HILLSBORO AIRPORT
PORT OF PORTLAND
STORMWATER POLLUTION CONTROL PLAN

DEQ FILE NO. 107009

EPA FILE NO. ORR800175

SIC Codes: 4512, 4513, 4522, 4581 and 3721

National Pollutant Discharge Elimination System Industrial Stormwater Discharge Permit No. 1200-Z

Prepared By:
The Port of Portland
Primary Author: Blake Hamalainen

Port of Portland and Co-permittees

August 31, 2021
Updated: December 31, 2021

Site Physical Address: 1040 NE 25th Avenue Hillsboro, Oregon 97125

Washington County

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Multnomah County

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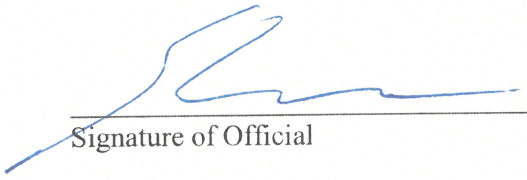
(503) 415-6566

SIGNATURE REQUIREMENT

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

Stan Jones
Name of Official

Senior Manager
Title of Official



Signature of Official

8-31-21
Date

Stormwater Pollution Control Plan Checklist

SITE NAME: HILLSBORO AIRPORT NAME DEQ FILE NO. 107009

Permit Schedule		SWPCP Required Element	Page No.	Comments (Official Use Only)
New Discharger	Condition I.1.a or b	A new discharger to an impaired water without a TMDL must meet one of the conditions in this section of the permit to obtain coverage	NA	
Signature	A.8.b.	Signed and certified in accordance with 40 CFR 122.22	II	
Title Page	A.10.a.	Plan date	I	
		Name of the site	I	
		Name of the site operator or owner	I	
		Name of the person(s) preparing the SWPCP	I	
		DEQ File No. and EPA Permit No.	I	
		Primary SIC code and any co-located SIC codes	I	
		Contact person(s) name, telephone number and email	I	
		Physical address, including county	I	
		Mailing address if different	I	
General Location Map	A.10.b.i.(1)	General location of the site in relation to surrounding properties, transportation routes, surface waters and other relevant features.	Figure 2	
Site Map* (please identify clearly)	A.10.b.i (2-19)	Drainage patterns, with flow arrows	Figure 2	
		Conveyance and discharge structures, such as piping or ditches	Figure 2	
		Exact location of all monitoring points labelled with a unique three-digit identifying number starting with 001, 002, etc.	Figure 2	
		Outline of the drainage area for each discharge point	Figure 2	
		Paved areas and buildings within each drainage area	Figure 2	
		Locations of discharge points if different from monitoring points	Figure 2	
		Areas used for outdoor manufacturing, treatment, storage, or disposal of significant materials	NA	
		Areas of known or discovered significant materials from previous operations	NA	
		Existing structural control measures for minimizing pollutants in stormwater runoff	Figure 2	
		Structural features that reduce flow or minimize impervious areas	Figure 2	
		Material handling and access areas	Figure 2	
		Hazardous waste treatment, storage and disposal facilities	NA	
		Location of wells including waste injection wells, seepage pits, drywells	NA	
		Location of springs, wetlands and other surface waterbodies both on-site and adjacent to the site	Figure 2	
		Location of groundwater wells	NA	
		Location and description of authorized non-stormwater discharges	NA	
		Location and description of spill prevention and cleanup materials	Figure 2	
		Locations of the following materials and activities if they are exposed to stormwater and applicable:	Figure 2	
		Fueling stations	Figure 2	

Permit Schedule		SWPCP Required Element	Page No.	Comments (Official Use Only)
		Vehicle and equipment maintenance cleaning areas	NA	
		Loading/unloading areas	Figure 2	
		Locations used for the treatment, storage, or disposal of wastes	NA	
		Liquid storage tanks	Figure 2	
		Processing and storage areas	Figure 2	
		Immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste materials, or by-products used or created by the facility	Figure 2	
		Transfer areas for substances in bulk	Figure 2	
		Machinery	NA	
		Locations and sources of run-on to your site from adjacent property	Figure 2	
Site Description*	A.10.b.ii	A description of industrial activities conducted at the site and significant materials stored, used, treated or disposed of in a manner which exposes those activities or materials to stormwater. Include in the description the methods of storage, usage, treatment or disposal	22	
	A.10.b.iii	Location and description, with any available characterization data, of areas of known or discovered significant materials from previous operations	NA	
	A.10.b.iv	Regular business hours of operation	5	
	A.10.b.v	For each area of the site where a reasonable potential exists for contributing pollutants to stormwater runoff, a description of the potential pollutant sources that could be present in stormwater discharges and if associated with a co-located SIC code	22	
	A.10.b.viiii	An estimate of the amount of impervious surface area (including paved areas and building roofs) and the total area drained by each stormwater discharge point to be reported in area units	6	
	A.1.k	Non-stormwater discharges	29	
Site Controls*	A.10.b.vi	A description of control measures installed and implemented to meet the technology and water quality-based requirements and any applicable sector-specific requirements in Schedule E	25-29	
		A description of how the stormwater control measures address potential pollutant sources from industrial activities and significant materials on-site, spills and leaks and authorized non-stormwater discharges	25-29	
	A.1.a	Minimize exposure	26	
	A.1.b	Oil and grease	26	
	A.1.c	Waste chemicals and material disposal	26	
	A.1.d	Erosion and sediment control	27	
	A.1.e	Debris control	27	
	A.1.f	Dust generation and vehicle tracking	27	
	A.1.g	Housekeeping	27	
Procedures and Schedules	A.10.b.vi	Include known maintenance schedules and frequency of housekeeping measures	28	
	A.1.h and A.10.c	**Spill prevention and response procedures:**	31-34	
	A.10.c.i	Procedures for preventing and responding to spills and cleanup and notification procedures	28	

Permit Schedule		SWPCP Required Element	Page No.	Comments (Official Use Only)
		Indicate who is responsible for on-site management of significant materials and include their contact information	31	
		Spill prevention plans required by other regulations may be substituted for this provision if the spill prevention plan addresses stormwater management concerns and the plan is included with the SWPCP	NA	
	A.1.h.v	Develop procedures for expeditiously stopping, containing and cleaning up leaks, spills and other releases	33	
	A.1.h.vi	Documentation and notification, including OERS number	32	
	A.1.i and A.10.d	**Preventative Maintenance:**	28	
		Procedures for conducting inspections, maintenance and repairs to prevent leaks, spills, and other releases from drums, tanks and containers exposed to stormwater	28-29	
		Schedules or frequency of maintaining all control measures	28-29	
		Schedules of waste collection	26-27	
	A.10.e	**Operations and Maintenance:**		
		Include an operation and maintenance plan for active treatment and passive treatment systems	28; App E	
		Include system schematic, manufacturer's maintenance and operations specifications	28; App E	
		Include routine maintenance standards and schedules	28-29	
	A.10.f and A.1.j	**Employee Education:**	28-29	
		Develop and maintain an employee orientation and education program to inform personnel of the pertinent components and goals of this permit and the SWPCP	28-29	
		Orientation no later than 30 calendar days of hire or change in duties, annually thereafter	28-29	
		Include a description of the training content and the required frequency	28-29	
Tier 2 Status	A.10.b.vii	Facility triggered Tier II under current permit ☐ Yes A description of stormwater treatment controls or source controls, including low impact development, in response to corrective action requirements and operation and maintenance procedures	NA	
		Include safety sheets for any stormwater treatment chemicals or substances used in stormwater treatment and stored on site	NA	
Receiving Waters	A.10.b.ix	The name(s) of the receiving water(s), latitude and longitude of discharge points, and applicable SIC code, if facility has co-located operations	6	
		If discharge point is to a municipal storm sewer system, name(s) and latitude and longitude of the receiving water and municipality	6	
Monitoring Locations*	A.10.b.x	The identification of each discharge point and the location(s) where stormwater monitoring will occur as required by Schedule B.6	6	
		Existing discharge points excluded from monitoring must include a description of the discharge point(s) and data or analysis supporting that the discharge point(s) are substantially similar as described in Schedule B.7.c.ii	12, 14	
**Some facilities must meet sector specific requirements (Schedule E) and include additional information in SWPCP, including the site map. If applicable, ensure that the SWPCP includes the sector specific information.*				

For Official Use Only			
New applicant:	☐ Yes ☐ No		
New discharger:	☐ Yes ☐ No	New discharger to impaired waters condition met:	☐ Yes ☐ No
		Outstanding Resource Water discharger:	☐ Yes ☐ No
Existing facilities:	☒ Yes ☐ No	SWPCP update per renewal:	☐ Yes ☐ No
		SWPCP update per Schedule A.9:	☐ Yes ☐ No
		Facility triggered Tier II under previous permit term:	☐ Yes ☐ No
		Facility triggered Tier II under current permit term:	☐ Yes ☐ No
Schedule E Requirements:	☐ Yes ☐ No	Schedule E additional information in SWPCP and site plan	☐ Yes ☐ No
Date received:		Plan Accepted:	☐ Yes ☐ No

Reviewed by: _____

1. _____
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I. Plan Preparation and Availability

This Stormwater Pollution Control Plan (SWPCP) has been prepared according to the requirements of the National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater Discharge Permit No. 1200-Z (1200-Z permit, see Appendix A) by the following individuals who are knowledgeable in stormwater management and familiar with the facility:

- Steve Nagy, Director, Airport Operations
- Nathan Grimes, Supervisor, GA Operations
- Gene Hollinger, General Aviation Maintenance Lead
- Blake Hamalainen, Water Quality Specialist
- Kat Maloney, GIS Analyst

This SWPCP shall be kept on site at Hillsboro Airport (HIO) and in the Environmental Department offices at Portland International Airport (PDX). A copy will be made available to all Port of Portland (Port) employees, contractors, tenants at HIO, and government agencies responsible for stormwater management.

II. Review and Revision Schedule

This SWPCP will be kept current and updated by the Port's Environmental Department as necessary to reflect any substantial changes to industrial activities or BMPs at HIO within 30 days of change. SWPCP revisions must be submitted only if they are made for any of the following reasons:

- Change in site contact(s);
- In response to a corrective action or inspection;
- Changes to the site or control measures that may significantly change the nature of pollutants present in stormwater discharge; or significantly increase the pollutant(s) levels, discharge frequency, discharge volume or flow rate; and
- Changes to the monitoring points or discharge points.

The Port will submit the required SWPCP revisions to the Department of Environmental Quality (DEQ). The Port will keep a copy of the revised SWPCP on site and at the Port Headquarters office and document the changes in the Record of Change form in Appendix B.

III. Definitions

The following provides definitions of pertinent terms used throughout this document.

Benchmarks are guideline concentrations ("levels of concern") not limitations. They are designed to assist the permittee in determining if the implementation of their SWPCP is reducing pollutant concentrations to below the levels of concern. For facilities that are subject to federal limitations, benchmarks apply to only those pollutants that are not limited by the federal regulations.

Best Management Practices (BMPs) refers to secondary containment, structural controls for oil and grease, proper management and disposal of waste chemicals and materials, erosion and sediment control, debris control, stormwater diversion away from industrial activities, covering activities, housekeeping practices, and other structural and non-structural controls and practices intended to prevent or reduce pollutants in stormwater.

Corrective Action is a documented response or SWPCP revision to benchmark exceedances in Schedule A.9, Schedule E or reference concentrations for impairment pollutants.

Point Source Discharge is any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

Impervious surfaces refer to surfaces that will not allow stormwater runoff to infiltrate into the natural ground.

Significant materials include, but are not limited to, raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; deicing and anti-icing chemicals; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.

Site controls include best management practices, spill prevention and response procedures, preventative maintenance, and employee education. The purpose of site controls is to eliminate or minimize the exposure of pollutants to stormwater.

Spill Prevention Control and Countermeasures (SPCC) regulations (40 CFR 112) establish the procedures, methods, and equipment to prevent the discharge of oil from non-transportation related oil processors and handlers. The objectives of the SPCC plan are to prevent spills from occurring at the facility, prepare for a possible spill, and to respond if a spill does occur. The three basic principles that the Plan encompasses are: 1) the practices devoted to the prevention of oil spills, 2) the plan of containment should a spill occur, and 3) the plan for removal and disposal of spilled oil. The SPCC plan is required for facilities that store petroleum products with a combined storage capacity of greater than 1,320 gallons.

Spill Prevention and Response Procedures (Spill Plan) are methods to prevent spills along with cleanup and notification procedures. These methods and procedures shall be made available to appropriate personnel. The required cleanup material shall be on-site and readily available. Spill prevention plans required by other regulations may be substituted for this provision providing that stormwater management concerns are adequately addressed.

Stormwater runoff means water discharged because of rain, snow, or other precipitation.

Total Maximum Daily Load (TMDL) is the sum of the individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources and background. If receiving water has only one-point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

Water quality limited means that the body of water does not meet applicable water quality standards.

IV. Co-permittee Responsibilities

HIO tenants and non-Port entities performing industrial activities who are a Co-permittee on the HIO 1200-Z permit. Each Co-permittee is covered under the 1200-Z permit and will comply with the 1200-Z permit and HIO's SWPCP.

HIO tenants may become Co-permittees by submitting an application to the Port. Each Co-permittee is responsible for their leasehold and for complying with all the following requirements:

- Implement pollution control measures and BMPs identified in this SWPCP.
- Conduct and document monthly inspections of industrial areas and activities exposed to stormwater, stormwater control measures, structures, catch basins, and treatment facilities including oil/water separators and catch basin filters in accordance with Schedule B.12.
- Perform any necessary preventative maintenance of stormwater control structures and facilities on leasehold.
- Submit information related to the Co-permittee's operation and participate in benchmark exceedance investigations if requested by the Port, Clean Water Services or DEQ.
- Retain copies of inspection forms, preventative maintenance and repair documentation for a minimum of three years and provide copies to the Port, Clean Water Services or DEQ upon request.
- Maintain a written schedule for regular pick-up and disposal of waste materials.
- Develop and implement a Spill Plan. The plan must include methods to prevent spills along with cleanup and notification procedures.
- Maintain a copy of the Spill Plan and adequate spill cleanup materials on-site.
- Conduct and document an employee education program to inform personnel of the components and goals of this SWPCP and the Spill Plan consistent with 1200-Z permit requirements. The education and training should occur within 30 days of hire and annually thereafter.
- Review this SWPCP whenever facility operations change.
    - Ensure activities are adequately represented in the SWPCP for compliance and accuracy.
    - Submit any revisions within two weeks to the Port's Environmental Department.
- Submit a completed and signed annual verification form to the Port certifying that the Co-permittee has performed the required inspections, preventative maintenance, and best management practices and has prevented illicit discharges. Verification forms are sent out to Co-permittees by the Port each year.

V. Introduction

A. Background

Section 402 of the Clean Water Act (CWA) establishes a program for NPDES Permits. The CWA is implemented via the Code of Federal Regulations (CFRs). 40 CFR §122.26(b) (14) identifies Standard Industrial Classification (SIC) codes and industrial activities that trigger a requirement for permit coverage under the NPDES program. An NPDES permit is required for facilities that fall under major group 45 (transportation by air) or group 37 Transportation Equipment. This includes related businesses that perform maintenance, parts manufacturing, fueling or deicing/anti-icing and that have one of the following SIC codes: 4512 (air transportation, scheduled), 4513 (air courier services), 4522 (air transportation, nonscheduled), 4581 (airports, flying fields, and airport terminal services) and 3721 Aircraft and Parts.

The Oregon DEQ has created general NPDES permits for many industrial activities; the 1200-Z permit is a general permit issued by the DEQ. The 1200-Z permit authorizes the discharge of stormwater from industrial activities into waters of the state. The DEQ issued the Port and Co-permittees at HIO a 1200-Z permit (Appendix A). The 1200-Z permit covers vehicle and aircraft maintenance (including rehabilitation, mechanical repairs, maintenance, painting, fueling, and lubrication), deicing operations, equipment cleaning operations, parts manufacturing and wholesale bulk petroleum storage and handling facilities. Schedule A of the 1200-Z permit, Controls and Limitations, requires the preparation and implementation of a SWPCP.

B. Purpose

This SWPCP is a guidance document for use by Port personnel and Co-permittees to guide daily operations for reducing concentrations of pollutants in stormwater runoff. The SWPCP details industrial activities and stormwater site control strategies and provides a baseline to evaluate future implementation of site controls.

This SWPCP is prepared consistent with the SWPCP requirements outlined in Schedule A of the 1200-Z permit and the provisions of Title 40, Code of Federal Regulations (CFR), Part 122 and serves as a guidance document for Port personnel to manage the quality of stormwater discharged from the site to the receiving waters.

VI. Site Description

The Port owns and operates HIO, which is a general aviation airport. Regular business hours are from 8:00am to 5:00pm. The Port leases property at HIO to many private parties and companies which include Fixed Base Operators (FBOs), car rental companies, flying clubs, a flight school, and support service providers. Tenants with activities classified under the Transportation by Air SIC code 45, 3721 Aircraft and Parts or that have other industrial activities impacting stormwater are Co-permittees on the 1200-Z permit (see Appendix A). The industrial activities at HIO include aircraft storage, airport hangar rental, airport terminal services, aircraft parking, fueling and maintenance. Other tenants have office space with no outdoor activities. Domestic water and sewer service at HIO are provided by the City of Hillsboro (City). Buildings at HIO are constructed of wood or metal with metal or composition roofs. The topography at HIO is predominately flat, with most pervious areas covered with agricultural grass fields, airfield grass or other landscape. There are six drainage areas at HIO within the permit boundary.

A. Location

HIO comprises approximately 678 acres in Sections 28, 29, and 32, Township 1 North, Range 2 West in the Willamette Meridian (Figure 1). Except for portions of clear zones and small areas of the approach zone and land lying north of NW Evergreen Road, the airport lies within the incorporated limits of the City of Hillsboro, in Washington County, Oregon. The site is bordered on the south by NE Cornell Road, on the east by NW Brookwood Parkway, on the north by NW Evergreen Street, and on the west by NE 25th Avenue and NE 272nd. There are a few parcels of Port owned land that are adjacent to this boundary, but not within it and not covered under this SWPCP since no industrial activities occur on these properties.

Table 1 Facility Location and Emergency Contacts

Facility Name: ***Facility Address:*** ***Business Hours***	*Port of Portland Hillsboro Airport* *1040 NE 25th Avenue, Hillsboro, OR 97125* *8:00am – 5:00pm*	
Emergency contact: ***(Spills and Security)***	*Port Communication Center*	***Phone #:*** *(503) 460-4000*
Stormwater contact:	Blake Hamalainen	***Phone #: (****503) 341-7836 (mobile)*
Port office main number:		***Phone #: (503) 415-6000***

B. Receiving Waters and Discharge Points

Stormwater from HIO discharges to Dawson Creek, McKay Creek, and the City's storm sewer system via the following discharge points prior to discharging to the Tualatin River. The airport lies on high ground between two watersheds. McKay Creek drains the northerly and westerly portions of the site. Dawson Creek drains the southern and eastern portions of the site. Drainage basin 6 drains into the City's storm sewer system, which discharges to the Tualatin River. Additional information on the location of the discharge points and the areas they drain is provided in Table 2.

- Discharge Point 001 is a 21-inch pipe that runs under Cornell Road located near the southeast corner of the site prior to discharging to Dawson Creek, a tributary to the Tualatin River. The latitude and longitude of Discharge Point 001 are 45.531934°N and 122.941595°W.
- Discharge Point 002 is a 30-inch pipe that runs under NE Brookwood Parkway located near the southeast corner of the site prior to discharging to an unnamed tributary to Dawson Creek, which is a tributary to the Tualatin River. The latitude and longitude of Discharge Point 002 are 45.535457°N and 122.941318°W.
- Discharge Point 003 is a 24-inch pipe that runs under Cornell Road located near the southern portion of the site prior to discharging via a 60-inch pipe to Dawson Creek, a tributary to the Tualatin River. The latitude and longitude of Discharge Point 003 are 45.531908°N and 122.944898°W.
- Discharge Point 004 is a 36-inch pipe that runs under NE 25th Avenue located in the western portion of the site, prior to discharging to McKay Creek, a tributary to the Tualatin River. The latitude and longitude of Discharge Point 004 are 45.544204°N and 122.957613°W.
- Discharge Point 005 is a 24-inch pipe that runs under NE 25th Avenue located near the northwestern corner of the site, prior to discharging to Glencoe Swale, a tributary of McKay Creek, which is a tributary to the Tualatin River. The latitude and longitude of Discharge Point 005 are 45.549199°N and 122.962845°W.
- Discharge Points 006A and 006B are each 4-inch pipes that discharge to the City's 36-inch pipe that runs under NE 25th Avenue located near the southwestern corner of the site. The latitude and longitude of Discharge Point 006A is 45.532379°N and 122.957140°W and Discharge Point 006B is 45.532012°N and 122.956868°W.

The combined flows from Discharge Points 001 and 003 are conveyed via 60-inch pipe and discharge to Dawson Creek. The latitude and longitude of the discharge to Dawson Creek are 45.5327°N and 122.9373°W.

C. Drainage Area Descriptions

HIO's drainage system is divided into six drainage areas (see Figure 2). Each drainage area has one major discharge point where stormwater discharges from HIO property. Detailed descriptions of each area including a summary of the Port's and Co-permittee industrial activities within each basin are provided below. Summary information on each drainage area is provided in Table 2. The total acreage owned by the Port within the 1200-Z permit boundary is approximately 678 acres. The total drainage area discharged through the Port's discharge points is approximately 1,211acres, which includes runoff from areas not owned nor managed by the Port. Examples of areas not owned or managed by the Port include public roadways and privately-owned parcels. The total impervious acreage within the permit boundary is approximately 194 acres or 29% and includes buildings, runways, parking lots, or structures operated or occupied by the Port or its tenants. Table 2 provides a description of each drainage area and identifies the estimated impervious area within the permit boundaries for each drainage area. Note that drainage area estimates are limited to pervious and impervious surfaces within the boundaries of the HIO permit because in some instances the drainage basin boundary extends to areas not owned or controlled by the Port or Co-

permittee.

Samples must be representative of the discharge. Unless approved in writing by DEQ, samples must be taken at monitoring points specified in the SWPCP before the stormwater joins or is diluted from areas outside the facility, wastewater, or any other waste stream, body of water or substance unless:

- Otherwise approved in writing by DEQ; or
- On-site stormwater flows are combined to utilize a common treatment facility (for example, a filter). In this case, monitor the discharge from the treatment facility.

The drainage basins discharging to the Tualatin River in the HIO permitted area are sampled and a description of the monitoring points is provided in Table 2 below.

Table 2 Drainage Area Summary

Drainage Area	Monitoring Points	Description	Industrial Activities	Potential Pollutants	Drainage Area* (sqft)	Impervious Area* (sqft)
1	001	Portion of runway 13/31, and its respective taxiways, one of Hillsboro Aviation's buildings, and Hillsboro Aviation's tie-down area. This stormwater runoff discharges via a 21-inch pipe into a 60-inch pipe under Cornell Road approximately 100 feet west of the NE Brookwood Parkway intersection.	Aircraft fueling, aircraft storage, aircraft taxi, aircraft landing and takeoff.	Petroleum products, antifreeze, hydraulic fluids, pesticides, herbicides, sediments and pavement deicers.	1,622,296	747,681

Drainage Area	Monitoring Points	Description	Industrial Activities	Potential Pollutants	Drainage Area* (sqft)	Impervious Area* (sqft)
		The water flows east under Cornell Road to Dawson Creek. Dawson Creek discharges to the Tualatin River.				
2	002	Runway 2/20 and a portion of runway 13/31, their respective parallel taxiways, the northeast t-hangars and the Twy F corporate hangars. The major outfall from drainage area 2 discharges into an unnamed tributary to Dawson Creek via a 30-inch pipe under NE Brookwood Parkway, approximately 1200 feet north of the Cornell Road intersection. The	Aircraft hangar rentals, aircraft fueling, aircraft storage, aircraft taxi, aircraft landing and takeoff. HIO maintenance sweeper debris containment area and equipment storage.	Petroleum products, antifreeze, hydraulic fluids, pesticides, herbicides, sediments and pavement deicers.	9,749,967	2,621,264

Drainage Area	Monitoring Points	Description	Industrial Activities	Potential Pollutants	Drainage Area* (sqft)	Impervious Area* (sqft)
		unnamed tributary flows southeast to Dawson Creek, then to the Tualatin River.				
3	003	Terminal building, the businesses located along NE Cornell Road, and aircraft tie downs. Drainage area 3 discharges via a 24-inch pipe into a 60-inch pipe under Cornell Road approximately 500 feet east of the intersection of NE 34th Avenue. The stormwater then flows east under Cornell Road to Dawson Creek and then to the Tualatin River.	Aircraft storage, aircraft support services including aircraft loading/unloading, fueling, unscheduled aircraft maintenance, equipment parking and maintenance, truck fueling, and parking	Petroleum products, antifreeze, hydraulic fluids, pesticides and herbicides, detergents, sediments, aircraft deicing and anti-icing materials and pavement deicers.	2,457,551	1,226,195
4	004	Hangars and surrounding	Aircraft taxi,	Petroleum products,	3,448,636	2,039,094

Drainage Area	Monitoring Points	Description	Industrial Activities	Potential Pollutants	Drainage Area* (sqft)	Impervious Area* (sqft)
		areas including associated ramps and tie-down areas, the FAA control tower, and some non-Port property. Drainage area 4 discharges via a 36-inch pipe into a pipe under NE 25th Avenue approximately 500 feet north of the Global Aviation Facility and 3,000 feet south of the NW Evergreen Parkway intersection. The stormwater flows west under NE 25th Avenue to McKay Creek then to the Tualatin River.	aircraft landing and takeoff, aircraft storage, truck fueling, maintenance, and washing, loading docks, parking, landscape maintenance.	antifreeze, hydraulic fluids, pesticides and herbicides, detergents, sediments, aircraft deicing and anti-icing materials, pavement deicers.		
5	005	Northeast end of Runways 13/31, Taxiway D, undeveloped	Aircraft taxi, aircraft landing and takeoff,	Petroleum products, antifreeze, hydraulic fluids, pesticides	10,968,848	1785131

Drainage Area	Monitoring Points	Description	Industrial Activities	Potential Pollutants	Drainage Area* (sqft)	Impervious Area* (sqft)
		properties on both sides of NE 30th Avenue, and the undeveloped area adjacent to Evergreen Road and NE Sewell Avenue. The drainage discharges via a 24-inch pipe and ditch to Glencoe Swale, a tributary to McKay Creek approximately 500 feet east of where the tributary crosses NE 25th. McKay Creek discharges into the Tualatin River. Sub-basin 5A, which drains a portion of Taxiway A, also flows to McKay Creek via a 24-inch pipe and ditch located on NE 25th	aircraft storage, aircraft support services including aircraft loading/unloading, fueling, unscheduled aircraft maintenance, equipment parking and maintenance, truck fueling, and parking	and herbicides, detergents, sediments, aircraft deicing and anti-icing materials and pavement deicers.		

Drainage Area	Monitoring Points	Description	Industrial Activities	Potential Pollutants	Drainage Area* (sqft)	Impervious Area* (sqft)
		Avenue. The Hillsboro Aviation facility discharges stormwater into the roadway ditch on NE 30th Avenue.				
6	NA	Port maintenance compound. It discharges via two 4-inch pipes into a 36-inch pipe under NE 25th Avenue approximately 500 feet north of the intersection with Cornell Road. The stormwater flows south to a 54-inch pipe under Cornell Road where it then heads east under Cornell Road to Dawson Creek. Dawson Creek discharges to the Tualatin River.	Vehicle maintenance and storage. Fuel truck transfers, fuel storage, used oil storage, material storage, landscape maintenance and pavement deicing.	Petroleum products, antifreeze, hydraulic fluids, pesticides and herbicides, detergents, sediments and pavement deicing.	47,126	32,917

Stormwater runoff collected from Drainage Areas 1, 2, 3, 4 and 5 is representative of the runoff quality from all industrial activities conducted by the Port and its tenants at the airport (i.e., the runoff water quality from landscaping, aircraft and vehicle refueling, aircraft and vehicle maintenance, equipment repair and maintenance). Drainage Areas 1, 2, 3, 4 and 5 have the following Monitoring Points 001, 002, 003, 004 and 005 respectively. Drainage Area 6 has similar industrial activities to Drainage Areas 1, 2, 3, 4 and 5 and the discharge is expected to be similar in composition and there is no access to sample stormwater prior to it comingling with the City's MS4 system; therefore, stormwater runoff from this drainage basin is not monitored in accordance with Schedule B.1.c of the 1200-Z permit.

Stormwater discharged from the designated monitoring points is visually monitored monthly and sampled for water quality four times each year. Visual observations of stormwater at the monitoring points (see Figure 2), when discharge is occurring during regular business hours, for the presence of floating and suspended solids, foam, visible oil sheen, odor, color, or other obvious indicators of stormwater pollution. Conduct visual observations by collecting stormwater samples in a clean, colorless glass or a plastic container and observing it in a well-lit area. A sample inspection form is included in Appendix C.

Sampling at the monitoring points is conducted four times per stormwater year. Two samples are taken prior to December 31 and two samples are taken after that date. Sampling events must be at least 14 calendar days apart and during the first 12 hours of the discharge event. All samples are analyzed for the pollutants summarized in Table 2. Monitoring waivers may be requested for eligible parameters per schedule B.4 of the permit.

D*. Monitoring *Points

Consistent with the United States Environmental Protection Agency (EPA) and DEQ requirements, stormwater discharge from site areas not associated with industrial activity are not subject to monitoring requirements. For example, office buildings and parking lots are not industrial activities and are therefore not subject to monitoring requirements. Drainage areas with industrial activities exposed to stormwater are monitored consistent with 1200-Z permit requirements.

Table 3 Outfalls and Monitoring Locations

Basin	Monitoring Point	Description	Comments
1	001	Manhole located on the southeast portion of the site between Cornell Road and the HIO perimeter fence, upstream of Discharge Point 001.	
2	002	Ditch outlet to a 30-inch pipe under NE Brockwood Parkway, located in the southeast portion of the site, upstream of Discharge Point 002.	
3	003	Catch basin located along Cornell Road near the southern portion of the site, upstream of Discharge Point 003.	
4	004	Catch basin located along NE 25th Avenue in the western portion of the site, upstream of Discharge Point 004.	
5	005	Catch basin located along NE 30th Avenue in the central portion of the site, upstream of Discharge Point 005.	Hillsboro Aviation sub-basin.
6	NA		Industrial activities and BMPs do not differ from basins 1, 2, 3,4 and 5 and no access available. See Table 2.

VII. Industrial Activities, Potential Pollutants, and Significant Materials

All industrial activities that require permit coverage at HIO are aviation related. Port industrial activities include equipment maintenance, equipment fueling and equipment washing. Tenant activities include aircraft and equipment maintenance, deicing, washing and fueling. Generally, potential pollutants in stormwater generated at the site are associated with the below industrial activities, galvanized building materials, and aircraft, truck and equipment traffic and maintenance. The potential pollutants are listed below:

- Galvanized surfaces (e.g., roofs, siding, fencing), as well as vehicle and equipment tires are potential sources of zinc in stormwater.
- Aircraft, vehicle, and equipment brake pads are a potential source of copper in stormwater.
- Leaks/spills of motor oil, gasoline, diesel, antifreeze, and hydraulic fluids from equipment and from aircraft, trucks, and other vehicles are a potential source of oil and grease, hydrocarbons, and oxygen demand in stormwater.
- Decaying vegetation and soil erosion from unvegetated, pervious areas, including gravel areas, are potential sources of suspended solids in stormwater.

The industrial activities and significant materials are described in greater detail in the sections that follow. ***There are no known historically significant materials from previous operations on the site.***

A. Airport Maintenance Facility (Port)

The HIO maintenance facility is located on the airport's west perimeter road off NE 25th Avenue. The maintenance facility has an office area and a vehicle and equipment maintenance garage. Maintenance activities conducted by Port maintenance staff or Port contractors include asphalt repair and maintenance, painting, mowing, and other miscellaneous landscaping operations. Equipment and vehicle repair are conducted inside the maintenance garage. Most significant materials that may contaminate runoff are stored indoors and are not exposed to stormwater; however, diesel fuel is stored outdoors in a 500-gallon double-walled Above Ground Storage Tank (AST) and there are two 280-gallon double-walled ASTs that store used oil.

B. Vehicle and Equipment Refueling (Port)

The Port maintains one 500-gallon double-walled diesel fuel AST for maintenance vehicle and equipment refueling. The tank is located on the south side of the maintenance shop and located in a secured area to restrict access. There is a catch basin adjacent to the fuel tank.

C. Storage of Significant Materials (Port)

Significant materials that may contaminate runoff are stored indoors and are not exposed to stormwater; however, diesel fuel is stored outdoors in a 500-gallon double-walled AST. The Port provides used oil collection for the airfield tenants in two 280-gallon double-walled ASTs located just north and west of the maintenance facility. Significant materials stored indoors

include used oil, lubricants, solvents, paints, pesticides, and herbicides. Vehicle maintenance conducted at the HIO facility includes routine oil changes and equipment repair. The used oil generated from these activities is stored in a 1,500 gallon above ground storage tank inside the maintenance shop. Used oil from the two 280-gallon tanks is transferred into the 1,500-gallon indoor AST about once per year.

D. Equipment Washing (Port)

Port maintenance staff uses vegetated areas adjacent to the HIO maintenance shop for rinsing equipment, such as mowers. Runoff from rinsing infiltrates to land. This is considered a de minimis activity allowed without a wash water permit. Potential pollutants of concern from rinsing of equipment include metals, oil and grease. The Port's pavement sweeper, which is used to remove Foreign Objects and Debris (FOD) from the airfield, is rinsed in a designated area. The designated grassy area does not drain to the stormwater system. The sweeper is used only on the runways and taxiways with grass, rocks, and other debris representing the majority of the solids collected in the sweeper. The solids are disposed of at an appropriate landfill.

E. Aircraft and Equipment Washing (Tenant)

Port policy prohibits the discharge of wash water into the stormwater drainage system. Various practices are acceptable under the Port policy; they include collection of the wash water for discharge to the sanitary system, or the use of wash facilities that drain to the sanitary sewer. Facilities with wash facilities that drain to the sanitary sewer are operated by Premier Jets, Global Aviation, Hillsboro Aero Academy and Hillsboro Aviation.

F. Aircraft and Equipment Fueling (Tenant)

Tenants at HIO own and operate storage tanks, both ASTs and Underground Storage Tanks (USTs), for the fueling of their mobile fuel trucks and aircraft and storing used oil. The fueling operations and storage of petroleum products have the potential to impact stormwater. Significant materials and potential pollutants stored and transferred are Jet-A, aviation gasoline (100LL), unleaded gasoline, and diesel fuel. The fuel is pumped from the UST or AST into a mobile fuel truck or directly to aircraft. All fuel transfers are performed on an impervious surface. Each Mobile Storage Tank (MST) is required to carry a spill kit and each AST or UST location is required to have a spill kit associated with it. Co-permittees are required to develop and implement their own spill plans.

G. Aircraft and Equipment Maintenance (Tenant)

Commercial and private aircraft maintenance is conducted at HIO by Co-permittees listed in Appendix B. The maintenance activities generally take place inside the buildings. Private aircraft may have minimal maintenance conducted on the ramps. The significant materials associated with these activities include oil, used oil, solvents, brake fluid, hydraulic fluid, grease, and fuel. Most of these materials are stored indoors and should have no contact with stormwater. A portion of tenant used oil is collected in two 280-gallon ASTs located outdoors. Used oil, hydraulic fluid and brake fluid are required to be recycled or disposed of properly. Spent solvents are required to be collected and disposed of appropriately. Potential pollutants of concern associated with this activity include used oil and other lubricants.

H. Aircraft Manufacturing (Tenant)

Commercial and private aircraft manufacturing is conducted at HIO by various tenants. The manufacturing activities are conducted inside. The significant materials associated with these activities include solvents, paint, thinners, lubricants, oil, hydraulic fluid, and brake fluid. All the chemicals are stored indoors and should have no contact with stormwater. Used oil may be stored in collection tanks equipped with secondary containment, which are located outdoors. Used oil is a potential pollutant of concern.

I. Storage of Significant Materials (Tenant)

Significant materials that may contaminate runoff are generally stored indoors and are not exposed to stormwater; however, fuels, including jet fuels, aviation gasoline, and gasoline and diesel fuel are stored outdoors in ASTs, USTs, and MSTs. Used oil collected from tenants is stored outdoors in two 280-gallon ASTs. Significant materials stored indoors include oils, lubricants, solvents, cleaning chemicals, paints, pesticides and herbicides. ***There are no known historically significant materials from previous operations on the site***

J. Aircraft and Pavement Deicing and Anti-icing (Tenant and Port)

Chemical from anti-icing and deicing pavement and aircraft activities have the potential to impact stormwater. When weather conditions warrant, Port maintenance may apply pavement deicer to runways and taxiways to remove snow and ice. The following Co-permittees may deice aircraft and pavement within their leased areas; Premier Jets, Global Aviation, Aero Air ADI and Hillsboro Aviation. Appendix D lists BMPs for managing stormwater runoff from deicing and anti-icing activities.

K. Air Transportation Sector-Specific Potential Pollutants

The 1200-Z permit includes sector-specific requirements, including identification of industry-specific sources. The primary industrial activity at HIO is classified under Transportation by Air SIC 4512-4581 and co-located industrial activities include Aircraft and Parts SIC code 3721. The Transportation by Air classification requires compliance with additional technology-based effluent limits in Schedule E Sector S Air Transportation Facilities of the 1200-Z permit. There are no additional technology-based effluent limits for Aircraft and Parts as defined in Schedule D and in *Table E-1. Sectors of Industrial Activity with Sector Specific Requirements* within the HIO 1200-Z permit boundary.

L. Sector S Air Transportation

Good Housekeeping Measures E.S.1.1.1 through E.S.1.1.5 and Additional SWPCP requirements E.S.2.1 through E.S.2.3 are addressed under VII. Site Controls. Sections E.S.1.1.6 through E.S.1.2, E.S.2.4 and E.S.3 apply to deicing and anti-icing activities. Deicing and anti-icing operations BMP and site controls are listed in Appendix D.

VIII. SITE CONTROLS

Implementation of site stormwater pollution controls helps reduce the concentration of pollutants in the stormwater runoff. Source controls are usually the most effective mechanisms for decreasing contamination and are typically less expensive than constructing end-of-pipe treatments.

Oregon is an EPA NPDES-approved state with the authority to write general permits. DEQ has established benchmarks as a means of assessing pollution control effectiveness. Benchmarks are not effluent limits. The Port follows the intent of the 1200-Z permit by implementing appropriate stormwater controls to reduce pollutant concentrations. BMPs and stormwater pollution controls outlined in the following sections are implemented even if the benchmarks are not exceeded.

Table 4 Industrial Activity and Corresponding Site Controls

Port and Tenant Industrial Activities	Site Controls
Fueling of aircraft and equipment	Implement spill response procedures, spill prevention education and awareness; spill response equipment, preventative maintenance; maintain secondary containment; maintain oil booms at the outfall in basin 2.
Storage of significant materials (fuel, oils, and lubricants, paint, thinner, antifreeze, solvents, pesticides, herbicides)	Covered and indoor material storage areas, visual inspections including tank and container integrity.
Washing of equipment and aircraft	Use a wash facility that drains to the sanitary sewer system or wash in an area that does not drain to the stormwater system. The Port has implemented policy and procedures to minimize the impact to the storm system from washing activities.
Aircraft and pavement deicing	Follow Deicing BMPs outlined in Appendix D.
Construction	Implement erosion control plan, comply with the applicable construction permit 1200-CA, 1200-C or 1200-CN, as well as the City of Hillsboro and CWS requirements for construction and the Port's construction contract specifications.
Aircraft and equipment maintenance	Materials are stored indoors; work conducted indoors; perform visual inspections; dispose and manage waste appropriately.

A. Stormwater Best Management Practices (BMPs)

The following operational and structural source control measures are implemented at HIO, consistent with the narrative technology-based effluent limits listed in Schedule A of the 1200-Z permit.

Minimizing Exposure
The Port implements structural and operational control measures to minimize the exposure of stormwater runoff to potential pollutants.

Chemical drums, fuel tanks and used oil stored outdoors and exposed to stormwater are stored within secondary containment and covered to the extent practicable to prevent leaks and spills from entering stormwater runoff.

The Port stores chemicals, lubricants and used oil inside the HIO maintenance shop. Chemicals are labeled and stored in one of four designated areas within the shop. Flammable chemicals are stored in fire-resistant cabinets.

The Port's 500-gallon diesel fuel AST is double-walled for secondary containment. A spill kit, and spill stopper mat are located immediately next to the tank. Additional spill equipment is stored inside the maintenance facility. The tank and pump are inspected monthly for integrity, spills, and leaks. The inspections are documented on the monthly industrial stormwater inspection form.

Existing control measures include both source control and structural/treatment BMPs. The source control BMPs consist of spill prevention and control measures. Vehicle and aircraft maintenance activities are conducted indoors to the extent practicable. Maintenance of vehicles and equipment is conducted indoors by the Port at its maintenance facility. Co-permittees also conduct various maintenance activities in their respective hangars and shops. Co-permittee activities conducted indoors include aircraft and vehicle maintenance, aircraft manufacturing, aircraft parts manufacturing, aircraft painting and other miscellaneous activities. Conducting these activities indoors and storing the associated chemicals indoors effectively reduces the exposures/contact of potential pollutants to stormwater runoff.
To the extent practicable, Co-permittees use drip pans or other means of collection, when conducting maintenance outdoors, to minimize the oil and grease dripped onto paved surfaces. Responsibilities are outlined in each tenants' individual lease agreement. Two 280 gallon used oil tanks are kept on the north and west side of the facility. The used oil tanks are doubled-walled and sit in a containment system that requires stormwater to run through oil booms before draining out of the containment to the surface below.

Oil and Grease
Structural controls include catch basins designed to capture oil and grease. The invert discharge pipe in these catch basins helps to minimize oil and grease that enters the stormwater system. Catch basins located in industrial areas are inspected by the responsible Co-permittee and are cleaned on an as needed basis. Some Co-permittees may be responsible for the cleaning and maintenance of the catch basins on their leaseholds. Other structural/treatment control BMPs include oil/water separators (tenant), two Contech StormFilter® vaults, and absorbent booms placed in drainage ditches at HIO.

Waste Chemicals and Material Disposal
Waste generated at HIO complies with RCRA, DEQ, METRO, and City waste and recycling regulations. HIO has a Conditional Exempt Generator (CEG) status for RCRA wastes. Waste and

recycling generated from the HIO maintenance facility are closely tracked and are on regular pick-up schedules. Table 5 summarizes the minimum pick-up frequency for each material generated at HIO.

Materials such as used oil and solvents are stored indoors to the extent practicable and are disposed of or recycled off-site.

Table 5 Waste and Recycling Collection Pick-up Schedule

Waste Material	Minimum Pick-up Frequency
Metals	Annually
Solid Waste	Weekly
Co-mingled Recycling	Weekly
Wood/Landscaping	As generated, not stored on-site
Used Oil	Annually

Erosion and Sediment Control
Areas subject to traffic at HOI are paved or covered with a roof, and pervious areas are vegetated, to the extent practicable, to minimize erosion. Paved surfaces are swept to remove sediment. Catch basins trap sediment in the sump to reduce the likelihood of discharging sediment-laden stormwater. The catch basins are cleaned of debris based on results of visual inspections to ensure they are working appropriately. Grassy swales and vegetated filter strips are also used to reduce the amount of debris in stormwater discharges and minimize erosion.

Debris Control
HIO catch basins prevent a large portion of the debris in the storm runoff from entering the storm system. The catch basins are cleaned of debris based on the results of visual inspections to ensure they are working appropriately. Grassy swales and vegetated filter strips are also used to reduce the amount of debris in stormwater discharges.

The Port periodically sweeps pavements, which reduces the debris and sediment entering the storm drains. The material collected is profiled and stored in a designated area until it can be disposed of at a landfill. This area is isolated from stormwater catch basins and inlets.

Dust Generation and Vehicle Tracking
High traffic areas at HIO are paved and swept. The maintenance shop floor is cleaned routinely to prevent tracking oil from the shop floor.

Housekeeping
The Port implements a rigorous housekeeping program that includes pavement sweeping to remove solids, fluids, and debris from paved surfaces; prompt cleanup of leaks or spills, and regular maintenance of aircraft, vehicles and equipment. The housekeeping program ensures that particulate matter, dust, and debris from industrial sources are promptly cleaned up, especially from areas where materials are loaded and unloaded, stored, or otherwise handled. Materials and

products are stored in designated areas and in appropriately labeled containers. Under the terms of their leases, tenants are responsible for their leasehold areas. The Port is responsible for non-leased and common use areas. Prompt cleanup of spills and leaks are the responsibility of the responsible party regardless of the location.

Stormwater Treatment System
Tier 2 treatment measures have been implemented at the site and include two portable media filters located at the downspouts at the southeast corner of Building 3301 to treat runoff from the Building 3301 roof in Drainage Basin 3. The Port's media filters are constructed from triple-rinsed, recycled 275-gallon Immediate Bulk Container totes. The portable media filters contain layers of drain rock, pea gravel, sand, a bio-retention soil mix, and mulch with plants. Treatment system maintenance activities are recorded on the monthly stormwater treatment system inspection and maintenance form and operation and maintenance information is provided in the Tier 2 Report (see Appendix E).

Two Contech StormFilter® vaults provide treatment to stormwater runoff from Drainage Basins 2 and 3. The Port inspects the Contech StormFilters® monthly and conducts maintenance if observed sediment depth is greater than approximately four inches on the bottom of the vault or if sediment depth exceeds ¼ inch on top of the cartridges. Maintenance of the Contech StormFilters® includes cartridge replacement and/or sediment removal. Per Contech's recommendation, the Port inspects the vault before the rainy season, and if maintenance is needed, replaces the filter cartridges, and removes accumulated sediments during periods of dry weather.

Grassy swales and vegetated filter strips located along the newly renovated taxiways and runways, filter pollutants from stormwater in sheet flow from paved surfaces. The Port visually inspects the grassy swales and vegetated filter strips monthly and conducts maintenance when an accumulation of sediment, trash, or debris, and/or erosion, scouring, ruts, or bare areas are visible. Maintenance of the grassy swales and vegetated filter strips is performed based on the results of the visual inspection.

Preventative Maintenance
Immediate maintenance and/or corrective action must be performed to correct any issues identified during the inspection relative to housekeeping, spills, staining, leaks, drips, structural integrity, or needed repairs to prevent the discharge of pollutants to stormwater.
Port personnel conduct monthly visual inspections of outfalls, conveyance ditches, swales, filter strips, and storage tanks. The Hillsboro airport has 409 stormwater inlets. Only those catch basins in industrial areas with the potential for spills or releases of significant materials are inspected monthly and cleaned based on the results of the visual inspections (when sediment depth is greater than 1/3 of the sump depth and/or if there is visible oil sheen across the water surface in the sump). Other maintenance or cleaning of stormwater controls or material storage areas is conducted based on the results of the visual inspection. Port preventative maintenance records are kept in the Environmental Department office at 7200 NE Airport Way, Portland, OR 97218. Table 6 summarizes the Port's preventative maintenance responsibilities.

Table 6 Port Preventative Maintenance and Inspection

Site Control/BMP	Locations	Maintenance Frequency	Visual Inspection
Grassy Swales and Vegetated Filter Strips	Basin 2, 4, and 5	Cleaned based on results of visual inspection.	Monthly
Oil Boom	Basin 2	Replaced annually or more frequently if needed	Monthly
Water Quality Manholes and Contech StormFilter® Vaults	Basins 2 and 3	Cleaned based on results of visual inspection; media is replaced based on the results of visual inspections	Annually
Portable Media Downspout Filters	Basin 3	Media is replaced every 3-5 years (See O&M Manual in App E)	Monthly
Catch Basin Filters	HIO MX Facility	Media is replaced annually or more frequently if needed based on results of visual inspection	Monthly
Sweeping	Taxiways, Runways and Terminal Ramp Area	Annually or more frequently if needed based on results of visual inspection	Monthly
Catch Basins[1]	HIO MX Facility & Terminal Ramp	Cleaned based on results of visual inspection	Monthly

Notes:

1. Only those catch basins in industrial areas are inspected monthly and cleaned as needed based on results of visual inspection.

Employee Education

The Port provides stormwater training to the General Aviation staff at HIO whose work has the potential to impact stormwater quality within thirty days of the time of initial hire, and annually thereafter. Annual training typically occurs during the winter months. For all personnel, topics in the training session may include:

- Importance of preventing stormwater pollution, including measures to minimize exposure of stormwater to potential pollution;
- Contents of the SWPCP as applicable to employee work;

- Stormwater monitoring, inspections, reporting, and recordkeeping;
- Spill prevention and internal reporting procedures;
- Unauthorized discharges to the stormwater system;
- Materials handling and storage procedures;
- Used oil management;
- Disposal of spent abrasives;
- Fueling procedures;
- Good housekeeping practices;
- Erosion and sediment control measures;
- Materials handling and storage procedures;
- Used oil management;
- Disposal of spent abrasives;
- Fueling procedures;
- Painting procedures; and
- Used battery management.

The training program also provides training to consultants responsible for stormwater sampling and reporting, and covers documentation requirements, inspection procedures, and the appropriate follow up to stormwater issues.

Co-permittees are responsible for training their employees. Each Co-permittee is required to develop an employee orientation and education program that informs personnel of the components and goals of the SWPCP.

Employee training must be documented, and records kept on file for a minimum of three years by each Co-permittee and must be available for review during business hours by the Port, Clean Water Services, or DEQ staff. All Port training records are filed in the Environmental Department office at Portland International Airport.

Non-Stormwater Discharges
The Port has developed an illicit detection and elimination program for all unauthorized non-stormwater discharges for its facilities. The Port will eliminate any unauthorized non-stormwater discharges if detected during routine industrial area inspections, annual dry weather field screening or upon discovering evidence of an illicit discharge in non-industrial areas anywhere on Port property. Dry weather field screening will be conducted annually in the summer months.
The Port may occasionally have the following authorized non-stormwater discharges:

- Routine external building wash-down water that does not use detergents or hot water;
- Landscape watering providing pesticides and fertilizers is conducted in accordance with the manufacturers' specifications;
- Pavement washwaters in which no detergents or hot water are used, no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed), and from surfaces that were swept immediately prior to washing; and
- Uncontaminated spring water or groundwater.

Drainage ditches, swales and sub-drains may convey uncontaminated spring water or groundwater into the Port's storm system throughout the year. Sub-drains are located under the taxiways and runways to protect the integrity of the infrastructure. All buildings on Port property could potentially be washed down. Landscape watering takes place in landscaped areas around buildings. All impervious surfaces could potentially be washed down. These areas are shown in Figure 2.

The following nonstormwater discharges are authorized under the Permit:

- Potable water, including water line flushing.
- Fire hydrant flushing.
- Discharges from firefighting activities.
- Uncontaminated condensate from air conditioners, coolers, and chillers and other compressors.
- Exterior vehicle washwater that does not use hot water or detergent; restricted to a maximum of eight vehicles washed per week.
- Foundation or footing drains where flows are not contaminated with process materials.
- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).

IX. Spill Prevention and Response Plan

A. Spill Prevention and Response Procedures

The following is a summary of spill response procedures.

PORT OF PORTLAND HILLSBORO AIRPORT FACILITY SPILL RESPONSE PLAN

PLEASE REFER TO THE FOLLOWING PROCEDURES WHEN HANDLING A SPILL INCIDENT.

*** * * * * * * * * THINK C-C-C* * * * * * * * * CONTROL-CONTAIN-CALL* * * * * * ***

#1 CONTROL the source of the spill. STOP the flow.

#2 CONTAIN the spill to the smallest possible area.

#3 CALL your supervisor for further instructions.

B. Emergency Contacts

SPILL RESPONSE/EMERGENCY CONTACTS
PORT OF PORTLAND HILLSBORO AIRPORT FACILITY

The following are the phone numbers of supervisors to contact in the event of a spill:

Regardless of the time of the day.

EMERGENCY NOTIFICATION PHONE LIST		
PRIORITIZED CONTACT LIST	**RESPONSIBLE ROLE**	**PHONE NUMBER**
PORT CONTACTS		
Airport 24-hour Contact Number	Incident Notification to Appropriate Parties	(503) 460-4000
Environmental Contact Number	Incident Command and Control	(503)-341-7836
Airport Operations Supervisor	Assist with Incident Management	(503) 709-6816
EMERGENCY RESPONSE CONTRACTORS		
Telluric Enterprises, Inc.	Provide Spill Response and Cleanup Resources	(503) 703-6057
NRC Environmental Services, Inc.	Provide Spill Response and Cleanup Resources	(800) 337-7455
Terra Hydr, Inc.	Provide Spill Response and Cleanup Resources	(503) 625-4000

EMERGENCY NOTIFICATION PHONE LIST		
PRIORITIZED CONTACT LIST	**RESPONSIBLE ROLE**	**PHONE NUMBER**
IF A SPILL REACHES OR HAS THE POTENTIAL TO REACH A SURFACE BODY OF WATER, GROUNDWATER, OR THE STORMWATER SYSTEM; OR IF IN EXCESS OF 42 GALLONS[1], YOU MUST CALL: (Spill reporting must be made as soon as possible after initial spill response and control)		
GOVERNMENT AGENCIES (Record name of person called and time of call)		
Hillsboro Fire/Police Time:_____ Name:_____	Assist in spill clean-up and fire control	911
National Response Center (NRC) Time:_____ Name:_____	Incident Reporting: If spill exceed CERCLA Federal Response Quantity	(800) 424-8802
Oregon Emergency Response System (OERS) Time:_____ Name:_____	Incident Reporting Provide Spill Response Assistance	(800) 452-0311
Oregon Department of Environmental Quality Time:_____ Name:_____	Incident Reporting Provide Spill Response Assistance	(800) 542-4011
Clean Water Services (CWS)	Incident Reporting	(503) 681-3600
U.S. Coast Guard Time:_____ Name:_____	Incident Reporting	(503) 240-9370
EPA Office Time:_____ Name:_____	Incident Reporting	(503) 326-2715

C. Notification Procedure

In the event of a spill incident, facility personnel on-duty will take immediate action to notify the Port personnel identified on the list of emergency telephone numbers in this section. The designated person (or coordinator) accountable for spill prevention is responsible and required by

[1] Petroleum product spills greater than 42 gallons to outdoor soil, gravel, or asphalt (but not indoor areas) that are not likely to contact waters of the state must be reported within one hour to OERS and the Clean Water Services Incident Reporting Line. Release of hazardous materials equal to or greater than the quantity listed in 40 CFR Part 302 (Table 302.4—List of Hazardous Substances and Reportable Quantities (https://www.govinfo.gov/content/pkg/CFR-2004-title40-vol26/pdf/CFR-2004-title40-vol26-sec302-4.pdf) requires immediate notification of the National Response Center, OERS, and the Clean Water Services Incident Reporting Line.

federal and state laws to notify the applicable federal, state, and local agencies provided on this list.

D. Spill Contingency Plan

In the event of a spill incident, facility personnel will follow procedures outlined below:

- CONTROL THE SOURCE OF THE SPILL
    - Stop the flow of product (secure valves and pumps)
    - Shut off ignition sources, if applicable
- CONTAIN THE SPILL TO THE SMALLEST POSSIBLE AREA
- CALL YOUR SUPERVISOR FOR FURTHER INSTRUCTIONS
- REPORT THE SPILL TO PROPER SPILL REPORTING AGENCIES AS REQUIRED

E. Spill Control Procedures

Should oil or other material spill incident occur, facility personnel will immediately implement the following spill control measures to prevent a spill from entering navigable waters:

- Ensure that spilled liquid is contained (see map of spill kits on Figure 2).
- Cover catch basins and use pads to absorb spilled material.
- Pump remaining spill into drums or other appropriate containers away from surface water or storm drains.

F. Countermeasure Procedures

Once the spill control procedures outlined above have been implemented, facility personnel initiate countermeasure activities to contain, cleanup, and mitigate the effects of a spill that could impact navigable waters. Furthermore, incident-specific considerations and precautions must also be implemented during each spill incident to adequately protect human health and the environment.

The site's countermeasure procedures are outlined below:

- Containment. Containment activities are initiated as soon as possible to prevent spreading of the spilled material. Containment techniques include, but are not limited to:
    - Trenching and diking
    - Filter fences
    - Booms
- Removal. Once the spill is contained, removal techniques include, but are not limited to:
    - Pumps
    - Sorbents (pads, pillows, or booms)
    - Skimmers
    - Vacuum trucks
- Disposal. After the spill is contained, the site is cleaned up. This includes recycling any recovered oil, disposing of abatement materials used to contain and/or remove the spill, and excavating contaminated soil. Disposal techniques include, but are not limited to:

- Recycling
- Disposal at an appropriate facility

X. Inspections and Recordkeeping

A. Monthly Inspections

Inspections are conducted monthly. Inspections are conducted at the locations identified in Section VII and on Figure 2. In addition, the stormwater pollution control measures will also be inspected. Form B is used to record the results of the inspection. Upon completion of the inspection, cleaning and repair activities are conducted and documented. The Port is responsible for conducting inspections of common use and non-leased areas. Co-permittees are responsible for conducting and documenting monthly inspections of activities on their leasehold, maintaining records on-site, and for performing preventative maintenance. Monthly inspections of the following are the responsibility of each Co-permittee:

- Areas with the potential for spills of significant materials;
- Areas with industrial activities including outdoor storage and maintenance areas;
- Stationary and mobile fueling equipment including tanks, nozzles, and associated secondary containment structures; and
- Stormwater control structures such as catch basins, oil/water separators, and swales.

Port Environmental Operations staff conduct monthly inspections of the facility stormwater system and drainage areas to evaluate the condition of the site control measures. Inspections focus on:

- Visual inspection of the site and identification of sources of pollutants (i.e., industrial materials, residue, or waste) to which stormwater is exposed. New sources of polultants must be added to this SWPCP.
- Leaks or spills from equipment, trucks, vehicles, drums, tanks, and other containers.
- Off-site tracking of waste materials or sediment where vehicles enter or exit the site.
- Evidence of, or the potential for, pollutants entering the drainage system or receiving waters.
- Evaluation of the condition of source control measures and the need for maintenance and/or repairs, including the spill kit(s).
- Visual observation of stormwater at the monitoring points (see Figure 2) when discharge is occurring during regular business hours, for the presence of floating and suspended solids, foam, visible oil sheen, odor, color, or other obvious indicators of stormwater pollution. Conduct visual observations by collecting stormwater samples in a clean, colorless glass or plastic container and observing it in a well-lit area.

Inspection forms are kept on file in the Port Administration Office.

Non-Port operators are responsible for conducting monthly inspections of their leased areas and areas within their control in compliance with Schedule B of the 1200-Z permit. Inspections of source areas and site controls are documented, kept onsite for at least three years and made available to the Port, CWS, or the City upon request.

B. Recordkeeping and Internal Reporting Procedures

The Port maintains the following records with the SWPCP documentation:

- A copy of this SWPCP and revisions;
- A copy of the 1200-Z permit;
- 1200-Z permit assignment letter and permit coverage documents;
- Discharge Monitoring Reports (DMRs), laboratory reports, pH calibration, and field sampling notes;
- Incidents of spills or leaks;
- Sampling/monitoring program;
- Inspection and maintenance records;
- Employee training materials and records;
- Tier 1 Reports and corrective action implementation records;
- Documentation of any benchmark exceedance and corrective action taken; and
- Tier 2 Report and engineering evaluation of infiltration facilities, if applicable.

Incidents of spills or leaks may require local, state, or federal agency notification. See the SPCC for the notification details. All records will be dated and signed by the person recording the events or activities. Records of the monthly inspections, preventative maintenance practices, cleaning and repair activities, and stormwater monitoring data are maintained for a period of **three years** with the SWPCP documentation.

XI. Benchmarks and Corrective Actions

The Port is required to monitor for the Willamette Valley benchmarks and implement corrective actions in response to a benchmark exceedance, as outlined in the following sections.

A. Willamette Valley Benchmarks

Benchmarks are guideline concentrations, not limitations. They are designed to assist the Port in determining whether the implementation of their SWPCP is sufficiently controlling pollutant concentrations. The following benchmarks apply to each discharge point associated with industrial activities.

Table 7 Willamette Valley Stormwater Discharge Benchmarks

Parameter	Permit Benchmarks
Total Copper	0.015 mg/L
Total Lead	0.11 mg/L
Total Zinc	0.14 mg/L
pH	5.5 - 9.0 S.U.
Total Suspended Solids	100 mg/L

Notes:
mg/L – milligrams per liter
S.U. – standard unit

B. Sector-Specific Benchmarks

Sector S – Air Transportation Facilities have sector-specific monitoring parameters and benchmark concentrations as shown in Table 8:

Table 8 Sector S Discharge Parameters and Benchmarks

Parameter	Benchmark
Biological Oxygen Demand (BOD_5)	30 mg/L
Chemical Oxygen Demand (COD)	120 mg/L
Ammonia	2.14 mg/L
pH	5.5-9.0 S.U.

Notes:
mg/L – milligrams per liter
S.U. – standard unit

C. Response to Benchmark Exceedance

Tier 1 Corrective Action Response

A Tier 1 Report must be prepared if stormwater sampling results exceed any of the Willamette Valley or sector-specific benchmarks in Schedule B.2 of the 1200-Z permit or visual observations of the discharge at monitoring points that show visible signs of pollution. Such visible signs include the presence of floating suspended solids, color, odor, foam, oil sheen, or other obvious indicators of pollution. The Port must complete the Tier 1Report within 30 calendar days of obtaining the monitoring results or visual observations of pollution and include the following:

- Investigate the cause of the elevated pollutant levels. If the elevated pollutant levels appear to be caused by a non-Port operator, the Port will require information from the non-Port operator to assist with the investigation.
- Review the SWPCP and the selection, design, installation and implementation of control measures to ensure compliance with the 1200-Z permit. If the Port determines that SWPCP revisions are necessary based on corrective action review, submit the revised pages of the SWPCP to CWS, including a schedule for implementing the control measures.
- Summaries the following in a Tier 1 Report that is retained on site and submitted to CWS or Agent upon request:
    - The results of the investigation.
    - Corrective actions taken or to be taken by the Port and/or the non-Port operator, including date corrective action completed or expected to be completed. Where the Port determines that corrective action is not necessary, provide the basis for this determination.
    - Document whether SWPCP revisions are necessary and update the SWPCP accordingly.
- Implement the corrective actions before the next storm event if possible or no later than 30 calendar days after receiving monitoring results or visual observations of pollution. If Tier 1 corrective actions take longer than 30 days, reasons for the delay must be documented.

Tier 2 Corrective Actions

If the geometric mean of the qualifying sampling results collected at any monitoring point exceeds an applicable Willamette Valley benchmark during any reporting year, or if 50 percent or more of the pH measurements collected at any monitoring point during two reporting years are outside the permitted range for pH, a Tier 2 Report, Tier 2 Mass Reduction Waiver Request, or Tier 2 Natural Background Waiver Request must be submitted to the CWS no later than December 31 (six months after the end of the reporting year that triggered Tier 2) unless CWS approves a later date. The geometric mean of the qualifying samples must be reported on the DMR due by August 15, unless a monitoring waiver is granted. This evaluation consists of reporting all qualifying samples collected during the reporting year and comparing the geometric mean of the sample results to the Willamette Valley benchmarks to determine whether Tier 2 corrective action requirements were triggered.

Tier 2 Report
The Tier 2 Report must summarize proposed stormwater treatment measures or a combination of stormwater treatment and source control measures, designed by an Oregon-licensed professional engineer (PE) with the goal of achieving the applicable 1200-Z permit benchmark. The Tier 2 Report should include a rationale for the selection of the treatment measures, the projected reduction of pollutant concentration(s), and the implementation schedule. The Tier 2 Report must be submitted by December 31 (six months after the end of the reporting year that triggered Tier 2) unless CWS approved a later date. Tier 2 measures must be implemented no later than September 30 (a year and nine months after the Tier 2 Report deadline), unless a later date is approved by CWS in writing. The Tier 2 Report must be stamped by a PE licensed in Oregon.

Tier 2 Mass Reduction Waiver Request
A Tier 2 Mass Reduction Waiver Request may be submitted if volume-reduction measures (e.g., infiltration) have resulted or will result in a reduction of the mass load of pollutant(s) in the discharge to below the mass-equivalent of the applicable statewide benchmark. The request must include data and analysis to support the rationale, including a description of the measure(s), a mass load analysis, and expected implementation date(s). The request must be stamped by a PE licensed in Oregon or by a certified engineering geologist.

Natural Background Waiver Request
A Tier 2 Natural Background Waiver Request may be submitted if an exceedance of a statewide benchmark is attributed solely to the presence of the pollutant(s) in natural background and is not associated with industrial activities at the site. The request must include the results of investigations and data collected on or around the site and/or published peer-reviewed studies. It should be noted that these waivers are most usually not applicable to developed industrial sites.

Tier 2 Notifications
The Port must notify the DEQ in writing within 30 days of completion of the Tier 2 measures and submit a revised SWPCP showing the implemented measures.

XII. Monitoring and Reporting Requirements

The Port monitors stormwater at the designated monitoring points (see Figure 2) for the following:

Table 9 Primary Monitoring Parameters (Grab Samples)

Parameter	Frequency
Total Copper Total Lead Total Zinc pH* Total Suspended Solids	Four times per year (two between July 1 and December 31; two between January 1 and June 30), unless a monitoring waiver is granted.
Sector S-Specific Parameters	
BOD_5 COD Ammonia pH*	Four times per year (two between July 1 and December 31; two between January 1 and June 30), unless a monitoring waiver is granted.

Note:
* pH analysis will be performed in the field utilizing a calibrated pH meter within the applicable analytical hold time. The remaining analyses will be performed by an outside laboratory in accordance with the EPA protocols.

Table 10 Visual Monitoring Parameters

Parameter	Frequency
Floating and Suspended Solids Visible Oil Sheen Foam Odor Color Other Obvious Indicators of Pollution	Once a month (when discharging)

A. Monitoring Waivers

Benchmark Pollutant Monitoring

A monitoring waiver may be requested in the following circumstances:

- If the geometric mean of five consecutive and qualifying sampling results is equal to or below the applicable Willamette Valley benchmarks.

- For pH, qualifying sample results are within the permitted range for five consecutive readings.

The Port may submit the monitoring waiver request to CWS in writing and include the geometric mean concentration calculations and supporting analytical data. CWS will notify the Port in writing if the monitoring waiver is approved. Until written approval is received the Port must continue monitoring. Approved monitoring waivers are in effect until July 1, 2025. Monitoring waivers do not apply to the first (2021-2022) and last (2025-2026) 1200-Z permit reporting years.

There is no reduction in monitoring allowed for visual observations unless the site is inactive or unstaffed, there are no industrial materials or activities exposed to stormwater, and the Port meets requirements in Schedule B.9.a.iv.1 of the 1200-Z permit.

The Port must reinstate the monitoring of stormwater discharge if:

- Prior monitoring efforts used to establish the monitoring waiver were improper or sampling results were incorrect;
- Changes to site conditions are likely to affect stormwater discharge characteristics;
- Additional monitoring occurs and the sampling results exceed benchmark(s), or
- For inactive or unstaffed sites, the facility becomes active and/or staffed or industrial materials or activities become exposed to stormwater.

CWS will notify the Port in writing if the monitoring waiver is revoked.

B. Recordkeeping and Reporting Requirements

Detailed records must be maintained to provide quality assurance/quality control for a stormwater sampling program. Personnel from the Port HIO facility use the forms provided with this monitoring plan to record the monitoring information. Components of the records management program include the following items:

- Field Data Sheets for pH calibration and measurements;
- Chain-of-Custody Forms; and
- Specific monitoring information (visual and grab sampling).

Records of monitoring information shall include:

- The date, exact place, time, and methods of sampling or measurements;
- The individual(s) who performed the sampling or measurements;
- The date(s) analyses were performed;
- The individual(s) who performed the analyses;
- The analytical techniques or method used; and
- The results of the analyses.

The Field Data Sheets, Chain-of-Custody Forms, and the analytical results are maintained with the SWPCP (current data) and in the corporate environmental files.

Reporting Requirements
The stormwater monitoring period is July 1 through June 30. The Port submits (DMRs) to Clean Water Services, DEQ authorized agent quarterly, November 15, February 15, May 15, and August 15. All records are retained for a minimum of 3 years by the Port at the Administrative Offices at 7200 NE Airport Way Portland, OR 97218 per Schedule B Reporting and Recordkeeping Requirements. Reports are sent to:

Source Control Division
Clean Water Services
2550 SW Hillsboro Highway
Hillsboro, OR 97123-9379

Stormwater program records are maintained by the Port, Port contractors, or Co-permittees. These documents are kept a minimum of three years with the SWPCP or at the locations identified below. Each Co-permittee is responsible for complying with permit recordkeeping requirements pertinent to their operations.

Table 11 Recordkeeping Forms

Record of:	Location
Fuel spills	HIO Maintenance office Tenant Facilities* PDX Environmental Department office
Vehicle and equipment maintenance	PDX AVANTIS System Co-permittee Facilities
Preventative maintenance	HIO Airport Maintenance PDX Environmental Department office
Industrial area inspections	PDX Environmental Department office Co-permittee Facilities
Outfall inspections	PDX Environmental Department office
Stormwater employee training records	PDX Environmental Department office

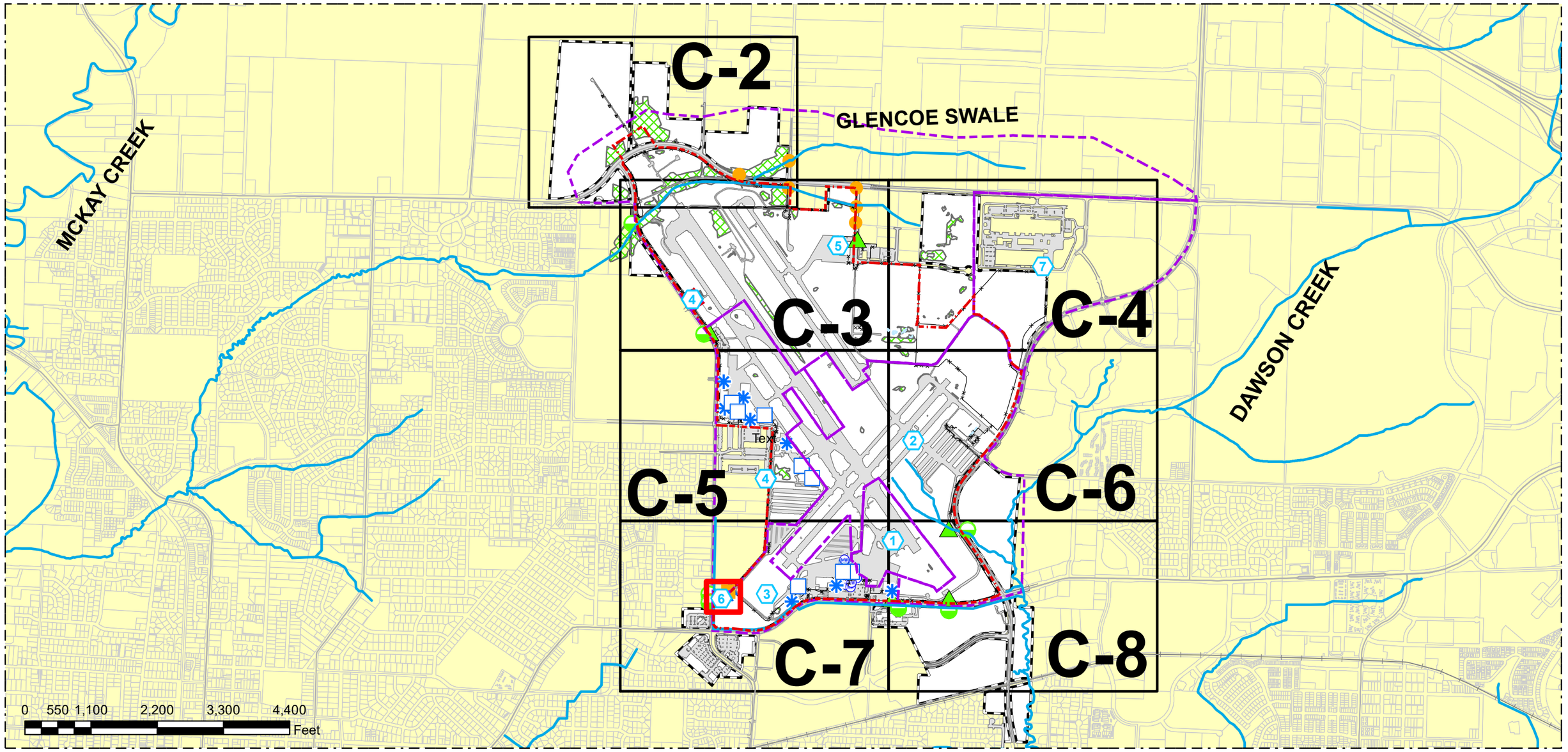
*Documentation of spills applies to all tenants

XI. Underground Injection Control Rules and Regulations

The Oregon Administrative Rules (OAR) 340-044-0050 regulate the discharge of waste disposal, including stormwater discharges, into disposal wells (dry wells, seepage pits, septic tanks). The 1200-Z Permit requires that all permittees comply with these regulations. There are no known underground injection systems in operation at Hillsboro.

Figures

Figure 1 Site Location



001 MONITORING POINT
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SIGNIFICANT STORAGE AREA
TENANT OWNED ABOVE GROUND STORAGE TANK
TENANT OWNED BELOW GROUND STORAGE TANK
SPILL KIT LOCATION
OIL / WATER SEPARATOR
DISCHARGE POINT

7777 PORT OWNED BUILDINGS & NUMBERS
POINT OF RUN ON
A STORM BASIN ID
C MONITORING WELL
12 VERIFIED PART OF SYSTEM
SUBTERRANEAN DRAINAGE (SUBDRAIN)
CENTERLINE OF DITCH
(OUT) 48 (IN) CULVERT END DESIGNATIONS

STORM BASIN BOUNDARY
PROPERTY LINE
PERMIT BOUNDARY
30 CONTOUR LINES
WETLAND
IMPERVIOUS P.O.P. AIRPORT SURFACE
VEGETATED SWALE
AIRCRAFT DEICING

STORM WATER POLLUTION CONTROL MAP

HILLSBORO AIRPORT, WASHINGTON COUNTY

N

PORT OF PORTLAND
PORTLAND, OREGON

SUBMITTED BY
BLAKE HAMALAINEN

DRAWING NO.
MD HIO 2021 3005

[redacted]

001 MONITORING POINT

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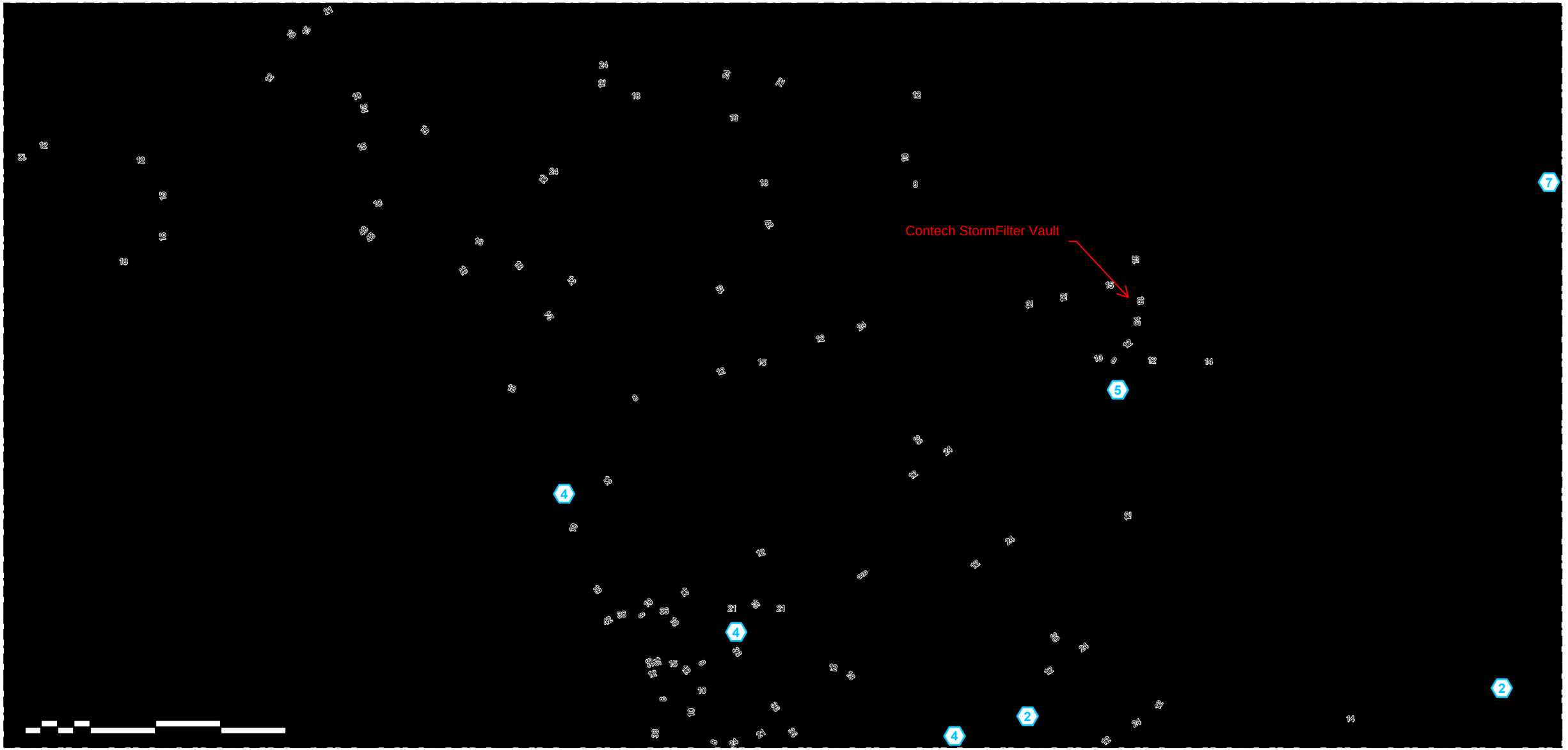

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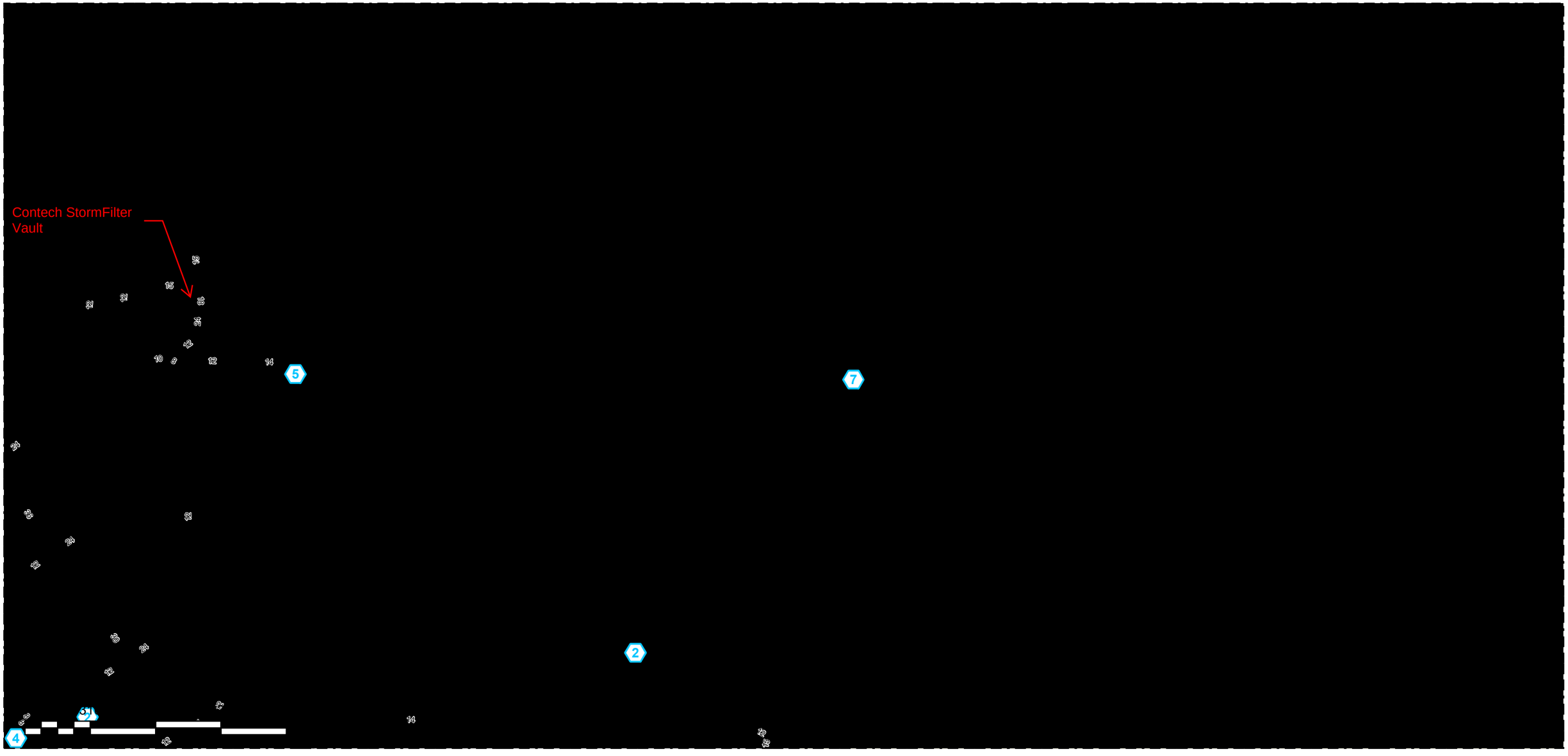

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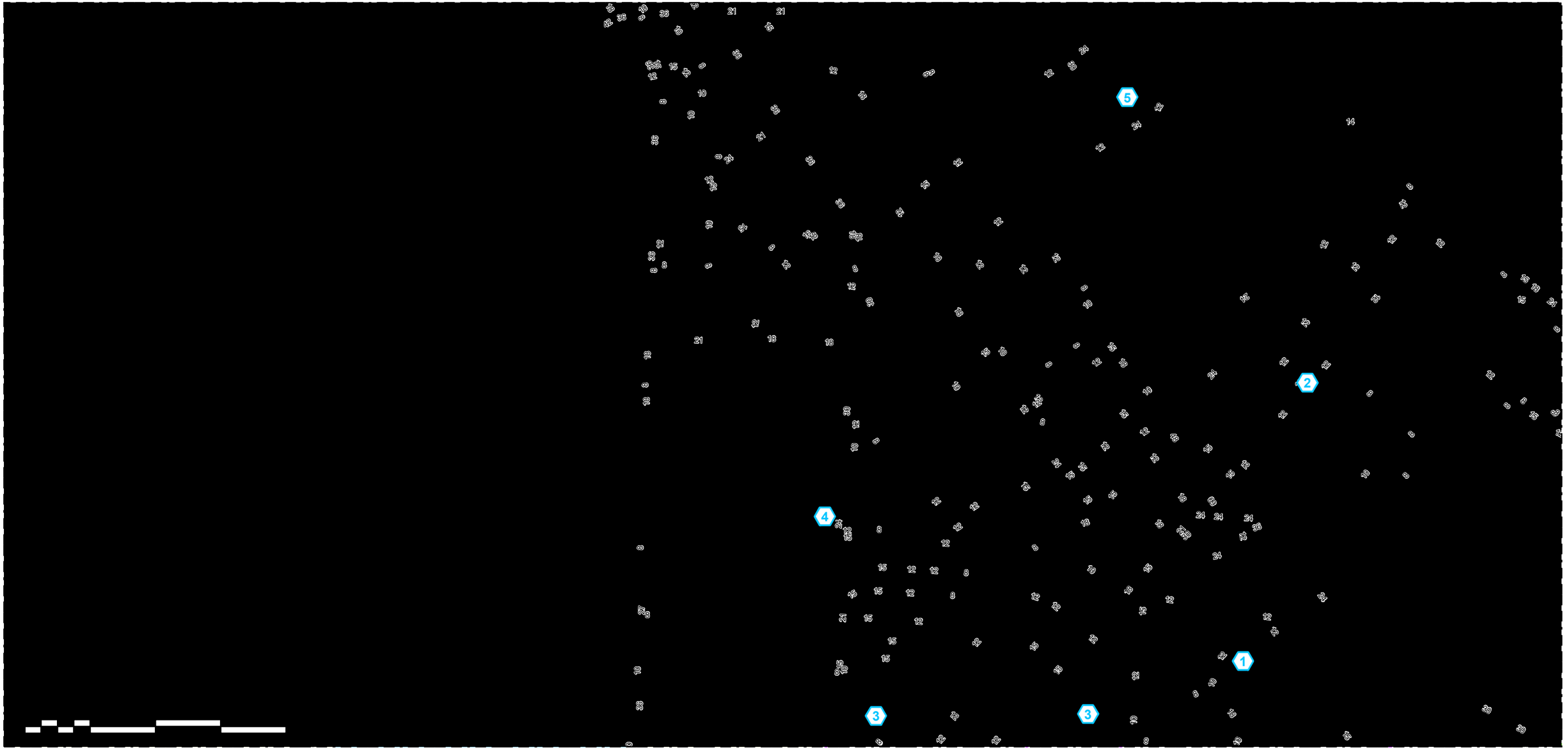

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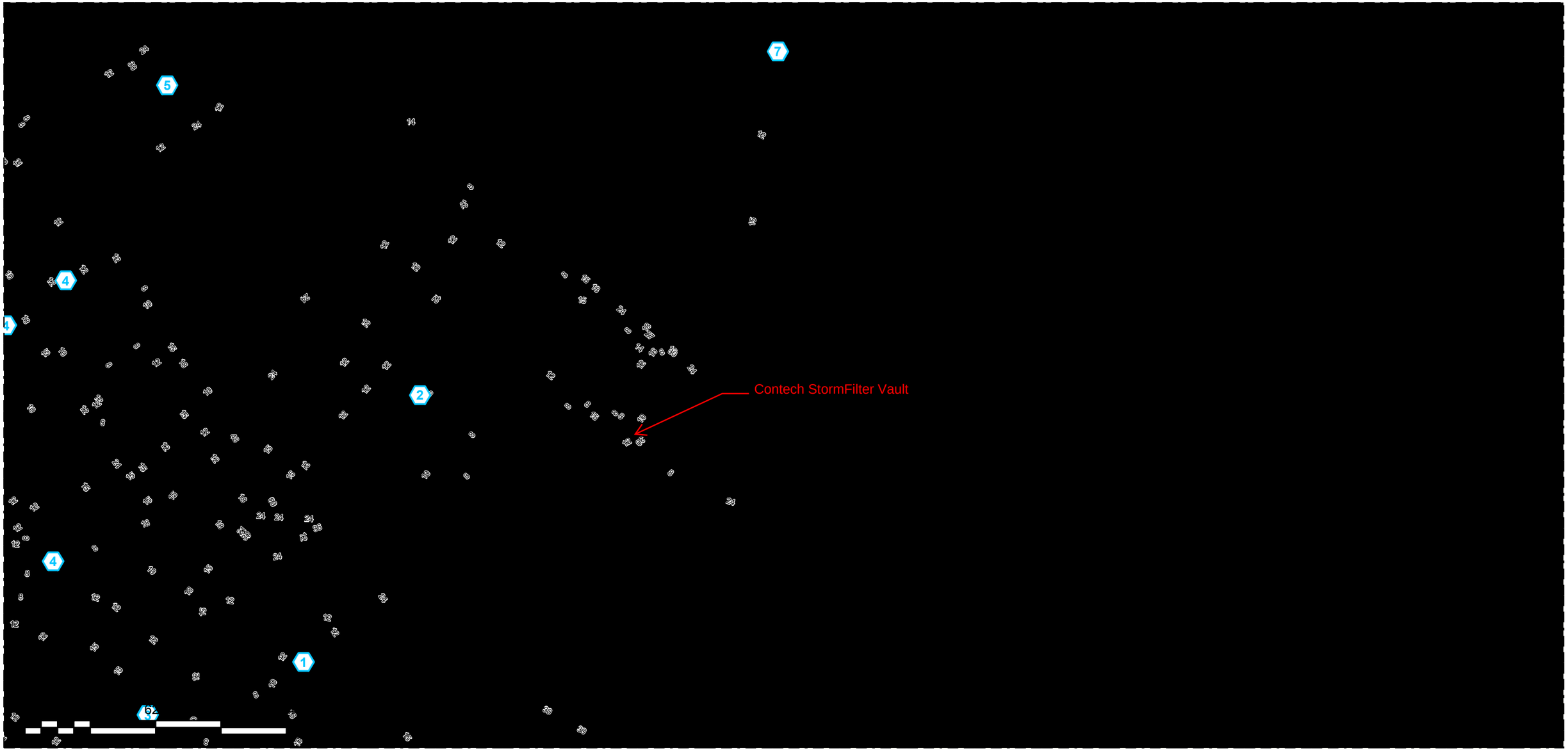

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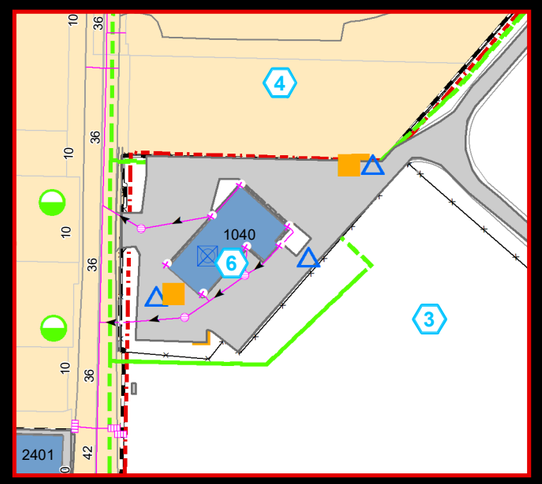

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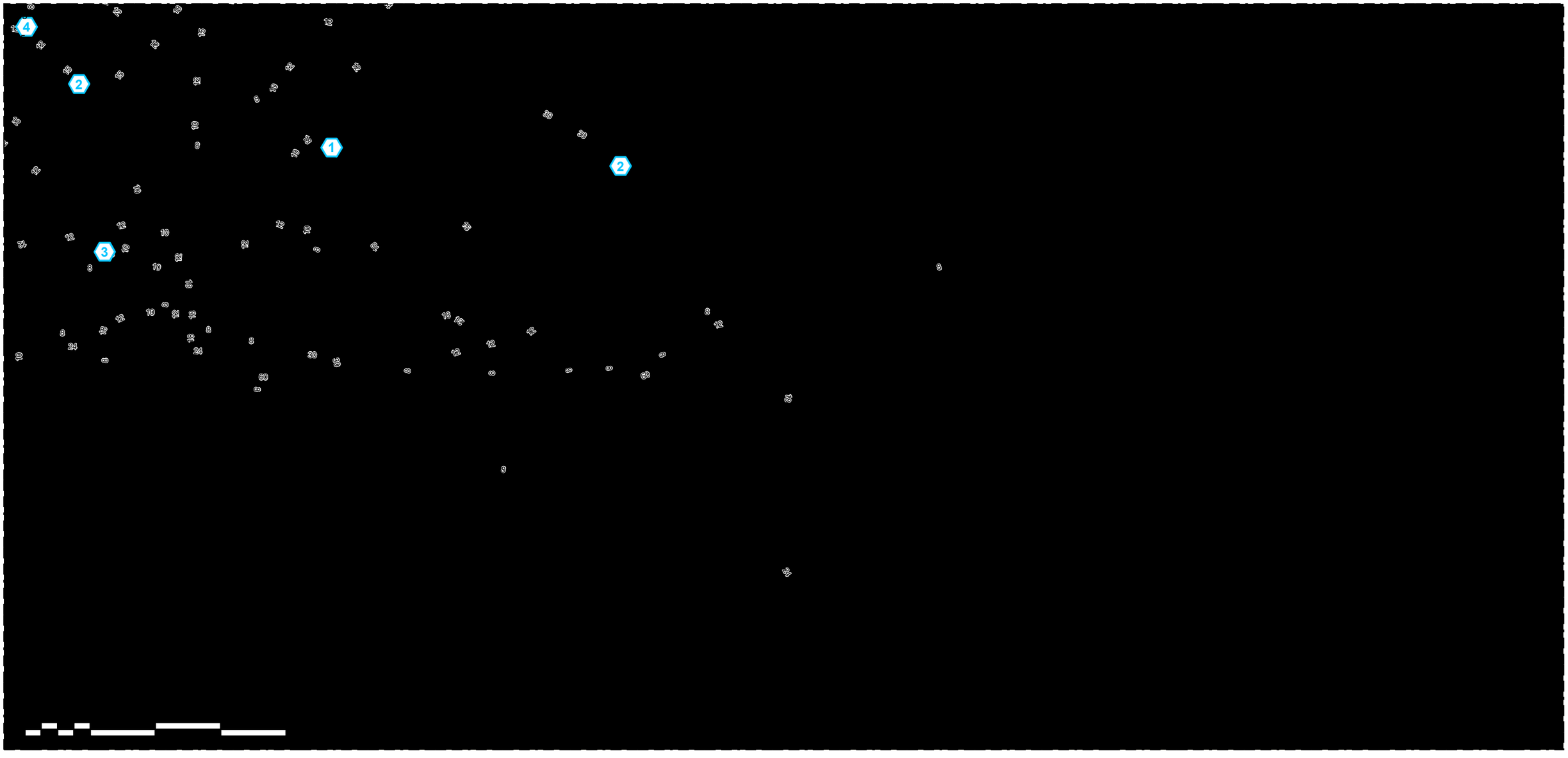

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Appendix A. 1200-Z Permit and Assignment Letter

THE NPDES 1200-Z PERMIT HAS NOT BEEN ATTACHED TO THE SUBMITTAL FOR PAPER SAVING MEASURES.

THE PERMIT IS ON FILE. THE FACILITY SWPCP HAS THE PERMIT AVAILABLE.

Appendix B Record of Changes

Date	Revision or Review	Corrective Action?	Person Making Change
February 4, 2014	Oil boom removed from Basin 4 Outfall on January 14, 2014. SWPCP Tables 4 & 6 and Appendix D updated.	No	Blake Hamalainen
December 29, 2014	Facility contact updated to Danelle Peterson	No	Danelle Peterson
December 29, 2014	Appendix I added for Tier II Corrective Action at SP2 for zinc	Yes	Danelle Peterson and Landau Associates
March 28, 2016	Corrective Action Appendix I updated to include roof seal coat	Yes	Danelle Peterson and Landau Associates
November 9, 2016	Added a monitoring location to the Site Plan for the new Hillsboro Aviation facility; Updated Table 3 to include the new monitoring points; Updated Table 1 to include the description of the new industrial activities in drainage basin 5 and updated the monthly outfall inspection form.	No	Danelle Peterson
December 21, 2017	Added the following for the new permit requirements: points of run-on to the site map, changed the monitoring point names from 1, 2, 3, and 5a to 001, 002, 003 and 004 respectively. explanation for each of the technology based effluent limitations, added more detail to the catch basin inspection schedule, reformatted the Table of Contents, general edits and formatting	No	Danelle Peterson
June 21, 2018	The following changes were made as requested by CWS: Changed the annual report due date to July 31.	Yes	Danelle Peterson

	Added monitoring points to Table 2. Added monitoring points names to the monthly inspection forms.		
04/14/2019	Administrative updates made to reflect the changes in the reissued 1200-Z permit.	No	Danelle Peterson
05/31/2019	Added the 194-gal backup generator diesel tank and the MX shop tanks to the monthly inspection form	No	Danelle
08/31/2021	Updated to meet requirements of 2021 Permit reissuance	No	Blake Hamalainen
12/29/21	Updated to address comments made by CWS	No	Blake Hamalainen

Appendix C Monthly Inspection and Maintenance Forms

HIO Stormwater Preventative MX Tracking

Task	Date	Location Description	Notes
CB Filter Change Out		MX Facility	
CB Cleaning		Multiple areas at HIO	
Boom Replacement		Basin 2	
280 gal AST Used Oil Clean Out		MX Area	
280 gal AST Used Oil Clean Out		MX Area	
500 gal AST Diesel Fuel Clean Out		MX Area	
Drainage Ditch Mowing		Basins 2, 4, and 5	
Grassy Swale Mowing, Cleaning		Taxiways and Runways Area	
Vegetated Filter Strip Mowing, Cleaning		Taxiways and Runways Area	
Sweeping		Taxiways, Runways, and Terminal Ramp Area	
Contech Storm Filter		Basin 2 (Penny Way Vault)	
Contech Storm Filter		Basin 3 (East of the Museum)	
Pavement washdowns		Multiple areas at HIO	
Portable Media Filters		Basin 3 (Building 3301 roof downspouts)	

Note: This form is used to track stormwater preventative maintenance tasks at GA airports including: Ditch MX, catch basin cleanout, boom change out, catch basin filter replacement, outfall repair and used oil tank mx.

Work Instruction: **Stormwater Monthly Inspections**	Work Instruction WI-AVI-WTR-001
	Date: 01/26/2017
	Rev. # 1
	Page: # 1 of 3
	Owner: Water Quality Manager

PURPOSE

1.1. The purpose of this procedure is to ensure compliance with the monthly inspection requirements associated with 1200-COLS National Pollution Discharge Elimination System (NPDES) permit and 1200-Z NPDES permits.

2.0 SCOPE

2.1. This procedure applies to the performance of monthly monitoring of stormwater discharges and monthly inspections of industrial areas at PDX (Portland International Airport), HIO (Hillsboro Airport), and TTD (Troutdale Airport).

2.2. These activities are specific to the Port of Portland's Industrial operations (this generally excludes tenant activities).

3.0 DEFINITIONS

3.1. *Site Controls - Best Management Practices (BMPs) for controlling and preventing stormwater pollution. These can be structural or procedural.*

3.2. *Environmental Management System (EMS)*

3.3. *Industrial Inspections – Inspecting areas where stormwater meets industrial activities such as: material handling areas, storage or maintenance of material handling equipment, storage areas for raw materials (tank farms) and intermediate and finished products and manufacturing buildings.*

3.4. *Outfall Monitoring – monitoring the stormwater discharges at designated stormwater outfalls as identified the SWPCP (stormwater pollution control plan).*

3.5. *House Keeping – areas that may contribute pollutants to stormwater must be kept clean. Sweeping, litter pick-up, prompt cleanup of spills and leaks, and proper maintenance of vehicles must be employed to eliminate or minimize exposure of stormwater to pollutants.*

4.0 **RESPONSIBILITY**

4.1. *Environmental Operations Specialist, Technician and/or delegate:*

- Conducts monthly monitoring and inspections per related permits, plans and protocols for each airport.
- Manages and maintains records related to monthly monitoring and reporting.
- Monitors corrective action when deficiencies in performance or controls are identified

4.2. *Aviation maintenance staff (as delegated):*

- *Respond to repair requests and address issues in a timely manner.*

4.3. *Designated Environmental Operations staff (generally the Administrative Coordinator):*

- Maintain records per the Port's records retention schedule.

5.0 GUIDANCE

5.1. Required Equipment

- Sampling equipment; for details reference the related monitoring protocol.
- Forms: Field Monitoring; Industrial Inspection; Outfall Monitoring.
- Links to the above referenced documents are provided in section 7 of this document.

5.2. Schedule

- Industrial inspections must be completed monthly.
- Stormwater discharges that occur Monday thorugh Friday during regular business hours (as defined in the associated Stormwater Pollution Control Plan) must be monitored monthly.

5.3. Conducting Inspections

- Reference the monthly industrial form for each airport (in scope).
- Document conditions at each monitoring point listed on forms.
- Collect samples (if necessary) – see permits for guidance.
- Reference: Stormwater Sampling Protocol for each airport.
- Document conditions of site controls and industrial areas listed on the inspection forms.
- Follow up and corrective action for for housekeeping issues, spills, or damaged site controls.
  - For PDX: Submit work orders in PDX maintenance request via e-mail, which will generate a work order. Assign completion timeline (as necessary). Monitor completion.
  - For HIO and TTD general aviation (GA): coordinate maintance requests with GA Maintenance Lead; establish timeline (as necessary) and monitor completion.

5.4. Recordkeeping and Reporting

- Industrial Inspections
  - Completed monthly inspection forms are maintained in the Stormwater Monthly Industrial & Outfall Inspections binder located at designated Environmental Specialist's work area. The binder includes records generated July 1 through June 30 of the current year.
  - After the tracking year is complete, records are transferred environmental files, along with annual report documentation and maintained per Port's Record Retention Schedule.
- Monthly Monitoring
  - Completed forms are scanned and e-filed in the stormwater database maintained by the designated Environmetnal Specialist

- Files are maintained in the Stormwater Monthly Industrial & Outfall Inspections binder located at Environmental Specialist's work area July 1 through June 30.

- After the tracking year, records are transferred environmental files along with annual report documentation and maintained per the Port's Record Retention Schedule.

1.0 VERIFICATION AND CORRECTIVE ACTION

1.1. This procedure is to be reviewed on a periodic basis by the Environmental Operations EMS Manager. If deficiencies are discovered in this procedure, corrective action will be taken.

1.2. Port conformance with this procedure is to be reviewed on a periodic basis by the Environmental Operations EMS Manager. If nonconformance is discovered, corrective action will be taken.

2.0 REFERENCES, RELATED POLICIES AND GUIDELINES

2.1. Environmental Water Resource Policy <7.4.16>

2.2. 1200-Z permits <HIO, TTD>

2.3. 1200-COLS <PDX>

2.4. Annual Stormwater Monitoring and Industrial Discharge Reporting (work instruction)

2.5. SWPC Plans <PDX, HIO, TTD>; updates – through action plans – are maintained by Aviation Environmental

2.6. Monitoring Protocol <1200-Z> <1200-COLS>

2.7. Inspection Forms and Monitoring Records

3.0 ATTACHMENTS

3.1. None

4.0 REVISION HISTORY

WI-AVI-WTR-001 Stormwater Monthly Inspections	
Date	**Description**
11/18/2010	This is the original version of this Work Instruction.
03/16/2016	Updates made for the 1200-COLS 2016 permit renewal. Aviation Environmental Specialist was changed to either Environmental Operations Specialist or Water Quality Manager. Under Record Keeping and Reporting, Monthly Monitoring, the following statement was removed," A copy is submitted to DEQ as part of annual reporting."

HIO MONTHLY INSPECTIONS

MONITORING/DISCHARGE POINT INSPECTIONS - Associated with Industrial Activities									
LOCATION / TIME	DESCRIPTION	WATER LEVEL	WATER COLOR	WATER CLARITY	FLOATING OR SUSPENDED SOLIDS	O&G SHEEN	ODOR	FOAM	COMMENTS/ FOLLOWUP
Basin 1 Time:	STSMH421 located on southeast portion of facility between Cornell Road and HIO perimeter fence	NO FLOW TRICKLE LOW MEDIUM HIGH VERY HIGH	NO COLOR GREEN BROWN GRAY YELLOW ORANGE OTHER:	CLEAR CLOUDY TURBID	NONE LIGHT MEDIUM HEAVY	NONE V. LIGHT LIGHT MEDIUM HEAVY	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	
Basin 2 Time:	Ditch on E. side of Airport, off of Perimeter Rd. between Hillsboro Aviation and NE Hangers	NO FLOW TRICKLE LOW MEDIUM HIGH VERY HIGH	NO COLOR GREEN BROWN GRAY YELLOW ORANGE OTHER:	CLEAR CLOUDY TURBID	NONE LIGHT MEDIUM HEAVY	NONE V. LIGHT LIGHT MEDIUM HEAVY	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	
Basin 3 Time:	SE corner of Hillsboro Aviation Parking lot (manhole)	NO FLOW TRICKLE LOW MEDIUM HIGH VERY HIGH	NO COLOR GREEN BROWN GRAY YELLOW ORANGE OTHER:	CLEAR CLOUDY TURBID	NONE LIGHT MEDIUM HEAVY	NONE V. LIGHT LIGHT MEDIUM HEAVY	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	
Basin 4 Time:	Manhole on W. side of Airport, North of Global Aviation and South of Hillsboro Fire	NO FLOW TRICKLE LOW MEDIUM HIGH VERY HIGH	NO COLOR GREEN BROWN GRAY YELLOW ORANGE OTHER:	CLEAR CLOUDY TURBID	NONE LIGHT MEDIUM HEAVY	NONE V. LIGHT LIGHT MEDIUM HEAVY	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	
Basin 5 Time:	Manhole along NE 30th Ave. due East of HIO stormwater treatment vault	NO FLOW TRICKLE LOW MEDIUM HIGH VERY HIGH	NO COLOR GREEN BROWN GRAY YELLOW ORANGE OTHER:	CLEAR CLOUDY TURBID	NONE LIGHT MEDIUM HEAVY	NONE V. LIGHT LIGHT MEDIUM HEAVY	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	

WEATHER FOR PAST 3 DAYS (Circle all that apply): Cold Wet Rainy Dry Other:_____

INSPECTED BY: _____ DATE: _____

COMMENTS: _____

HIO MONTHLY INSPECTIONS

_____

_____

_____

_____

_____

AST INSPECTIONS									
AREA	TANK #	DESCRIPTION	LOCATION	EVIDENCE OF SPILLS	PUMP CONDITION	SPILL KIT / BOOM	TANK INTEGRITY	2ND CONTAIN.	COMMENTS / FOLLOWUP
Maintenance Facility	**37**	500-Gal. Diesel Tank (Double Wall)	South of HIO MX	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
	45	280-Gal. Used Oil (Double Wall)	North of Auto Gate, Outside HIO MX Yard	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
	46	280-Gal. Used Oil (Double Wall)	South of Auto Gate, Inside HIO MX Yard	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
	41	250-Gal. Used Oil (Steel Single Wall) Transfer Tank	Inside MX Shop	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
	47	1,500-Gal. Used Oil (Double Wall)	Inside MX Shop	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
	48	(2) 52-Gal. Diesel and Gasoline (Single Wall)	Mounted to Bed of Vehicle 17026	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
	N/A	(10) 55-Gal. Drums	Elevated Rack Inside MX Shop	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	
FAA Tower	**N/A**	85-Gal. Transformer Fluid Steel Regulator	Inside Regulator Room	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	

HIO MONTHLY INSPECTIONS

	49	194-Gal. Backup Generator	North of FAA Tower	NO YES (DESCRIBE IN COMMENTS)	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT. NONE	GOOD NEEDS MAINT.	GOOD NEEDS MAINT. NONE	

HIO MONTHLY INSPECTIONS

BOOM INSPECTIONS					
LOCATION	DESCRIPTION	GENERAL HOUSEKEEPING	EVIDENCE OF SPILLS	BOOM CONDITION	COMMENTS / FOLLOW UP
Basin 2 Booms	Ditch on E. Side of Airport, at Basin 2 Monitoring Point	GOOD NEEDS ATTENTION (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	NEW GOOD OKAY REPLACE NONE	

CATCH BASIN INSPECTIONS								
SITE	CATCH BASIN NO. & LOCATION	CONDITION OF STRUCTURE	DEBRIS IN BASIN	CLEANING REQUIRED?	ODOR	SHEEN	EVIDENCE/ POTENTIAL FOR POLLUTIANTS ENTERING BASIN	COMMENTS / FOLLOW UP
Airside of Admin. Building	**STSCB490** East of Auto Gate	GOOD NEEDS MAINT.	NONE LEAVES GRASS SILT SAND TRASH OTHER:	NO YES (DESCRIBE):	NONE MUSTY PETROLEUM OTHER:	NONE LIGHT MEDIUM HEAVY	NO YES (DESCRIBE):	
	STSCB489 West of Auto Gate	GOOD NEEDS MAINT.	NONE LEAVES GRASS SILT SAND TRASH OTHER:	NO YES (DESCRIBE):	NONE MUSTY PETROLEUM OTHER:	NONE LIGHT MEDIUM HEAVY	NO YES (DESCRIBE):	
Maintenance Facility	**STSMH285** Driveway from 25th Avenue	GOOD NEEDS MAINT.	NONE LEAVES GRASS SILT SAND TRASH OTHER:	NO YES (DESCRIBE):	NONE MUSTY PETROLEUM OTHER:	NONE LIGHT MEDIUM HEAVY	NO YES (DESCRIBE):	
	STSMH286 Rear of MX Building	GOOD NEEDS MAINT.	NONE LEAVES GRASS SILT SAND TRASH OTHER:	NO YES (DESCRIBE):	NONE MUSTY PETROLEUM OTHER:	NONE LIGHT MEDIUM HEAVY	NO YES (DESCRIBE):	
	STSMH313 South MX Yard, Adj. to AST	GOOD NEEDS MAINT.	NONE LEAVES GRASS SILT SAND TRASH OTHER:	NO YES (DESCRIBE):	NONE MUSTY PETROLEUM OTHER:	NONE LIGHT MEDIUM HEAVY	NO YES (DESCRIBE):	

HIO MONTHLY INSPECTIONS

INDUSTRIAL AREA INSPECTIONS							
AREA	DEBRIS OR TRASH PRESENT	ARE INDUSTRIAL MATERIALS STORED UNDER COVER?	EVIDENCE OF LEAKING DRUMS, VEHICLES, TANKS, OR OTHER EQUIPMENT?	EVIDENCE OF SPILLS?	ARE CONTAINERS LABELED?	ARE CONTAINERS IN SECONDARY CONTAINMENT	COMMENT/ FOLLOW UP
HIO Maintenance Facility	NO YES (DESCRIBE IN COMMENTS)	N/A YES NO (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	N/A YES NO (DESCRIBE IN COMMENTS)	N/A YES NO (DESCRIBE IN COMMENTS)	
Other/Misc. Areas:	NO YES (DESCRIBE IN COMMENTS)	N/A YES NO (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	NO YES (DESCRIBE IN COMMENTS)	N/A YES NO (DESCRIBE IN COMMENTS)	N/A YES NO (DESCRIBE IN COMMENTS)	

ADDITIONAL COMMENTS: _____

Appendix D Deicing and Anti-icing Best Management Practices

1.0 General Best Management Practices (BMPs) (Port and Tenants)

1.1 Proper Storage of Anti-icing and Deicing Materials

Aircraft and pavement deicing, and anti-icing materials must be stored in accordance with all applicable regulatory requirements. All permanent, aboveground deicing and anti-icing fluid storage tanks at the airport must be double-walled or equipped with secondary containment and undergo routine inspections. To prevent contamination of stormwater, tenant must use appropriate spill response techniques per their established spill response plan.

1.2 Weather Forecasting

The Port and tenants will obtain existing and forecasted weather conditions for HIO endeavor to utilize that information, as well as existing conditions, to determine the timing and selection of anti-icing or deicing materials application. Each tenant is solely responsible for deicing their aircraft consistent with FAA guidelines and regulatory requirements. The overall goal is to contribute the lowest possible pollutant loading consistent with maintaining safe operating conditions.

1.3 Education and Training of Employees and Contractors

It is the responsibility of each tenant to develop and implement an employee and contractor education and training program about environmental requirements and proper application associated with the use of anti-icing and deicing materials, ensure awareness of best management practices and spill response procedures, and to inform and train personnel who are directly involved in anti-icing or deicing operations regarding required best management practices and operational procedures.

The training programs include (but are not limited to) the following:

- The requirements of the 1200-Z National Pollutant Discharge Elimination System permit Sector S requirements
- Tenant best management practices
- Tenant operational procedures and requirements
- Tenant spill response plan and procedures
- Tenant material management practices

2.0 Aircraft BMPs (Tenants)

Anti-icing and deicing BMPs for aircraft must be implemented at HIO. Tenants must select appropriate application equipment and deice in locations that minimize

discharges to the maximum extent practicable to the storm system. Each tenant is solely responsible for deicing of their aircraft consistent with FAA guidelines.

2.1 Best Management Practices for Aircraft Deicing and Anti-icing

To reduce the potential environmental impacts of anti-icing and deicing materials, each tenant must identify and implement best management practices for aircraft deicing and anti-icing operations. Best management practices may include:

- Indoor storage of aircraft
- Manual deice methods
- Hot water deicing
- Aircraft anti-icing and deicing efficient mixtures
- Heating aircraft deicing mixtures
- Application techniques for deicing mixtures
- Proactive aircraft anti-icing
- Two-step aircraft application method

These are described individually below.

2.2 Indoor Storage of Aircraft

When practical, tenants will store aircraft in hangars until aircraft are ready for departure. Port Airport Operations will coordinate airfield snow removal operations with tenants to limit the time aircraft wait on their ramps to taxi.

2.3 Manual Deice Methods

When practical, tenants may remove snow and ice with squeegees, brooms, or other appropriate tools. Although manual methods typically take more time to remove contaminants compared to deicing fluid, the manual method reduces the amount of deicing fluid required for safe flight. This method can be used for aircraft that have overnighted or have long-turnaround times. Manual methods are most satisfactory with light, dry snow accumulations.

2.4 Hot Water Deicing

Water heated to 180F-200F can be used satisfactorily to remove ice or snow from the aircraft surfaces when the ambient temperature is 27F or greater. To prevent the water from freezing, an application of anti-icing fluid to aircraft surfaces immediately after hot water deicing may be necessary, depending upon ambient conditions.

2.5 Aircraft Anti-icing and Deicing Efficient Mixtures

Adjust Type I deicing fluid concentrations based on ambient temperature or use lower concentration formulas as the standard mixture.

FAA's "clean aircraft" concept requires that an 18°F buffer must be provided between outside air temperature and the freeze point of the deicing mixture. For example, a 50:50 mixture of a Type I deicing fluid has a freeze point of -30°F, and can be used when the outside air temperature is as low as -12°F. It cannot be used, however, if the air

temperature decreases further, because the temperature buffer of the deicing fluid would be less than 18°F. Under typical winter conditions at HIO, deicing and anti-icing will be conducted at air temperatures at or above -12°F. At these moderate temperatures, lower concentration deicing mixtures with as little as 20 percent glycol can be effective in meeting FAA requirements.

2.6 Heating Aircraft Deicing Mixtures

Tenants may heat Type I deicing mixtures to a minimum temperature of 140°F before application to the aircraft to ensure maximum deicing effectiveness.

2.7 Efficient Application Techniques

To improve efficiency, tenants may use adjustable deicing nozzles to apply mixtures and apply only as needed to ensure aircraft safety.

2.8 Proactive Anti-icing

To the extent practical, tenants may apply Type IV fluids to prevent or retard the formation of ice or frost on the aircraft. This approach can reduce the overall pollutant loads to stormwater because Type IV fluids provide longer holdover times (time between deicing and departure), thus reducing the amount of deicing fluid needed.

2.9 Two-step Aircraft Application Method

Tenants may employ the "two-step" method of deicing and anti-icing. Under the appropriate conditions, Type IV anti-icing fluids are applied to clean aircraft after receiving applications of Type I deicing fluids to prevent refreezing of surfaces. Use of Type IV fluids improves aircraft holdover times (time between deicing and departure) and increases the chance that the aircraft can take off without secondary deicing, i.e., a second round of deicing. This practice tends to reduce the total volume of deicing and anti-icing materials needed.

2.10 Post-Application Collection

Tenants will collect aircraft deicing materials to the maximum extent practicable. Tenants may choose from the following BMPs to manage aircraft deicing runoff:

- Deice aircraft in locations that drain to the sanitary sewer
- Deice the aircraft indoors with no discharge to the sanitary sewer
- Deice the aircraft outdoors and collect the runoff

2.10.1 Deice aircraft in locations that drain to the sanitary sewer

Deice aircraft in locations outdoors or indoors where the runoff drains to a sanitary sewer inlet. Deicing locations may include; a fuel pad with a valve connection to both

the storm and sanitary systems that can be operated to discharge to the sanitary sewer during deicing activities or the inside of a hangar that has a drain that discharges to the sanitary. Deicing activities that discharge runoff into the sanitary sewer must obtain and comply with a pretreatment permit from Clean Water Services.

2.10.2 Deice aircraft indoors to minimize co-mingling with stormwater

Deicing indoors will minimize co-mingling with stormwater and runoff. Tenant must prevent deicing fluids from entering the sanitary drains unless allowable under a pretreatment permit with Clean Water Services.

2.10.3 Deice aircraft outdoors

The tenant must prevent fluid to maximum extent practicable from discharging into the storm system. Plug inlets and collect deicing runoff with absorbent material, a boom collection system or glycol recovery vehicle. All collected material must be disposed of appropriately.

2.11 Recordkeeping

Each co-permittee must monitor the types and volumes of aircraft deicing and anti-icing materials used and purchased during the deicing season (November 1 through April 30). Tenants must also submit their usage to the Port annually; see the Annual Reconciliation Form below.

3.0 Pavement BMPs (Port and Tenants)

Consistent with flight safety, the Port and tenants will implement pavement deicing and anti-icing BMPs these include:

- Material selection
- Minimizing applications and application areas
- Management of Ice, Slush and Snow Containing Deicing Materials
- Record Keeping

3.1 Selection of Pavement Anti-icing and Deicing Materials

All anti-icing and deicing materials used within the HIO airfield perimeter fence must meet FAA approved specifications. Tenants must select pavement anti-icing and deicing materials that provide the lowest pollutant loading for conditions at HIO consistent with FAA requirements. Sodium formate (solid) and potassium acetate (liquid) are recommended for pavement deicing because both products have a lower pollutant loading compared to other FAA-approved deicers. Anhydrous sodium acetate (solid) may be used as a backup product if sodium formate is temporarily unavailable.

3.2 Minimize Pavement Anti-icing and Deicing Area

Tenants and Port maintenance must apply deicing and anti-icing materials to the smallest possible area, consistent with safe operations, to minimize pollutant loading.

Deicing and anti-icing of airside pavements by HIO Maintenance is performed consistent with the prioritization in the *Snow Removal Priorities and Braking Action Reporting Producers.* Runways and taxiways are first plowed before deicing material is applied to reduce the quantity of deicer applied.

3.3 Management of Ice, Slush, and Snow Containing Airside Deicing Materials

The snow and ice mechanically removed from runways and taxiways remain piled alongside in snow banks. Snow bank heights are sloped back from the taxiway or runway to clear aircraft engines and wingtips. The snow bank will melt overtime into vegetated areas before discharging into the storm system.

3.4 Recordkeeping

Each tenant is responsible for monitoring the types and quantities of airside pavement deicing and anti-icing materials used and purchased during the deicing season (November 1 through April 30). Tenants must also submit their usage to the Port annually; see the Annual Reconciliation Form below.

HIO Maintenance monitors the types and quantities of airside pavement deicing and anti-icing materials used and purchased by the Port during the deicing season (November 1 through April 30).

4.0 Summary

To reduce pollutant loads to surface waters, tenants will implement BMPs, consistent with flight safety measures during the deicing season (November 1 – March 30), as summarized below.

Summary of Deicing Best Management Practices (BMPs) for HIO

BMP	Implementation
General	
Proper storage	All permanent, aboveground ADF storage tanks will be double-walled or equipped with secondary containment. Aboveground tanks will be routinely inspected. Spill response plans will be followed to minimize stormwater impacts.

Summary of Deicing Best Management Practices (BMPs) for HIO

BMP	Implementation
Forecasting of anti-icing and deicing weather	Weather forecasting will be used to minimize deicing material usage while maintaining safe aircraft operating conditions in compliance with applicable regulations.
Education and training	Tenants will conduct permit, best management practice and spill management training for their employees and contractors.
Aircraft	
Indoor Storage of Aircraft	Tenants will store their aircraft indoors to the maximum extent practical before takeoff.
Efficient mixtures	Tenants will use variable mixtures or fixed mixtures at less than 50% concentration of glycol consistent with safe flight and manufacturer recommended hold-over times.
Heating Mixtures	Deicing mixtures will be heated to minimum of 140°F before application to maximize deicing effectiveness.
Efficient application techniques	Adjustable deicing nozzles will be used to the maximum extent practical to improve application efficiency.
Proactive Anti-icing	Under appropriate conditions, tenants will apply Type IV fluids to reduce fluid usage and associated pollutant loads.
Two-Step Application	Under appropriate conditions, the two-step method of deicing and anti-icing will be performed.
Post-application collection	Tenants will collect aircraft deicing materials to the maximum extent practicable
Pavement	
Material selection	Select materials that provide the lowest pollutant loading conditions consistent with safe flight. Liquid potassium acetate and solid sodium formate will be used airside, unless sodium formate supply limitations warrant use of hydrated sodium acetate.
Reduce application amounts	Flow-controlled application equipment will be used to maximize material application and reduce volume of applied material.

Summary of Deicing Best Management Practices (BMPs) for HIO

BMP	Implementation
Minimize pavement applications	Deicing and anti-icing material are applied to the smallest area practicable.

HILLSBORO AIRPORT
AIRCRAFT ANTI-ICING/DEICING MATERIAL
ANNUAL RECONCILIATION LOG

Company: _____

Name of Facility Contact: _____

Phone No.: _____

Email: _____

Amounts On-hand at Beginning of the Season (November 1):

Type I _____ gallons (undiluted glycol) Manufacture/Brand/Model_____

Type II _____ gallons (undiluted glycol) Manufacture/Brand/Model_____

Type IV _____ gallons (undiluted glycol) Manufacture/Brand/Model_____

Amounts Received During the Season:

Type I _____ gallons (undiluted glycol) Manufacture/Brand/Model_____

Type II _____ gallons (undiluted glycol) Manufacture/Brand/Model_____

Type IV _____ gallons (undiluted glycol) Manufacture/Brand/Model_____

Amounts On-hand at the End of the Season (April 30):

Type I _____ gallons (undiluted glycol)

Type II _____ gallons (undiluted glycol)

Type IV _____ gallons (undiluted glycol)

Non-aircraft Usage (November 1 – April 30):

[Includes lavatory use, fluid disposed off-site, fluid sold to other airlines, etc.]

Type I _____ gallons (undiluted glycol)

Type II _____ gallons (undiluted glycol)

Type IV_____ gallons (undiluted glycol)

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

Signatur**e:** _____ Date: _____

Name Printed: _____

Appendix E Tier 2 Corrective Action Response

DEQ Industrial Stormwater Permits
Tier II Revised Stormwater Pollution Control Plan Checklist

Instructions: *Complete this form and submit with the revised SWPCP and engineered plan or waiver request. Fill in the requested information in the highlighted cells and the appropriate page number(s) indicating the location of information in the revised SWPCP.*

Facility Name: Hillsboro Airport (HIO) **File No.:** 107009

Permit Schedule	Requirement					Page #	Comments (for official use only)
A.12.c.ii	Date Revised Plan submitted:						
A.12	Outfall	Parameter	Geometric Mean Exceedance	Units	Percent Reduction in Concentration	Percent of Design Storm Infiltrated or Injected	
	Sample Point 2	Zinc	0.17	mg/L	0.098	NA	
A.12.c.i.1	**Proposed Tier II Corrective Action Response**					Portable media filter	
		Design storm in inches				NA	
A.12.c.i.1	Rationale for the selection of the measures					Attached	
A.12.c.ii.	Schedule for implementing these measures					Attached	
A.12.c.i.2	Stamped by PE or CEG					Attached	
Cost of installation						~$7,000.00	
Treatment system schematic and operational plan						Attached	
Operation and maintenance schedule for treatment measures and/or volume reduction measures proposed						Attached	

For DEQ or Agent use only			
A.12.c	Revised SWPCP complete and acceptable		
A.12.c.ii	Implementation of treatment measures by June 30th of 4th year of permit		
A.12.c.iii	Tier II Benchmark Exceedance Report submitted to DEQ or Agent		

Notes: _____

Late updated: 11/12/14
Created by: Mark Riedel

TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Danelle Peterson, Port of Portland

FROM: Joseph Kalmar, P.E. and James Raspen

DATE: Wednesday, December 17, 2014

REGISTERED PROFESSIONAL ENGINEER 65319PE Joseph Kalmar OREGON JOSEPH A. KALMAR EXPIRES 6/30/15

RE: TIER 2 CORRECTIVE ACTION RESPONSE
HILLSBORO AIRPORT (HIO)
PORT OF PORTLAND
HILLSBORO, OREGON

INTRODUCTION

This technical memorandum provides an engineering review of stormwater source control and treatment measures at the Hillsboro Airport (HIO) in accordance with the requirements of its National Pollutant Discharge Elimination System (NPDES) General Stormwater Discharge 1200-Z Permit (Permit) issued by the Oregon Department of Environmental Quality (DEQ).

HIO is located at 1040 NE 25th Avenue in Hillsboro, Oregon, and is owned and operated by the Port of Portland (Port). As per Schedule A.12 of the Permit, a 2nd year Geometric Mean Benchmark Evaluation, which includes submitting the geometric mean of the sampling results at all designated sampling locations, is to be conducted during the second year of the current permit. The geometric mean of total zinc at one of the Port's designated sampling locations, SP2, was 0.17 milligrams per liter (mg/L) which exceeds the total zinc permit benchmark of 0.12 mg/L; therefore, a Tier II Corrective Action Response (CAR) is to be submitted to Clean Water Services, a DEQ authorized agent, by December 31, 2014. This Tier II CAR is to include an evaluation of the Port's Stormwater Pollution Control Plan (SWPCP) to determine source control and/or treatment measures that need revision and/or new measures that need to be implemented in order to achieve permit benchmarks during future sampling events. A licensed Professional Engineer (PE) or Certified Engineering Geologist (CEG) must then review and stamp any revisions applied to the SWPCP. This technical memorandum, also to be stamped by a PE, is provided to the Port to be included with a revised and updated SWPCP. As described in the terms of the Permit, the submittal and acceptance of these documents, followed by successful implementation, will achieve full compliance. In addition, pollutant reduction analysis and a schedule of implementation are included within this technical memorandum. The following sections refer to specific sections of the current permit to assist with acknowledging permit requirements and DEQ's Tier II Revised Stormwater Pollution Control Plan Checklist.

RATIONALE FOR SELECTION OF NEW TREATMENT MEASURE (A.12.C.I.1)

Based on a previous technical memorandum submitted to the Port by Landau Associates (HIO Zinc Investigation) (Landau Associates 2014), it was determined that the uncoated metal roof sections of Building 3301 were a major source of zinc and was a potential cause for elevated concentrations of zinc within the HIO's Drainage Basin 3 and subsequent sampling location, SP2. After review of the HIO Zinc Investigation which included a cost evaluation of various treatment measures, the Port decided to install downspout treatment units at downspout locations around Building 3301. This plan was determined to be the most efficient way to reduce the zinc concentrations at SP2. Installation of downspout treatment units at various other industrial sites and ports have proven to be effective treatment measures in reducing the total zinc concentration within stormwater generated from metal roof runoff.

TREATMENT MEASURE OPERATIONAL PLAN

The Port of Vancouver recently developed downspout treatment units called the Grattix. These treatment units are similar in design to the City of Portland's Stormwater Management Manual (SWMM) for a planter filter, in which a recycled Immediate Bulk Container (IBC) is layered with drain rock, sand, a bio-retention soil mix, and mulch with a few plants. Contained within the drain rock is an underdrain system of perforated pipe connected to the outlet of the IBC. While zinc concentration loading can vary at each location, zinc removal efficiency was reported to range from 92 to 98 percent.

The Port intends to install a similar type of downspout treatment unit as the Grattix at selected downspouts connected to Building 3301 with a few modifications. The Port's downspout treatment unit (referred to as a Portable Media Filter) will specify that the sand used must be washed and meet ASTM C33 specifications as concrete sand and will adhere to the media specifications addressed in the Port's Stormwater Design Manual for media filter. In addition, the drain rock will be washed aggregate of 0.75 to 3-inch round or crushed rock and the void space in the aggregates will be between 30 to 40 percent. No plants will be added as they generally provide an aesthetic element and are not necessary for the effective removal of zinc. These slight modifications should provide equal or greater zinc removal efficiency rates as compared to the reported results of the Grattix. A design schematic of the Portable Media Filter is provided by the Port as Figure 1.

The following design alternatives may be incorporated upon installation of these Portable Media Filters, but should not affect the overall zinc removal efficiency of the media filter. Rhyolite sand, a naturally occurring mineral used as top dressing on golf courses, is an effective and reliable substitute for concrete sand due to its favorable physical properties (e.g., durable, light weight, low angularity, consistent gradation). The 6-inch layer of pea gravel may be replaced with geo-textile fabric which will reduce the overall height of the media while still providing a separation of fines from the drain rock and

underdrain system. A 2-inch overflow bypass pipe may be installed at an elevation that allows at least a minimum ponding depth of 2 inches. This bypass pipe connects directly to the underdrain system and allows for overflow water to drain to a piped outlet.

The Port's Portable Media Filters will be made from triple-rinsed, recycled IBC totes with overall capacity of 275 gallons. These totes provide a surface area of approximately 11.56 square feet (ft^2) with depth of approximately 38 inches. In Landau Associates' previous experiences with similar types of downspout treatment units; these Portable Media Filters are capable of treating a drainage area of approximately 2,000 ft^2. Building 3301 has two uncoated metal roof sections; one main section consisting of approximately 24,000 ft^2 and four downspouts, and an auxiliary section consisting of approximately 2,300 ft^2 and one downspout. While each downspout handles over 4,000 ft^2 of roof drainage, the roof pitch is fairly flat and the deep box gutter style allows for a fair amount of time for the entire roof to discharge. Therefore two Portable Media Filters should be able to handle the drainage flow rate from each downspout. During high intensity rainfalls in which a portion of the roof drainage may bypass treatment via the overflow device, the zinc concentration would be much more dilute because of the reduced contact time with the uncoated metal.

With ongoing monitoring, the Port may find that two Portable Media Filters at each of the four main Building 3301 downspouts and at the auxiliary section downspout provide a relatively short life span for the filter media before requiring media replacement. Addition of a third filter at each downspout may be advisable if that is found to be the case. Most of the roof downspouts are rectangular in shape and shall be fitted with y-splitters above the Portable Media Filters, to allow for roughly equal flow to each filter unit.

TREATMENT MEASURE OPERATION AND MAINTENANCE SCHEDULE

In addition to the Port's normal monthly visual inspections, these Portable Media Filters will be periodically inspected to make sure the number of filters are adequately handling the roof runoff from typical storms without overflow occurring. As each application and downspout location is slightly different, inlet/outlet sampling of the filters will be done semiannually at first to ensure breakthrough is not reached earlier than expected. If the effluent of a filter has a zinc concentration greater than 0.09 mg/L, that filter should be marked for media replacement. Spent filter media will be managed and disposed of per the Port's hazardous waste specifications and guidelines.

PROJECTED REDUCTION OF ZINC CONCENTRATION (A.12)

In order to provide an estimated reduction in zinc concentrations through the installation of the Portable Media Filters, the results of the HIO Zinc Investigation were used to approximate the amount of

zinc that was generated from Building 3301 and the amount of zinc that would eventually pass through SP2 if the Portable Media Filters were installed. For the following calculations, stormwater samples collected from downspouts of Building 3301, the manhole directly upstream of SP2 and SP2 were used from the HIO Zinc Investigation. All calculations and assumptions for the projected reduction of zinc at SP2 are listed in Table 1 and are described as follows. Since these Portable Media Filters act as flow-through media filters with no infiltration or injection into the ground surface, there was no projected volume reduction analysis completed and therefore no requirement for determining a design storm depth.

For the HIO Zinc Investigation, stormwater samples were collected during two rain events. During the second rain event, a stormwater sample was not collected from SP2; therefore, the two stormwater samples collected from the manhole directly upstream from SP2 (STSMH435) and SP2 during the first rain event were used to develop a dilution factor of the stormwater passing through SP2 in comparison to stormwater passing through STSMH435. Three stormwater samples collected during the second rain event, two downspout locations connected to Building 3301 and one from STSMH435, were used to provide a correlation of the amount of zinc generated from roof runoff of Building 3301 to the amount of zinc passing through STSMH435. Then using the dilution factor calculated from the first rain event, the total amount of zinc passing through SP2 during the second rain event was calculated.

Building 3301 is comprised of multiple sections of varying roofing materials. The main and northeast sections of the building are an uncoated, galvanized metal roof, while another section is painted metal, with the remaining sections consisting of single poly ethylene propylene (EP) membrane. One of the Building 3301 downspouts sampled during the second rain event is located in the southeast corner of the building, which receives roof runoff from the main section of Building 3301 and is assumed to be the major source of zinc. During the second rain event, the southeast downspout had total zinc concentration of 4.91 mg/L.

Using the total impervious area of Drainage Basin 3 and the total precipitation depth that occurred during the second rain event, a total volume of water that passed through SP2 was calculated. The total precipitation depth was supplied from a local rain gauge provided by the Weather Underground website (Wunderground 2014). The concentration at SP2 was then calculated by using the dilution factor calculated from the first rain event and the concentration at STSMH435 during the second rain event. Then using the concentration at SP2 and the total volume of water that passed through SP2, a total amount of zinc that passed through SP2 was calculated.

Since the southeast downspout sample location received roof runoff entirely from the uncoated metal section of Building 3301, the amount of zinc generated from the entire metal roof section was calculated based on the total surface area of the uncoated metal roof sections, the zinc concentration of the southeast downspout, and the total precipitation depth during the second rain event.

To estimate the future effectiveness of using Portable Media Filters for HIO building downspouts, testing results of the Grattix units were examined. The Grattix unit zinc removal testing results are provided in Table 2. Considering that the maximum observed effluent zinc concentration from the similar Grattix treatment units was 0.0213 mg/L, it is conservatively estimated that the effluent zinc concentration from Portable Media Filters used at HIO would not exceed 0.1 mg/L assuming proper monitoring and media replacement. Based on this expected zinc removal effectiveness, installing the Portable Media Filters at downspout locations around the uncoated metal roof sections of Building 3301 is projected to reduce zinc at SP2 by approximately 55 percent. Applying this estimated reduction to the 2nd year geometric mean of total zinc at SP2 would result in a zinc concentration of 0.098 mg/L (see Table 1), which is below the permit benchmark.

SCHEDULE (A.12.C.II)

Installation of the Portable Media Filters at downspout locations connected to uncoated metal roof sections of Building 3301 is planned to begin following agreement with Clean Water Services that the aforementioned treatment measures are satisfactory to remain compliant with the Permit. Installation is to be completed in timely fashion but no later than the end of the fourth year of the Permit. In the event of future zinc benchmark exceedances, additional Portable Media Filters will be installed at additional downspouts to assist with achieving the zinc benchmark.

JRR/JAK/emw

REFERENCES

Landau Associates. 2014. Technical Memorandum: *Drainage Basin 3 Zinc Investigation, Port of Portland, Hillsboro Airport (HIO).* From Joe Kalmar, P.E., Principal Engineer, and James Raspen, E.I.T., Senior Staff Engineer, to Danelle Peterson and Susan Aha, Port of Portland. February 28.

Wunderground. 2014. *Weather history for Portland Hillsboro, OR.* Available at http://www.wunderground.com/history/airport/KHIO/2013/12/20/DailyHistory.html?req_city=NA&req_state=NA&req_statename=NA. Accessed October 23.

ATTACHMENTS

Table 1: Projected Reduction of Zinc Calculations
Table 2: Grattix Performance Data
Figure 1: Portable Media Filter Design Schematic (provided by the Port)

TABLE 1
PROJECTED REDUCTION OF ZINC CALCULATIONS
PORT OF PORTLAND
HILLSBORO, OREGON

	Area (ft^2) (a)	Volume (ft^3) (b)	Volume (L)	Zinc Concentration 12/20/13 (mg/L) (c)	Mass of Zinc (mg) (d)	Mass of Zinc after Treatment (mg) (e)	Zinc Concentration after Treatment (mg/L) (f)	Overall Projected Reduction of Zinc (g)
Drainage Basin 3 Impervious Area	1,211,613	11,106	314,500	0.217 (h)	68,246	30,965	0.098 (SP2)	55%
Metal Roof Sections of Building 3301	29,860	274	7,751	4.91	38,056	775	0.1	

Total Precipitation Depth on 12/20/13 (inches)	0.11
Total Zinc Permit Benchmark (mg/L)	0.12
2nd Year Total Zinc Geometric Mean at the Port Facility (mg/L)	0.174
Projected Total Zinc Geometric Mean After Treatment (mg/L)	0.078

Notes:

(a) Area is an estimated value based on approximate measurements provided by the Port of Portland. Actual surface area is not provided.

(b) Volume is calculated based on total volume of flow generated at each given area based on total precipitation depth on 12/20/13.

(c) Zinc Concentration of Building 3301 runoff is determined by associated downspout grab sample of the southeast downspout on the main section of the building.

(d) Mass is calculated based on assumed, uniform concentration over the duration of rain event.

(e) Based on grattix performance data, the maximum expected effluent concentration of zinc is 0.10 mg/L.

(f) Zinc concentration at SP2 after treatment is calculated by dividing the remaining mass of zinc by the total volume of stormwater. Zinc benchmark value is 0.12 mg/L

(g) Projected reduction of zinc is calculated by dividing the difference in zinc concentrations pre & post treatment by the pre-treatment zinc concentration.

(h) Concentration is calculated based on concentrations found at STSMH435 WL and calculated dilution factor between STSMH435 WL and SP2 on 11/7/13.

(SP2) Zinc concentration at sampling location, SP2.

ft^2 = Square Foot

ft^3 = Cubic Feet

L = Liter

mg/L = Milligrams per Liter

mg = Milligrams

TABLE 2
GRATTIX PERFORMANCE DATA
PORT OF PORTLAND
HILLSBORO, OREGON

Date		Total Zinc µg/l BM 120	Dissolved Zinc µg/l BM n/a
11/20/2008	Pre-Treat	295	290
	Post-Grattix	21.3	ND<5.00
	% Reduction	93%	98%
11/25/2008	Pre-Treat	947	1020
	Post-Grattix	14.7	ND<5.00
	% Reduction	98%	100%
12/12/2008	Pre-Treat	278	275
	Post-Grattix	ND<5.00	ND<5.00
	% Reduction	98%	98%
12/29/2008	Pre-Treat	213	178
	Post-Grattix	ND<20.0	ND<20.0
	% Reduction	91%	89%
2/10/2009	Pre-Treat	155	141
	Post-Grattix	11.8	9.67
	% Reduction	92%	93%
5/4/2009	Pre-Treat	148	154
	Post-Grattix	5.27	ND<5.00
	% Reduction	96%	97%
9/7/2010	Pre-Treat	202	151
	Post-Grattix	13.3	12.3
	% Reduction	93%	92%
10/25/2010	Pre-Treat	264	308
	Post-Grattix	3.14	ND<3.08
	% Reduction	99%	99%
2/16/2011	Pre-Treat	94.1	85.3
	Post-Grattix	ND<3.08	ND<3.08
	% Reduction	97%	96%
1/19/2012	Pre-Treat	55.6	56.1
	Post-Grattix	ND<4.00	ND<4.00
	% Reduction	93%	93%

Influent Geometric Mean	201
Effluent Geometric Mean	6.02 (a)
% Reduction	97.0%

Notes

(a) Non-detect values are assumed to be one-half of the reported limit

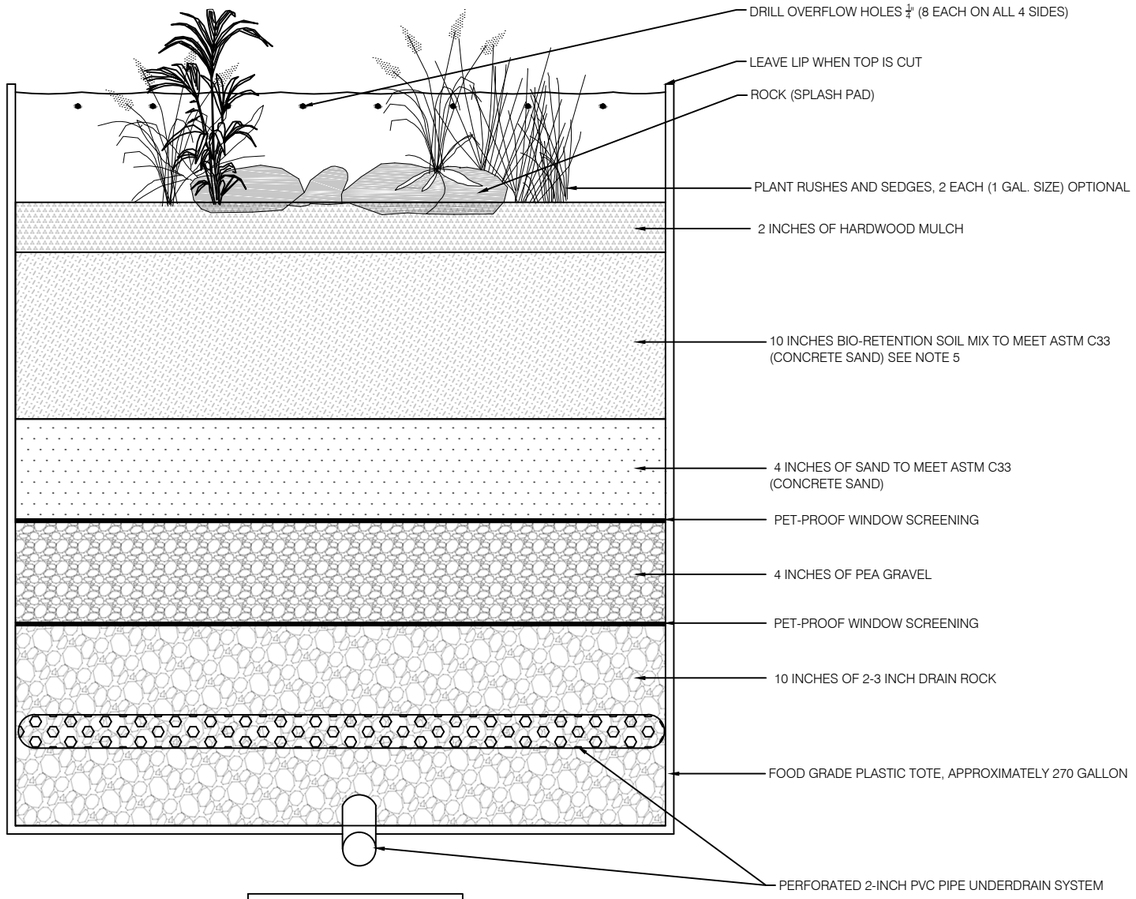
ND = Not detected

µg/L = Micrograms per Liter

Figure 1 Treatment Schematic

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

CROSS SECTION OF A PORTABLE MEDIA FILTER



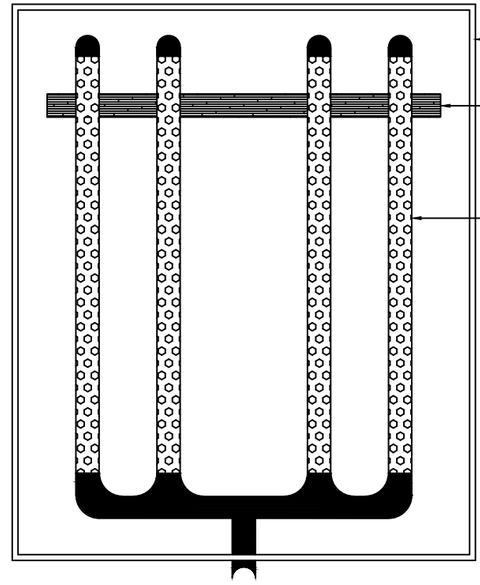
PORTABLE MEDIA FILTER

Scale: NTS

NOTES:

1. LEAVE 8-10 IN. FREEBOARD FOR PONDING
2. CREATE A SPLASH PAD FROM LARGE ROCK OR COBBLES
3. DRILL HOLES IN ALL 4 SIDES FOR BYPASS (SMALL - SEE NOTE ABOVE)
4. REMOVE MULCH 6 MO - 1 YR (WHEN FILM FORMS)
5. ADD 10-INCHES OF BIO RETENTION SOIL MIX [80-88% SAND, 8-12% SANDY LOAM, 1-5 % ORGANICS - MATURE COMPOST]

DIMENSIONS (45" X 38" X 36")



UNDERDRAIN SYSTEM

Scale: NTS

10 STEPS TO BUILDING PORTABLE MEDIA FILTER

1. OBTAIN A FOOD GRADE PLASTIC TOTE APPROXIMATELY 270 GALLON CAPACITY / RINSE THOROUGHLY / DISCHARGE TO SANITARY
2. INSTALL A PERFORATED 2-INCH PVC PIPE UNDERDRAIN SYSTEM
3. ADD 10 INCHES OF 2-3 INCH DRAIN ROCK (DOUBLE WASHED TO PREVENT TURBIDITY AND CLOGGING)
4. PLACE A LAYER OF PET-PROOF WINDOW SCREENING
5. ADD 4 INCHES OF PEA GRAVEL (DOUBLE WASHED)
6. PLACE ANOTHER LAYER OF PET-PROOF WINDOW SCREENING OVER THE PEA GRAVEL
7. ON TOP OF THE SCREENING, ADD 4 INCHES OF SAND (DOUBLE WASHED)
8. THEN ADD 10-INCHES OF BIO RETENTION SOIL MIX [80-88% SAND, 8-12% SANDY LOAM, 1-5 % ORGANICS - MATURE COMPOST]
9. PLANT RUSHES AND SEDGES - 2 EACH, 1 GAL. SIZE, AND THEN PLACE 2-3 INCHES OF HARD-WOOD MULCH AROUND PLANTS. POSITION ROCKS TO CREATE A SPLASH PAD

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

NO.	DATE	BY	REVISIONS	APP'D	CK'D

NO.	DATE	BY	REVISIONS	APP'D	CK'D

PORT OF PORTLAND
PORTLAND, OREGON

2014ZGEN — DESIGN NUMBER
1174 — PROJECT NUMBER

DESIGNED BY M. GRAVES & M. MATTIX
DRAWN BY J. HOYE-HOUSE
CHECKED BY B. FREEMAN
DATE NOV 2014
SCALE AS SHOWN

PORTLAND INTERNATIONAL AIRPORT

STORMWATER TREATMENT TECHNOLOGY ASSESSMENT
PORTABLE MEDIA FILTER
BASED ON GRATTIX APPLICATION

SUBMITTED BY BRIAN FREEMAN — PROJECT MANAGER
TYPE CD | DRAWING NO. PDX 2014-3 1 / 1 (C-1)

PRINTED: 12/11/2014 12:54:27 PM FREEMB r:\aviation\pdx\2014\0003\grattix mock up v2.dwg

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