MAUL FOSTER ALONGI
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July 25, 2025
Project No. M0232.17.111

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

Re: Terminal Core Redevelopment Project – Environmental Management Plan

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 after issuance of the NPDES 1200-CA to address areas now known or suspected to contain per-and polyfluoroalkyl substances (PFAS) associated with historical operations.

Applicability

The construction activities will be conducted on a portion of the Portland International Airport (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 (previously uploaded to YDO).
- 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 perform periodic site inspections to verify compliance with all requirements. A construction completion report will be prepared and submitted to the DEQ.

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:

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- 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 YDO for erosion control drawings.
- 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 plans in YDO.
- 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
    - See proposed discharge location shown on drawing PDX 2021-510 Sheet C4.010-F in Attachment C.
- All soil types within areas to be disturbed
    - See CMMP in Attachment A.
- All area of earth disturbance
    - See YDO for erosion control drawings.
- Sufficient indication of topography to indicate where stormwater flows
    - See YDO for erosion control drawings.
- Schematic drawing of the proposed treatment system
    - See Groundwater Discharge, Treatment, and Monitoring Management Plan in Attachment C.

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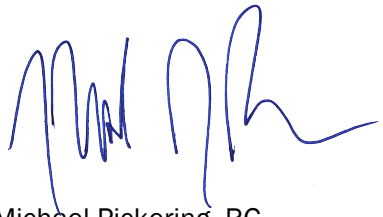
Sincerely,

Maul Foster & Alongi, Inc.



Michael Pickering, RG
Principal Geologist

Attachments

Limitations

A—CMMP

B—Temporary Erosion and Sediment Control Plans (already submitted via YDO)

C—Groundwater Discharge, Treatment, and Monitoring Management Plan

D—EMP Review Application

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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.

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Attachment A

CMMP

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Revised Contaminated Media Management Plan

Terminal Core Redevelopment Project
Portland International Airport

Prepared for:

Port of Portland

July 25, 2025
Project No. M0232.17.111

Prepared by:

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

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Revised Contaminated Media Management Plan

Terminal Core Redevelopment 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.

Michael Pickering, RG
Principal Geologist

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Contents

Limitations

Tables

Figures

Appendix

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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
ng/g	nanograms/gram
ng/L	nanograms per liter
OAR	Oregon Administrative Rules
OSHA	Occupational Safety and Health Administration
PFAS	per- and polyfluoroalkyl substances (PFAS)
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PFBS	perfluorobutane sulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
Port	Port of Portland
RCRA	Resource Conservation and Recovery Act
the Site	Terminal Core Redevelopment Project
TPH	total petroleum hydrocarbons
TCLP	toxicity characteristic leaching procedure
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
VOC	volatile organic compounds

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1 Introduction

This contaminated media management plan (CMMP) (the "Plan") was prepared for the Port of Portland (Port) Terminal Core Redevelopment Project PKG F – Grease Interceptor site (the "Site"; near Gate D-3) at the Portland International Airport (PDX). The Site is presented on drawing PDX 2021-510 Sheet C4.005-F in Attachment C of the Environmental Management Plan (EMP). The project activities will include the installation of a grease waste interceptor. The project work period is expected to occur from approximately July 21 through September 15, 2025 with dewatering occurring approximately July 28 through August 28, 2025 (i.e., during predominantly dry weather).

Pre-construction sampling detected very low concentrations of contaminants of potential concern (COPCs) in shallow groundwater and soil occurring within the shallow groundwater zone, therefore, shallow groundwater and soil excavated greater than 5 feet below ground surface (bgs) will be assumed to contain COPCs and managed as described in this Plan (5 feet bgs was chosen as a conservative elevation well above the observed seasonally high groundwater level). Soils excavated above 5 feet bgs are not expected to contain COPCs. This Plan includes measures for managing 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, excavation protocols, soil-handling procedures, waste characterization and disposal requirements, and construction dewatering measures to be addressed and implemented during redevelopment of the Site. PFAS compounds are not listed as hazardous substances under state law and no cleanup decisions for PFAS have been made at PDX to date, Plan components specific to PFAS are voluntary, but the parties intend for DEQ's approval of the CMMP to remain valid and in effect following any final DEQ rulemaking listing certain PFAS compounds as hazardous substances.

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

1.2 Site Assessment

At the time the TCORE project was initiated, the only known contaminants were jet fuel hydrocarbons confined to a limited area in the southeastern portion of the project. Since then, a number of investigations were carried out in the general vicinity of the terminal.

MFA completed preliminary soil and groundwater assessments for a nearby taxiway project (Taxiway A) (MFA 2024a and MFA 2024b). The primary focus of the assessments was to determine the presence or absence of per-and polyfluoroalkyl substances (PFAS) associated with historical operations. Three push probe borings were completed at the locations shown on Figure 1-2. Groundwater samples were analyzed for PFAS by U.S. Environmental Protection Agency (EPA) Method 1633, diesel and oil-range total petroleum hydrocarbons (TPH) by Northwest Method

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NWTPH-Dx (with silica gel cleanup) and volatile organic compounds (VOCs) by EPA Method 8260C. Soil samples were analyzed for diesel and oil-range TPH by Northwest Method NWTPH-Dx (with silica gel cleanup), VOCs by EPA 8260C, and RCRA 8 metals by EPA 6000/7000 series methods. The soil samples were collected just above the observed groundwater depth as shown on the boring logs in the Appendix. Data tables presenting these laboratory analytical results and regulatory screening are presented as Table 1-1 and Table 1-2.

- **TPH.** Estimated (J-flagged) concentrations of TPH as diesel were detected above the method detection limit (MDL) in soil from borings TA-01 and TA-02 at concentrations of 3.6 and 3.3 milligrams per kilogram (mg/kg), respectively. TPH as diesel was not detected above the MDL in soil from boring TA-03. TPH as oil was not detected in soil above the MDL.

  Estimated concentrations of TPH as diesel were detected above the MDL in groundwater from borings TA-01 and TA-02 at concentrations of 92 and 140 micrograms per liter (ug/L), respectively. Estimated (J-flagged) concentrations of TPH as oil were detected above the MDL in groundwater from borings TA-01 and TA-02 at concentrations of 78 and 160 ug/L, respectively. TPH as diesel was detected at a concentration of 410 ug/L in groundwater from boring TA-03.

- **VOCs.** Estimated concentrations of acetone and benzene were detected above the MDL in soil from boring TA-01 at 4.4 and 0.40 micrograms/kilogram (ug/kg), respectively.

  Estimated concentrations of acetone, carbon disulfide, naphthalene, and 1,2,3-trichlorobezene were detected above the MDL in water from boring TA-01 at 7.5, 0.070, 0.10 and 0.18 ug/L, respectively. Estimated concentrations of acetone and carbon disulfide were detected above the MDL in water from boring TA-02 at 3.8 and 0.070 ug/L, respectively.

- **PFAS.** No direct sampling for PFAS has been conducted at the Site. However, PFAS has been detected in groundwater in the surrounding area based on investigations overseen by the DEQ Environmental Cleanup group. Groundwater samples were collected from monitoring wells and geoprobes within approximately 2,000 feet of the Site. Table 1-3 presents the locations of these samples relative to the Site, along with the measured concentrations of six PFAS compounds. The highest concentration was observed in Well MW-11-I58499 located to the southwest, in the direction of the former PDX fire stations. Based on geostatistical interpolation of the surrounding groundwater data, estimated PFAS concentrations in groundwater near Gate D-3 are as follows:

PFAS Compound	Concentration (nanograms per liter - ng/L)
PFOA	100
PFOS	3
PFHxS	10
PFNA	1
HFPO-DA (Gen-X)	Nondetect
PFBS	2

  For the purposes of designing the dewatering treatment system, it is anticipated that PFAS concentrations will be lower than the maximum levels observed at Well MW-11-158499.

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In soil Perfluorooctanoic acid (PFOA) was detected near the water table at an estimated concentration of 0.36 nanograms/gram (ng/g) in soil from nearby Taxiway A boring TA-01. PFAS compounds were not detected above the MDL in soil from borings TA-02 or TA-03.

- **Metals.** Soils collected from TA-01 had detections for each of the eight metals analyzed, however, metals occur naturally in soil and were detected at typical background concentrations in soil from TA-01 (DEQ 2018).

In summary, low concentrations of TPH as diesel, TPH as oil, and several VOCs were reported in groundwater in two of three Taxiway A sampling locations adjacent to the Site. Low concentrations of PFAS compounds were also detected in all three Taxiway A boring locations. Additional PFAS results withing the vicinity of the Site also show low concentrations of PFAS compounds indicating PFAS is likely to occur at the Site.

Low concentrations of TPH as diesel, acetone, and benzene were reported in one or more soil samples collected just above the observed groundwater depth and within the zone of seasonal groundwater fluctuation. PFAS compounds were only detected in soil from boring TA-01.

1.3 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.

2 Distribution of Contaminants of Potential Concern

2.1 Site Contaminants

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

2.2 Nature and Extent of Contamination

COPCs are likely present in groundwater and in soil in the zone of seasonal groundwater fluctuation. There is no known release of COPCs that occurred at the Site. The detections of COPCs occurred in soil within the zone of seasonal groundwater fluctuation. The upper boundary of this zone represents the highest level the water table reaches, typically during wet seasons, while the lower boundary represents the lowest level, usually during dry periods. Both sampling events were collected during periods of lower relative seasonal water table conditions (i.e., December 2023 and August 2024).

The COPCs detected in the soil samples were consistent with the detections in the groundwater samples indicating that the soil had been in contact with groundwater during higher seasonal water levels. Concentrations of TPH as diesel, TPH as oil, and VOCs (i.e., naphthalene) detected in

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groundwater are below Oregon Department of Environmental Quality (DEQ) risk-based concentrations (RBCs) for exposure pathways and receptors applicable to the Site. The detected concentrations are also below the DEQ RBCs for the *Volatilization to Outdoor Air* exposure pathway for the occupational receptor and the *Groundwater in Excavation* exposure pathway for the construction and excavation worker receptor.

Concentrations of TPH as diesel, acetone, and benzene detected in soil just above the observed groundwater depth (at the time of sampling) are below applicable DEQ RBCs including *Direct Contact* (for occupational, construction, and excavation worker exposure scenarios) and *Volatilization to Outdoor Air* for occupational receptors. The detected concentrations were also below the DEQ clean fill criteria (DEQ 2018).

Very low concentrations of PFAS were detected in groundwater and there was only one detection in soil at a concentration above the method detection limits. The shallow groundwater beneath the Site where PFAS are likely present is not used for drinking water and will not be used for drinking water in the future. Deeper groundwater beneath the Site (and PDX in general) could be used for drinking water in the future, and the Columbia River downriver from PDX is used for drinking water. However, the PFAS in shallow groundwater beneath PDX have not migrated to deeper groundwater or the Columbia River. Therefore, the PFAS present in groundwater at PDX do not pose an unacceptable risk to human health.

Estimated Volumes of Contaminated Media. Potentially impacted soils excavated from depths greater than 5 feet below ground surface (bgs) are expected to be on the order of 125 cubic yards. Construction dewatering will be necessary during the project. Where dewatering is necessary, the total volume will be minimized using a localized approach (e.g., a limited number of dewatering wells). Time allowed for dewatering is further limited since the Site is within an active aircraft movement area and during construction, adjacent gates, taxiways and runways must be shut down, impacting airport operations. The estimated maximum discharge rate at well start up is 100 gallons per minute.

3 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. The procedures listed in this section may be superseded by the requirements of a project-specific health and safety plan (HASP), if such a plan has been prepared following the guidelines described in Section 3.3.

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.

3.1 Description of Soil-Disturbing Activities

Activities at the Site will include a variety of construction activities. Soil from the surface to 5 feet bgs is above the zone of seasonal groundwater fluctuation and is not known to contain COPCs, therefore,

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it is considered suitable for reuse at PDX. Soils excavated below 5 feet bgs will be reused as backfill at the Site below 5 feet bgs or stockpiled in accordance with Section 4.2.4 and tested in accordance with Section 4.2.2. As discussed in Section 2.2, detected concentrations of TPH and VOCs in soil and groundwater are below DEQ RBCs applicable to the Site. Also, discussed in Section 2.2, the low concentrations of PFAS were detected in groundwater that is not used for drinking water now or in the future. Although deeper groundwater could be used for drinking water in the future, investigations have shown that PFAS in shallow groundwater has not migrated to deeper groundwater or the Columbia River. Therefore, the PFAS present in groundwater at PDX do not pose an unacceptable risk to human health. In addition, the proposed reuse of soil aligns with current best practices that emphasize overall sustainability and net environmental benefit. The environmental impact of transport and off-site disposal far outweigh any benefits, especially given these low chemical concentrations at an industrial facility. Stockpiled soils removed from the Site with detectable concentrations of PFAS will be disposed of off-site at a Subtitle C or Subtitle D landfill designated by the Port.

These 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 3.2 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.

3.2 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. 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

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4 Management of Contaminated Soil

4.1 Procedures for Identification and Response to Suspected Contaminated Soil

As discussed above, the potential exists to encounter unknown 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 area.
- 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 undocumented contamination, underground storage tanks, or other potentially hazardous conditions are encountered that are not addressed in the Environmental Management Plan, discharges exposed to the contaminated media will cease and DEQ will be notified within 48 hours. Discharges exposed to the contaminated media will not occur until DEQ approves the updates to the CMMP.

4.2 Waste Characterization

4.2.1 Suspected Contaminated Soil

Soil encountered during excavation may contain unknown hazardous substances and may be regulated under federal or State of Oregon solid or hazardous waste rules. Consequently, soil that is suspected of containing hazardous wastes that have not already been characterized, must be adequately characterized, as described below, before its removal from the Site, to ensure compliance with these regulations.

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 from the surface to 5 feet bgs, characterization will include the following COPCs: TPH as

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diesel, TPH as oil, VOCs, and metals. Characterization of suspected contaminated soil below 5 feet will include the following COPCs: TPH as diesel, TPH as oil, VOCs, metals, and PFAS.

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 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 2018), the soil can be used in accordance with DEQ clean fill criteria.

4.2.2 Stockpiled Soil from Utility Excavations

Soil excavated below 5 feet bgs and not reused as backfill at the Site below 5 feet bgs will be stockpiled and sampled for laboratory analysis. 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 will be analyzed for TPH as diesel, TPH as oil, VOCs, metals and PFAS. If contaminant levels meet DEQ clean fill criteria (DEQ 2018) and are also non-detect for PFAS, the soil will be reused in accordance with DEQ clean fill criteria. Excess soil with detected concentrations of PFAS will be disposed of at a Subtitle C or Subtitle D landfill based on the landfill acceptance criteria.

4.2.3 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 4.4, 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 contractor conducting the work will coordinate with and seek approval from the Port before completing such recycling.

4.2.4 Stockpiling

Any suspected contaminated soil, including soil excavated below 5 feet bgs that cannot be reused on the Site 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

[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).

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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.

Temporary stockpile of uncontaminated soil shall follow the best management practices (BMPs) included in the project erosion and sediment control plan (ESCP).

4.3 Disposition of Excavated Soil

Soil must be managed consistent with one of the methods described below.

4.3.1 Placement on Site

Soils shall not be redistributed across the Site without prior Port approval.

- Soil from the surface to 5 feet that do not exhibit signs of suspected contamination as described in Section 4.1 above will be reused on the Site or another location at PDX designated by the Port.
- Soil excavated below 5 feet bgs that do not exhibit signs of suspected contamination as described in Section 4.1 above will be used for backfill at the Site (below 5 feet bgs) or will be stockpiled and sampled for laboratory analysis. If contaminant levels meet DEQ clean fill criteria (DEQ 2018), the soil can be used in accordance with DEQ clean fill criteria. If these conditions are met and the soil is non-detect for PFAS compounds, the soil can be reused on site or another PDX location designated by the Port.

4.3.2 Off-Site 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 can 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 based on landfill acceptance criteria.

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.

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- Soil shall be transported in accordance with appropriate Department of Transportation regulations.

5 Construction Dewatering

Dewatering will be conducted using a localized approach (e.g., a limited number of dewatering wells) to help minimize the volume of water. Groundwater removed by dewatering will be filtered using adsorptive media suitable for PFAS and other COPCs. While the preferred discharge method at PDX is discharge to the ground surface for infiltration, the nearest unpaved area is approximately 500 feet to the north, across the aircraft apron and an active taxiway. Due to restrictions governing aircraft safety, it is not practicable to discharge to the ground surface for infiltration. As a result, discharge will be to the storm sewer in the work area. Due to the work area being within active airport operations, the equipment used for dewatering will need to be mobile. A Groundwater Discharge, Treatment, and Monitoring Plan further describing this process is included in Attachment C of the EMP.

6 Reporting

A letter report summarizing the implementation of this EMP 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.
- 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.

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References

DEQ. 2018. *Internal Management Directive, Clean Fill Determinations.* Prepared by Oregon DEQ.

MFA. 2024a. *Taxiway A Pre-Construction Sampling Results.* Portland International Airport. Prepared by Maul Foster & Alongi, Inc. February 29.

MFA. 2024b. *Taxiway A Supplemental Pre-Construction Sampling Results.* Portland International Airport. Prepared by Maul Foster & Alongi, Inc. October 8.

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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.

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Tables

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Table 1-1
Summary of Groundwater Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-W	TA-02-W	TA-03-W
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.5	10.5	10.5
Conventional Parameters (mg/L)			
Total suspended solids	**4,360**	**330**	--
TPH (ug/L)			
Diesel-range hydrocarbons	**92 J**	**140 J**	**410**
Residual-range hydrocarbons	**78 J**	**160 J**	95 U
PFAS (ng/L)			
11Cl-PF3OUdS (F-53B Minor)	0.40 U	0.39 U	1 U
3:3 FTCA	6.9 U	6.8 U	2 U
4:2 FTSA	0.43 U	0.42 U	2 U
5:3 FTCA	4.3 U	4.2 U	5 U
6:2 FTSA	1.4 U	1.3 U	2 U
7:3 FTCA	6.1 U	6.0 U	5 U
8:2 FTSA	0.87 U	0.86 U	2 U
9Cl-PF3ONS (F-53B Major)	0.46 U	0.45 U	1.2 U
ADONA	0.37 U	0.36 U	1 U
EtFOSA	0.86 U	0.85 U	1 U
EtFOSAA	0.97 U	0.95 U	1 U
EtFOSE	0.94 U	0.92 U	5 U
HFPO-DA (GenX)	0.42 U	0.41 U	0.78 U
MeFOSA	1.3 U	1.2 U	1 U
MeFOSAA	0.92 U	0.91 U	1 U
MeFOSE	0.83 U	0.82 U	5 U
NFDHA	0.59 U	0.58 U	1.4 U
PFBA	**12**	**4.1 J**	**6.2 J**
PFBS	**1.2 J**	**0.63 J**	1 U
PFDA	**4.7 J**	**1.3 J**	**4.7**
PFDoA	**8.0**	0.61 U	1.1 U
PFDoS	0.57 U	0.56 U	1.1 U
PFDS	0.68 U	0.67 U	1 U
PFEESA	0.44 U	0.43 U	1 U
PFHpA	**5.2**	**3.2 J**	**3.9 J**
PFHpS	0.70 U	0.69 U	1 U
PFHxA	**7.8**	**5.7**	**7.1**
PFHxS	**5.8**	**1.6 J**	**1.4 J**
PFMBA	0.55 U	0.54 U	1 U
PFMPA	0.42 U	0.41 U	1 U

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Table 1-1
Summary of Groundwater Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-W	TA-02-W	TA-03-W
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.5	10.5	10.5
PFNA	**3.8 J**	**2.5 J**	**5.2**
PFNS	0.34 U	0.33 U	1 U
PFOA	**110**	**11**	**15**
PFOS	**6.1**	**5.9**	**5.9**
PFOSA	0.73 U	0.72 U	1 U
PFPeA	**9.7**	**12**	**5.3**
PFPeS	0.90 U	0.89 U	1 U
PFTeDA	**2.5 J**	1.3 U	1.6 U
PFTrDA	**2.3 J**	0.46 U	1.2 U
PFUnA	**3.3 J**	0.82 U	1 U
VOCs (ug/L)			
1,1,1,2-Tetrachloroethane	0.11 U	0.11 U	--
1,1,1-Trichloroethane	0.075 U	0.075 U	--
1,1,2,2-Tetrachloroethane	0.16 U	0.16 U	--
1,1,2-Trichloroethane	0.14 U	0.14 U	--
1,1-Dichloroethane	0.077 U	0.077 U	--
1,1-Dichloroethene	0.080 U	0.080 U	--
1,1-Dichloropropene	0.089 U	0.089 U	--
1,2,3-Trichlorobenzene	**0.18 J**	0.11 U	--
1,2,3-Trichloropropane	0.20 U	0.20 U	--
1,2,4-Trichlorobenzene	0.096 U	0.096 U	--
1,2,4-Trimethylbenzene	0.069 U	0.069 U	--
1,2-Dibromo-3-chloropropane	0.22 U	0.22 U	--
1,2-Dibromoethane	0.10 U	0.10 U	--
1,2-Dichlorobenzene	0.12 U	0.12 U	--
1,2-Dichloroethane	0.080 U	0.080 U	--
1,2-Dichloropropane	0.095 U	0.095 U	--
1,3,5-Trimethylbenzene	0.089 U	0.089 U	--
1,3-Dichlorobenzene	0.10 U	0.10 U	--
1,3-Dichloropropane	0.14 U	0.14 U	--
1,4-Dichlorobenzene	0.12 U	0.12 U	--
2,2-Dichloropropane	0.065 U	0.065 U	--
2-Butanone	1.9 U	1.9 U	--
2-Chlorotoluene	0.10 U	0.10 U	--
2-Hexanone	2.7 U	2.7 U	--
4-Chlorotoluene	0.13 U	0.13 U	--

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Table 1-1
Summary of Groundwater Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-W	TA-02-W	TA-03-W
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.5	10.5	10.5
4-Isopropyltoluene	0.060 U	0.060 U	--
4-Methyl-2-pentanone	2.6 U	2.6 U	--
Acetone	**7.5 J**	**3.8 J**	--
Benzene	0.062 U	0.062 U	--
Bromobenzene	0.12 U	0.12 U	--
Bromodichloromethane	0.091 U	0.091 U	--
Bromoform	0.16 U	0.16 U	--
Bromomethane	0.16 U	0.16 U	--
Carbon disulfide	**0.070 J**	**0.070 J**	--
Carbon tetrachloride	0.096 U	0.096 U	--
Chlorobenzene	0.11 U	0.11 U	--
Chlorobromomethane	0.16 U	0.16 U	--
Chloroethane	0.16 U	0.16 U	--
Chloroform	0.072 U	0.072 U	--
Chloromethane	0.068 U	0.068 U	--
cis-1,2-Dichloroethene	0.067 U	0.067 U	--
cis-1,3-Dichloropropene	0.18 U	0.18 U	--
Dibromochloromethane	0.14 U	0.14 U	--
Dibromomethane	0.15 U	0.15 U	--
Dichlorodifluoromethane (Freon 12)	0.13 U	0.13 U	--
Ethylbenzene	0.050 U	0.050 U	--
Hexachlorobutadiene	0.11 U	0.11 U	--
Isopropylbenzene	0.051 U	0.051 U	--
m,p-Xylene	0.11 U	0.11 U	--
Methylene chloride	0.10 U	0.10 U	--
Naphthalene	**0.10 J**	0.088 U	--
n-Butylbenzene	0.054 U	0.054 U	--
n-Propylbenzene	0.054 U	0.054 U	--
o-Xylene	0.074 U	0.074 U	--
sec-Butylbenzene	0.062 U	0.062 U	--
Styrene	0.089 U	0.089 U	--
tert-Butylbenzene	0.059 U	0.059 U	--
Tetrachloroethene	0.099 U	0.099 U	--
Toluene	0.054 U	0.054 U	--
trans-1,2-Dichloroethene	0.072 U	0.072 U	--
trans-1,3-Dichloropropene	0.068 U	0.068 U	--

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Table 1-1
Summary of Groundwater Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-W	TA-02-W	TA-03-W
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.5	10.5	10.5
Trichloroethene	0.10 U	0.10 U	--
Trichlorofluoromethane (Freon 11)	0.12 U	0.12 U	--
Vinyl chloride	0.075 U	0.075 U	--

Notes

Data are unvalidated. J and U qualifiers from the laboratory are shown; other flags from the laboratory are not included.

bold = detected above the method detection limit.

ft bgs = feet below ground surface.

J = result is estimated.

mg/L = milligrams per liter.

ng/L = nanograms per liter.

PFAS = per- and polyfluoroalkyl substances.

TPH = total petroleum hydrocarbons.

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

ug/L = micrograms per liter.

VOC = volatile organic compound.

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Table 1-2
Summary of Soil Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-S	TA-02-S	TA-03-S
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.0-8.5	8.5-9.0	9.5-10.0
TPH (mg/kg)			
Diesel-range hydrocarbons	**3.6 J**	**3.3 J**	14 U
Residual-range hydrocarbons	5.4 U	4.6 U	20 U
Metals (mg/kg)			
Arsenic	**4.80**	--	--
Barium	**197**	--	--
Cadmium	**0.331**	--	--
Chromium	**26.8**	--	--
Lead	**10.1**	--	--
Mercury	**0.042**	--	--
Selenium	**0.5 J**	--	--
Silver	**0.111**	--	--
PFAS (ng/g)			
11Cl-PF3OUdS (F-53B Minor)	0.10 U	0.10 U	0.33 U
3:3 FTCA	0.60 U	0.60 U	0.33 U
4:2 FTSA	0.10 U	0.10 U	0.23 U
5:3 FTCA	0.60 U	0.60 U	1.90 U
6:2 FTSA	0.10 U	0.10 U	0.23 U
7:3 FTCA	0.60 U	0.60 U	2.10 U
8:2 FTSA	0.10 U	0.10 U	0.23 U
9Cl-PF3ONS (F-53B Major)	0.10 U	0.10 U	0.27 U
ADONA	0.10 U	0.10 U	0.23 U
EtFOSA	0.10 U	0.10 U	0.06 U
EtFOSAA	0.10 U	0.10 U	0.06 U
EtFOSE	0.10 U	0.10 U	0.58 U
HFPO-DA (GenX)	0.10 U	0.10 U	0.25 U
MeFOSA	0.10 U	0.10 U	0.06 U
MeFOSAA	0.10 U	0.10 U	0.12 U
MeFOSE	0.10 U	0.10 U	0.58 U
NFDHA	0.10 U	0.10 U	0.13 U
PFBA	0.10 U	0.10 U	0.23 U
PFBS	0.10 U	0.10 U	0.06 U
PFDA	0.10 U	0.10 U	0.06 U
PFDoA	0.10 U	0.10 U	0.06 U
PFDoS	0.10 U	0.10 U	0.07 U
PFDS	0.10 U	0.10 U	0.07 U

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Table 1-2
Summary of Soil Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-S	TA-02-S	TA-03-S
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.0-8.5	8.5-9.0	9.5-10.0
PFEESA	0.10 U	0.10 U	0.13 U
PFHpA	0.10 U	0.10 U	0.06 U
PFHpS	0.10 U	0.10 U	0.06 U
PFHxA	0.10 U	0.10 U	0.07 U
PFHxS	0.10 U	0.10 U	0.06 U
PFMBA	0.10 U	0.10 U	0.12 U
PFMPA	0.10 U	0.10 U	0.12 U
PFNA	0.10 U	0.10 U	0.07 U
PFNS	0.10 U	0.10 U	0.07 U
PFOA	**0.36 J**	0.10 U	0.06 U
PFOS	0.10 U	0.10 U	0.07 U
PFOSA	0.10 U	0.10 U	0.06 U
PFPeA	0.10 U	0.10 U	0.12 U
PFPeS	0.10 U	0.10 U	0.08 U
PFTeDA	0.10 U	0.10 U	0.06 U
PFTrDA	0.10 U	0.10 U	0.06 U
PFUnA	0.10 U	0.10 U	0.06 U
VOCs (ug/kg)			
1,1,1,2-Tetrachloroethane	0.15 U	0.15 U	--
1,1,1-Trichloroethane	0.15 U	0.15 U	--
1,1,2,2-Tetrachloroethane	0.17 U	0.18 U	--
1,1,2-Trichloroethane	0.20 U	0.20 U	--
1,1-Dichloroethane	0.16 U	0.16 U	--
1,1-Dichloroethene	0.33 U	0.33 U	--
1,1-Dichloropropene	0.17 U	0.18 U	--
1,2,3-Trichlorobenzene	0.25 U	0.25 U	--
1,2,3-Trichloropropane	0.59 U	0.59 U	--
1,2,4-Trichlorobenzene	0.17 U	0.18 U	--
1,2,4-Trimethylbenzene	0.071 U	0.071 U	--
1,2-Dibromo-3-chloropropane	0.53 U	0.53 U	--
1,2-Dibromoethane	0.13 U	0.13 U	--
1,2-Dichlorobenzene	0.11 U	0.11 U	--
1,2-Dichloroethane	0.092 U	0.092 U	--
1,2-Dichloropropane	0.17 U	0.18 U	--
1,3,5-Trimethylbenzene	0.13 U	0.13 U	--
1,3-Dichlorobenzene	0.13 U	0.13 U	--

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Table 1-2
Summary of Soil Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-S	TA-02-S	TA-03-S
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.0-8.5	8.5-9.0	9.5-10.0
1,3-Dichloropropane	0.16 U	0.16 U	--
1,4-Dichlorobenzene	0.12 U	0.12 U	--
2,2-Dichloropropane	0.13 U	0.13 U	--
2-Butanone	1.2 U	1.2 U	--
2-Chlorotoluene	0.16 U	0.16 U	--
2-Hexanone	1.3 U	1.3 U	--
4-Chlorotoluene	0.12 U	0.12 U	--
4-Isopropyltoluene	0.084 U	0.084 U	--
4-Methyl-2-pentanone	2.4 U	2.4 U	--
Acetone	**4.4 J**	3.9 U	--
Benzene	**0.40 J**	0.071 U	--
Bromobenzene	0.12 U	0.12 U	--
Bromodichloromethane	0.21 U	0.21 U	--
Bromoform	0.19 U	0.19 U	--
Bromomethane	0.27 U	0.27 U	--
Carbon disulfide	0.13 U	0.13 U	--
Carbon tetrachloride	0.13 U	0.13 U	--
Chlorobenzene	0.085 U	0.086 U	--
Chlorobromomethane	0.32 U	0.32 U	--
Chloroethane	0.97 U	0.97 U	--
Chloroform	0.15 U	0.15 U	--
Chloromethane	0.24 U	0.24 U	--
cis-1,2-Dichloroethene	0.16 U	0.16 U	--
cis-1,3-Dichloropropene	0.17 U	0.18 U	--
Dibromochloromethane	0.24 U	0.24 U	--
Dibromomethane	0.37 U	0.37 U	--
Dichlorodifluoromethane (Freon 12)	0.16 U	0.16 U	--
Ethylbenzene	0.13 U	0.13 U	--
Hexachlorobutadiene	0.53 U	0.53 U	--
Isopropylbenzene	0.11 U	0.11 U	--
m,p-Xylene	0.14 U	0.14 U	--
Methylene chloride	0.21 U	0.21 U	--
Naphthalene	0.17 U	0.18 U	--
n-Butylbenzene	0.091 U	0.091 U	--
n-Propylbenzene	0.17 U	0.18 U	--
o-Xylene	0.11 U	0.11 U	--

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Table 1-2
Summary of Soil Analytical Results
Taxiway A West Rehabilitation Project
Port of Portland

Location:	TA-01	TA-02	TA-03
Sample Name:	TA-01-S	TA-02-S	TA-03-S
Collection Date:	12/20/2023	12/20/2023	8/29/2024
Collection Depth (ft bgs):	8.0-8.5	8.5-9.0	9.5-10.0
sec-Butylbenzene	0.097 U	0.097 U	--
Styrene	0.19 U	0.19 U	--
tert-Butylbenzene	0.19 U	0.19 U	--
Tetrachloroethene	0.21 U	0.21 U	--
Toluene	0.20 U	0.20 U	--
trans-1,2-Dichloroethene	0.16 U	0.16 U	--
trans-1,3-Dichloropropene	0.15 U	0.15 U	--
Trichloroethene	0.20 U	0.20 U	--
Trichlorofluoromethane (Freon 11)	0.12 U	0.12 U	--
Vinyl chloride	0.24 U	0.24 U	--
Xylenes (total)	0.24 U	0.24 U	--

Notes

Data are unvalidated. J and U qualifiers from the laboratory are shown; other flags from the laboratory are not included.

bold = detected above the method detection limit.

-- = not analyzed.

ft bgs = feet below ground surface.

J = result is estimated.

mg/kg = milligrams per kilogram.

ng/g = nanograms per gram.

PFAS = per- and polyfluoroalkyl substances.

TPH = total petroleum hydrocarbons.

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

ug/kg = micrograms per kilogram.

VOC = volatile organic compound.

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Table 1-3
Summary of Nearby PFAS Results
Taxiway A West Rehabilitation Project
Port of Portland

Well/Geoprobe I.D.	Distance from Gate D3 (Feet)	Direction	PFOA (ng/L)	PFOS (ng/L)	HFPO-DA (Gen-X) (ng/L)	PFBS (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	TOTAL (ng/L)
TA-02	870	North	11	5.9	ND	0.63	1.6	2.5	21.6
MW-11-L58499	890	Southwest	832	1.08	ND	4.34	65.13	0.7	903
TA-01	930	Northwest	110	6.1	ND	1.2	5.8	3.8	127
B-6	1,680	South	42.3	ND	ND	ND	2.22	2.53	47.1
B-4	1,700	South	10.38	0.585	ND	0.336	0.251	0.12	11.7
B-8	1,860	South	34.2	4.08	ND	1.61	5.74	ND	45.6
MW-102	1,930	West	10.7	ND	ND	ND	3.95	ND	14.7
TA-03	2,040	Northeast	15	5.9	ND	ND	1.4	5.2	27.5

Notes

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

PFBS = perfluorobutane sulfonic acid

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

ng/L = nanogram per liter

ND = nondetect

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Figures

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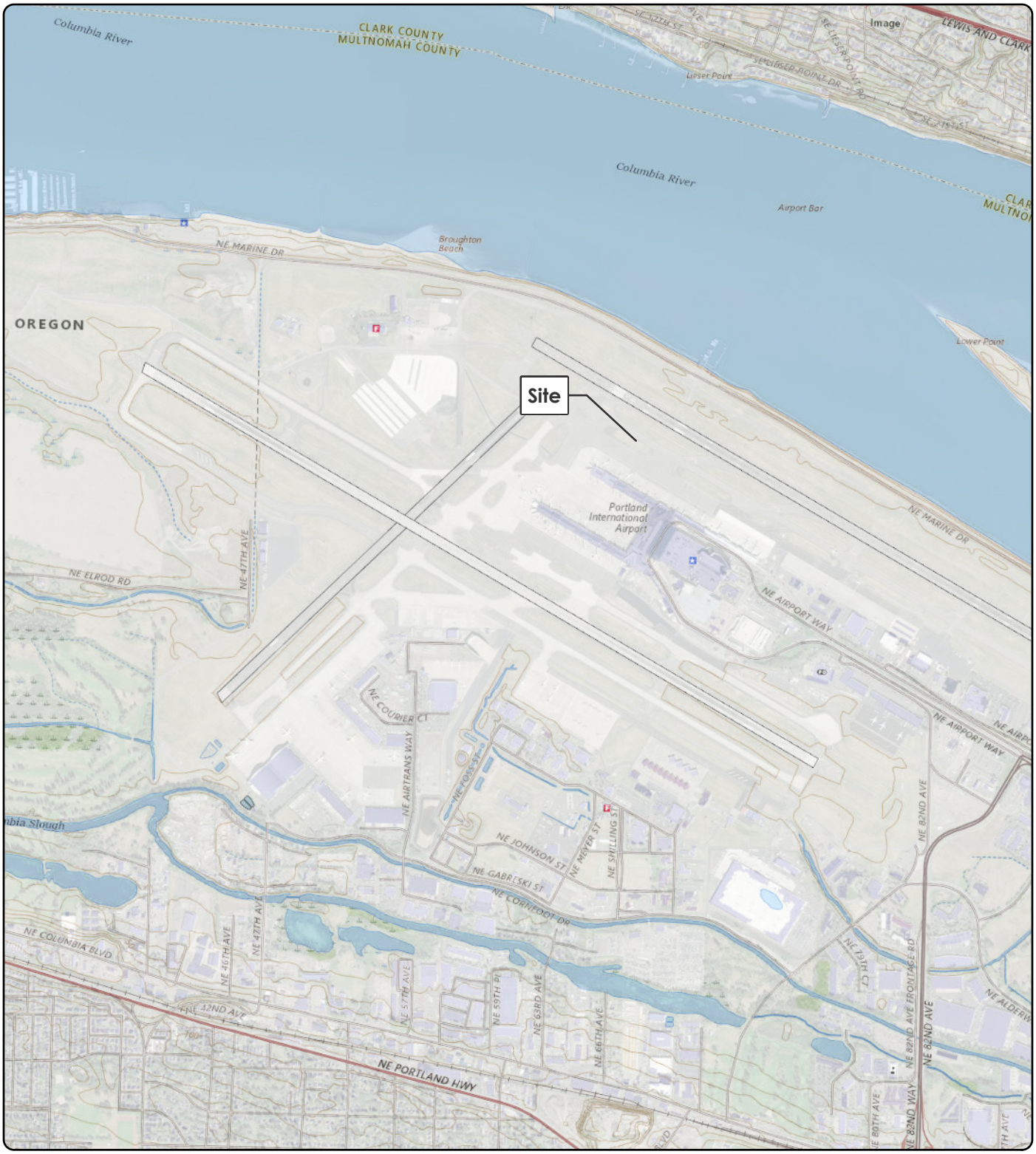

Notes
U.S. Geological Survey 7.5-minute topographic quadrangle (2020): Mount Tabor.
Township 1 north, range 2 east, section 8.

Figure 1-1
Site Location

Taxiway A West Rehabilitation Project
Portland International Airport
Port of Portland
Portland, Oregon

0 1,000 2,000
Feet

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Path: X:\0232.17 Portland Airport\78 Pro\M0232_17_078_002.aprx\Fig 1-1 Property Location
Print Date: 1/11/2024
Reviewed By: cclough
Produced By: jelstrott
Project: M0232.17.078

Path: X:\0232.17 Portland Airport\89\Pro\M0232_17_089_001.aprx\Fig 2 Sample Locations
Print Date: 1/30/2024
Reviewed By: cclough
Produced By: jroberts
Project: M0232.17.089

Figure 1-2
Boring Locations

Taxiway A West
Rehabilitation Project
Portland International Airport
Port of Portland
Portland, OR

Legend
Soil Boring

Notes:
TA-01 and TA-02 completed on December 20, 2023.
TA-03 completed on August 29, 2024.

0 300
Feet

Data Sources
Aerial photograph obtained from the City of Portland (2022).

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Appendix

Investigation Boring Logs

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0232.17.089	**TA-01**	**1 of 1**

Project Name	**POP - Taxiway A**		
Project Location	**Portland International Airport**	Surface Elevation (feet)	
Start/End Date	**12/19/23 to 12/20/23**	Northing	
Driller/Equipment	**AEC/Geoprobe**	Easting	
Geologist/Engineer	**M. Pickering**	Total Depth of Borehole	**15.0 feet**
Sample Method	**Macrocore Liner**	Outer Hole Diam	**2.25 inch**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Lithologic Column	Soil Description
1					0.0 to 1.0 feet: SILT WITH SAND (ML); brown; 80% fines; 20% sand; moist.
2					1.0 to 3.0 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, medium; no sheen; moist.
3		**60**			
4					3.0 to 5.0 feet: No Recovery.
5					
6					5.0 to 7.5 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, medium; no sheen; moist.
7	▽				
8		**74**	**TA-01-S**		7.5 to 8.7 feet: SILT WITH SAND (ML); brown; 85% fines; 15% sand; no sheen; moist.
9					8.7 to 10.0 feet: No Recovery.
10					
11					10.0 to 11.0 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, coarse; no sheen; wet.
12					11.0 to 15.0 feet: SILT WITH SAND (ML); brown; 85% fines; 15% sand; no sheen; moist.
13		**100**			
14					
15					

Total Depth = 15.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. GP = Geoprobe macro-core sampler. 3. Depths are approximate and relative to feet bgs. 4. PID = photo ionization detector. 5. ppm = parts per million. 6. GW = groundwater sample TA-01-W at 1:05AM; pH = 6.53, Temperature = 11.3 degrees Celsius, Electrical Conductivity = 4.8 relative millivolts.

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

Reconnaissance Well Completion Details
Temporary prepacked well screen placed from 6.0 to 11.0 feet below ground surface.

▽ **Water level measured in feet below ground surface.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0232.17\TAXIWAY A.GPJ 12/21/23

Geologic Borehole Log

MAUL FOSTER ALONGI

Project Number	Boring Number	Sheet
M0232.17.089	TA-02	1 of 1

Project Name	POP - Taxiway A		
Project Location	Portland International Airport	Surface Elevation (feet)	
Start/End Date	12/20/23 to 12/20/23	Northing	
Driller/Equipment	AEC/Geoprobe	Easting	
Geologist/Engineer	M. Pickering	Total Depth of Borehole	15.0 feet
Sample Method	Macrocore Liner	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Percent Recovery	Sample Data: Sample ID	Lithologic Column	Soil Description
1					0.0 to 1.0 feet: SILTY SAND (SM); brown; 20% fines; 80% sand; no sheen; moist.
2					1.0 to 2.7 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, medium; no sheen; moist.
3		70			1.0 to 2.7 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, coarse; no sheen; moist.
4					3.5 to 5.0 feet: No Recovery.
5					
6					5.0 to 9.4 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, coarse; no sheen; moist.
7					
8		88			
9	▽		TA-02-S		
10					9.4 to 10.0 feet: No Recovery.
11					10.0 to 15.4 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, coarse; no sheen; wet.
12					
13		100			
14					
15					

Total Depth = 15.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. GP = Geoprobe macro-core sampler. 3. Depths are approximate and relative to feet bgs. 4. PID = photo ionization detector. 5. ppm = parts per million. 6. GW = groundwater sample TA-02-W at 2:15AM; pH = 6.75, Temperature = 10.7 degrees Celsius, Electrical Conductivity = 6.8 relative millivolts.

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

Reconnaissance Well Completion Details
Temporary prepacked well screen placed from 8.0 to 13.0 feet below ground surface.

▽ **Water level measured in feet below ground surface.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0232.17\TAXIWAY A.GPJ 12/21/23

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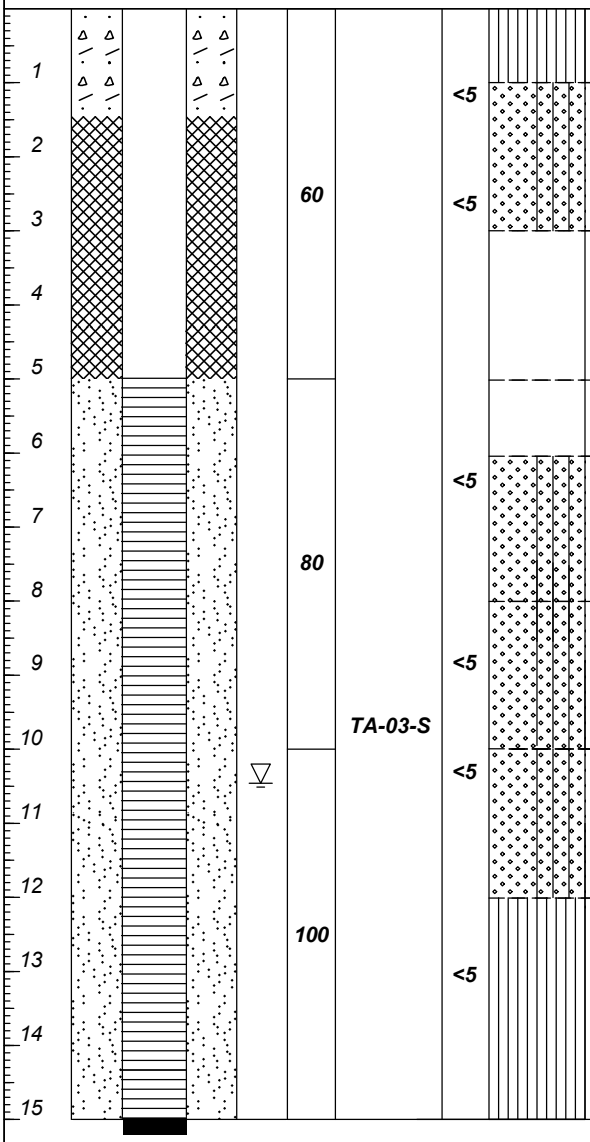
Geologic Borehole Log

Project Number	Boring Number	Sheet
M0232.17.098	**TA-03**	**1 of 1**

Project Name	**POP - Taxiway A**		
Project Location	**Portland International Airport**	Surface Elevation (feet)	
Start/End Date	**8/29/2024**	Northing	
Driller/Equipment	**Cascade/Geoprobe**	Easting	
Geologist/Engineer	**C. Clough**	Total Depth of Borehole	**15.5 feet**
Sample Method	**Macrocore Liner**	Outer Hole Diam	**3.75 inch**



Soil Description
0.0 to 1.0 feet: Surface soils with organics; brown; 80% fines; 20% sand; dry.
1.0 to 3.0 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, medium; no sheen; dry.
3.0 to 5.0 feet: No Recovery.
5.0 to 6.0 feet: No Recovery.
6.0 to 8.0 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, medium to course; no sheen; dry.
8.0 to 10.0 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, coarse; no sheen; moist.
10.0 to 12.0 feet: SAND WITH SILT (SW-SM); brown; 10% fines; 90% sand, coarse; no sheen; wet.
11.5 feet: silt increasing.
12.0 to 15.0 feet: SILT (ML); gray; 95% fines; 5% sand; no sheen; wet.

Total Depth = 15.5 feet bgs

NOTES:

1. bgs = below ground surface. 2. GP = Geoprobe macro-core sampler. 3. Depths are approximate and relative to feet bgs.
4. PID = photoionization detector. 5. ppm = parts per million. 6. GW = groundwater sample TA-03-W at 10:40AM.

Borehole and Monitoring Well Completion Details
0.0 to 15.5 feet: 3.75-inch-diameter boring.
Flush-mounted surface monument set in concrete.
0.0 to 5.0 feet: 3/4-inch-diameter, schedule 40, polyvinyl chloride riser pipe.
5.0 to 15.0 feet: 3/4-inch-diameter, schedule 40, polyvinyl chloride, 0.010-inch, machine slot, prepacked well screen.
15.0 to 15.5 feet: 3/4-inch-diameter, schedule 40, polyvinyl chloride, pipe end cap.

▽ **Water level measured in feet below ground surface.**

Attachment B (already submitted via YDO)

Temporary Erosion and Sediment Control Plans

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Attachment C

Groundwater Discharge, Treatment, and Monitoring Management Plan

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Revised Groundwater Discharge, Treatment, and Monitoring Management Plan

Terminal Core Redevelopment Project
Portland International Airport

Prepared for:

Port of Portland

July 25, 2025

Project No. M0232.17.111

Prepared by:

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

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MAUL FOSTER ALONGI

Revised Groundwater Discharge, Treatment, and Monitoring Management Plan

Terminal Core Redevelopment 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.

Michael Pickering, RG
Principal Geologist

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Contents

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Abbreviations

BMPs	best management practices
Clear Creek	Clear Creek Systems, Inc.
CMMP	contaminated media management plan
Coffman	Coffman Excavation Inc.
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
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	Terminal Core Redevelopment Project
TPH	total petroleum hydrocarbons
VOC	volatile organic compounds
YDO	Your DEQ Online

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1 Introduction

This groundwater discharge, treatment, and monitoring management plan (the "Plan") was prepared for the Port of Portland (Port) Terminal Core Redevelopment Project PKG F – Grease Interceptor site (the "Site") at the Portland International Airport (PDX). The Site is presented on drawing PDX 2021-510 Sheet C4.005-F in Appendix A.

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 DEQ for review and approval under the National Pollution Discharge Elimination System (NPDES) 1200-CA 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). PFAS compounds are not listed as hazardous substances under state law and no cleanup decisions have been made at the VCP Site to date, DEQ Cleanup staff are reviewing and providing comment on the submittal in conjunction with the 1200-CA review process as a part of DEQ oversight of the VCP Site. Plan components specific to PFAS are voluntary, but the parties intend for DEQ's approval to remain valid and in effect following any final DEQ rulemaking listing certain PFAS compounds as hazardous substances.

2.2 Port of Portland Construction Project Team

The Port project team includes Coffman Excavation Inc. (Coffman; the construction contractor) who will be responsible for dewatering their work areas to facilitate construction. The Coffman construction dewatering plan, presented in Appendix A, describes the means and methods proposed for dewatering their work area including estimated dates and flow rates.

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Coffman 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, 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 5.

3 Construction Dewatering

Construction dewatering may be required in areas where the utilities are installed near the depth of the water table. It is anticipated that where dewatering is necessary, the total volume will be minimal and it will be conducted using a localized approach (e.g., localized dewatering wells) to help to further minimize the volume of water. The project work period is expected to occur from approximately July 21 through September 15, 2025 with dewatering occurring approximately July 28 through August 28, 2025 (i.e., during predominantly dry weather). Based on this proposed dewatering period, the Port does not anticipate significant contribution from precipitation, rainwater, or stormwater runoff.

Groundwater removed by dewatering will be filtered using adsorptive media suitable for PFAS and other COPCs and will be discharged to the storm sewer (e.g., catch basin) in the vicinity of the work area. The proposed location is shown on dewatering plan drawing PDX 2021-510 sheet C4.010-F in Appendix A. The receiving manhole on the stormwater system is located in PDX Basin 7a which discharges to McBride Slough on the Columbia Slough. Appendix A also includes a plan showing the PDX stormwater basin. Due to the work area being within active airport operations, the equipment used for dewatering will need to be mobile. 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. As discussed in Section 2.2, the Coffman construction dewatering plan describes the means and methods proposed for dewatering their work area including estimated dates and flow rates.

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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 B. Low concentrations of TPH as diesel, TPH as oil, and several VOCs were reported in groundwater. Low concentrations of PFAS compounds were also detected in groundwater from each of the three borings conducted adjacent to the Site in December 2023 and August 2024. More details are presented in Section 1.2 of the CMMP in Attachment A of the EMP.

4.1 Treatment Design Parameters

The treatment system was sized based on the parameters from the Coffman construction dewatering plan. The specific volume and number of tanks were selected to optimize treatment for post treatment ground application of the construction dewatering. The system was designed to remove turbidity through passive gravity separation, flocculation, and filtration. If present, TPH, VOCs and PFAS will be treated by adsorptive media vessels prior to discharge to the storm sewer. Cut sheets for system equipment are included in Appendix C.

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 is shown in Appendix B. The treatment system includes chitosan-enhanced sediment removal, sand filters, bag/cartridge filters (for polishing), two 2,000 pound carbon/organoclay vessels, two 2,000 pound Fluro-Sorb 200 vessels, valving, and controls. The carbon/organoclay vessels and Fluro-Sorb 200 vessels will be plumbed in series to increase the bed contact time. As needed, carbon dioxide injection will be used for pH adjustment. The system also includes a recirculation line. Safety Data Sheets for the proposed treatment system additives are included in Appendix D.

- 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 performed 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

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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 estimated maximum discharge rate at well start up is 100 gallons per minute. Flow rates over 100 gallons per minute are not anticipated based on historical dewatering/treatment at the Portland International Airport (PDX). The system influent will be throttled, where necessary, to limit the input flow rate to 100 gpm.

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 6.5 to 8.5 which is based on the criteria of the receiving waterbody according to OAR 340-041-0021. The treatment system is equipped with CO2 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. The application area, discussed further in Section 6.1, will be inspected prior to every discharge event. 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 6.3, to prevent migration of the discharged water to surface water or stormwater infrastructure.

Daily routine maintenance will include the following:

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- 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 Storm System Discharge and Monitoring

Dewatering will be conducted using a localized approach (e.g., a limited number of dewatering wells) to help minimize the volume of water. While the preferred discharge method at PDX is discharge to the ground surface for infiltration, the nearest unpaved area is approximately 500 feet to the north,

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across the aircraft apron and an active taxiway. Due to restrictions governing aircraft safety, it is not practicable to discharge to the ground surface for infiltration. As a result, discharge will be to the storm sewer in the work area.

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 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, perfluorooctane sulfonate (PFOS), and perfluorooctanoic acid (PFOA) breakthrough is considered to have occurred when concentrations are reported above the method reporting limit (MRL). The laboratory MRLs for TPH, VOCs, and PFAS are presented in Appendix E. None of the MRLs for TPH and VOCs applicable to the site exceed the screening levels values for the following:

- 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.

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. Because the project is within an aircraft movement area, the treatment system is space and height constrained which limits the capacity to accumulate and hold water for PFAS testing. The project location requires that all equipment be mobile. 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. The shallow groundwater beneath the Site where PFAS are present is not used for or designated as drinking water, and have not been shown through Site investigations under DEQ oversight to migrate to any drinking water source.

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6.3 Pre-Discharge Requirements

Testing prior to discharge is not possible since work is within an active aircraft movement area, requiring all equipment to be mobile. Prior to discharging water from the system, the operator must have completed the daily observation and maintenance, detailed in Section 5.1.

6.4 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.

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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.

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Appendix A

Coffman Excavation Inc. Dewatering Plan

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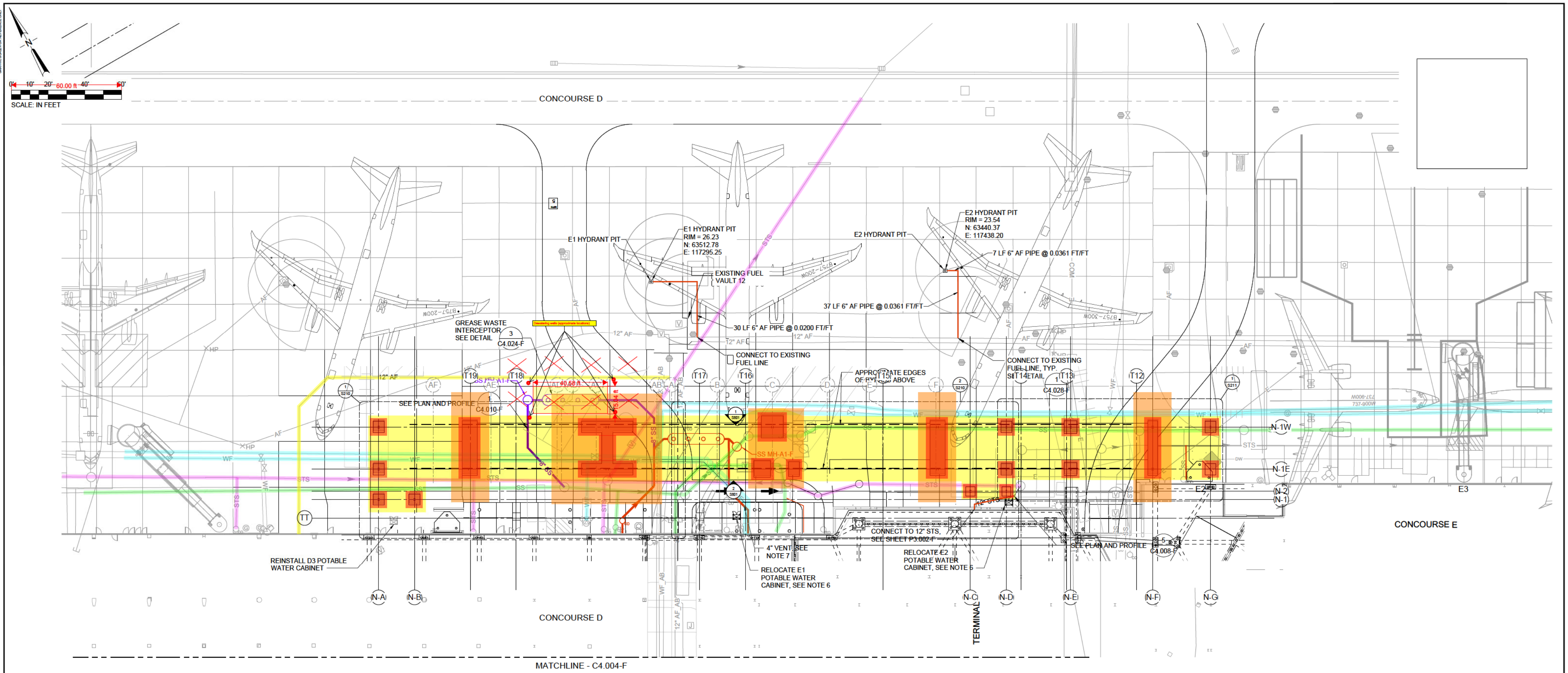
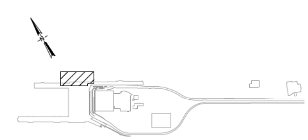


LEGEND:

EXISTING	NEW	
		FUEL PIT (HYDRANT, HIGH POINT VENT, LOW POINT DRAIN)
		NEW CLEAN OUT
		NEW MH
		NEW CATCH BASIN
		EXISTING PLUG OR CAP
		HYDRANT
		WATER VALVE
		CATHODIC PROTECTION (CP) TEST STATION
		PORTABLE WATER CABINET
		LIMITS OF NEW PAVEMENT
STS	STS	NEW STORM SEWER
FW	WF	FIRE PROTECTION WATER
DW	W	WATER LINE
SS	SS	SANITARY SEWER
AF	AF	AVIATION FUEL
	STS	EXISTING STORM SEWER
	P_ABAND_STS	ABANDONED STORM SEWER
		ELECTRICAL/COM
		DUCT BANK, NEW OR EXISTING

NOTE(S):

1. FOR UTILITY PROFILES SEE SHEETS C4.007-F TO C4.010-F.
2. FOR PAVEMENT LAYOUT PLAN, SEE SHEET C2.002-F TO C2.007-F.
3. THE CONTRACTOR SHALL MATCH FINISH GRADES TO THE RIM ELEVATION OF EXISTING UTILITIES EXCEPT WHERE EXISTING STRUCTURES ARE TO BE ADJUSTED.
4. EXISTING GROUNDWATER LEVELS IN THE PROJECT AREA CAN BE AT GROUND SURFACE.
5. SEE PLAN AND PROFILE SHEETS FOR DETAILED UTILITY LOCATION INFORMATION.
6. FOR POTABLE WATER CABINET BUILDING CONNECTIONS SEE SHEETS P3.140-F-P3.141-F (PDX 2021-510)
7. FOR GREASE WASTE PIPE AND VENT CONNECTIONS SEE SHEET P3.101-F (PDX 2021-510)



KEY PLAN
SCALE: N.T.S.

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. THE GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

NO.	DATE	BY	REVISIONS	APP'VD
12	5/27/24		Sheet REVISED by RFI #6941	
11	7/18/22		Sheet REVISED by CC #29.5	
10	1/10/22		Sheet REVISED by CC #29.4	
2	N/A		REVISIONS NO. 2-9 NOT USED	
1	9/17/21		Sheet ADDED by CC #29.3	

PORT OF PORTLAND
PORTLAND, OREGON

ZGF — 1223 SW Washington Street, Suite 200, Portland, OR 97205, T 503 224 3860 - F 503 224 2482
HNTB CORPORATION — 777 108th Avenue NE, Suite 1000, Bellevue, WA 98004, Tel (425) 455-3555, Fax (425) 453-9179, www.hntb.com

2016D006 DESIGN NUMBER
102191 PROJECT NUMBER

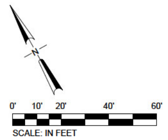
DESIGNED BY V. NGUYEN
DRAWN BY N. HATCHER
CHECKED BY H. CONRADT
DATE FEBRUARY 2021
SCALE 1" = 20'

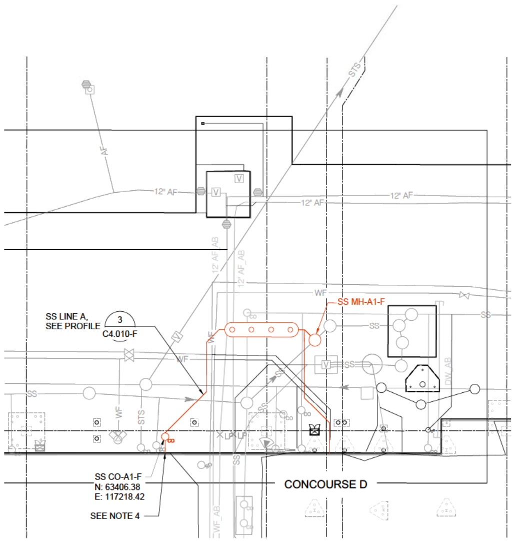
PORTLAND INTERNATIONAL AIRPORT
TCORE - BUILDING ENCLOSURE AND INTERIOR CONSTRUCTION
UTILITY LAYOUT PLAN
AIRSIDE 4

SUBMITTED BY STEVE JANNSEN, PORT ENGINEER
TYPE CD
DRAWING NO. PDX 2021-510
SHEET NO.
DISC. SHT. NO. C4.005-F

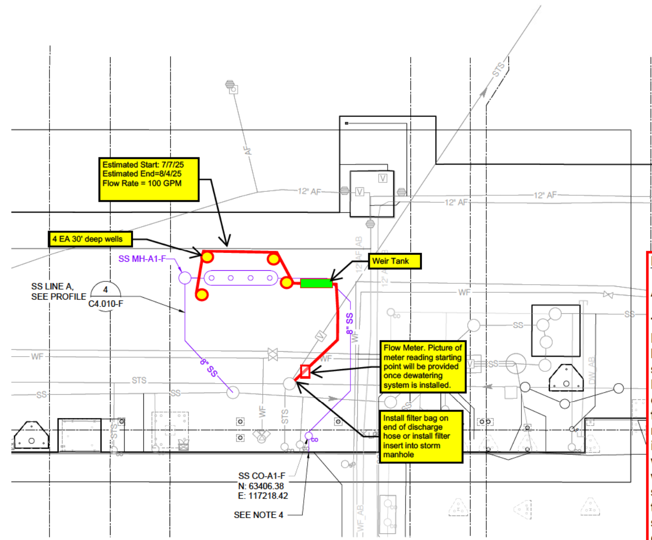
DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 22" x 17".

PRINTED: 11/18/2024 10:22:00 AM File Path: \\seaw00\jobs2\63842\CADD\DS001\Exhibits\20241005\4.005-F UTILITY LAYOUT PLAN.dwg





1 SS LINE A PLAN
SCALE: 1" = 20'



2 SS LINE 2A PLAN
SCALE: 1" = 20'

Discharge Totals Information:

Estimated Max Discharge Rate = 100 GPM.

Estimated Max Daily Discharge Volume = 144,000 Gal

Estimated Total Discharge Volume for Project = 4,176,000 Gal

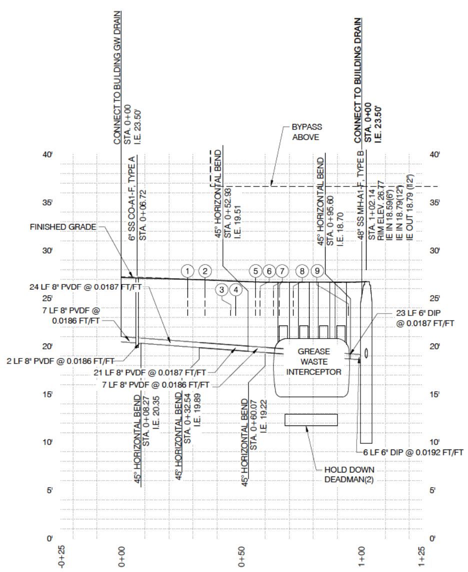
DP F Grease Inerceptor - Dewatering Plan Narrative:

Approximate Time Frame of De-watering: 7/28/25 - 8/25/25

The proposed dewatering systems will several 30' deep well casings with each casing housing a 1 HP or a 5HP submersible pump. A cross-section of the well system has been provided in this submittal packet. Each submersible pump will discharge into a solid 3-4" PVC stand pipe which will extend up to the surface out of the well casing. Each stand pipe will be connected to a 6" PVC header pipe which will route all discharge water into a weir tank as shown to filter out any sediment. Discharge water from the weir tanks will go threw a flexible hose to dump into an existing storm manhole as shown in the plan on this sheet. Discharge water will be visually inspected daily by Coffman Excavation's employees to determine if the discharge water is suitable to discharge into the storm system. All results of visual inspections will be documented by Coffman Excavation. The end of the discharge hose into the storm manhole will have a filter bag on the end to remove any remaining sediment that may be in the discharge water. The estimated max flow rate of these dewatering systems is 100 GPM at any one time. All wells will be installed by a licensed well driller with the drill rig as shown in the attached submittal document. When dewatering activities are no longer required, all wells will be abandoned per state regulations. Once the proposed dewatering system is up and operational all further operation and maintenance will be performed by Coffman Excavation. Well start cards and well reports will be provided to the Port and to the State of Oregon Water Resource Department.

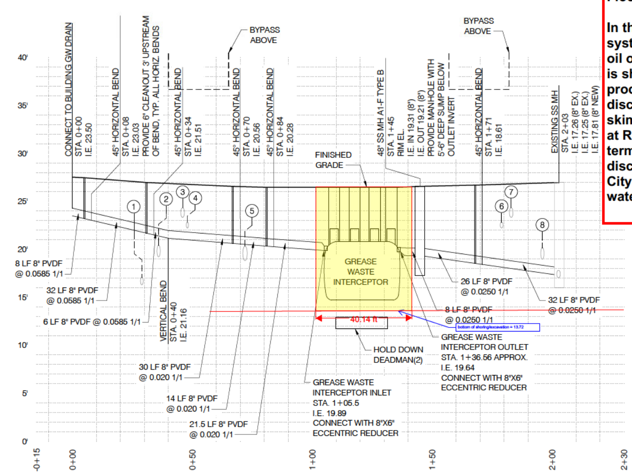
Immediate action will be taken to fix any issues with turbidity or any other issues with the dewatering system. Possible solutions to fixing turbidity issues may be to adding flocculent into the weir tanks to help to settle any sediment to the bottom of the tanks quicker and/or add additional tanks to the series of tanks to aid in filtration. Flocculent information can be found in this submittal packet.

In the event that odors or discoloration of ground water is detected, the dewatering system will be shut down immediately and the port will be notified straight away. Any oil or petroleum products that do end up entering the weir systems before the system is shut down, will be trapped in the first weir cell of the first weir tank as these products will float on the waters surface in the weir tank and will not be able to be discharged into the storm system. The oil or petroleum products can then be skimmed off the waters surface using a vacuum truck and then be disposed of offsite at Rivercity Environmental located off of NE 109th Street in Portland. Also, as a short term solution for managing any possibly contaminated ground water we can discharge water from the weir tank into water trucks and haul this water off to River City Environmental. In the event that contaminated water is encountered all discharge water from the system will be diverted to the sanitary system.



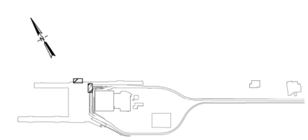
LINE A UTILITY CROSSINGS (#)				
NO.	UTILITY	STATION	INVERT	NOTES
1	EX. 8" SS	0+28	17.11 TOP	DIP
2	EX. 12" STS	0+35	20.43 TOP	RCP
3	EX. 10" WF	0+46	23.32 BOT	DIP
4	EX. 6" W	0+48	22.22 BOT	DIP
5	EX 6" W	0+56	22.22 BOT	DIP
6	EX. 10" WF	0+58	23.32 BOT	DIP
7	EX. AF	0+63	-	ABAND/REMOVE
8	EX. SS	0+72	-	ABAND/REMOVE
9	EX. SS	0+95	-	ABAND/REMOVE

3 SS LINE A PROFILE
SCALE: HOR: 1" = 20'
VER: 1" = 5'



LINE A UTILITY CROSSINGS (#)				
NO.	UTILITY	STATION	ELEVATION	NOTES
1	EX. 8" SS	0+29	17.11 TOP	DIP
2	EX. 12" STS	0+36	20.43 TOP	RCP
3	EX. 10" WF	0+46	23.32 BOT	DIP
4	EX. 6" W	0+48	22.22 BOT	DIP
5	EX. 15" STS	0+72	20.34 TOP	RCP
6	EX. 6" W	1+79	22.23 BOT	DIP
7	EX. 10" WF	1+83	23.33 BOT	DIP
8	EX. 12" STS	1+96	18.98 BOT	RCP

2A SS LINE A PROFILE ALTERNATIVE
SCALE: HOR: 1" = 20'
VER: 1" = 5'



KEY PLAN
SCALE: N.T.S.

NO.	DATE	BY	REVISIONS	APPVD

PORT OF PORTLAND
PORTLAND, OREGON

ZGF
HNTB

DESIGNED BY	V. NGUYEN
DRAWN BY	N. HATCHER
CHECKED BY	H. CONRADT
DATE	FEBRUARY 2021
SCALE	AS SHOWN

PORTLAND INTERNATIONAL AIRPORT

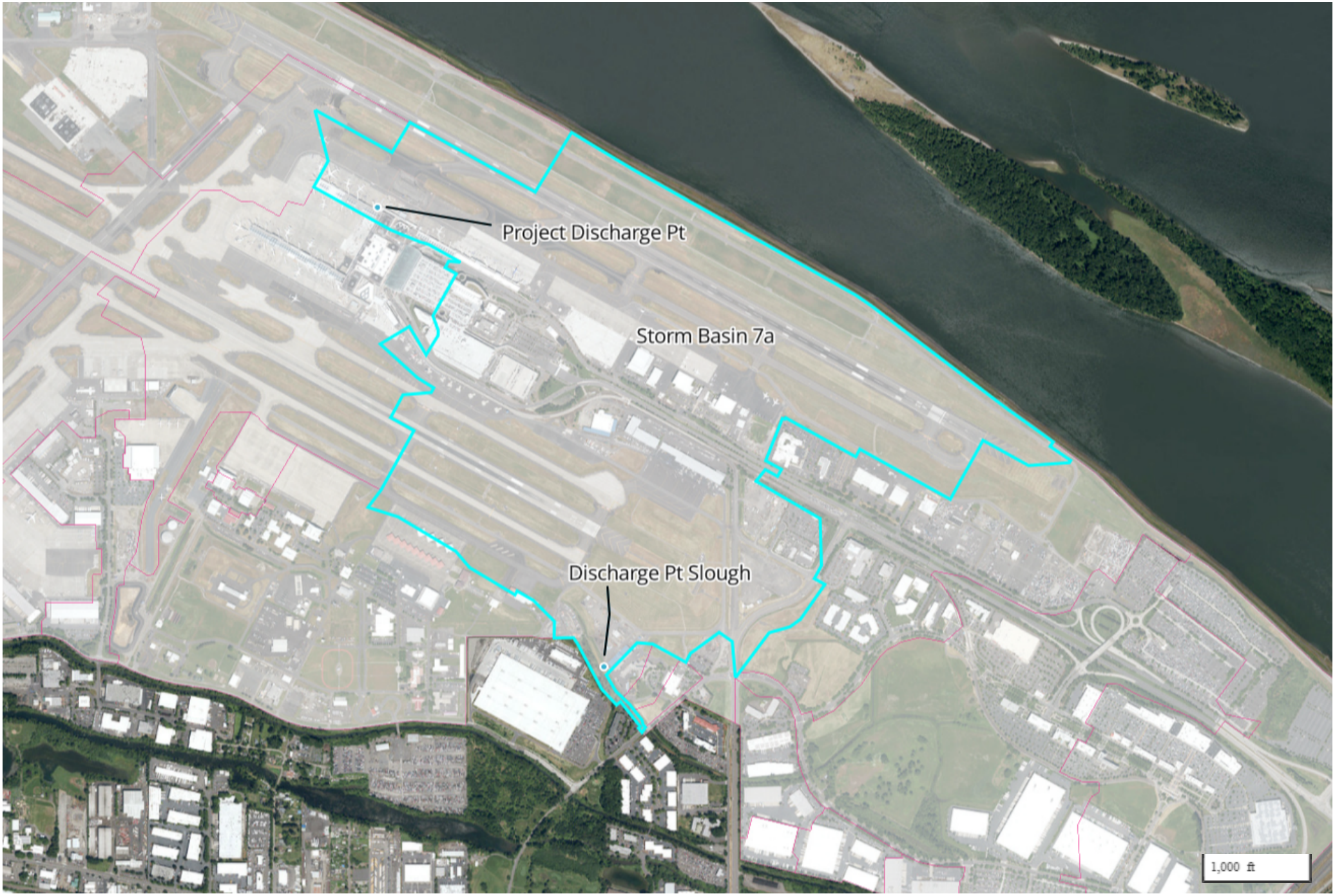
TCORE - BUILDING ENCLOSURE AND INTERIOR CONSTRUCTION
UTILITY PLAN AND PROFILE
SANITARY SEWER

SUBMITTED BY STEVE JANNSEN, PORT ENGINEER

TYPE	DRAWING NO.	SHEET NO.	DISC. SHT. NO.
CD	PDX 2021-510		C4.010-F

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 22" x 17".

PRINTED: 11/14/2024 1:30:39 PM



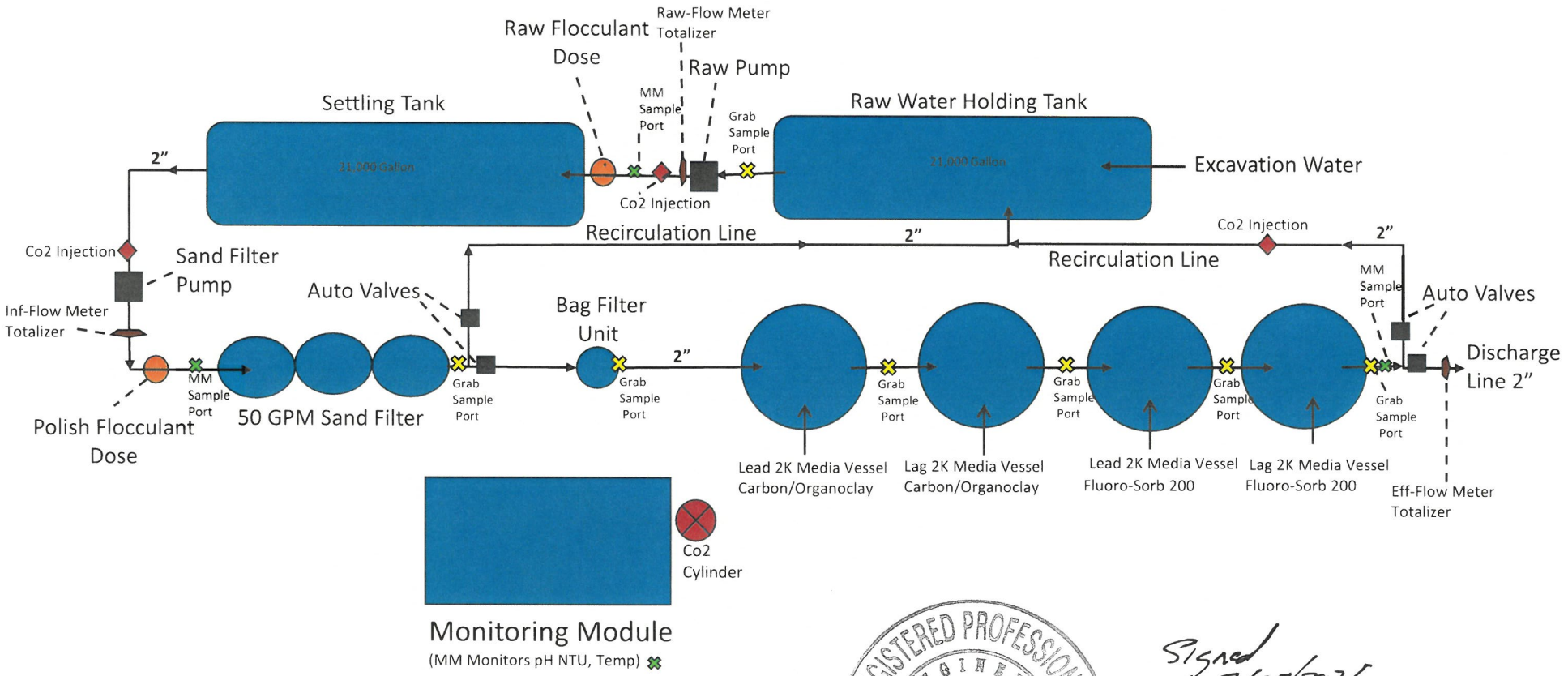
TCore EMP PKG F Interceptor Map

Port of Portland geospatial data is gathered, maintained and primarily used for internal reference and analysis, and is only updated as resources permit. Geospatial data refers to data and information referenced to a location on the Earth's surface such as maps, charts, air photos, satellite images, cadastre and land and water surveys, in digital or hard copy form. Geospatial data may be gathered and maintained by more than one person or department within the Port, and data distributed by one person or department may not reflect the most recent data available from the Port or from other sources. Port geospatial data is not intended for survey or engineering purposes or to describe the authoritative or precise location of boundaries, fixed human works, or the shape and contour of the earth. The Port makes no warranty of any kind, expressed or implied, including any warranty of merchantability, fitness for a particular purpose, or any other matter with respect to its geospatial data. The Port is not responsible for possible errors, omissions, misuse, or misrepresentation of its geospatial data. Port geospatial data is not intended as a final determination of such features as existing or proposed infrastructure, conservation areas, or the boundaries of regulated areas such as wetlands, all of which are subject to surveying or delineation and may change over time. No representation is made concerning the legal status of any apparent route of access identified in geospatial data. The foregoing disclaimer applies to uses of Port geospatial data in any context, including online access at Port workstations, remote access, or use in downloaded digital or hard copy form.

Appendix B

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

Proprietary & Confidential to Clear Creek Systems

Appendix C

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 D

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.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

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

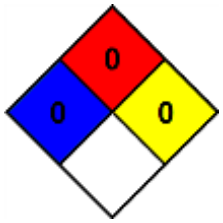
SECTION 16: Other information

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

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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

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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

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Back to HS-250-AC

Appendix E

Laboratory MRLs

MAUL
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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

MAUL FOSTER ALONGI

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 - TCORE 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:			
Not applicable/none			

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:	

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: 7/18/2025

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 - TCORE 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:	

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: 7/18/2025

Email: Blake.Hamalainen@portofportland.com

First Name	Last Name	Certification Expiration	Trained By	Current CCSI Employee
Marcus	Bohler	8/18/2026	Clear Creek Systems	Yes
Zoe	Wickline	8/18/2026	Clear Creek Systems	Yes
Sam	Pepper	12/15/2026	Clear Creek Systems	Yes
Jeremy	Gubner	8/18/2026	Clear Creek Systems	Yes
Matthew	Ross	8/18/2026	Clear Creek Systems	Yes
Brian	Anderson	12/15/2026	Clear Creek Systems	Yes
Vasiliy	Betev	12/15/2026	Clear Creek Systems	Yes
Sam	Petrie	6/21/2027	Clear Creek Systems	Yes
Jason	Martino	6/21/2027	Clear Creek Systems	Yes
Tyson	West	12/15/2026	Clear Creek Systems	Yes
Xavior	Terlaje	12/15/2026	Clear Creek Systems	Yes
Jorge	Farias	8/18/2026	Clear Creek Systems	Yes
Taylor	Johnson	6/21/2027	Clear Creek Systems	Yes
Jame	Westran	6/21/2027	Clear Creek Systems	Yes
Chase	Cannon	12/15/2026	Clear Creek Systems	Yes