THE COLUMBIA RIVER

POLLUTANT GENERATING MATERIALS:
PETROLIUM, SEDIMENT FROM EXCAVATIONS, CONCRETE, ASPHALT, PAVEMENT MARKINGS

NON-STORMWATER DISCHARGES:
POSSIBLE WATER TO CONTROL DUST, UNCONTAMINATED, NON-TURBID DISCHARGES OF GROUNDWATER OR SPRING WATER, NON-CONTAMINATED BYPASS OF SWALE WATER AND /OR STORMWATER, POTABLE WATER, AND/OR UNCONTAMINATED WATER LINE FLUSHING.

STAGING AREAS:
STAGING AREAS INCLUDE SANITARY FACILITIES AND WASTE RECEPTACLE WITH LID. THE CONTRACTOR SHALL PROVIDE CONCRETE CLEANOUT.

PHASES OF CONSTRUCTION:
- UTILITIES CONSTRUCTION
- FILLING AND GRADING DITCH
- PAVEMENT RESTORATION

SHEET INDEX:

PERMITEE'S SITE INSPECTOR:
NAME: JEREMIAH SONNE
COMPANY/AGENCY: PORT OF PORTLAND
CESCL: ECO-3-7062114
EXPIRATION: 8/5/2027
PHONE: 503-381-6286
EMAIL: JEREMIAH.SONNE@PORTOFPORTLAND.COM
DESCRIPTION OF EXPERIENCE: 12 YEARS OF CONSTRUCTION OVERSIGHT AS IT RELATES TO ENVIRONMENTAL PERMIT COMPLIANCE. WASHINGTON STATE CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (CESCL).

RATIONALE STATEMENT:
A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMPs WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS: INCLUDING SOIL CONDITIONS, TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

_____
INITIAL

	CLEARING	MASS GRADING	UTILITY INSTALLATION	PAVEMENT CONSTRUCTION	FINAL STABILIZATION
EROSION PREVENTION:					
PRESERVE NATURAL VEGETATION	X**	X	X	X	X
GROUND COVER					X
HYDRAULIC APPLICATIONS			X		X
PLASTIC SHEETING			X		
MATTING		X			
DUST CONTROL	X	X	X	X	X
TEMPORARY PERMANENT SEEDING					X
BUFFER ZONE					
BONDED FIBER MATRIX					
SEDIMENT CONTROL:					
SEDIMENT FENCE (PERIMETER)					
SEDIMENT FENCE (INTERIOR)		X	X	X	
STRAW WATTLES		X	X		
DITCH PROTECTION (STRAW BALES)		X	X		
FILTER BERM					
INLET PROTECTION	X**	X	X	X	
DEWATERING		X	X	X	
SEDIMENT TRAP	X**	X	X		
RUNOFF CONTROL:					
CONSTRUCTION ENTRANCE	X**	X	X	X	X
PIPE SLOPE DRAIN					
OUTLET PROTECTION					
SURFACE ROUGHENING					
SEDIMENT TRAP					
POLLUTION PREVENTION:					
PROPER SIGNAGE					
HAZ WASTE MANAGEMENT					
SPILL KIT ON-SITE					
CONCRETE WASHOUT AREA				X	
OTHER:					

** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

INSPECTION FREQUENCY:

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOWMELT IS OCCURRING AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OR SITE INACCESSIBILITY	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURE ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY TWO (2) WEEKS.
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY

- HOLD A PRE-CONSTRUSTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS.
- ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-CA PERMIT REQUIREMENTS.
- INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-CA PERMIT REQUIREMENTS.
- RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE DAYS, RETAIN THE ESCP AT THE CONSTRUCTION SITE OR AT ANOTHER LOCATION.

#	DATE	BY	REVISION	APP

#	DATE	BY	REVISION	APP

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL COVER SHEET

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	16
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.01

PRINTED: 9/5/2025 11:48:31 AM VIG75558 c:\pwworking\hmm\dms83014\erosion and sediment control - cover and notes.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

light
grey
dark
grey
black

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

STANDARD EROSION/ SEDIMENT CONTROL (ESCP) NOTES:

1. INCLUDE A LIST OF ALL PERSONEL (BY NAME AND POSITION) THAT ARE RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND MAINTENANCE OF STORMWATER CONTROL MEASURES (E.G. ESCP DEVELOPER, BMP INSTALLER (SEE SECTION 4.10), AS WELL AS THEIR INDIVIDUAL RESPONSIBILITIES. (SECTION 4.4.C.II)
2. VISUAL MONITORING INSPECTION REPORTS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SECTION 6.5)
3. INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SECTION 6.5.Q)
4. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. (SECTION 4.7)
5. THE PERMIT REGISTRANT MUST IMPLEMENT THE ESCP FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICE DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SECTION 4 AND 4.11)
6. THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SECTION 4.8)
7. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REDLINES ON SITE PLANS WITHIN 7 DAYS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 30 DAYS. (SECTION 4.9)
8. SEQUENCE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SECTION 2.2.2)
9. CREATE SMOOTH SURFACES BETWEEN SOIL SURFACE AND EROSION AND SEDIMENT CONTROLS TO PREVENT STORMWATER FROM BYPASSING CONTROLS AND PONDING. (SECTION 2.2.3)
10. IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SECTION 2.2.1)
11. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SECTION 2.2.5)
12. MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN 50-FEET OF WATERS OF THE STATE. (SECTION 2.2.4)
13. INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET CONTROL AS WELL AS SEDIMENT BASINS, TRAPS AND BARRIERS PRIOR TO LAND DISTURBANCE. (SECTION 2.1.3)
14. CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SECTIONS 2.1.1. AND 2.2.16)
15. CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SECTIONS 2.2.6 AND 2.2.13)
16. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT BEFORE BEGINNING CONCRETE WORK. (SECTION 2.2.14)
17. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATION MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS. (SECTIONS 2.2.20 AND 2.2.21)
18. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SECTION 2.3.7)
19. KEEP WASTE CONTAINER LIDS CLOSED WHEN NOT IN USE AND CLOSE LIDS AT THE END OF THE BUSINESS DAY FOR THOSE CONTAINERS THAT ARE ACTIVELY USED THROUGHOUT THE DAY. FOR WASTE CONTAINERS THAT DO NOT HAVE LIDS, PROVIDE EITHER (1) COVER (E.G., A TARP, PLASTIC SHEETING, TEMPORARY ROOF) TO PREVENT EXPOSURE OF WASTES TO PRECIPITATION, OR (2) A SIMILARLY EFFECTIVE MEANS DESIGNED TO PREVENT THE DISCHARGE OF POLLUTANTS (E.G., SECONDARY CONTAINMENT). (SECTION 2.3.7)
20. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SECTION 2.2.7)
21. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SECTION 2.2.7.F)
22. CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SECTIONS 1.5 AND 2.3.9)
23. ENSURE THAT STEEP SLOPE AREAS WHERE CONSTRUCTION ACTIVITIES ARE NOT OCCURRING ARE NOT DISTURBED. (SECTION 2.2.10)
24. PREVENT SOIL COMPACTION IN AREAS WHERE POST-CONSTRUCTION INFILTRATION FACILITIES ARE TO BE INSTALLED. (SECTION 2.2.12)
25. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZERS, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SECTIONS 2.2.15 AND 2.3)
26. PROVIDE PLANS FOR SEDIMENTATION BASINS THAT HAVE DESIGNED PER SECTION 2.2.17 AND STAMPED BY AND OREGON PROFESSIONAL ENGINEER. (SEE SECTION 2.2.17.A)
27. IF ENGINEERED SOILS ARE USED ON SITE, A SEDIMENTATION BASIN/IMPOUNDMENT MUST BE INSTALLED. (SEE SECTIONS 2.2.17 AND 2.2.18)
28. PROVIDE A DEWATERING PLAN FOR ACCUMULATED WATER FROM PRECIPITATION AND UNCONTAMINATED GROUNDWATER SEEPAGE DUE TO SHALLOW EXCAVATION ACTIVITIES. (SEE SECTION 2.4)
29. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SECTION 2.3)
30. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUES AS NEEDED TO AVOID WIND-BLOWN SOIL. (SECTION 2.2.9)
31. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SECTION 2.3.5)
32. IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN ENVIRONMENTAL MANAGEMENT PLAN APPROVAL FROM DEQ BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SECTION 1.2.9)
33. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SECTION 2.2)
34. AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SECTION 2.2.8)
35. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SECTION 2.1.5.B)
36. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL. (SECTION 2.1.5.C)
37. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND A T THE COMPLETION OF THE PROJECT. (SECTION 2.1.5.D)
38. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE,MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DEPARTMENT OF STATE LANDS REQUIRED TIMEFRAME. (SECTION 2.2.19.A)
39. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS. (SECTION 2.2.19)
40. DOCUMENT ANY PORTION(S) OF THE SITE WHERE LAND DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED OR WILL BE TEMPORARILY INACTIVE FOR 14 OR MORE CALENDAR DAYS. (SECTION 6.5.F.)
41. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SECTION 2.2.20)
42. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS, AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS NEEDED FOR LONG TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE. (SECTION 2.2.21)

LOCAL AGENCY-SPECIFIC EROSION CONTROL NOTES:

1. PORT REQUIRES DAILY INSPECTIONS OF BMPS IN ACTIVE CONSTRUCTION SITES AND LOGGED.
2. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAN OCTOBER 15; THE TYPE AND PERCENTAGES OF SEED IN THE MIX MUST BE IDENTIFIED ON THE PLANS. SEED MIX MUST BE APPROVED BY PORT ENVIRONMENTAL.
3. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP I.E. (FILTER BAG FOLLOWED BY GRANULAR ACTIVATED CARBON [GAC] UNIT).
4. ADJUST AS NECESSARY FOR ANY DEQ REQUIRED TREATMENT, SAMPLING, AND MONITORING.

EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. ALL "SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING)" SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.
3. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING MATTING" SHALL BE IN PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES:

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.
4. CONSTRUCTION ENTRANCES SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

GRADING, UTILITY, EROSION, AND SEDIMENT CONSTRUCTION NOTES :

1. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
2. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOILS WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
3. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
4. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
5. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
6. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
7. ACTIVE INLETS TO STORMWATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
8. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
9. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORMWATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
10. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORMWATER SYSTEM, SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
11. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORMWATER SYSTEM.
12. USE BMPS SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
13. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORMWATER SYSTEM.

GENERAL NOTES:

1. THE PORT HAS A NDPES GENERAL PERMIT 1200-CA.
2. THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200-CA PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200-CA PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200-CA PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AN EROSION AND SEDIMENT CONTROL INSPECTOR THAT SHALL BE CERTIFIED IN ONE OF THE ACCEPTABLE CERTIFICATIONS REQUIRED IN THE 1200-CA PERMIT.
4. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL TRANSFER OWNERSHIP OF 1200-CA PERMIT FROM PORT OF PORTLAND TO THE CONTRACTOR'S REPRESENTATIVE.
5. DURING THE CONSTRUCTION PERIOD, ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE UPGRADED AS NEEDED TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT LEAVE THE CONSTRUCTION SITE, ENTER THE DRAINAGE SYSTEMS, BE TRACKED ON ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL CONFORM TO THE PORT OF PORTLAND AND THE CITY OF PORTLAND EROSION AND SEDIMENT CONTROL STANDARDS.

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

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Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL NOTES SHEET

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	17
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.02

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

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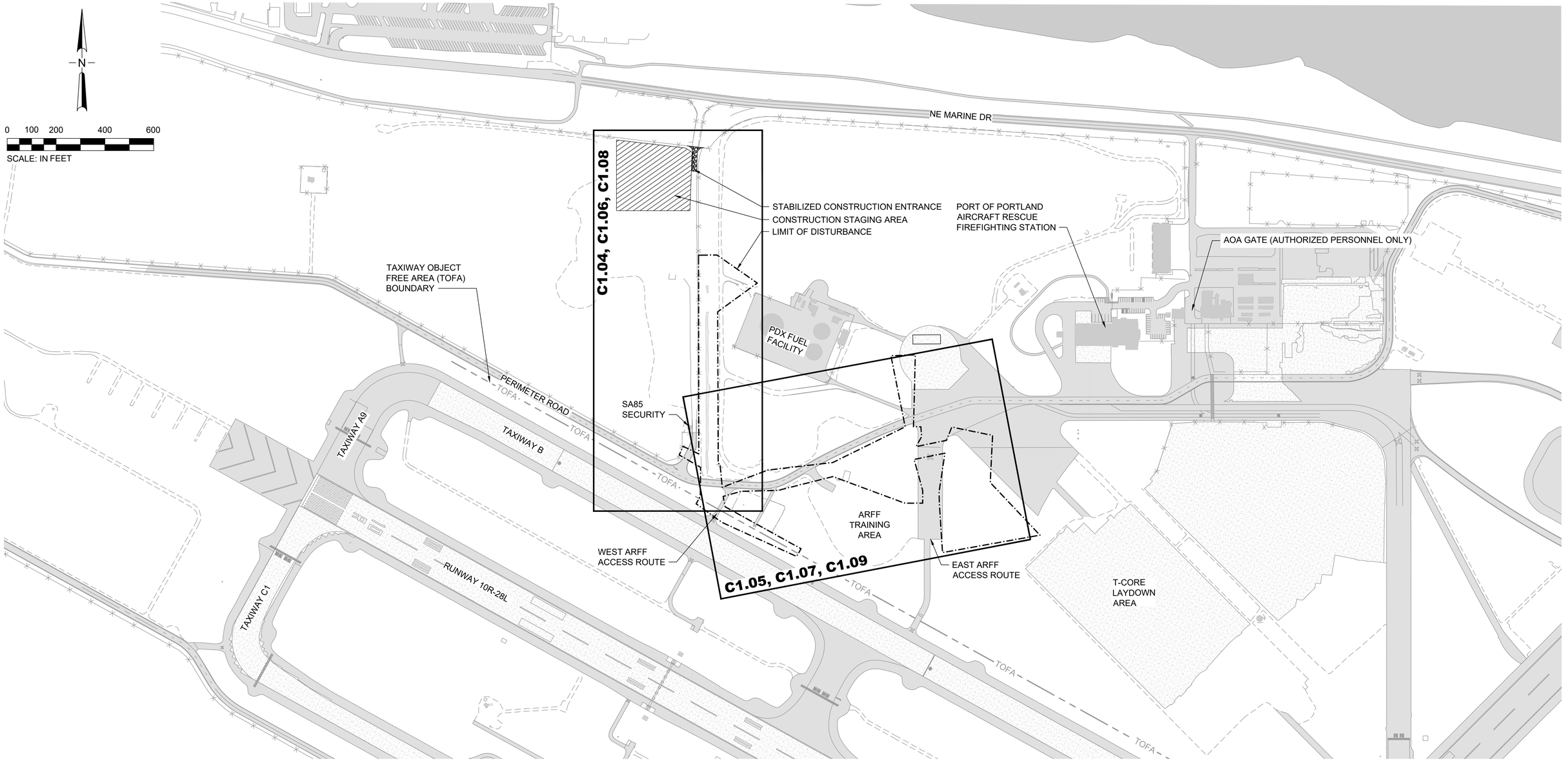
dark gray
black



1 ESCP SHEET LAYOUT PLAN
SCALE: 1" = 200'

#	DATE	BY	REVISION	APP

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Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
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REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL
SHEET LAYOUT PLAN

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	18 TYPE: CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.03

GRAPHIC SCALE - FOR REFERENCE ONLY
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IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

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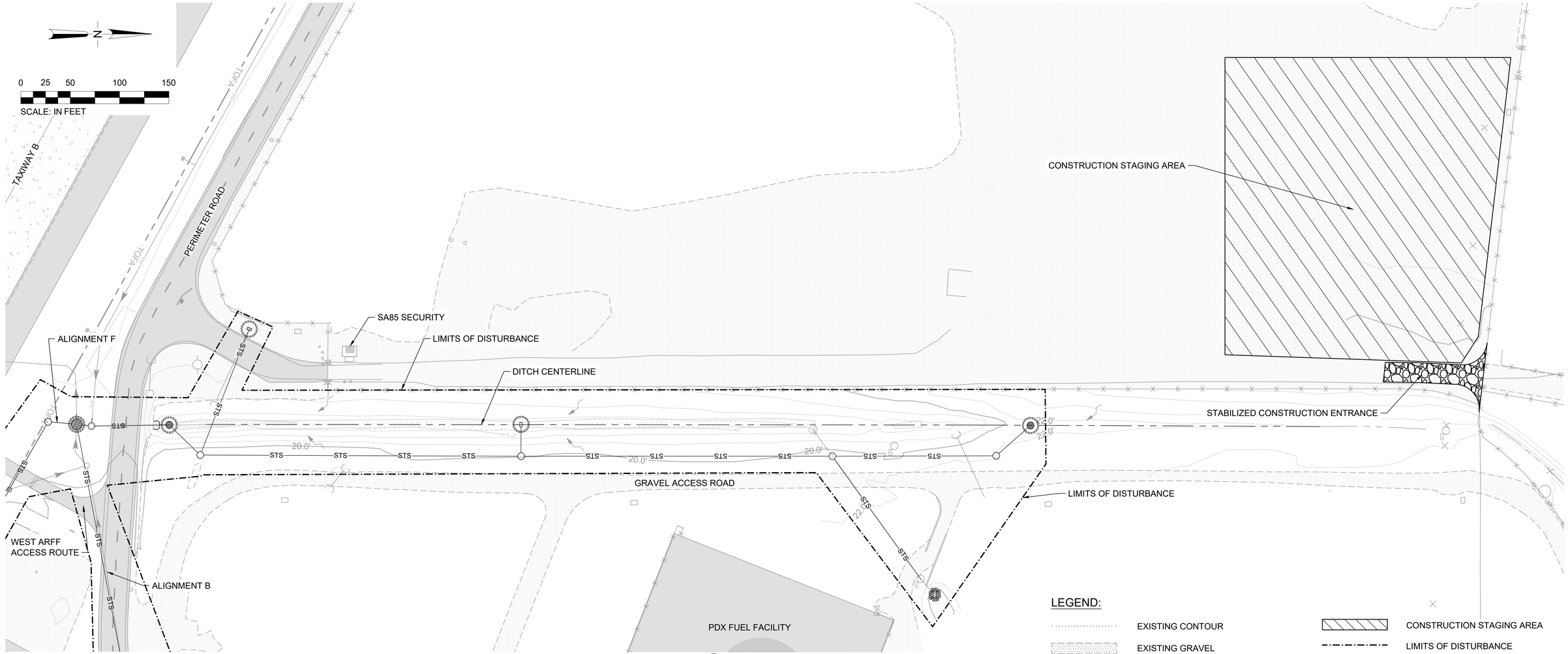

1 PLAN
SCALE: 1" = 50'

NOTES:

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AT THE DITCH AREA PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.

LEGEND:

- EXISTING CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- WETLANDS
- TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- INLET PROTECTION BAG INSERT, SEE DETAIL SHEET C-1.10
- STRAW WATTLES
- CONSTRUCTION STAGING AREA
- LIMITS OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- EXISTING DRAINAGE FLOWS

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#	DATE	BY	REVISION	APP

Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

ESCP DEMOLITION AND CLEARING
ALIGNMENT A

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	19
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.04

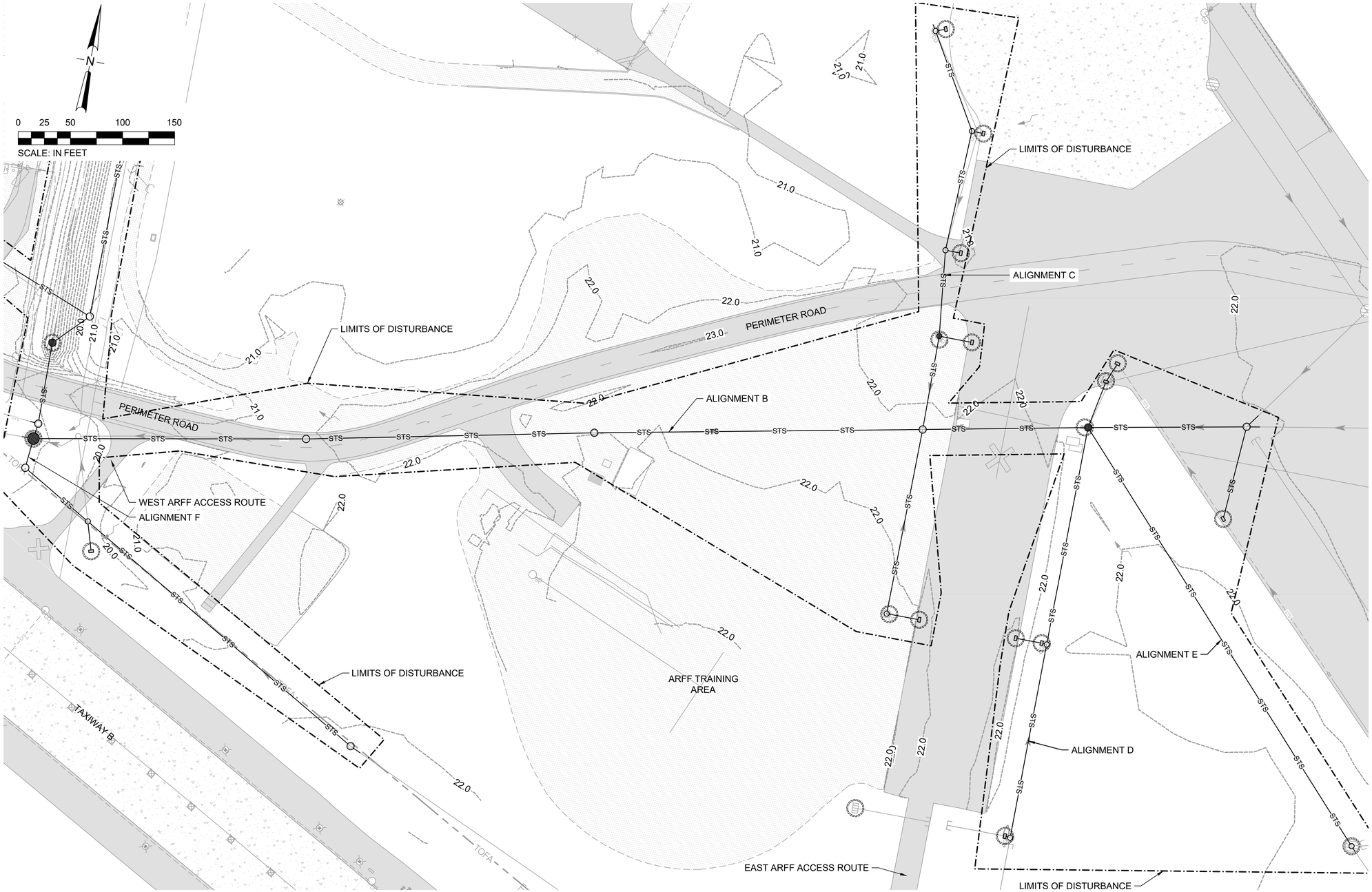
GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

PRINTED: 9/5/2025 1:13:34 PM VIG75558 c:\pwworking\hmm\dms83014\escp demolition and clearing alignment a.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.



1 PLAN
SCALE: 1" = 50'

LEGEND:

- EXISTING CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- INLET PROTECTION BAG INSERT, SEE DETAIL SHEET C-1.10
- LIMITS OF DISTURBANCE
- EXISTING DRAINAGE FLOWS

NOTES:

1. FOR MANHOLES WITH SLOTTED GRATE COVER, CONTRACTOR MAY CHOOSE BETWEEN INSTALLING INLET PROTECTION INSERTS OR INSTALLING STRAW WATTLES AROUND THE STRUCTURE FOR SOIL EROSION AND SEDIMENT CONTROL.

GRAPHIC SCALE - FOR REFERENCE ONLY

#	DATE	BY	REVISION	APP

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Port of Portland

1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER

102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
JAMES ANDREW JEFFREY
MAY 10, 2016
RENEWS: 07/01/25

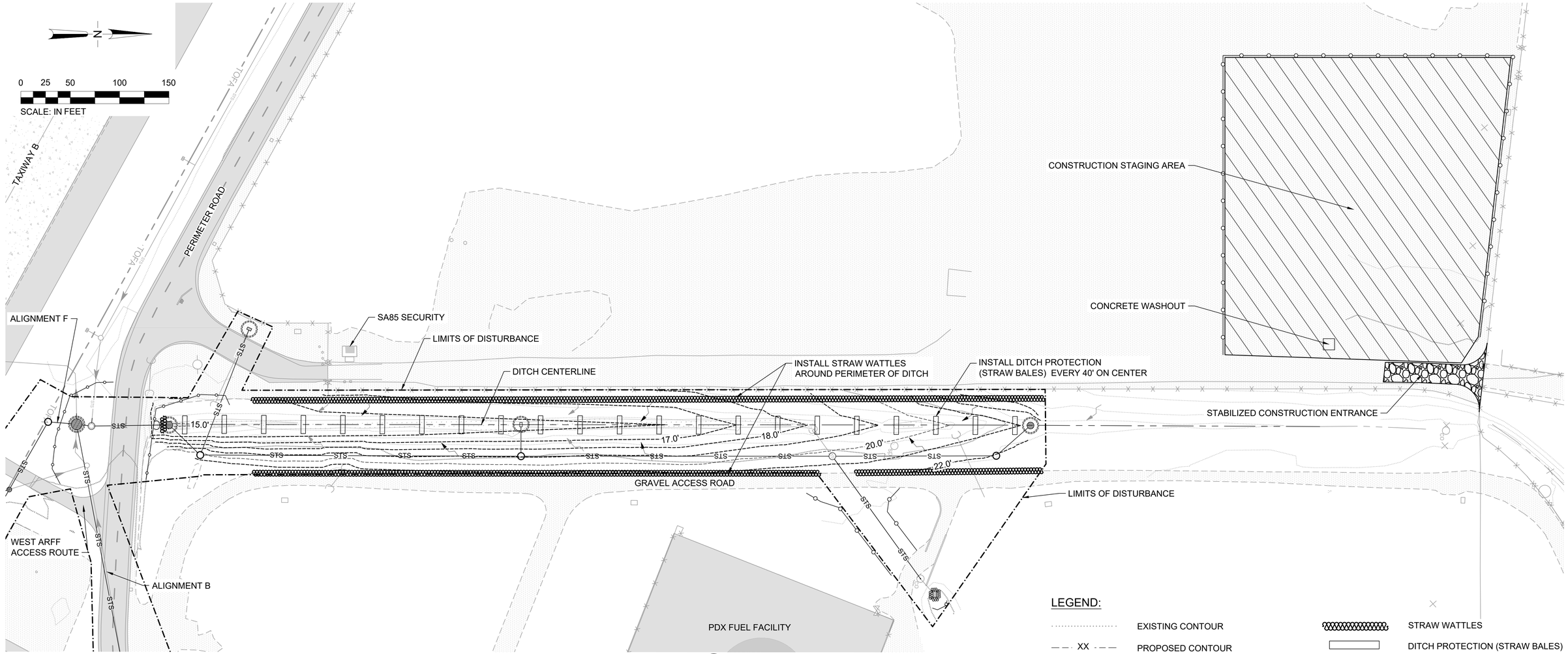
PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

ESCP DEMOLITION AND CLEARING
ALIGNMENT B THROUGH ALIGNMENT F

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	20
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.05

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.



1 PLAN
SCALE: 1" = 50'

NOTES:

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AT THE DITCH AREA PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
2. THE DITCH SHALL REMAIN AS AN ACTIVE STORMWATER CONVEYANCE DEVICE WHILE THE ADJACENT NEW 48-INCH STORM SEWER PIPE IS INSTALLED. AFTER THE NEW 48-INCH STORM SEWER IS INSTALLED AND ACTIVE, CONSTRUCTION TO FILL IN THE DITCH CAN COMMENCE. STRAW WATTLES AND DITCH PROTECTION SHALL BE INSTALLED WITHIN THE DITCH DURING CONSTRUCTION TO HELP CONTROL SEDIMENTS FROM ENTERING THE DOWNSTREAM DRAINAGE SYSTEMS AND ATTENUATE STORMWATER RUNOFF ENTERING THE DITCH.

LEGEND:

- EXISTING CONTOUR
- XX PROPOSED CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- WETLANDS
- TOFA TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- INLET PROTECTION BAG INSERT, SEE DETAIL SHEET C-1.10
- STRAW WATTLES
- DITCH PROTECTION (STRAW BALES)
- SEDIMENT FENCING TO BE INSTALLED PER PORT DIRECTION. THE PORT MAY NOT REQUIRE ALL FENCING TO BE INSTALLED PER PLAN.
- CONSTRUCTION STAGING AREA
- LIMITS OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- EXISTING DRAINAGE FLOWS
- PROPOSED DRAINAGE FLOWS

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MOTT MACDONALD

2024D016 DESIGN NUMBER

102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

ESCP UTILITIES AND PAVEMENT RESTORATION ALIGNMENT A

SUBMITTED BY	SHERYL WALSH		
DESIGN BY	K.NOLLSTADT		
DRAWN BY	E. VIGLIOROLO		
CHECKED BY	A. JEFFREY		
DATE	SEPTEMBER 2025		
SHEET NO.	21	TYPE:	CD
DRAWING NO.	PDX 2025-513	DISC. SHT. NO.	C1.06

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

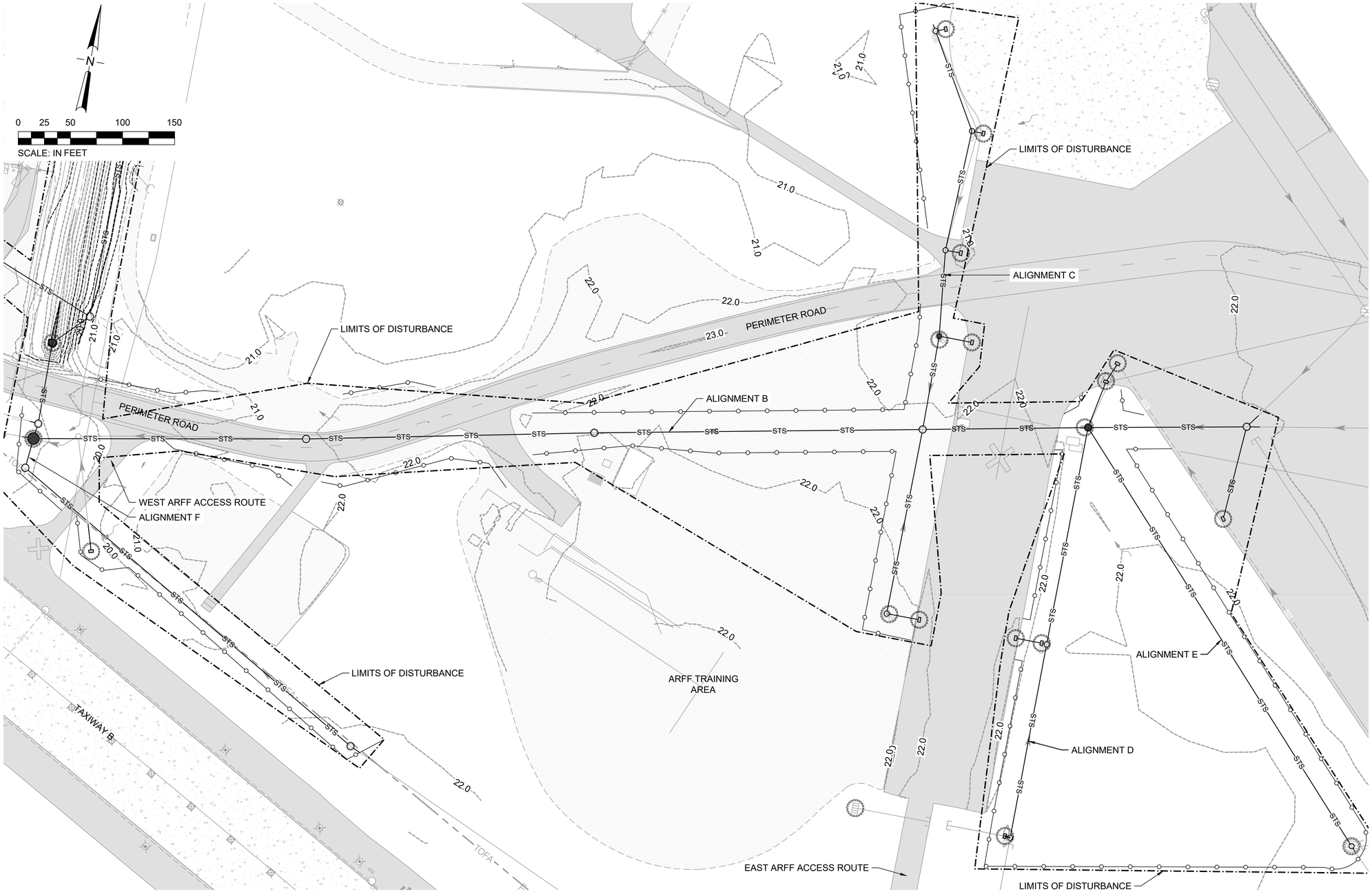
PRINTED: 9/5/2025 2:55:29 PM VIG75558 c:\pwworking\hmm\dms83014\escp utilities and pavement restoration - alignment a.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

light grey
dark grey
black



1 PLAN
SCALE: 1" = 50'

LEGEND:

- EXISTING CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- TOFA — TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- INLET PROTECTION BAG INSERT, SEE DETAIL SHEET C-1.10
- SEDIMENT FENCING TO BE INSTALLED PER PORT DIRECTION. THE PORT MAY NOT REQUIRE ALL FENCING TO BE INSTALLED PER PLAN.
- LIMITS OF DISTURBANCE
- EXISTING DRAINAGE FLOWS

NOTES:

1. FOR MANHOLES WITH SLOTTED GRATE COVER, CONTRACTOR MAY CHOOSE BETWEEN INSTALLING INLET PROTECTION INSERTS OR INSTALLING STRAW WATTLES AROUND THE STRUCTURE FOR SOIL EROSION AND SEDIMENT CONTROL.
2. FINAL GRADING TO MATCH EXISTING, ISOLATE DISTURBED AREAS.

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

#	DATE	BY	REVISION	APP

#	DATE	BY	REVISION	APP

Port of Portland

1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER

102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
JAMES ANDREW JEFFREY
MAY 10, 2016
RENEWS: 07/01/25

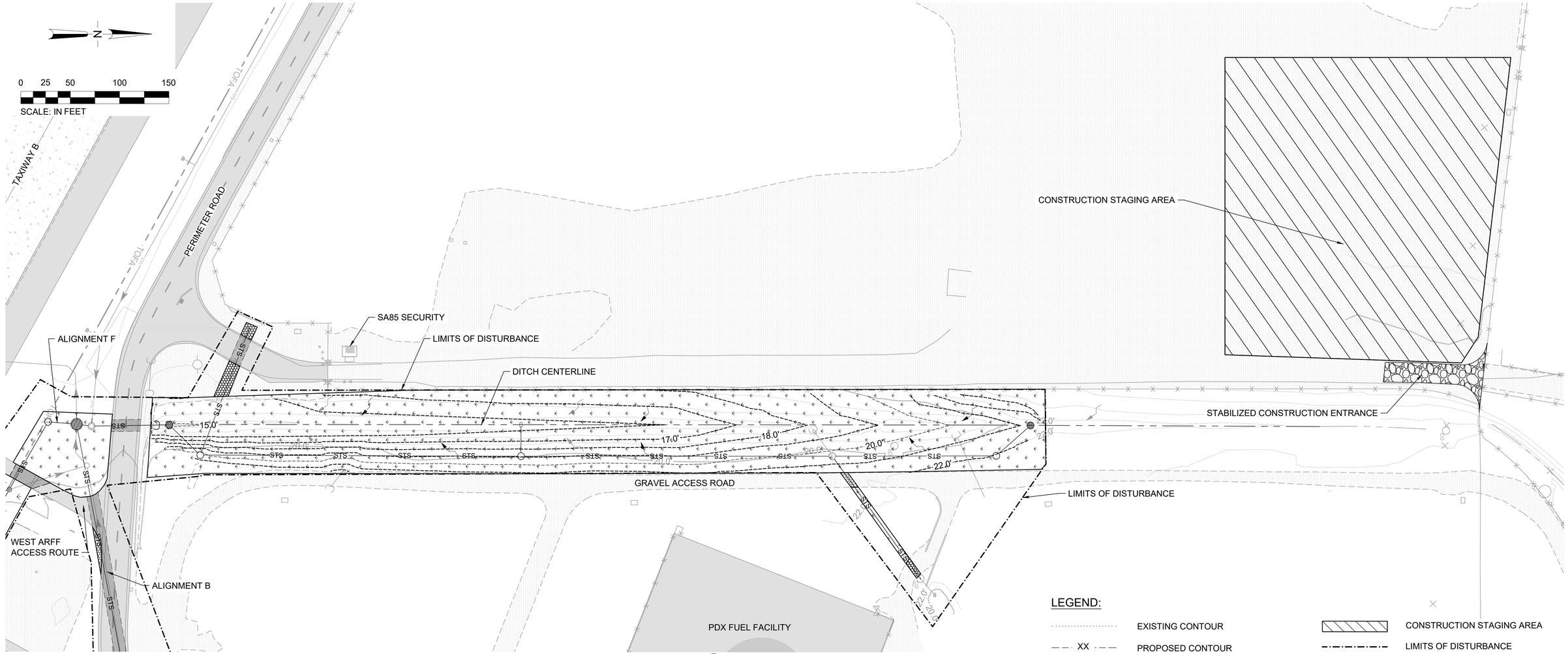
PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

ESCP UTILITIES AND PAVEMENT RESTORATION
ALIGNMENT B THROUGH F

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	22
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.07

CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.



1 PLAN
SCALE: 1" = 50'

NOTES:

1. AFTER COMPLETION OF FINAL GRADING AND CONSTRUCTION ACTIVITIES WITHIN THE DITCH, THE DITCH SHALL BE PERMANENTLY VEGETATED WITH A PROPER SEED/GRASS MIXTURE (SEE CONSTRUCTION SPECIFICATIONS SECTION 329219 - SEEDING).
2. SOIL STOCKPILE AREA TO BE LOCATED WITHIN THE STAGING AREA. ALL SOIL MUST BE STORED ON AN IMPERVIOUS SURFACE, THEREFORE PLASTIC SHEETING MUST BE PLACED PRIOR TO PLACING SOIL.

LEGEND:

- EXISTING CONTOUR
- XX PROPOSED CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- TOFA TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- CONSTRUCTION STAGING AREA
- LIMITS OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- EXISTING DRAINAGE FLOWS
- PROPOSED DRAINAGE FLOWS
- PROPOSED HYDROSEEDING
- PROPOSED GRAVEL
- PROPOSED ASPHALT OR CONCRETE

#	DATE	BY	REVISION	APP

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REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

ESCP FINAL LANDSCAPING AND SITE STABILIZATION
ALIGNMENT A

SUBMITTED BY	SHERYL WALSH	
DESIGN BY	K.NOLLSTADT	
DRAWN BY	E. VIGLIOROLO	
CHECKED BY	A. JEFFREY	
DATE	SEPTEMBER 2025	
SHEET NO.	23	TYPE: CD
DRAWING NO.	PDX 2025-513	DISC. SHT. NO. C1.08

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

PRINTED: 9/5/2025 3:52:04 PM VIG75558 c:\pwworking\hmm\dms83014\escp final landscaping and site stabilization - alignment a.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

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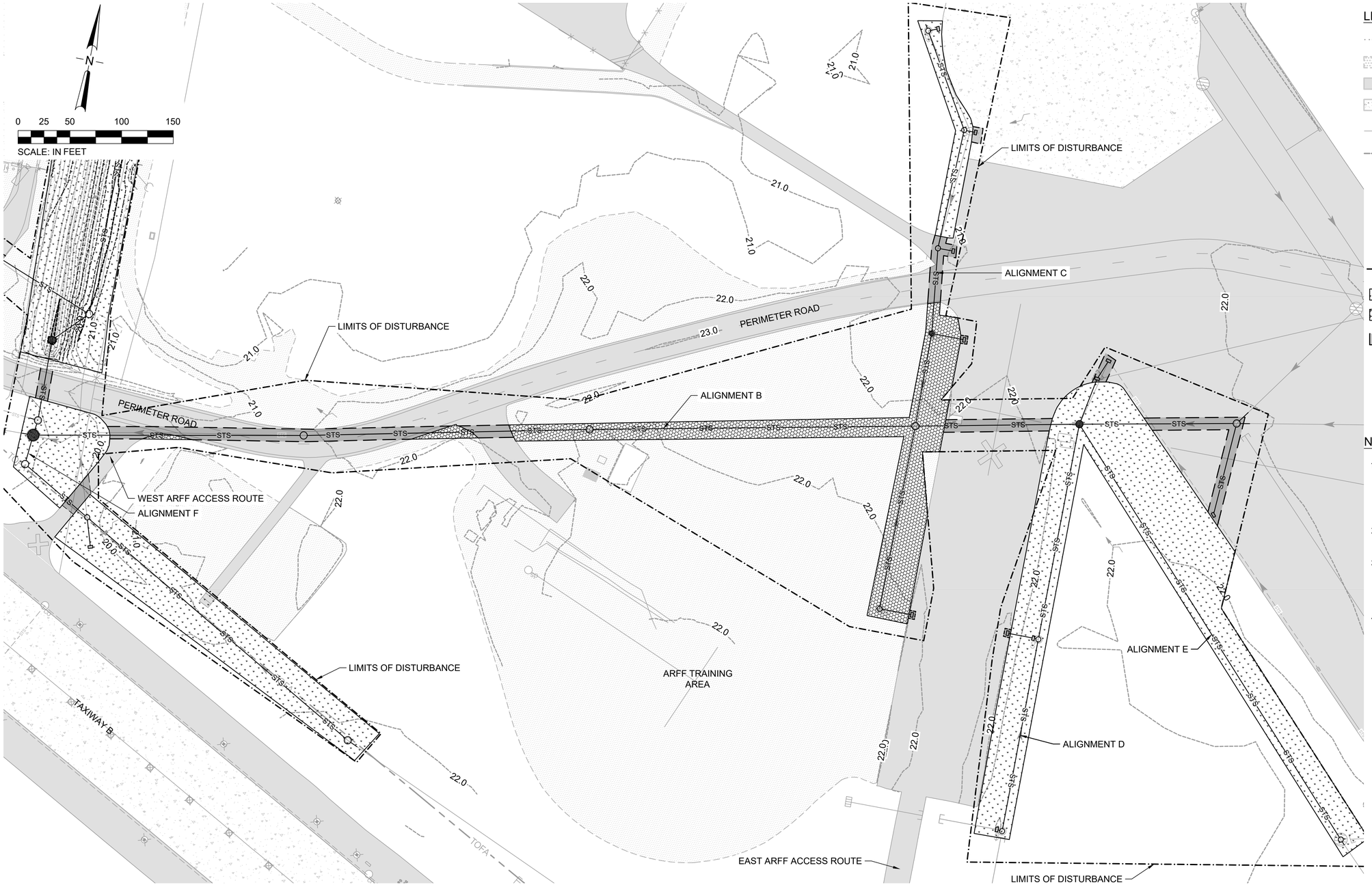

1 PLAN
SCALE: 1" = 50'

LEGEND:

- EXISTING CONTOUR
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING FENCE
- TOFA — TAXIWAY OBJECT FREE AREA (TOFA)
- CATCH BASIN
- MANHOLE
- MANHOLE WITH SLOTTED GRATE COVER
- CULVERT/FLARED END SECTION
- LIMITS OF DISTURBANCE
- PROPOSED HYDROSEEDING
- PROPOSED GRAVEL
- PROPOSED ASPHALT OR CONCRETE
- EXISTING DRAINAGE FLOWS

NOTES:

1. FOR MANHOLES WITH SLOTTED GRATE COVER, CONTRACTOR MAY CHOOSE BETWEEN INSTALLING INLET PROTECTION INSERTS OR INSTALLING STRAW WATTLES AROUND THE STRUCTURE FOR SOIL EROSION AND SEDIMENT CONTROL.
2. FINAL GRADING TO MATCH EXISTING, ISOLATE DISTURBED AREAS.
3. AFTER COMPLETION OF CONSTRUCTION ACTIVITIES, GRASSY AREAS SHALL BE PERMANENTLY VEGETATED WITH A PROPER SEED/GRASS MIXTURE (SEE CONSTRUCTION SPECIFICATIONS SECTION 329219 - SEEDING).
4. SOIL STOCKPILE AREA TO BE LOCATED WITHIN THE STAGING AREA. ALL SOIL MUCH BE STORED ON AN IMPERVIOUS SURFACE, THEREFORE PLASTIC SHEETING MUST BE PLACED PRIOR TO PLACING SOIL.

#	DATE	BY	REVISION	APP'D

#	DATE	BY	REVISION	APP'D

Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

ESCP FINAL LANDSCAPING AND SITE STABILIZATION
ALIGNMENT B THROUGH ALIGNMENT F

SUBMITTED BY	SHERYL WALSH
DESIGN BY	K.NOLLSTADT
DRAWN BY	E. VIGLIOROLO
CHECKED BY	A. JEFFREY
DATE	SEPTEMBER 2025
SHEET NO.	24
TYPE:	CD
DRAWING NO.	PDX 2025-513
DISC. SHT. NO.	C1.09

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

PRINTED: 9/5/2025 3:08:14 PM VIG75558 c:\pwworking\hmm\dms83014\escp final landscaping and site stabilization - alignment b through alignment f.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

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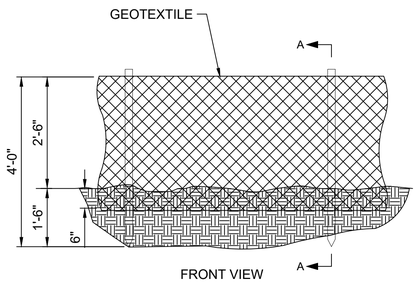
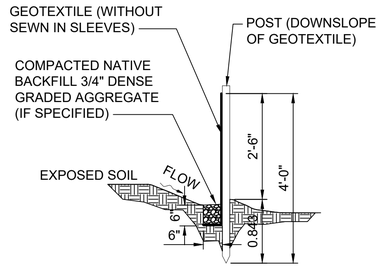
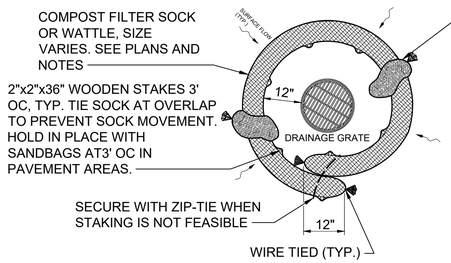
light grey
dark grey
black



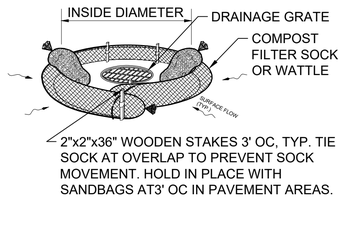
SEDIMENT FENCE AND GEOTECTILE BURY DETAIL
SCALE: SCALE: NTS



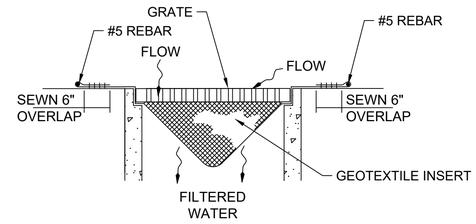
SECTION A-A
SCALE: SCALE: NTS



AREA DRAIN PLAN
SCALE: SCALE: NTS



AREA DRAIN PERSPECTIVE VIEW
SCALE: SCALE: NTS

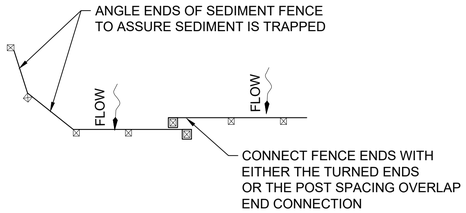


PREFABRICATED FILTER INSERT
SCALE: SCALE: NTS

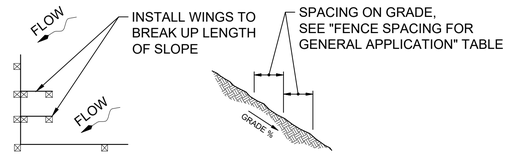
NOTE:

INSTALL PREFABRICATED FILTER INSERTS ACCORDING TO THE PLANS, SPECIAL PROVISIONS, AND MANUFACTURER RECOMMENDATIONS. PREFABRICATED INSERTS WITH PROVISIONS FOR OVERFLOW ARE ALLOWED ONLY WHEN ACCOMPANIED BY ADDITIONAL BMP'S TO PREVENT THE POTENTIAL OF SEDIMENTS ENTERING PROJECT STORM SYSTEMS. FIELD FABRICATED INSERTS ARE NOT ALLOWED.

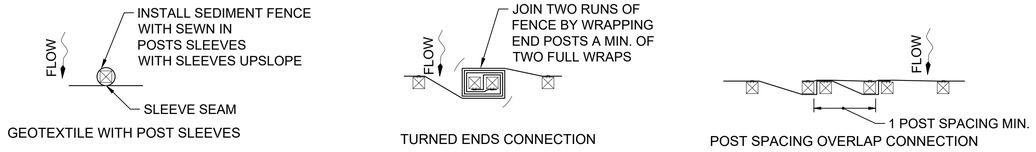
2 INLET PROTECTION
SCALE: NTS



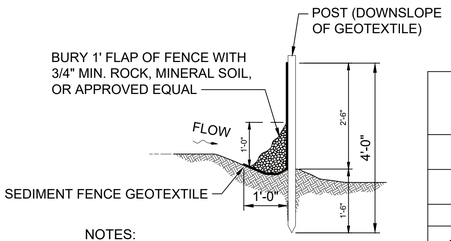
PLAN VIEW
SCALE: SCALE: NTS



TERMINATION AT CORNER OR PROPERTY LINE
SCALE: SCALE: NTS



GEOTEXTILE END CONNECTIONS
SCALE: SCALE: NTS



NOTES:
1. USE MUST BE APPROVED BY THE ENGINEER.
2. NOT APPROVED FOR USE WITH SEDIMENT FENCING WITH SEWN-IN POST SLEEVES.

ALTERNATE SEDIMENT FENCE WITHOUT TRENCHING - TYPE 2
SCALE: SCALE: NTS

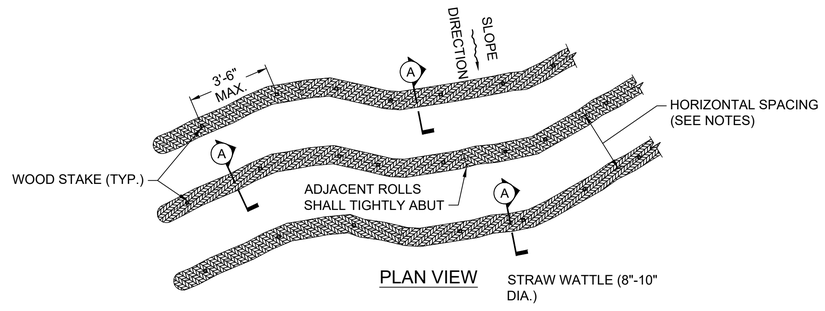
FENCE SPACING FOR GENERAL APPLICATION TABLE	
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS	
GRADE	MAX. SPACING ON GRADE
GRADE <10%	300'
10% ≤ GRADE < 15%	150'
15% ≤ GRADE < 20%	100'
20% ≤ GRADE < 30%	50'
30% ≤ GRADE	25'

POST SPACING TABLE	
6'	SEDIMENT FENCE WITH GEOTEXTILE ELONGATION LESS THAN 50%
4'	SEDIMENT FENCE WITH GEOTEXTILE ELONGATION 50% OR MORE

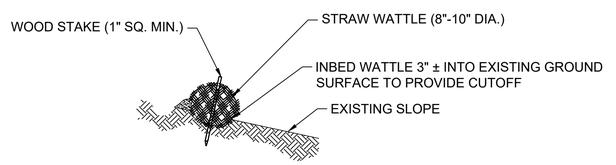
NOTES:

1. USE 2"X2" WOOD FENCE POSTS.
2. POSTS TO BE INSTALLED ON DOWNHILL SIDE OF SEDIMENT FENCE GEOTEXTILE. POSITION POSTS TO PREVENT SEPARATION FROM GEOTEXTILE.
3. COMPACT FILTER FABRIC TRENCH BACKFILL AND SOIL ON UPHILL SIDE OF FENCE.
4. LOCATE FENCE NO CLOSER THAN THREE FEET TO THE TOE OF A SLOPE.
5. WING SPACING SHALL COMPLY WITH "FENCE SPACING FOR GENERAL APPLICATION TABLE".

1 SEDIMENT FENCE DETAIL
SCALE: NTS



PLAN VIEW



SECTION A-A

NOTES:

1. WHERE USED AS SLOPE PROTECTION MEASURE, STRAW WATTLES TO BE PLACED ALONG SITE CONTOURS, PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE.
2. HORIZONTAL SPACING VARIES DEPENDING ON SOIL TYPE AND STEEPNESS, SEE PLAN (5' MIN - 25' MAX)
3. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
4. WATTLES SHALL CONSISTOF CYLINDERS OF PLANT MATERIAL SUCH AS WEED-FREE STRAW, COIR, WOOD CHIPS, EXCELSIOR, OR WOOD FIBER OR SHAVINGS ENCASED WITHIN NETTING MADE OF NATURAL PLANT FIBERS UNALTERED BY SYNTHETIC MATERIALS.

3 STRAW WATTLES
SCALE: NTS

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/4" 1/2" 1" 2"

#	DATE	BY	REVISION	APP'D

#	DATE	BY	REVISION	APP'D

Port of Portland
1050 SW 6th Avenue
Suite 1010
Portland, OR 97204
MOTT MACDONALD
2024D016 DESIGN NUMBER
102943 PROJECT NUMBER

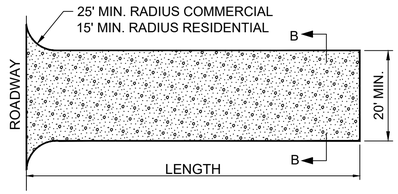
REGISTERED PROFESSIONAL ENGINEER 91162PE OREGON MAY 10, 2016 JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT
BASIN 1 SUBAREA STORMWATER IMPROVEMENTS
EROSION AND SEDIMENT CONTROL CONSTRUCTION DETAILS 1

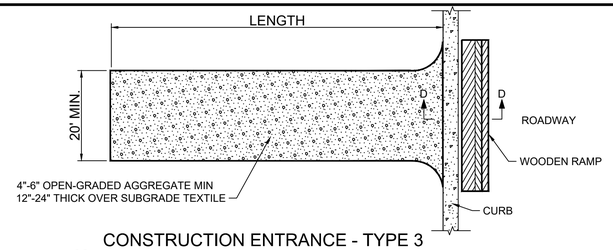
SUBMITTED BY	SHERYL WALSH	
DESIGN BY	K.NOLLSTADT	
DRAWN BY	E. VIGLIOROLO	
CHECKED BY	A. JEFFREY	
DATE	SEPTEMBER 2025	
SHEET NO.	25	TYPE: CD
DRAWING NO.	PDX 2025-513	DISC. SHT. NO. C1.10

PRINTED: 9/5/2025 1:08:36 PM VIG75558 c:\pwworking\hmm\dms83014\erosion and sediment control construction details.dwg
IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING
DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

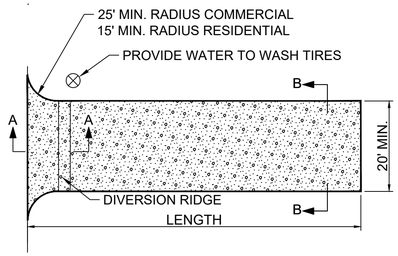
CAN YOU SEE THE AIRPLANES? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.



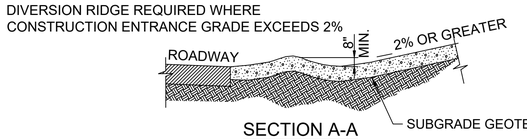
1 CONSTRUCTION ENTRANCE - TYPE 1
SCALE: NTS



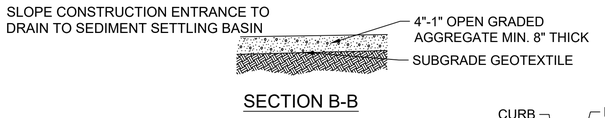
3 CONSTRUCTION ENTRANCE - TYPE 3
TYP E 1 OR 2 WITH CURB
SCALE: NTS



2 CONSTRUCTION ENTRANCE - TYPE 2
SCALE: NTS



SECTION A-A

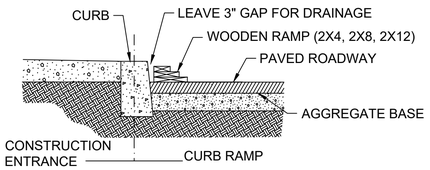


SECTION B-B

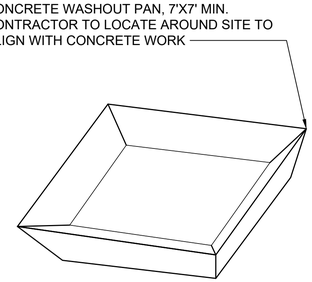
CONSTRUCTION ENTRANCE TABLE MINIMUM LENGTH	
LENGTH (FT)	AREA OF EXPOSED SOIL (AC)
20	0.25
50	0.25 < A < 1.0
100	A > 1.0

NOTES:

1. THE TYPE 1 ENTRANCE IS A SIMPLE ENTRANCE WITHOUT A DIVERSION RIDGE OR SETTLING BASIN.
2. THE WOODEN RAMP MAY BE USED ON EITHER TYPE 1 OR TYPE 2 ENTRANCES IN SITUATIONS WHERE THERE IS CURB AND THE CURB IS NOT REMOVED FOR THE CONSTRUCTION ENTRANCE.



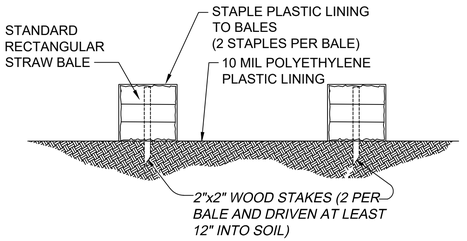
WOODEN CURB RAMP
SECTION D-D



NOTES:

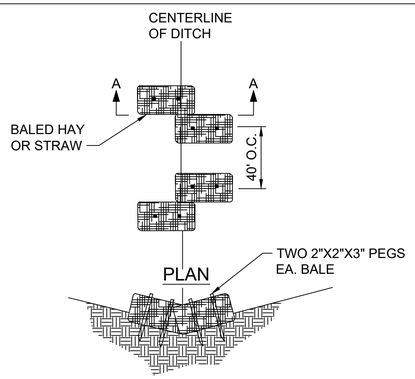
1. INSTALL A MOBILE CONCRETE WASHOUT, ECO PAN, OR APPROVED EQUAL. LOCATE THE WASHOUT IN A PLACE THAT WILL BE ACCESSIBLE TO CONCRETE TRUCKS.
2. PROVIDE 7'X7' MINIMUM WASHOUT PAN. INCREASE SIZE OR PROVIDE ADDITIONAL WASHOUTS AS REQUIRED TO ACCOMMODATE PROJECT CONDITIONS.
3. FOR WASHOUTS LOCATED IN AREAS DESIGNATED TO RECEIVE HARDSCAPE, SOLIDS MAY BE BURIED IN PALCE. FOR OTHER APPLICATION, REMOVE AND DISPOSE OF SOLIDS.

5 CONCRETE WASHOUT PAN
SCALE: NTS



SECTION VIEW

6 CONCRETE WASHOUT FACILITY
SCALE: NTS



PLAN

SECTION A-A

NOTES:

1. EMBED BALES 4" TO 6".
2. DRIVE STAKES MIN. 12" INTO GROUND SURFACE.

4 DITCH PROTECTION
SCALE: NTS

#	DATE	BY	REVISION	APP

#	DATE	BY	REVISION	APP

Port of Portland

1050 SW 6th Avenue
Suite 1010
Portland, OR 97204

MOTT MACDONALD

2024D016 DESIGN NUMBER

102943 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
91162PE
OREGON
MAY 10, 2016
JAMES ANDREW JEFFREY
RENEWS: 07/01/25

PORTLAND INTERNATIONAL AIRPORT

BASIN 1 SUBAREA STORMWATER IMPROVEMENTS

EROSION AND SEDIMENT CONTROL
CONSTRUCTION DETAILS 2

SUBMITTED BY	SHERYL WALSH		
DESIGN BY	K.NOLLSTADT		
DRAWN BY	E. VIGLIOROLO		
CHECKED BY	A. JEFFREY		
DATE	SEPTEMBER 2025		
SHEET NO.	26	TYPE:	CD
DRAWING NO.	PDX 2025-513	DISC. SHT. NO.	C1.11

GRAPHIC SCALE - FOR REFERENCE ONLY
0 1/8" 1/2" 1" 2"

PRINTED: 9/5/2025 1:09:28 PM VIG75558 c:\pwworking\hmm\dms83014\erosion and sediment control construction details.dwg

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 11" x 17"

Attachment C

Groundwater Discharge, Treatment, and Monitoring Management Plan

MAUL FOSTER ALONGI

Groundwater Discharge, Treatment, and Monitoring Management Plan

Basin 1 Subarea Stormwater Improvements Project
Portland International Airport

Prepared for:

Port of Portland

October 24, 2025
Project No. M0232.17.105

Prepared by:

Maul Foster & Alongi, Inc.
3140 NE Broadway, Portland, OR 97232

MAUL FOSTER ALONGI

Groundwater Discharge, Treatment, and Monitoring Management Plan

Basin 1 Subarea Stormwater Improvements Project
Portland International Airport

The material and data in this report were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.

~~EXPIRES: 1/1/2026~~
This digital seal certifies the signatory and document content.

Michael Pickering, RG
Principal Geologist

Michael Whitson, RG
Project Geologist

Contents

Abbreviations

BMPs	best management practices
Clear Creek	Clear Creek Systems, Inc.
CMMP	contaminated media management plan
COPC	contaminants of potential concern
DEQ	Oregon Department of Environmental Quality
ECSI	Environmental Cleanup Site Information database
EMP	Environmental Management Plan
EPA	U.S. Environmental Protection Agency
MFA	Maul Foster & Alongi, Inc.
MRL	method reporting limit
NPDES	National Pollution Discharge Elimination System
OAR	Oregon Administrative Rules
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
Port	Port of Portland
Project Team	Port project construction team
PVC	polyvinyl chloride
the Site	Basin 1 Subarea Stormwater Improvements Project
TPH	total petroleum hydrocarbons
VOC	volatile organic compounds
YDO	Your DEQ Online

1 Introduction

This groundwater discharge, treatment, and monitoring management plan (the "Plan") was prepared for the Port of Portland (Port) Basin 1 Subarea Stormwater Improvements Project site (the "Site") at the Portland International Airport (PDX). The Site is presented on drawing PDX 2025-513 Sheet C1.001 in Attachment B of the Environmental Management Plan (EMP).

1.1 Project Description and Background

A description of the project including background information is presented in the Contaminated Media Management Plan (CMMP) presented in Attachment A of the EMP.

2 Project Organization

The following information generally describes the duties, responsibilities, authorities, and qualifications of the personnel involved in the dewatering project; project organization; identification of reporting relationships; lines of communication; and authorities.

2.1 Oregon Department of Environmental Quality

The Oregon Department of Environmental Quality (DEQ) is the regulatory agency. This Plan is being submitted to the DEQ for review and approval under the National Pollution Discharge Elimination System (NPDES) 1200-CA construction stormwater permit EMP requirements.

The Port is also engaged with DEQ's Voluntary Cleanup Program (VCP) investigating historical contaminant releases at PDX including per- and polyfluoroalkyl substances (PFAS) compounds. The Environmental Cleanup Site Information database/Your DEQ Online (ECSI/YDO) site identification number for this work is #3324 (the VCP Site).

The state of Oregon recently adopted rules to include six per- and polyfluoroalkyl substances (PFAS) in the definition of hazardous substances in Oregon Administrative Rules. This gives DEQ authority to require investigation and removal and remedial actions of PFAS releases. This project is not a cleanup effort. Rather, this Groundwater Discharge, Treatment, and Monitoring Management Plan is designed to ensure proper handling of contaminated groundwater during construction dewatering activities, in compliance with 1200-CA permit requirements.

2.2 Port of Portland Construction Project Team

The Port construction project team (Project Team) has not yet been contracted. The Project Team will include a prime construction contractor (or general contractor) and potential subcontractors to complete dewatering system operations. A forthcoming construction dewatering plan, to be

submitted by the prime construction contractor once selected, will describe the means and methods proposed for dewatering their work area, including initial turbidity control, and will include estimated dates and flow rates. The forthcoming plan will be reviewed for adherence to this Plan and attached. The prime construction contractor or the Port will subcontract the following operations to Clear Creek Systems, Inc (Clear Creek):

- Turbidity control operation
- Water treatment system operation and discharge

The Port will be responsible for implementing the Plan. Clear Creek will provide equipment for turbidity controls (e.g., weir tanks) and water treatment. Daily observations and required operations and maintenance associated with the treatment equipment will be provided by Clear Creek. Contaminants of potential concern (COPCs) include total petroleum hydrocarbons (TPH) as diesel, TPH as oil, volatile organic compounds (VOCs), and PFAS compounds.

2.3 Maul Foster & Alongi, Inc.

Maul Foster & Alongi, Inc. (MFA) prepared the Plan on behalf of the Port and will assist the Port with implementation and strategic assistance throughout the project. MFA will conduct the sampling and reporting activities discussed in Section 6.

3 Construction Dewatering

Construction dewatering may be required in areas where the utilities are installed at or below the water table. The project work period is expected to occur from May through September 2026 (i.e., during predominantly dry weather). Based on this proposed work period the Port does not anticipate significant contribution from precipitation, rainwater, or stormwater runoff.

Groundwater removed by dewatering will be treated using filter and adsorptive media suitable for PFAS and other COPCs and will be discharged to the land surface in the vicinity of the work area in a manner allowing infiltration and preventing erosion. If land application allowing infiltration and preventing erosion is not possible, treated water will be discharged to stormwater infrastructure in Basin 1. Typical treatment system components will include turbidity control, sand filtration, bag filters, and vessels containing adsorptive media.

The Port is applying all known, available, and reasonable methods, of prevention, control, and treatment to ensure compliance with water quality requirements under the NPDES permit. The forthcoming construction dewatering plan will focus on means and methods for dewatering the work area, confirm the project schedule and duration, provide estimates of dewatering flow rates, and propose initial turbidity control. The dewatering plan will also acknowledge the potential for varying chemical concentrations, establish procedures for managing unanticipated contamination and identify key personnel responsible for implementing the plan.

4 Treatment System

Construction dewatering performed during project activities will be directed to a holding tank for treatment of turbidity and potential contaminants. As discussed in this section and shown on the process flow drawing in Appendix A, PFAS, TPH as diesel, TPH as oil, and several VOCs were reported in groundwater. More details are presented in Section 2 of the CMMP in Attachment A of the EMP.

4.1 Treatment Design Parameters

The treatment system will be sized based on the parameters from the forthcoming construction dewatering plan to be provided by the prime construction contractor. The specific volume will determine the number of holding tanks and other treatments system components required to optimize treatment for post treatment discharge. The system will be designed to remove turbidity through passive gravity separation, flocculation, and filtration. If present, TPH, VOCs and PFAS will be treated by filtration and adsorptive media vessels prior to land application or storm system discharge. Cut sheets for system equipment are included in Appendix B.

4.2 Treatment Approach

Groundwater removed by construction dewatering will, at minimum, be treated for turbidity and potential contaminants through the use of a weir tank and adsorptive media filtration. A process flow diagram presenting typical system components is shown in Appendix A. The treatment system will likely include an oil/water separator, chitosan-enhanced sediment removal, sand filters, bag/cartridge filters (for polishing), two carbon/organoclay vessels, two Fluoro-Sorb 200 vessels, valving, and controls. The carbon/organoclay vessels and Fluoro-Sorb 200 vessels will be plumbed in series to increase the bed contact time. As needed, carbon dioxide or sodium hydroxide injection will be used for pH adjustment, as needed. The system will also include a recirculation line. Safety Data Sheets for the proposed treatment system additives are included in Appendix C.

- Chitosan-Enhanced Turbidity Treatment – Fine particles (e.g., silts and clays) can remain in suspension without settling due to their relative size and ionic charge. Chitosan will be used as a coagulant/flocculant to modify the surface charge of soil particles and cause them to bind together to create larger, heavier particles. These larger particles will then be removed through gravity settling in the tanks plumbed to receive influent below the water surface (to reduce aeration).
- Sand and Bag/Cartridge Filtration – Additional particle removal can be achieved by including sand, bag, or cartridge filters plumbed in series from the discharge of the tanks. Use of these additional filter types may be required to prevent excessive loading and subsequent blinding of the adsorptive media treatment. Filters also require additional maintenance, such as backwashing and recirculation of backwash waters through the turbidity treatment system.
- Adsorptive Media Treatment – Adsorptive media vessels will be used to remove potential TPH, VOCs and PFAS in the collected groundwater prior to discharge. The quantity, sizing, and layout of tanks will be selected to treat the quantity of water removed from the construction project. The media type, pore size, and vessel sizing will be specified by the adsorptive media vendor based

on their review of the design parameters. Maintenance for the adsorptive media vessels is discussed further in Section 5.1.

The equipment will be piped using either flexible hose and quick-connect fittings or hard plumbed using rigid polyvinyl chloride (PVC) pipe. The system layout design will accommodate modification to the system as project need requires. A flow totalizer will be located prior to the system discharge to quantify the volume of water treated and discharged.

The water treatment system will be equipped with monitoring modules throughout the treatment train that measure turbidity, pH, and temperature and trigger recirculation of the treated water based on pre-programmed parameters. Discharge from the water treatment system for pH will be limited to 5.5 to 9.0. The treatment system is equipped with carbon dioxide or sodium hydroxide sparging (see process flow diagram) to be used, as necessary.

5 Maintenance–Adsorptive Media Vessels, Turbidity Treatment System, and Application Area

5.1 Daily Observations and Daily Routine Maintenance

Visual monitoring of the treatment system operation will be conducted on a daily basis (during system operation) until the dewatering system is no longer required. Discharge water quality and the application area, discussed further in Section 6.4, will be inspected prior to every discharge event or daily during continuous discharge events. The inspections will include observations for the following:

- Visual parameters including sheen, discoloration, floating solids, and odor.
- Inspection of system components (including valves, piping, and other connections) for signs of degradation, leaking, or failure.
- Tracking of the total volume quantified by the flow totalizer.
- Conditions of erosion control best management practices (BMPs) (as specified in the erosion control plan) near the application area.
- Conditions of the application area, specifically noting signs of surface runoff and other observations that may limit infiltration. Flow rates will be adjusted, as discussed in Section 6.4, to prevent migration of the discharged water to surface water or stormwater infrastructure.

Daily routine maintenance will include the following:

- System pressure readings will be recorded and flow rates through the adsorptive media vessels will be adjusted to optimize residence time and corresponding removal efficiency. The pressure readings will also be used to determine when backwashing of adsorptive media vessels is needed.

- Bag filter changes will be completed based on observed pressure readings.

The daily inspection form will be maintained and submitted to the Port. The daily inspection forms will be developed after the treatment system design is finalized so that all required inspection items can be included on the forms.

5.2 Adsorptive Media Maintenance - Backwashing

Adsorptive media needs to be periodically backwashed. Backwashing will be completed for either of the following conditions.

- Partially spent media will be backwashed to remove sediment from the top of the bed and improve flow through the media (i.e., to reduce channeling).
- After soaking and prior to being placed in-service, fresh media will be backwashed to remove fines, remove entrapped air, and to fully stratify the media bed.

Due to the expected duration of the project, media change out is not anticipated. If change out of adsorptive media is required, it will include removal of the spent media, placement of fresh media into the vessel, soaking of the media, and backwashing. Water used for backwashing will be circulated through the treatment system. Spent media will be chemically profiled and disposed of at a landfill designated by the Port or regenerated (as applicable based on results of chemical profiling).

5.3 Turbidity Treatment System Maintenance

The chitosan injection system will be monitored to determine the optimal dosing for sediment removal. Depending on the volume of solids that collect in the weir tank, the solids may need to be removed (via vacuum truck) prior to the completion of the project. Solids removed from the tanks will be profiled and disposed of off-site at a landfill designated by the Port.

If treatment includes sand, bag, or cartridge filtration, filters that have become fouled would be backwashed or replaced as needed. Sand filters typically have an automatic backwashing mode. Backwashing water will be routed to the tanks and recirculated through the treatment system.

6 Discharge and Monitoring

Treated water will be discharged to the land surface for infiltration or to the storm sewer system.

6.1 Influent Sampling

Influent sampling will be performed to assess the influent concentration of contaminants and to help estimate media consumption and system performance. The system may be operated by batch or continuous discharge depending on flow rates. Sampling from the system influent will be completed when sufficient water has accumulated in the first holding tank. The samples will be analyzed for TPH, VOCs, and PFAS.

6.2 Initial Pre-Discharge Testing

Dewatering operations completed for the TCORE Grease Interceptor and the PDX Fuel Storage Facility Improvements Project have demonstrated the ability to treat a range of influent concentrations for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) to below the U.S. Environmental Protection Agency (EPA) Maximum Contaminant Levels and the Basin 1 project will utilize the same treatment approach provided by the same vendor, Clear Creek. Considering the successful performance of these prior projects, no pre-discharge testing is planned for this project.

6.3 Performance Sampling

Sampling between the two Fluoro-Sorb 200 media vessels will be completed on a weekly basis to further assess media consumption and the potential for breakthrough. Samples will be analyzed for TPH, VOCs, and PFAS (EPA Method 1633). Samples will be submitted to the analytical laboratory on a rush turnaround time (e.g., 24 to 48 hours for TPH and VOCs and 10 to 25 business days for PFAS). If breakthrough occurs, the media in the vessels that experienced breakthrough will be replaced. For TPH, VOCs, PFOS, and PFOA breakthrough is considered to have occurred when concentrations are reported above the method reporting limit (MRL). The list of PFAS compounds will be modified (as necessary) to include those regulated in the State of Oregon at the time of the construction project. The laboratory MRLs for TPH, VOCs, and PFAS are presented in Appendix D. None of the MRLs for TPH and VOCs applicable to the Site exceed the screening level values for the following:

- DEQ, 2019. Oregon National Ambient Water Quality Criteria: Oregon Administrative Rules (OAR) 340-041-8033, Table 30, Aquatic Life Water Quality Criteria for Toxic Pollutants.
- DEQ, 2011. Appendix D: Stormwater Data Reporting and Screening Table for Non-Portland Harbor Sites.

Samples will be submitted on a rush turnaround time, however, depending on actual flow rates, it may be infeasible to batch discharge based on the typically long turnaround time for PFAS analytical results. Laboratory analytical results for PFAS have typical turnaround times of 10 to 25 business days (when submitted on a rush turnaround time).

The Port is using the most stringent, EPA recognized technology available and will use the weekly performance data to monitor the performance of the treatment system, while the final media polishing vessel serves as a safeguard.

6.4 Land Application Area

The proposed land application will be to vegetated areas in the vicinity of the work area, but with sufficient distance to limit the potential for short circuiting back into the excavations. Discharge will also be conducted using means and methods to limit runoff potential. Borings in the vicinity of the work area encountered predominantly sand with silt which should provide sufficient infiltration capacity for the proposed land application but will be confirmed once the dewatering plan is available.

The design of the land application dispersal systems will be determined by the Port, MFA, and Clear Creek, but common systems include perforated piping or sprinkler heads within the application area that spread the groundwater discharge over a larger volume of land to improve infiltration. The flow rate of the system will be monitored and adjusted to match infiltration rates and prevent erosion.

6.5 Storm Sewer Discharge

If additional discharge capacity is needed to prevent runoff, erosion or groundwater mounding the treated water will be routed to the storm sewer located in the work area.

6.6 Pre-Discharge Requirements

Prior to discharging water from the system, the operator must have completed the daily observation and maintenance, detailed in Section 5.1. Before the initial discharge from the treatment system can occur, pre-discharge sample results must be in compliance with this Plan.

6.7 Discharge Monitoring and Reporting

Discharges will be monitored and recorded on discharge forms. These forms will include start and end times of discharge events, flow rates, volumes discharged, and other observations. The application area will be monitored during discharge events for evidence of surface runoff. If runoff is observed, discharge will be discontinued, and the system will be adjusted to prevent additional runoff or additional volume will be directed to the storm sewer.

Limitations

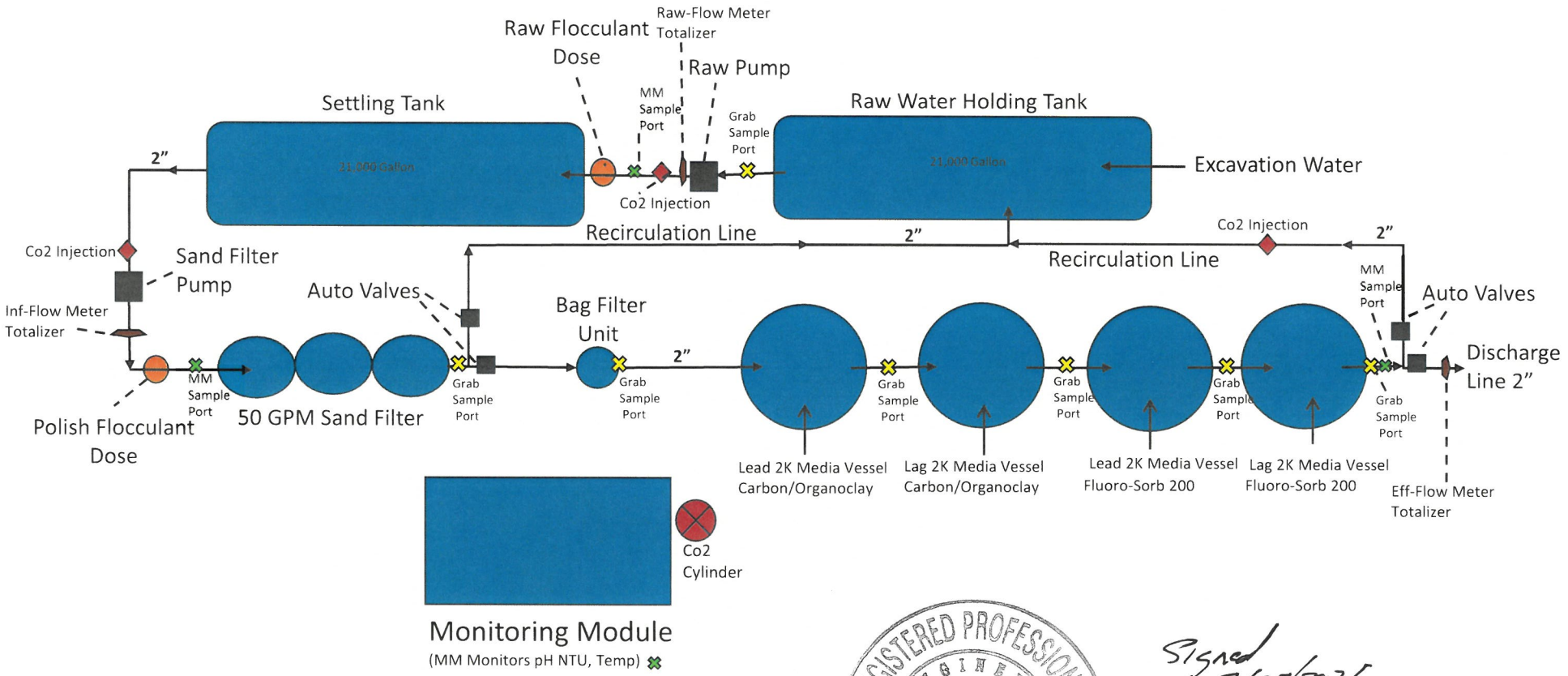
The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Appendix A

Process Flow Diagram

MAUL FOSTER ALONGI



REGISTERED PROFESSIONAL ENGINEER 65720PE OREGON JAN. 13, 2004 DANIEL A. SCARPINE

RENEWAL DATE: 6/30/ 2026

Signed 7/25/2025

Clear Creek Systems

Appendix B

Treatment System Cut Sheets

MAUL FOSTER ALONGI

Chitosan Enhanced Sand Filtration-ATS

WATER TREATMENT/MONITORING MODULE

• Turbidity Control • pH Control • Up to 1,200 GPM

WATER TREATMENT

- FloClear Chitosan Polymer injection for fine particle removal and turbidity control
- CO2 injection for pH control
- 24 Hrs per day – 7 days per week operational capability

MONITORING/DATA MANAGEMENT

- Programmable controller for influent and effluent flow control and data logging
- Monitors and controls turbidity, pH and water flow data
- Direct download to a computer for easy reporting
- Alerts the operator when a problem arises
- Lights, heater and work space for computer and jar testing
- Completely enclosed and lockable
- 8' Wide x 10' Long x 8' High
- Requires: 120v, 20 amp service
- Approximate Weight: 4,200 lbs.
- Complies with State of California storm water permit requirements for Active Treatment Systems (ATS)

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

WATER STORAGE
FRAC TANK

• Open Top • 21,000 Gallon

FEATURES

- Epoxy coated smooth wall interior
- Sloped bottom for easy clean out
- 20” curbside manway
- (4) 6” front ports (2) 6” rear ports
- Rear stairwell
- Full length observation walkway with OSHA hand rails
- Compact foot print
- No internal bracing

TECHNICAL

- Dimensions 39’ 9” L x 8’ 5” W x 11’ 4”H
- Safety Rail Height 44”
- Over the Road Height 12’ 10”
- Stairs Down Width 10’
- 25,000 lb. dry weight

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

B200
SEDIMENT FILTRATION

• Up to 200 GPM • 150 PSI

FEATURES

- Dual bag filtration
- Two (2) bag filters for high solids holding capacity
- Replaceable filter bags from 0.5 to 200 micron (Nominal)
- Manifold valving for easy isolation
- Capable of 100 GPM flow while changing one bag
- No moving parts
- Skid mounted
- Lifting lug

TECHNICAL

- Units fitted with bleed valves and pressure gauges
- Initial pressure drop is less than 5 psi at 200 gpm
- System can stand alone for sediment removal or can be used in combination with media vessels
- Utilizes industry standard type #2 bag filters

MATERIAL SPECIFICATIONS

- Chambers constructed with 304 stainless steel
- Piping construction: 3” Stainless Steel
- 3” Camlock inlet and outlet
- Each bag filter chamber holds one (1) 7” x 30”
- Type #2 filter bag
- Maximum operating pressure 150 psig
- Height 65” Width 56” Length 31”

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

SF-100
SEDIMENT FILTRATION

• Up to 1000 GPM • 150 PSI

FEATURES

- Skid mounted high rate automatic backwashing sand media filter designed for general-purpose water filtration of organic/inorganic solids.
- Ultra 116 automatic filter controller.
- Flush activation based on elapsed time and/or pressure differential.
- Back flush of 47 gpm, automatic (10 psi differential pressure over clean pressure drop, or manual mode)
- 13.5 sq ft of total filtration area

TECHNICAL

- Filtration- down to 20-30 microns
- Height: 5'-6"
- Width: 2'-4"
- Length: 6'-9" (skid length)
- Weight: 860 lbs (equipment only)
  1,850 lbs (media only)
  3,400 lbs operational
- Inlet/Outlet 3" flange, backwash line 2"

MATERIAL SPECIFICATIONS

- Design press – 100 psi max.
- Capacity- 95-142 gpm (normal flow range)
- Compressed air- 5 cfm minimum at 60 psi supplied by intergrally mounted compressor
- Requires 110 V AC

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

Appendix C

Safety Data Sheets

MAUL FOSTER ALONGI

SAFETY DATA SHEET

Carbon Dioxide

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier : Carbon Dioxide

Chemical name : Carbon dioxide, gas

Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

Product type : Gas.

Product use : Synthetic/Analytical chemistry and Medical use.

Synonym : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

SDS # : 001013

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

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 : GASES UNDER PRESSURE - Liquefied gas
Simple asphyxiant.

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.
May increase respiration and heart rate.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position.

Prevention : Use and store only outdoors or in a well ventilated place.

Response : Not applicable.

Storage : Protect from sunlight. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.
May cause frostbite.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Carbon dioxide, gas

Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

Product code : 001013

CAS number/other identifiers

CAS number : 124-38-9

Ingredient name	%	CAS number
Carbon Dioxide	100	124-38-9

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 10 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 : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

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.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

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.

Section 4. First aid measures

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.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

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. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. 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".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. 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 : Immediately contact emergency personnel. Stop leak if without risk.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. 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). Contains gas under pressure. Avoid breathing gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous.

Section 7. Handling and storage

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. Remove contaminated clothing and protective equipment before entering eating areas. 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 a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Carbon Dioxide	**ACGIH TLV (United States, 3/2017). Oxygen Depletion [Asphyxiant].** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **NIOSH REL (United States, 10/2016).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 10 hours. TWA: 5000 ppm 10 hours. **OSHA PEL (United States, 6/2016).** TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 18000 mg/m³ 8 hours. TWA: 10000 ppm 8 hours.

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. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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. 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

Section 8. Exposure controls/personal 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. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Compressed gas.]

Color : Colorless.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Sublimation temperature: -79°C (-110.2 to °F)

Boiling point : Not available.

Critical temperature : 30.85°C (87.5°F)

Flash point : [Product does not sustain combustion.]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

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

Vapor pressure : 830 (psig)

Vapor density : 1.53 (Air = 1) Liquid Density@BP: Solid density = 97.5 lb/ft3 (1562 kg/m3)

Specific Volume (ft^3/lb) : 8.7719

Gas Density (lb/ft^3) : 0.114

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : 0.83

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 44.01 g/mole

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 : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Section 11. Toxicological information

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

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

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Carbon Dioxide	0.83	-	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 at all times 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. Empty Airgas-owned pressure vessels should be returned to Airgas. 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. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1013	UN1013	UN1013	UN1013	UN1013
UN proper shipping name	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE
Transport hazard class(es)	2.2 	2.2 	2.2 	2.2 	2.2 
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : **Limited quantity** Yes.
Quantity limitation Passenger aircraft/rail: 75 kg. Cargo aircraft: 150 kg.

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).
Explosive Limit and Limited Quantity Index 0.125
Passenger Carrying Road or Rail Index 75

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 75 kg. Cargo Aircraft Only: 150 kg.

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.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Section 15. Regulatory information

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

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : **Japan inventory (ENCS)**: This material is listed or exempted.
Japan inventory (ISHL): This material is listed or exempted.

Malaysia : Not determined.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

Thailand : Not determined.

Turkey : This material is listed or exempted.

United States : This material is listed or exempted.

Viet Nam : Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	/	1
Flammability		0
Physical hazards		3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
GASES UNDER PRESSURE - Liquefied gas	Expert judgment

History

Date of printing : 2/12/2018

Date of issue/Date of revision : 2/12/2018

Date of previous issue : 4/25/2017

Version : 0.03

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Notice to reader

Section 16. Other information

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.

FloClear 2%

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 01/09/2017 Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Product name : FloClear 2%

Product code : 001401

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

Use of the substance/mixture : Stormwater Flocculant

1.3. Details of the supplier of the safety data sheet

Rocklin Products
4101 Union Avenue
Bakersfield, CA 93305 - USA

1.4. Emergency telephone number

Emergency number : Not Required

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified

2.2. Label elements

GHS-US labelling

No labelling applicable

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Allow breathing of fresh air. Allow the victim to rest.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Not flammable.

Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. No smoking.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well-ventilated place. Keep container closed when not in use.

Incompatible products : Strong bases. Strong acids.

Incompatible materials : Sources of ignition. Direct sunlight.

Storage temperature : 10 - 50 °C will freeze at 3C.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

FloClear 2%	
ACGIH	Not applicable
OSHA	Not applicable

8.2. Exposure controls

Personal protective equipment : Avoid all unnecessary exposure.

Hand protection : Wear protective gloves/protective clothing/eye protection/face protection protective gloves.

Eye protection : Chemical goggles or safety glasses.

Respiratory protection	:	Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Other information	:	Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	Colorless to Pale Yellow
Odour	:	vinegar
Odour threshold	:	No data available
pH	:	3 - 4.5
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	99.4 °C
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Density	:	1 - 1.1 g/ml
Solubility	:	Soluble.
Log Pow	:	No data available
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Not classified
Skin corrosion/irritation	:	Not classified pH: 3 - 4.5
Serious eye damage/irritation	:	Not classified pH: 3 - 4.5
Respiratory or skin sensitisation	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified
Potential adverse human health effects and symptoms	:	Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

FloClear 2%	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

FloClear 2%	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming	:	No known ecological damage caused by this product.
Other information	:	None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Ecology - waste materials : None known.

SECTION 14: Transport information

UN-No.(DOT)	:	Non Regulated
UN-No. (IMDG)	:	Non Regulated
UN-No. (IATA)	:	Non Regulated

14.2. UN proper shipping name

Proper Shipping Name (DOT)	:	Not applicable
Proper Shipping Name (IMDG)	:	Not applicable
Proper Shipping Name (IATA)	:	Not applicable

14.3. Transport hazard class(es)

Transport hazard class(es) (DOT) : Not applicable

:

Transport hazard class(es) (IMDG) : Not applicable

Transport hazard class(es) (IATA) : Not applicable

14.4. Packing group

Packing group (DOT) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : Not applicable

14.5. Environmental hazards

Marine pollutant(IMDG) : No

Marine pollutant(IATA) : No

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

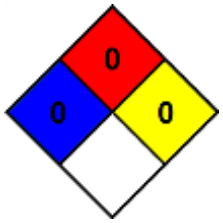
SECTION 16: Other information

Other information : None.

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 0 - No significant risk to health

Flammability : 0

Physical : 0

Personal Protection : B

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.

BRENNTAG

SAFETY DATA SHEET

1. Identification

Other means of identification None known.

Product identifier **SODIUM HYDROXIDE 25% NSF**

Recommended use ALL PROPER AND LEGAL PURPOSES

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Brenntag Pacific Inc.

Address 10747 Patterson Place
Santa Fe Springs, CA 90670

Telephone 562-903-9626

E-mail Not available.

Emergency phone number 800-424-9300 CHEMTREC

2. Hazard(s) identification

Physical hazards Not classified.

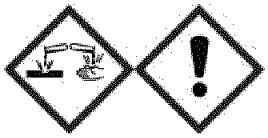
Health hazards

Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements



Signal word Danger

Hazard statement Causes severe skin burns and eye damage. Causes serious eye damage. May cause respiratory irritation.

Precautionary statement

Prevention Do not breathe mist/vapors. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

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. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information 25% of the mixture consists of component(s) of unknown acute oral toxicity. 75% of the mixture consists of component(s) of unknown acute inhalation toxicity.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
SODIUM HYDROXIDE (NA(OH))		1310-73-2	25
Other components below reportable levels			75

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Skin contact	Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Most important symptoms/effects, acute and delayed	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.
General information	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist/vapors. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Do not breathe mist/vapors. Do not get in eyes, on skin, or on clothing. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Store in tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	PEL	2 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	Ceiling	2 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	Ceiling	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

The following are recommendations for Personnel Protective Equipment (PPE). The employer/user of this product must perform a Hazard Assessment of the workplace according to OSHA regulations 29 CFR 1910.132 to determine the appropriate PPE for use while performing any task involving potential exposure to this product.

Eye/face protection Chemical respirator with organic vapor cartridge and full facepiece.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear appropriate chemical resistant clothing.

Respiratory protection Chemical respirator with organic vapor cartridge and full facepiece.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Liquid.

Form Liquid.

Color CLEAR TO HAZY

Odor ODORLESS

Odor threshold Not available.

pH 14

Melting point/freezing point -1 °F (-18.33 °C)

Initial boiling point and boiling range 791.6 °F (422 °C) estimated

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	10.66 lbs/gal 1.28 g/ml
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Percent volatile	75 % estimated
Specific gravity	1.28

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong acids.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Information on toxicological effects

Acute toxicity Not known.

Product	Species	Test Results
SODIUM HYDROXIDE 25% NSF		
Acute		
Dermal		
ATEmix		4400 mg/kg

Skin corrosion/irritation	Causes severe skin burns and eye damage.
Serious eye damage/eye irritation	Causes serious eye damage.
Respiratory or skin sensitization	
Respiratory sensitization	Due to partial or complete lack of data the classification is not possible.
Skin sensitization	Due to partial or complete lack of data the classification is not possible.
Germ cell mutagenicity	Due to partial or complete lack of data the classification is not possible.

Carcinogenicity Due to partial or complete lack of data the classification is not possible.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Due to partial or complete lack of data the classification is not possible.

Aspiration hazard Due to partial or complete lack of data the classification is not possible.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)			
Aquatic			
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	34.59 - 47.13 mg/l, 48 hours
Fish	LC50	Western mosquitofish (Gambusia affinis)	125 mg/l, 96 hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN1824

UN proper shipping name SODIUM HYDROXIDE SOLUTION RQ

Transport hazard class(es)

Class 8

Subsidiary risk -

Packing group II

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport information on packaging may be different from that listed. Transportation information on packaging may be different from that listed.

IATA

UN number UN1824

UN proper shipping name SODIUM HYDROXIDE SOLUTION RQ

Transport hazard class(es)

Class 8

Subsidiary risk -

Packing group II

Environmental hazards No.

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number UN1824

UN proper shipping name SODIUM HYDROXIDE SOLUTION (SODIUM HYDROXIDE (NA(OH)))

Transport hazard class(es)

Class 8

Subsidiary risk -

Packing group II

Environmental hazards

Marine pollutant No.

EmS F-A, S-B

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2) Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories	Skin corrosion or irritation Serious eye damage or eye irritation Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	05-04-2016
Revision date	11-03-2021
Version #	17
HMIS® ratings	Health: 3 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 3 Flammability: 0 Instability: 1
Disclaimer	While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with applicable federal, state, and local law. This SDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.

WESMAR CO. INC.
SAFETY DATA SHEET

1. Identification

Product identifier **SODIUM HYDROXIDE 50%**

Other means of identification Not available.

Synonyms Caustic Soda, Caustic Alkali, Lye, Caustic Soda Liquid 50%, Soda Lye, Liquid Caustic, Sodium Hydrate

Recommended restrictions None known.

Manufacturer / Importer / Supplier / Distributor information

Company name Wesmar Co. Inc.
Address 5720 204 ST SW
Lynnwood, WA 98036
Telephone 206-783-5344
E-mail http://www.wesmarcompany.com

Emergency phone number PERS (US) 1-800-633-8253

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage.

Precautionary statement

Prevention Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe mist or vapor. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Keep only in original container.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If inhaled: Remove person to fresh air and keep comfortable for breathing. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor/. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.

Storage Store in corrosive resistant container with a resistant inner liner. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) Not classified.

Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 3

Supplemental information

Hazard statement Harmful to aquatic life.

Precautionary statement

Prevention Avoid release to the environment.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Sodium hydroxide	1310-73-2	48 - 52
Sodium chloride	7647-14-5	< 1

4. First-aid measures

Inhalation

Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

Skin contact

Take off immediately all contaminated clothing. Wash off IMMEDIATELY with plenty of water for at least 15-20 minutes. Get medical attention immediately! Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion

Call a physician or poison control center immediately. Do not induce vomiting. Immediately rinse mouth and drink plenty of water. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Never give anything by mouth to an unconscious person. Do not use mouth-to-mouth method if victim ingested the substance.

Most important symptoms/effects, acute and delayed

Burning pain and severe corrosive skin damage. Permanent eye damage including blindness could result. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Shortness of breath.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Symptoms may be delayed. Keep victim under observation.

General information

In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media

Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). Use extinguishing agent suitable for type of surrounding fire.

Unsuitable extinguishing media

Do not use a solid water stream as it may scatter and spread fire. Do not use halogenated extinguishing agents.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. The product itself does not burn. May decompose upon heating to produce corrosive and/or toxic fumes. Contact with metal may release flammable hydrogen gas.

Special protective equipment and precautions for firefighters

Fire fighters should enter the area only if they are protected from all contact with the material. Full protective clothing, including self-contained breathing apparatus, coat, pants, gloves, boots and bands around legs, arms, and waist, should be worn. No skin surface should be exposed. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire-fighting equipment/instructions

In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Ensure adequate ventilation. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container. Following product recovery, flush area with water.

Small Spills: Absorb spill with vermiculite or other inert material. Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. For waste disposal, see Section 13 of the SDS.

Environmental precautions

Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Use caution when combining with water; DO NOT add water to caustic; ALWAYS add caustic to water while stirring to minimize heat generation. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe mist or vapor. Use only with adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Keep container tightly closed. Store in a cool, dry, well-ventilated place. Store in corrosive resistant container with a resistant inner liner. Store away from incompatible materials (See Section 10). Do not allow material to freeze.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	PEL	2 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	Ceiling	2 g/m3

US NIOSH Pocket Guide to Chemical Hazards: Ceiling Limit Value and Time Period (if specified)

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear chemical goggles and face shield.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear appropriate chemical resistant clothing.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with organic vapor cartridge and full facepiece.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Liquid.

Form Viscous liquid.

Color Clear to light grey.

Odor Odorless.

Odor threshold Not available.

pH 14

Melting point/freezing point 50 - 53 °F (10 - 11.67 °C) (50% solution)

Initial boiling point and boiling range 266 - 284 °F (130 - 140 °C) (50% solution)

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	23.76 mm Hg (25°C/77°F)
Vapor density	Not available.
Relative density	1.53
Relative density temperature	60 °F (15.56 °C)
Solubility(ies)	Completely miscible with water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	12.76 lb/gal (15.5°C / 60°F)
Molecular formula	NaOH
Molecular weight	40.1 g/mol

10. Stability and reactivity

Reactivity	Contact with metal may release flammable hydrogen gas.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Reacts violently with strong acids. This product may react with oxidizing agents. Do not mix with other chemicals. Corrosive to aluminum, tin, zinc, copper and most alloys in which they are present including brass and bronze. Corrosive to steels at elevated temperatures above 40°C (104°F).
Incompatible materials	Oxidizing agents. Acids. Phosphorus. Aluminum. Zinc. Tin. Initiates or catalyzes violent polymerization of acetaldehyde, acrolein or acrylonitrile.
Hazardous decomposition products	Contact with metals (aluminum, zinc, tin) and sodium tetrahydroborate liberates hydrogen gas.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Causes digestive tract burns. Harmful if swallowed.
Inhalation	May cause irritation to the respiratory system.
Skin contact	Causes severe skin burns.
Eye contact	Causes severe eye burns. Causes serious eye damage.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity Harmful if swallowed.

Product	Species	Test Results
Sodium Hydroxide Solutions (CAS Mixture)		
Acute		
dermal		
LD50	Rabbit	1350 mg/kg, (Sodium hydroxide)
Oral		
LD50	Rat	140 - 340 mg/kg, (Sodium hydroxide)

Skin corrosion/irritation	Causes severe skin burns and eye damage.
Serious eye damage/eye irritation	Causes severe eye burns. Causes serious eye damage.
Respiratory sensitization	No data available.
Skin sensitization	No data available.

Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	Not available.
Specific target organ toxicity - repeated exposure	Not available.
Aspiration hazard	Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
Chronic effects	Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity Harmful to aquatic life.

Components		Species	Test Results
Sodium hydroxide (CAS 1310-73-2)			
Aquatic			
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	34.59 - 47.13 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	99 mg/l, 48 hours
		Western mosquitofish (Gambusia affinis)	125 mg/l, 96 hours

Persistence and degradability	Expected to degrade rapidly in air.
Bioaccumulative potential	The product is not expected to bioaccumulate.
Mobility in soil	Not available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1824
UN proper shipping name	Sodium hydroxide solution
Transport hazard class(es)	8
Subsidiary class(es)	
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	B2, IB2, N34, T7, TP2
Packaging exceptions	154
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1824
UN proper shipping name	Sodium hydroxide solution
Transport hazard class(es)	8
Subsidiary class(es)	
Packaging group	II
Environmental hazards	No
Labels required	8
ERG Code	8L

Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1824
UN proper shipping name	SODIUM HYDROXIDE SOLUTION
Transport hazard class(es)	8
Subsidiary class(es)	
Packaging group	II
Environmental hazards	
Marine pollutant	No
Labels required	8
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	This substance/mixture is not intended to be transported in bulk.

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Sodium hydroxide (CAS 1310-73-2) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - Yes
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.
Food and Drug Administration (FDA)	Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Sodium hydroxide (CAS 1310-73-2)

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

Sodium hydroxide (CAS 1310-73-2)

US. Rhode Island RTK

Sodium hydroxide (CAS 1310-73-2)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

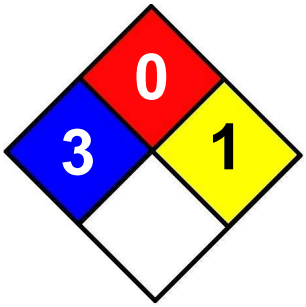
16. Other information, including date of preparation or last revision

Issue date 09-January-2014

Revision date

Version # 01

NFPA Ratings



List of abbreviations

LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.
EC50: Effective concentration, 50%.
TWA: Time weighted average.

References

EPA: AQUIRE database
HSDB® - Hazardous Substances Data Bank
US. IARC Monographs on Occupational Exposures to Chemical Agents
IARC Monographs. Overall Evaluation of Carcinogenicity
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

Disclaimer

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

SAFETY DATA SHEET

1. Identification

Product identifier **FLUORO-SORB® 200 absorbent**

Other means of identification

CAS number 68953-58-2

Recommended use adsorbent or absorbent technical function of substance

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name CETCO, a Minerals Technologies Company

Address 2870 Forbs Avenue
Hoffman Estates, IL 60192
United States

Telephone General Information 800.527.9948

Website http://www.cetco.com

E-mail safetydata@mineralstech.com

Emergency phone number 1.866.519.4752 (US, CA, MX) 1 760.476.3962

Americas 1.866.519.4752 (US, Canada, Mexico) 1 760 476 3962

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Carcinogenicity	Category 1A
Specific target organ toxicity, repeated exposure	Category 1

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May cause cancer. Causes damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Observe good industrial hygiene practices.

Response If exposed or concerned: Get medical advice/attention.

Storage Store in accordance with local/regional/national regulations.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information 100% of the substance consists of component(s) of unknown acute oral toxicity. 100% of the substance consists of component(s) of unknown acute dermal toxicity. 100% of the substance consists of component(s) of unknown acute inhalation toxicity. 100% of the substance consists of component(s) of unknown acute hazards to the aquatic environment. 100% of the substance consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite		68953-58-2	100

Constituents

Chemical name	Common name and synonyms	CAS number	%
QUARTZ (SIO2)		14808-60-7	<= 6
CRISTOBALITE		14464-46-1	<= 2

Composition comments Occupational Exposure Limits for constituents are listed in Section 8.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact Do not rub eyes.

Ingestion Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Dusts may irritate the respiratory tract, skin and eyes. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe dust. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Collect dust using a vacuum cleaner equipped with HEPA filter. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store in tightly closed container. Store in a well-ventilated place. Keep out of the reach of children. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	PEL	0.05 mg/m3	Respirable dust.
QUARTZ (SIO2) (CAS 14808-60-7)	PEL	0.05 mg/m3	Respirable dust.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Additional components	Type	Value	Form
INERT OR NUISANCE DUSTS	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	TWA	0.05 mg/m3	Respirable.
		1.2 mppcf	Respirable.
QUARTZ (SIO2) (CAS 14808-60-7)	TWA	0.1 mg/m3	Respirable.
		2.4 mppcf	Respirable.

US. ACGIH Threshold Limit Values

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	TWA	0.025 mg/m3	Respirable fraction.
QUARTZ (SIO2) (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	TWA	0.05 mg/m3	Respirable dust.
QUARTZ (SIO2) (CAS 14808-60-7)	TWA	0.05 mg/m3	Respirable dust.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

Individual protection measures, such as personal protective equipment

Eye/face protection

Applicable for industrial settings only. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.

Skin protection

Hand protection

Applicable for industrial settings only. Wear appropriate chemical resistant gloves.

Other	Applicable for industrial settings only. Use of an impervious apron is recommended.
Respiratory protection	Applicable for industrial settings only. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Solid.
Form	Micropowder. Powder. or Granular.
Color	Grey.
Odor	Slight. fatty odor
Odor threshold	Not available.
pH	6 - 9
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	275 °F (135 °C)
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Flammability	>= 950 °F (>= 510 °C)
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.

Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation Dust may irritate respiratory system.

Skin contact Dust or powder may irritate the skin.

Eye contact Dust may irritate the eyes.

Ingestion Knowledge about health hazard is incomplete.

Symptoms related to the physical, chemical and toxicological characteristics Dusts may irritate the respiratory tract, skin and eyes.

Information on toxicological effects

Acute toxicity Not known.

Toxicological data

Constituents	Species	Test Results
CRISTOBALITE (CAS 14464-46-1)		
Acute		
Oral		
LD50	Rat	> 22500 mg/kg

Skin corrosion/irritation Due to partial or complete lack of data the classification is not possible.

Serious eye damage/eye irritation Due to partial or complete lack of data the classification is not possible.

Respiratory or skin sensitization

Respiratory sensitization Due to partial or complete lack of data the classification is not possible.

Skin sensitization Due to partial or complete lack of data the classification is not possible.

Germ cell mutagenicity Due to partial or complete lack of data the classification is not possible.

Carcinogenicity May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

CRISTOBALITE (CAS 14464-46-1)	1 Carcinogenic to humans.
QUARTZ (SIO2) (CAS 14808-60-7)	1 Carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

CRISTOBALITE (CAS 14464-46-1)	Cancer
QUARTZ (SIO2) (CAS 14808-60-7)	Cancer

US. National Toxicology Program (NTP) Report on Carcinogens

CRISTOBALITE (CAS 14464-46-1)	Known To Be Human Carcinogen. Reasonably Anticipated to be a Human Carcinogen.
QUARTZ (SIO2) (CAS 14808-60-7)	Known To Be Human Carcinogen.

Reproductive toxicity Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - single exposure Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard Due to partial or complete lack of data the classification is not possible.

Chronic effects Causes damage to organs through prolonged or repeated exposure.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

CRISTOBALITE (CAS 14464-46-1)	Cancer
QUARTZ (SIO2) (CAS 14808-60-7)	Cancer
CRISTOBALITE (CAS 14464-46-1)	lung effects
QUARTZ (SIO2) (CAS 14808-60-7)	lung effects
CRISTOBALITE (CAS 14464-46-1)	immune system effects
QUARTZ (SIO2) (CAS 14808-60-7)	immune system effects
CRISTOBALITE (CAS 14464-46-1)	kidney effects
QUARTZ (SIO2) (CAS 14808-60-7)	kidney effects

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	No (Exempt)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

California Proposition 65

WARNING: This product can expose you to QUARTZ (SIO2), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

QUARTZ (SIO2) (CAS 14808-60-7) Listed: October 1, 1988

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

CRISTOBALITE (CAS 14464-46-1)
QUARTZ (SIO2) (CAS 14808-60-7)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 12-July-2019

Revision date 12-December-2019

Version # 15

HMIS® ratings Health: 3*
Flammability: 0
Physical hazard: 0

NFPA ratings Health: 2
Flammability: 0
Instability: 0

Disclaimer CETCO, a Minerals Technologies Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use.

The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision information This document has undergone significant changes and should be reviewed in its entirety.

Hydrosil International LTD.
125 Prairie Lake Road - East Dundee, IL 60118
Phone: 847-844-0680
Emergency Phone: 847-844-0680
Fax: 847-844-0799

Back to HS-250-AC

HS-250-AC

50/50 Blend by Volume of HS-200 and 6 x 12 Mesh Coconut Shell Activated Carbon Safety Data Sheet

Revision date : 2017

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 - Product Identifier

Product Name: HS-250AC

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

Use of the substance/mixture : Filtration

1.3 - Details of the supplier of the safety data sheet

Hydrosil International Ltd.
125 Prairie Lake Rd
East Dundee, IL 60118
(P) 847-844-0680
(F) 847-844-0799
www.hydrosilintl.com

1.4 - Emergency telephone number

Emergency number : 1-847-844-0680

Section 2: Hazards Identification

2.1 - Classification of the substance or mixture

GHS-US classification
Eye Dam. 1 H318
STOT SE 3 H335

2.2 - Label Elements

GHS-US labelling

Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) :

H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor/…
P312 - Call a POISON CENTER/doctor/…/if you feel unwell
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to ...

2.3 - Other Hazards

No additional information available

2.4 - Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1 - Substances

Not applicable

3.2 - Mixture

Name	Product Identifier	%	GHS-US Classification
Zeolite	(CAS No.) 1318-02-1	55.85 - 57.85	STOT SE 3, H335
Carbon	(CAS No.) 7732-18-5	33.09 - 35.09	Not classified
Water	(CAS No.) 7732-18-5	2.84 - 8.84	Not classified
N,N,N-Trimethyl-1-hexadecanaminium chloride	(CAS No.) 112-02-7	2.22 - 4.22	Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400

SECTION 4: First aid measures

4.1 - Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Get immediate medical attention.
First-aid measures after skin contact : If skin reddening or irritation develops, seek medical attention.
First-aid measures after eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.
First-aid measures after ingestion : If the material is swallowed, get immediate medical attention or advice. DO NOT induce vomiting unless directed to do so by medical personnel.

4.2 - Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May cause respiratory irritation.
Symptoms/injuries after skin contact : Causes skin irritation.
Symptoms/injuries after eye contact : Causes serious eye irritation.
Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3 - Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1 - Extinguishing media

Suitable extinguishing media : If involved with fire, flood with plenty of water.
Unsuitable extinguishing media : None.

5.2 - Special hazards arising from the substance or mixture

Fire hazard : None known.
Explosion hazard : None known.

5.3 - Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

6.1 - Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with the skin and the eyes.
For non-emergency personnel : No additional information available
For emergency responders : No additional information available

6.2 - Environmental precautions

None.

6.3 - Methods and material for containment and cleaning up

For containment : If possible, stop flow of product.
Methods for cleaning up : Shovel or sweep up and put in a closed container for disposal.

6.4 - Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1 - Precautions for safe handling

Precautions for safe handling : Avoid contact with eyes.

7.2 - Conditions for safe storage, including any incompatibilities

Storage conditions : Protect containers from physical damage. Store in dry, cool, well-ventilated area.

7.3 - Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1 - Control parameters

No additional information available

8.2 - Exposure controls

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.
Hand protection : Use impervious gloves.
Eye protection : Safety glasses.
Skin and body protection : Wear suitable working clothes.
Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

SECTION 9: Physical and chemical properties

9.1 - Information on basic physical and chemical properties

Physical state : Solid
Appearance : Irregular shaped
Colour : White/black
Odour : No data available
Odour threshold : No data available
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : No data available
Self ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : No data available
Relative vapour density at 20 °C : No data available
Relative density : 54-56 lb/ft3
Solubility : No data available
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

9.1 - Other information

No additional information available

SECTION 10: Stability and reactivity

10.1 - Reactivity

No additional information available

10.2 - Chemical stability

Stable under normal conditions.

10.3 - Possibility of hazardous reactions

Will not occur

10.4 - Conditions to avoid

None

10.5 - Incompatible materials

Strong oxidizing and reducing agents.

10.6 - Hazardous decomposition products

Carbon monoxide may be generated in the event of a fire. Organic chlorides, amines, hydrogen chloride may be produced.

SECTION 11: Toxicological information

11.1 - Information on toxicological effects

Acute toxicity : Not classified

Zeolite (1318-02-1)	
LD50 oral rat	5000 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	2.4 mg/l (Exposure time: 1 h)
ATE (oral)	5000 mg/kg

Carbon (7440-44-0)	
LD50 oral rat	> 10000 mg/kg

Potassium permanganate (7722-64-7)	
LD50 dermal rabbit	4300 uL/kg/24H;

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes serious eye damage.
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified

Zeolite (1318-02-1)	
IARC group	3

Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : May cause respiratory irritation.
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1 - Toxicity

Zeolite (1318-02-1)	
LC50 fishes 1	1800 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [semi-static])
EC50 Daphnia 1	1000 - 1800 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	18 mg/l (Exposure time: 96 h - Species: Desmodesmus subspicatus)
LC50 fish 2	3200 - 5600 mg/l (Exposure time: 96 h - Species: Oryzias latipes [semi-static])

12.2 - Persistence and degradability

No additional information available

12.3 - Bioaccumulative potential

No additional information available

12.4 - Mobility in soil

No additional information available

12.5 - Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1 - Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with DOT / ADR / RID / ADNR / IMDG / ICAO / IATA

14.1 - UN number

Not applicable

14.2 - UN proper shipping name

Not applicable

SECTION 15: Regulatory information

15.1 - US Federal regulations

N,N,N-Trimethyl-1-hexadecanaminium chloride (112-02-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Carbon (7440-44-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2 - US State regulations

No additional information available

SECTION 16: Other information

Full text of H-phrases:

Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Irrit. 2	skin corrosion/irritation Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation
H400	Very toxic to aquatic life

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt
medical attention is given.
NFPA fire hazard : 0 - Materials that will not burn.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water

Back to HS-250-AC

Appendix D

Laboratory MRLs

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Analytical Method Details - Apex Laboratories

Method	Analyte	MDL	MRL	Units	Surr. %R	DUP RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike %R	Blank Spike RPD	CAS #	OAR 340-041-8033, Table 30 RBC Chronic	OAR 340-041-8033, Table 30 RBC Acute	Appendix D Columbia Slough SLV
Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Silica Gel Column Cleanup in Water														
NWTPH-Dx/SGC	Diesel	0.0400	0.0800	mg/L	-	30	36-132	30	36-132	30	68334-30-5	0.64	--	--
NWTPH-Dx/SGC	Oil	0.0800	0.160	mg/L	-	30	-	-	-	-	Oil	0.64	--	--
Volatile Organic Compounds by EPA 8260D in Water														
EPA 8260D	Acetone	10.0	20.0	ug/L	-	30	39-160	30	80-120	30	67-64-1	1,700	15,000	1,500
EPA 8260D	Acrylonitrile	1.00	2.00	ug/L	-	30	63-135	30	80-120	30	107-13-1	12,000	100,000	0.25
EPA 8260D	Benzene	0.100	0.200	ug/L	-	30	79-120	30	80-120	30	71-43-2	160	700	51
EPA 8260D	Bromobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	108-86-1	--	--	--
EPA 8260D	Bromochloromethane	0.500	1.00	ug/L	-	30	78-123	30	80-120	30	74-97-5	--	--	--
EPA 8260D	Bromodichloromethane	0.500	1.00	ug/L	-	30	79-125	30	80-120	30	75-27-4	320	2,900	--
EPA 8260D	Bromoform	0.500	1.00	ug/L	-	30	66-130	30	80-120	30	75-25-2	230	1,100	140
EPA 8260D	Bromomethane	5.00	5.00	ug/L	-	30	53-141	30	80-120	30	74-83-9	16	38	--
EPA 8260D	2-Butanone (MEK)	5.00	10.0	ug/L	-	30	56-143	30	80-120	30	78-93-3	22,000	200,000	--
EPA 8260D	n-Butylbenzene	0.500	1.00	ug/L	-	30	75-128	30	80-120	30	104-51-8	--	--	--
EPA 8260D	sec-Butylbenzene	0.500	1.00	ug/L	-	30	77-126	30	80-120	30	135-98-8	--	--	--
EPA 8260D	tert-Butylbenzene	0.500	1.00	ug/L	-	30	78-124	30	80-120	30	98-06-6	--	--	--
EPA 8260D	Carbon disulfide	5.00	10.0	ug/L	-	30	64-133	30	80-120	30	75-15-0	15	130	0.92
EPA 8260D	Carbon tetrachloride	0.500	1.00	ug/L	-	30	72-136	30	80-120	30	56-23-5	77	690	1.6
EPA 8260D	Chlorobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	108-90-7	25	220	50
EPA 8260D	Chloroethane	5.00	5.00	ug/L	-	30	60-138	30	80-120	30	75-00-3	--	--	--
EPA 8260D	Chloroform	0.500	1.00	ug/L	-	30	79-124	30	80-120	30	67-66-3	140	1,300	470
EPA 8260D	Chloromethane	2.50	5.00	ug/L	-	30	50-139	30	80-120	30	74-87-3	--	--	--
EPA 8260D	2-Chlorotoluene	0.500	1.00	ug/L	-	30	79-122	30	80-120	30	95-49-8	--	--	--
EPA 8260D	4-Chlorotoluene	0.500	1.00	ug/L	-	30	78-122	30	80-120	30	106-43-4	--	--	--
EPA 8260D	Dibromochloromethane	0.500	1.00	ug/L	-	30	74-126	30	80-120	30	124-48-1	320	2,900	13
EPA 8260D	1,2-Dibromo-3-chloropropane	2.50	5.00	ug/L	-	30	62-128	30	80-120	30	96-12-8	--	--	--
EPA 8260D	1,2-Dibromoethane (EDB)	0.250	0.500	ug/L	-	30	77-121	30	80-120	30	106-93-4	--	--	--
EPA 8260D	Dibromomethane	0.500	1.00	ug/L	-	30	79-123	30	80-120	30	74-95-3	--	--	--
EPA 8260D	1,2-Dichlorobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	95-50-1	23	130	--
EPA 8260D	1,3-Dichlorobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	541-73-1	22	79	--
EPA 8260D	1,4-Dichlorobenzene	0.250	0.500	ug/L	-	30	79-120	30	80-120	30	106-46-7	9.4	57	--
EPA 8260D	Dichlorodifluoromethane	0.500	1.00	ug/L	-	30	32-152	30	80-120	30	75-71-8	340	3,100	--
EPA 8260D	1,1-Dichloroethane	0.200	0.400	ug/L	-	30	77-125	30	80-120	30	75-34-3	410	3,700	47
EPA 8260D	1,2-Dichloroethane (EDC)	0.200	0.400	ug/L	-	30	73-128	30	80-120	30	107-06-2	2,000	8,200	37
EPA 8260D	1,1-Dichloroethene	0.200	0.400	ug/L	-	30	71-131	30	80-120	30	75-35-4	410	3,700	--
EPA 8260D	cis-1,2-Dichloroethene	0.200	0.400	ug/L	-	30	78-123	30	80-120	30	156-59-2	620	5,500	590
EPA 8260D	trans-1,2-Dichloroethene	0.200	0.400	ug/L	-	30	75-124	30	80-120	30	156-60-5	560	10,000	590
EPA 8260D	1,2-Dichloropropane	0.250	0.500	ug/L	-	30	78-122	30	80-120	30	78-87-5	520	3,300	15
EPA 8260D	1,3-Dichloropropane	0.500	1.00	ug/L	-	30	80-120	30	80-120	30	142-28-9	--	--	--
EPA 8260D	2,2-Dichloropropane	0.500	1.00	ug/L	-	30	60-139	30	80-120	30	594-20-7	--	--	--
EPA 8260D	1,1-Dichloropropene	0.500	1.00	ug/L	-	30	79-125	30	80-120	30	563-58-6	--	--	--
EPA 8260D	cis-1,3-Dichloropropene	0.500	1.00	ug/L	-	30	75-124	30	80-120	30	10061-01-5	--	--	0.055
EPA 8260D	trans-1,3-Dichloropropene	0.500	1.00	ug/L	-	30	73-127	30	80-120	30	10061-02-6	--	--	0.055
EPA 8260D	Ethylbenzene	0.250	0.500	ug/L	-	30	79-121	30	80-120	30	100-41-4	61	550	7.3
EPA 8260D	Hexachlorobutadiene	2.50	5.00	ug/L	-	30	66-134	30	80-120	30	87-68-3	1	10	--
EPA 8260D	2-Hexanone	5.00	10.0	ug/L	-	30	57-139	30	80-120	30	591-78-6	--	--	99
EPA 8260D	Isopropylbenzene	0.500	1.00	ug/L	-	30	72-131	30	80-120	30	98-82-8	4.8	43	--
EPA 8260D	4-Isopropyltoluene	0.500	1.00	ug/L	-	30	77-127	30	80-120	30	99-87-6	16	150	--
EPA 8260D	Methylene chloride	5.00	10.0	ug/L	-	30	74-124	30	80-120	30	75-09-2	1,500	8,500	590
EPA 8260D	4-Methyl-2-pentanone (MiBK)	5.00	10.0	ug/L	-	30	67-130	30	80-120	30	108-10-1	170	2,200	170
EPA 8260D	Methyl tert-butyl ether (MTBE)	0.500	1.00	ug/L	-	30	71-124	30	80-120	30	1634-04-4	730	6,500	--
EPA 8260D	Naphthalene	2.50	5.00	ug/L	-	30	61-128	30	80-120	30	91-20-3	21	170	--
EPA 8260D	n-Propylbenzene	0.250	0.500	ug/L	-	30	76-126	30	80-120	30	103-65-1	--	--	--
EPA 8260D	Styrene	0.500	1.00	ug/L	-	30	78-123	30	80-120	30	100-42-5	32	290	--
EPA 8260D	1,1,1,2-Tetrachloroethane	0.200	0.400	ug/L	-	30	78-124	30	80-120	30	630-20-6	85	770	11
EPA 8260D	1,1,2,2-Tetrachloroethane	0.250	0.500	ug/L	-	30	71-121	30	80-120	30	79-34-5	200	910	4
EPA 8260D	Tetrachloroethene (PCE)	0.200	0.400	ug/L	-	30	74-129	30	80-120	30	127-18-4	53	430	3.3
EPA 8260D	Toluene	0.500	1.00	ug/L	-	30	80-121	30	80-120	30	108-88-3	62	560	9.8
EPA 8260D	1,2,3-Trichlorobenzene	1.00	2.00	ug/L	-	30	69-129	30	80-120	30	87-61-6	8	130	--
EPA 8260D	1,2,4-Trichlorobenzene	1.00	2.00	ug/L	-	30	69-130	30	80-120	30	120-82-1	130	420	--
EPA 8260D	1,1,1-Trichloroethane	0.200	0.400	ug/L	-	30	74-131	30	80-120	30	71-55-6	76	690	--
EPA 8260D	1,1,2-Trichloroethane	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	79-00-5	730	3,200	16
EPA 8260D	Trichloroethene (TCE)	0.200	0.400	ug/L	-	30	79-123	30	80-120	30	79-01-6	220	2,000	30
EPA 8260D	Trichlorofluoromethane	1.00	2.00	ug/L	-	30	65-141	30	80-120	30	75-69-4	--	--	--
EPA 8260D	1,2,3-Trichloropropane	0.500	1.00	ug/L	-	30	73-122	30	80-120	30	96-18-4	--	--	--
EPA 8260D	1,2,4-Trimethylbenzene	0.500	1.00	ug/L	-	30	76-124	30	80-120	30	95-63-6	15	140	--
EPA 8260D	1,3,5-Trimethylbenzene	0.500	1.00	ug/L	-	30	75-124	30	80-120	30	108-67-8	26	230	--
EPA 8260D	Vinyl chloride	0.100	0.200	ug/L	-	30	58-137	30	80-120	30	75-01-4	930	8,400	2.4
EPA 8260D	m,p-Xylene	0.500	1.00	ug/L	-	30	80-121	30	80-120	30	179601-23-1	--	--	1.8
EPA 8260D	o-Xylene	0.250	0.500	ug/L	-	30	78-122	30	80-120	30	95-47-6	--	--	13
EPA 8260D	Xylenes, total	0.750	1.50	ug/L	-	30	79-121	30	80-120	30	1330-20-7	27	240	--

Notes:

DEQ, 2019. Oregon National Ambient Water Quality Criteria: OAR 340-041-8033, Table 30, Aquatic Life Water Quality Criteria for Toxic Pollutants.

DEQ, 2011. Appendix D: Stormwater Data Reporting and Screening Table for Non-Portland Harbor Sites.

Method: **EPA 1633**
Matrix: **Aqueous**
Units: **ng/L**

			non-DoD		DoD		
LIMS Order	CAS #	Analyte	MDL (ng/L)	MRL (ng/L)	DL (ng/L)	LOD (ng/L)	LOQ (ng/L)
1	375-22-4	PFBA	1.60	6.40	2.40	4.80	6.40
2	377-73-1	PFMPA	0.683	3.20	1.20	2.40	3.20
3	356-02-5	3:3FTCA	1.58	8.00	3.00	6.00	8.00
4	2706-90-3	PFPeA	0.419	3.20	1.20	2.40	3.20
5	863090-89-5	PFMBA	0.451	3.20	1.20	2.40	3.20
6	757124-72-4	4:2FTS	1.27	6.00	2.24	4.48	6.00
7	151772-58-6	NFDHA	1.55	3.20	1.20	2.40	3.20
8	375-73-5	PFBS	0.675	1.42	0.503	1.06	1.42
9	307-24-4	PFHxA	0.273	1.60	0.600	1.20	1.60
10	13252-13-6	HFPO-DA	1.70	6.68	2.40	4.80	6.68
11	914637-49-3	5:3FTCA	6.77	40.0	15.0	30.0	40.0
12	113507-82-7	PFEESA	0.372	2.85	1.07	2.14	2.85
13	375-85-9	PFHpA	0.271	1.60	0.600	1.20	1.60
14	2706-91-4	PFPeS	0.484	1.50	0.565	1.13	1.50
15	919005-14-4	ADONA	1.59	6.32	2.26	4.52	6.32
16	27619-97-2	6:2FTS	1.22	6.07	2.28	4.56	6.07
17	335-67-1	PFOA	1.78	2.00	0.600	1.20	1.60
18	355-46-4	PFHxS	0.504	1.60	0.550	1.10	1.60
19	812-70-4	7:3FTCA	3.59	40.0	15.0	30.0	40.0
20	375-95-1	PFNA	0.242	1.60	0.600	1.20	1.60
21	375-92-8	PFHpS	0.377	1.52	0.570	1.14	1.52
22	39108-34-4	8:2FTS	1.87	6.14	2.32	4.64	6.14
23	335-76-2	PFDA	0.425	1.60	0.600	1.20	1.60
24	2355-31-9	MeFOSAA	0.691	1.60	0.600	1.20	1.60
25	1763-23-1	PFOS	1.17	1.49	0.555	1.11	1.49
26	2991-50-6	EtFOSAA	0.689	1.60	0.600	1.20	1.60
27	2058-94-8	PFUnA	0.413	1.60	0.600	1.20	1.60
28	756426-58-1	9Cl-PF3ONS	1.92	6.24	2.24	4.48	6.24
29	68259-12-1	PFNS	0.604	1.54	0.580	1.16	1.54
30	754-91-6	PFOSA	0.398	1.60	0.600	1.20	1.60
31	307-55-1	PFDoA	0.223	1.60	0.600	1.20	1.60
32	335-77-3	PFDS	0.564	1.54	0.580	1.16	1.54
33	72629-94-8	PFTrDA	0.256	1.60	0.600	1.20	1.60
34	763051-92-9	11Cl-PF3OUdS	1.93	6.00	2.26	4.52	6.00
35	376-06-7	PFTeDA	0.239	1.60	0.600	1.20	1.60
36	79780-39-5	PFDoS	0.497	1.55	0.580	1.16	1.55
37	24448-09-7	MeFOSE	2.60	16.0	6.00	12.00	16.00
38	31506-32-8	MeFOSA	1.01	1.60	0.600	1.20	1.60

39	1691-99-2	EtFOSE	2.55	16.0	6.00	12.00	16.00
40	4151-50-2	EtFOSA	0.972	1.60	0.600	1.20	1.60

MDL last verified 2/02/24.

*Based on 500mL initial and 5mL final

List of 40 analytes.

Limits are updated periodically

For instruments M/V

Attachment D

EMP Review Application

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Contaminated Media Environmental Management Plan Review Application

Under Section 6 of the 1200-CA NPDES Construction Stormwater General Discharge Permit, if "treatment chemicals" are to be added to stormwater and/or authorized non-stormwater prior to discharge, the following EMP application must be submitted to DEQ prior to the initiation of construction activities. Submit this form to describe the proposed use of treatment chemicals.

I. Permit Registrant Information

Permit Registrant Name: Port of Portland			
Mailing Address: 7200 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Phone: (503) 415-6566	Email:	Blake.Hamalainen@portofportland.com	

II. Project/Site Information

Project/Site Name: Portland International Airport - Basin 1 Subarea Stormwater Improvements Project			
Project/Site Address: 7000 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Site contact name (if different from permit registrant):			
Name:	Phone:	Email:	
Name:	Phone:	Email:	
Names of receiving waterbodies:			
Columbia Slough			

III. Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Erosion and Sediment Control Plan (ESCP):

- DEQ Environmental Cleanup Site Information (ECSI) site number (if applicable)
- A list or table of all known contaminants with lab tests results showing concentration and depth
- A list of all disposal locations
- Notice of approval from local jurisdiction if discharge is to public storm system
- A map with sample locations
- Temporary Erosion and Sediment Control Plans specific to contaminated soils
- Plans for offsite disposal of contaminated soils
- Any relevant (related) portions of ESCP that address the management of contaminated and potentially contaminated construction stormwater and dewatering program (if applicable)
- The dewatering plan (if applicable)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All area of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

IV. Responsible Personnel

Treatment System Operator	Subcontractor (if applicable)
Clear Creek Systems	

Street/Location:	City:	State	Zip	County
6457 NE Columbia Street	Portland	OR	97218	Multnomah

Responsible personnel. List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

Lists of operators with training and certifications is attached. Clear Creek Systems is a dedicated water treatment firm specializing in the requirements of the project.

V. Proposed Treatment

- Check proposed treatment system.
- Chitosan enhanced sand filtration with discharge to infiltration (ground water)
- Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).
- Chitosan enhanced sand filtration with discharge to surface waters (flow-through).
- Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/ discharge)

Check proposed cationic chemical(s) to be used:			
FlocClear™ (2% chitosan acetate solution)	X	LiquiFloc™ (1% chitosan acetate solution).	
ChitoVan™ (1% chitosan acetate solution)		StormKlear™	
LiquiFloc™ (3% Chitosan acetate solution)		StormKlearTM LiquiFlocTM (1% chitosan acetate solution)	
Other"			
Estimated Treatment Period Start Date:		Estimated Treatment Period End Date:	
May 2026		September 2026	

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

This information is presented in the Groundwater Discharge, Treatment, and Monitoring Plan.

VI. Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the ESCP for this project:

- The ESCP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to tribal waters, I notified the appropriate tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g., cause erosion).

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

Authorized Official First Name, Middle Initial, Last Name:

Title:

Manager, Environmental Land & Water

Signature:

Blake Hamalainen

Date:

10/24/2025

Email: Blake.Hamalainen@portofportland.com

Active Chemical Treatment Systems

This Section of Appendix A provides the Environmental Management Plan review application for projects with an active chemical treatment system (e.g., electro-coagulation, flocculants, filtration, polymers, hydrochloric or sulfuric acid) for sediment, pH neutralization, or other pollutant removal is planned or implemented. When "treatment chemicals" are proposed to treat stormwater and/or authorized non-stormwater prior to discharge, Section 6 of the 1200-CA permit requires the permit registrant to submit the following EMP review application to DEQ prior to the commencement of construction activities. DEQ may assign coverage under this permit after the permit registrant has included appropriate controls and implementation procedures designed to ensure that the above activities will not lead to discharges that cause an exceedance of water quality standards. In the absence of authorization, the permit registrant must apply for and receive coverage under an individual permit prior to discharging from the site.

Active Chemical Treatment System Environmental Management Plan Review Application

Under Section 6 of the 1200-CA NPDES Construction Stormwater General Discharge Permit, if "treatment chemicals" are to be added to stormwater and/or authorized non-stormwater prior to discharge, the following EMP application must be submitted to DEQ before the initiation of construction activities. Submit this form to describe the proposed use of treatment chemicals.

I. Permit Registrant Information

Permit Registrant Name: Port of Portland			
Mailing Address: 7200 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Phone: (503) 415-6566	Email:	Blake.Hamalainen@portofportland.com	

II. Project/Site Information

Project/Site Name: Portland International Airport - Basin 1 Subarea Stormwater Improvements Project			
Project/Site Address: 7000 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Site contact name (if different from permit registrant):			
Name:	Phone:	Email:	
Name:	Phone:	Email:	
Names of receiving waterbodies:			
Columbia Slough			

III. Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Erosion and Sediment Control Plan (ESCP):

- DEQ Environmental Cleanup Site Information (ECSI) site number (if applicable)
- A list or table of all known contaminants with lab tests results showing concentration and depth
- A list of all disposal locations
- Notice of approval from local jurisdiction if discharge is to public storm system
- A map with sample locations
- Temporary Erosion and Sediment Control Plans specific to contaminated soils
- Plans for offsite disposal of contaminated soils
- Any relevant (related) portions of ESCP that address the management of contaminated and potentially contaminated construction stormwater and dewatering program (if applicable)
- The dewatering plan (if applicable)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All area of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

IV. Responsible Personnel

Treatment System Operator	Subcontractor (if applicable)
Clear Creek Systems	

Street/Location:	City:	State	Zip	County
6457 NE Columbia Street	Portland	OR	97218	Multnomah

Responsible personnel. List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

Lists of operators with training and certifications is attached. Clear Creek Systems is a dedicated water treatment firm specializing in the requirements of the project.

V. Proposed Treatment

- Check proposed treatment system.
- Chitosan enhanced sand filtration with discharge to infiltration (ground water)
- Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).
- Chitosan enhanced sand filtration with discharge to surface waters (flow-through).
- Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/ discharge)

Check proposed cationic chemical(s) to be used:			
FlocClear™ (2% chitosan acetate solution)	X	LiquiFloc™ (1% chitosan acetate solution).	
ChitoVan™ (1% chitosan acetate solution)		StormKlear™	
LiquiFloc™ (3% Chitosan acetate solution)		StormKlearTM LiquiFlocTM (1% chitosan acetate solution)	
Other"			

Estimated Treatment Period Start Date:	Estimated Treatment Period End Date:
May 2026	September 2026

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

This information is presented in the Groundwater Discharge, Treatment, and Monitoring Plan.

VI. Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the ESCP for this project:

- The ESCP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to tribal waters, I notified the appropriate tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g., cause erosion).

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

Authorized Official First Name, Middle Initial, Last Name:

Title:

Manager, Environmental Land & Water

Signature: Blake Hamalainen

Date: 10/24/2025

Email: Blake.Hamalainen@portofportland.com