

**STORMWATER POLLUTION
PREVENTION PLAN**

**SEATTLE-TACOMA INTERNATIONAL
AIRPORT**

PORT OF SEATTLE

November 1998

(Rev. 1 – 4/99; Rev. 2 – 12/01)

AR 052594

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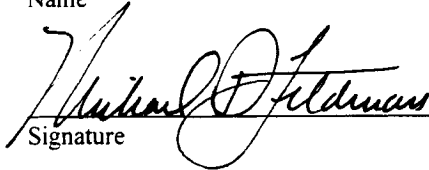
CERTIFICATION

Any person signing a document under this section shall make the following certification:

“I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or person who manage the system or those persons directly responsible for gathering 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.”

Michael D. Feldman

Name


Signature

Director, Aviation Facilities

Title

12/19/01

Date

CHAPTER 1 INTRODUCTION

The Port of Seattle (Port) is required by its National Pollutant Discharge Elimination System (NPDES) Permit (No. WA-002465-1) to prepare a Storm Water Pollution Prevention Plan (SWPPP) covering areas of industrial aviation activity that drain to the Port's storm drainage system (SDS) and to the Industrial Wastewater System (IWS). This SWPPP has been prepared in accordance with Special Condition S12B of the NPDES Permit (see Appendix A). The permit requires an updated SWPPP to be submitted to Ecology twice during the permit cycle. The first update was submitted November 30, 1998. This is the second update that is required to be submitted with the permit reapplication (no later than 180 days prior to the expiration of the current permit or June 30, 2002).

As stated in the NPDES Permit, the objectives of this SWPPP are:

- To eliminate the discharges of unpermitted industrial wastewater, domestic wastewater, noncontact cooling water or other illicit discharges to the storm drainage system;
- To implement and maintain Best Management Practices (BMPs) to identify, reduce, eliminate, and/or prevent the discharge of stormwater pollutants;
- To prevent violations of water quality, groundwater quality, or sediment management standards; and
- To prevent adverse water quality impacts on beneficial uses of receiving water by controlling peak rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

Due to safety factors governed by Federal Aviation Administration (FAA) regulations, the airport must take into consideration, and may not be able to utilize, certain BMPs that are outlined in the surface water management design manuals. For example, FAA regulations restrict open water in the vicinity of runways due to the possible attraction of birds to the area, which is a serious safety problem [FAA Advisory Circular 150/5200-33 (5/97)].

1.1 IMPLEMENTATION SCHEDULE

The current NPDES Permit requires the Port to:

- Modify the SWPPP whenever there is an alteration of airport facilities or their operation or maintenance, which cause the SWPPP to be less effective in controlling pollutants.
- Conduct self-inspections to verify that the description of potential pollutant sources or the pollution prevention measures and controls identified in the SWPPP are adequate.
- Modify the SWPPP, as appropriate, within two (2) weeks of such inspection for noncapital BMPs.
- Modify the SWPPP within six (6) months of such inspection for capital BMPs.
- Submit proposed capital modifications to Ecology at least 30 days in advance of implementing the proposed changes in the plan unless the Department approves immediate implementation.

- Provide for implementation of any modifications to the SWPPP in a timely manner.

1.2 POLLUTION PREVENTION TEAM

The Surface Water Internal Management Group (SWIM) is designated as the Pollution Prevention Team and consists of representatives from the following Port departments:

Aeronautical Line of Business (ALOB)

Landside Line of Business (LLOB)

Aviation Fire Department

Aviation Facilities (Maintenance, Infrastructure, and Environmental)

Engineering

Aviation Project Management Group

Health, Safety and Environmental Services

1.3 SWPPP AREA

The coverage area of the SWPPP is presented in **Figure 1**. The SWPPP covers industrial activity areas of the SDS and IWS . Some non-industrial areas are included within the storm drainage sub-basin boundaries. There are several non-Port areas that drain to the SDS. These are:

- SR 518, S. 154th St., and 24th Ave. drain to SDN-1,

- SR 99 (International Blvd.), Seafirst Bank drain to SDE-4,
- S. 188th St. drains to SDS-1, SDS-2 and SDS-3, and
- 16th Ave. S. drains to SDS-2.

1.4 DEFINITIONS

The following terms are used throughout this SWPPP and are defined below.

- Aircraft Movement Area (AMA). This area is comprised of the runways and taxiways.
- Air Operations Area (AOA). This area encompasses the AMA and includes the aircraft ramps (gates) and maintenance areas, and perimeter roads inside the security fences.
- Sea-Tac International Airport (STIA). STIA includes the two areas above, the public terminals, parking garages and other Port properties.

1.5 MODIFICATION OF THE SWPPP

The Port will formally review and submit the SWPPP at least twice during the term of the NPDES permit as specified by permit Section S12.B. These formal revisions will incorporate addenda and any minor or major permit modifications. The SWPPP will not be formally revised for minor permit modifications or other actions where addenda are more appropriate. These addenda will be retained with this SWPPP.

1.6 RETENTION OF THE SWPPP

The Surface Water Manager retains the original SWPPP, Addenda and inspection results, which will be made available to Ecology if requested during an onsite inspection.

1.7 EVALUATION OF CURRENT BMPS

Specific data and an annual evaluation of BMP effectiveness are provided in the Annual Stormwater Monitoring Report submitted each year to Ecology.

BMPs that were in place at the time of the implementation of this SWPPP and additional BMPs that have been added or constructed over the course of the last 4 years appear to have been successful in reducing the surface water pollutants discharged from STIA. Through the addition of pump stations and re-routing of discharge lines in several locations around the facility, there is a continuing increase in the percentage of the total surface area that drains or is pumped to the IWS, and therefore potential sources of pollution in these areas are decreasing.

Two pump stations have been installed in SDN2 that effectively remove 46.4 acres from the total STIA area of 161 acres that discharge to Miller Creek. These pump stations operate continuously and are only likely to be bypassed when rainfall exceeds the design rate of approximately 0.22 inches/hour.

Drainage in portions of SDS1 totaling approximately 35 acres has been re-routed to the IWS for the purpose of directing runoff from aircraft service areas to the IWS. These changes have resulted in a decrease in the levels of glycols, BOD₅, copper, zinc, and lead. Please refer to the Annual Stormwater Monitoring Reports for specific data on runoff sampling for these pollutants.

No significant trends in concentrations of fecal coliforms have been observed in the samples collected over the past 4 years. Fecal coliforms occasionally exceed levels typical of stormwater. The Port began a source tracing effort early in 1998 to identify the potential sources. Initial storm samples did not indicate distinct sources, and do not indicate gross contamination from sanitary sewage. This study corroborated previous work, demonstrating an absence of cross connections for sanitary sewage with STIA storm drainage. Baseflow in the several outfalls tested was often absent, and when present had low to non-detectable fecal coliforms with no indications of human sources. The study used the microbial source tracing (MST) technique developed at the University of Washington. The MST method isolates *E. coli* bacteria DNA in the samples and compares it to isolates from specific sources already characterized in the regional database and several site-specific sources characterized in the study. The Port issued a separate report for this study (Herrera, 2001). The SDE4 discharges that formed the impetus for this study have exhibited sporadically elevated fecal coliform levels that the study indicated were associated primarily with animal wastes, principally nuisance bird populations (e.g., pigeons). This study also showed that fecal coliform sources, notably some attributable to humans, were present in runoff and baseflows upgradient from STIA (Bow Lake), even in samples with low fecal coliform concentrations. Human sources found in airport runoff were limited to isolated samples from SDE4 and SDS3 runoff, where many samples had low fecal coliform concentrations. Aircraft lavatory wastewater-specific sources were implicated in less than 10% of all SDS3 samples and none of the SDE4 samples. Because the data suggest these human sources may be associated with aircraft lavatory waste transfer operations, the Port will continue to investigate this issue.

The BMPs in place at STIA continue to be effective in prevention of violations of water quality, groundwater quality, and sediment management standards. The Port continually investigates any sources of potential violations through source-tracing and additional monitoring, and works to correct those problems when they are discovered. Areas with potential for contributing pollutants to stormwater are identified and generally routed to

the IWS as with the snowmelt facilities and drainage reroutes, or those potential sources are removed.

Other operational and source control BMPs are utilized at STIA including: employee, contractor and tenant training in stormwater pollution prevention, implementation of a Spill Prevention, Control and Countermeasure Plan, pavement sweeping and periodic runway rubber removal, inspections for inappropriate connections, monitoring of tenants and contractors for compliance with measures for control of sediment and other pollutants, and designation of the SWIM for management of stormwater runoff. The effects of these activities are difficult to quantify but are likely to have an impact on stormwater pollution prevention.

Evaluation of the stormwater discharges at STIA is an ongoing process. Based on the data and conclusions presented in the annual report, as well as other knowledge regarding STIA activities, the following potential new initiatives have been identified.

- Evaluate monitoring requirements in the permit and request modifications as appropriate, based on the effectiveness of BMPs or other changes at STIA.
- Explore rerouting of drainage from several minor SDS3 drain inlets beneath the overhangs of the C Concourse that could be responsible for isolated elevated BOD₅ concentrations in SDS3.
- Require contractors to implement source control and BMPs related to construction activities. Construction monitoring is covered under a separate part of the permit.
- Continue to evaluate tenant activities.
- Revise and update the SWPPP on a regular basis.

1.8 INCIDENTS OF NONCOMPLIANCE

Since 1998, there has been only one minor spill of jet fuel, which occurred on April 28, 1999 from a 747 aircraft fuel tank expansion relief valve on a wing tip emergency relief valve. Most of the spilled fuel was contained on the airfield and recovered before reaching the drainage system. It was estimated that less than 5 gallons of fuel reached Des Moines Creek.

1.9 SUMMARY OF INSPECTION RESULTS

Inspections performed have indicated that BMPs implemented under this plan are adequate. No significant problems or deficiencies have been identified. Any minor issues have been addressed and corrected by the tenant or other responsible party. Completed inspection forms are available from the Surface Water Manager.

CHAPTER 2 DESCRIPTION OF DRAINAGE SYSTEM AND INDUSTRIAL ACTIVITIES

2.1 DRAINAGE SYSTEM

Drainage from most of the areas of industrial activity is routed to the IWS for treatment prior to discharge. The other areas of STIA drain to the SDS, which routes water to various detention facilities prior to discharge to Miller and Des Moines Creeks. The sub-basins on the northern side of the airport route water to Lake Reba, which discharges to Miller Creek. Runoff from the NEPL flows into a vault that also discharges to Lake Reba. Stormwater from the southern, eastern, and western portions of STIA is detained in either Tyee or Northwest Ponds prior to discharge to Des Moines Creek. One drainage sub basin, SDS-3 discharges directly to Des Moines Creek. The Taxi Yard, Engineering Yard, and Ground Transportation lots discharge to City of SeaTac storm drains, which discharge to Gilliam Creek.

2.1.1 Drainage Basin Boundaries

Figure 1 shows the approximate boundaries of the sub-basins that drain to the permitted STIA outfalls defined in the NPDES permit. Outfall 001, which is the industrial wastewater outfall from the IWS plant, receives less than one-third of the surface water runoff and is not covered by the SWPPP. Table 1 lists the estimates of drainage areas and pervious and impervious surface areas of the sub-basins.

2.1.2 Drainage Basin Activities

Regulated industrial activities for transportation related facilities are defined under 40 CFR § 122.26(b)(14)(viii):

TABLE 1
STORMWATER DRAINAGE SYSTEM TO DRAINAGE AREAS^(a)

STORMWATER DRAINAGE SUB-BASINS	PERVIOUS AREA (acres)	IMPERVIOUS AREA (acres)	TOTAL AREA (acres)
SDN-1	3.7	24.4	28.1
SDN-2 ^(b)	0.0 ^(b)	0.0 ^(b)	0.0 ^(b)
SDN-3	42.9	27.0	69.9
SDN-4	22.6	7.7	30.2
Total Miller Creek	69.2	59.1	128.2
SDE-4 ^(c)	51.7	97.4	149.1
SDS-1	1.5	14.4	15.9
SDS-2	12.2	1.0	13.2
SDS-3	238.1	224.3	462.3
SDS-4	42.6	20.8	63.4
SDW-3 ^(d) (SDS-7)	7.0	7.0	14.0
B (SDS-6)	48.2	1.4	49.6
D (SDS-5)	30.7	3.2	33.9
Total Des Moines Creek	432.0	369.4	801.4
Engineering Yard	0.3	1.2	1.5
Taxi Yard	0.0	0.8	0.8
Total City of SeaTac Storm Drains	0.3	2.0	2.3
Total - SDS	501.5	430.5	931.9

Notes:

- (a) Drainage areas were calculated using geographic information system (GIS) of airport, and include facilities built through December 2000. Drainage investigations are continuing to increase the accuracy of estimated drainage basin areas. In the application for the renewal of the Port's NPDES permit, several of these outfalls will be consolidated to reflect the quality of Port stormwater when it reaches waters of the State after the stormwater has been treated by BMPs and stormwater detention facilities. The SDN-1,2,3 and 4 outfalls will be consolidated at the outlet of the Lake Reba Detention Facility and SDS2, 3, 5, 6 and 7 will be consolidated at the NW Ponds outlet.
- (b) Drainage from the 46.7 acres of SDN-2 has been re-directed to the IWS. Run-off from the air cargo area and the north snowmelt facility in that sub-basin is pumped to the IWS up to the 6-month/24-hour storm event. Runoff magnitudes greater than these pump capacities overflow to SDN-2.
- (c) Approximately 12.5 acres of former SDE-4 in the North Satellite area is pumped to the IWS up to the 6-month/24-hour storm event, and 0.2 acres of former SDE-4 at the North Satellite snowmelt facility is pumped to the IWS up to the 6-month/24-hour storm event. Runoff magnitudes greater than these pump capacities overflow to SDE-4.
- (d) Approximately 0.4 acres of former SDS-4 at the south snowmelt facility is pumped to the IWS up to the 6-month/24-hour storm event. Runoff magnitudes greater than the pump capacity overflows to SDS-4.

(viii) Transportation facilities classified as Standard Industrial Classification 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171, which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (b)(14)(i)-(vii) or (ix)-(xi) of this section are associated with industrial activity.

Table 2 identifies the industrial and non-industrial activities within each basin.

TABLE 2

**INDUSTRIAL ACTIVITIES OCCURRING WITHIN EACH
STORM DRAINAGE SYSTEM BASIN**

(Construction Activities are covered under separate SWPPPs for each project)

OUTFALL NUMBER BASIN DESIGNATION	RECEIVING WATER	OUTFALL LOCATION	ACTIVITIES ^(a)
#006, SDN-1 ^(c)	Miller Creek	Manhole SDN1-22 flows to Lake Reba which is a stormwater detention facility. Lat 47°27'56" Long 122°18'09"	Parking, Air Cargo Road, building rooftops, SR518, S.154 th St., 24 th Ave. So., landscape management
#007, SDN-2 ^{(b)(c)}	Miller Creek	Immediately north of S. 156th, then to Lake Reba. Lat 47°28'00" Long 122°18'28"	Runway/taxiway deicing/anti-icing, snow storage ^(c) , contractor staging, aircraft service equipment parking, aircraft taxi
#008, SDN-3 ^(c)	Miller Creek	Same as above. Lat 47°27'59" Long 122°18'45"	Runway/taxiway deicing/anti-icing, aircraft taxi, takeoff and landings
#011, SDN-4 ^(c)	Miller Creek	Same as above. Lat 47°28'00" Long 122°18'38"	Runway/taxiway deicing/anti-icing, aircraft taxi
#002, SDE-4.	Des Moines Creek, east tributary	Manhole SDE4-47 to City of SeaTac SDS, which in turn combines with Bow Lake and other drainage that discharges near S. 28 St. Lat 47°26'13" Long 122°17'38"	Taxiway deicing/anti-icing, roadway deicing, snow storage ^(c) , loading/unloading of trucks and temporary storage of ground vehicle engine fluids, fueling of ground vehicles, construction staging, aircraft taxi, parking of airfield ground vehicles
#003, SDS-1	Des Moines Creek, east tributary	Near the Olympic Tank Farm Lat 47°26'00" Long 122°18'01"	Parking of servicing equipment
#004, SDS-2 ^(b)	Des Moines Creek, west tributary	Through swale to Northwest Ponds Lat 47°25'50" Long 122°18'42"	parking on City of SeaTac street
#005, SDS-3 ^(b)	Des Moines Creek, west tributary	Through swale to Northwest Ponds Lat 47°25'58" Long 122°18'30"	Runway/taxiway deicing/anti-icing, aircraft taxi, takeoff and landings
#009, SDS-4	Des Moines Creek, west tributary	Near confluence of east and west tribs. Lat 47°25'33" Long 122°18'15"	Runway/taxiway deicing/anti-icing, aircraft taxi, takeoff and landings

**INDUSTRIAL ACTIVITIES OCCURRING WITHIN EACH
STORM DRAINAGE SYSTEM BASIN**
(Construction Activities are covered under separate SWPPPs for each project)

OUTFALL NUMBER BASIN DESIGNATION	RECEIVING WATER	OUTFALL LOCATION	ACTIVITIES ^(a)
#010, SDW-3 ^(b)	Des Moines Creek, west tributary	Ditch along S. 188th, then to Northwest Ponds Lat 47°26'09" Long 122°18'53"	Occasional aircraft parking, aircraft taxi, occasional taxiway deicing/anti-icing
#012 Engineering Yard	City of SeaTac storm drain	City of SeaTac storm drains Lat 47°27'34" Long 122°17'50"	Parking (Roadway deicing sand is stored inside)
#013 Taxi Yard	City of SeaTac storm drain	City of SeaTac storm drains Lat 47°27'37" Long 122°17'43"	Parking
#014 SDS-6 ^(b)	Des Moines Creek, west tributary	Ditch along S. 188th, then to Northwest Ponds Lat 47°26'07" Long 122°18'48"	Contractor staging, Fire pit ^(d)
#015 SDS-7 ^(b)	Des Moines Creek, west tributary	Ditch along S. 188th, then to Northwest Ponds Lat 47°26'07" Long 122°18'47"	FAA equipment maintenance, occasional contractor staging

Notes:

- (a) Activities listed include both industrial and non-industrial activities.
- (b) SDN-2 drainage has been diverted by a pump station to the IWS.
- (c) Snow storage areas drain to the IWS.
- (d) Fire pit water drains to the IWS
- (e) SDN-1, 2, 3 and 4 will be consolidated to the outlet of the Lake Reba Detention Facility.
- (f) DS 2, 3, 5 6, and 7 will be consolidated to the outlet of the Northwest Ponds

CHAPTER 3 POTENTIAL POLLUTION SOURCES AND BMPs

This chapter describes potential pollutant sources from industrial activities in the storm drainage basins and BMPs for those activities. These activities and BMPs are summarized on Table 3.

3.1 AIRCRAFT SERVICING

3.1.1 Activities

Servicing includes fueling, washing, anti-icing, deicing, and maintaining aircraft and ground service vehicles that support aircraft. Anti-icing denotes measures taken to prevent snow and ice accumulation on the surface of the aircraft, AMA, or runway. Deicing means removing snow or ice from the surface of the aircraft or AMA.

3.1.2 BMPs

3.1.2.1 Restrict aircraft servicing (deicing, fueling, etc.) to IWS areas. If aircraft are parked in areas that drain to the SDS, there will be no exterior maintenance, fueling, or anti-icing/deicing of the aircraft. If emergency servicing must occur outside of IWS areas, drains will be blocked and bermed prior to activity beginning. The activity will be monitored by Airport Operations.

3.1.2.2 Store glycol in IWS areas and within secondary containment.

TABLE 3

**OPERATIONAL AND SOURCE CONTROL
BMP SUMMARY⁽⁶⁾**

ACTIVITY	BMP	TYPE	STATUS	RESPONSIBLE ORGANIZATION
Aircraft servicing	Restrict to IWS areas or drains blocked Store glycol in IWS areas Confine parking of lavatory waste trucks to IWS Identify and connect problem SDS areas to IWS Restrictions for fueling on taxiway Alpha Monitor certain SDS outfalls during deicing per NPDES permit	Operational Operational Operational Operational Operational	Ongoing Ongoing Ongoing Ongoing Ongoing	ALOB AVENV/ ALOB/ Tenant AVENV/ ALOB AVENV/ AVPMG ALOB AVENV ALOB/ LLOB/ Maintenance LLOB/ Maintenance
AMA anti-icing/deicing	Minimize chemical use ⁽⁶⁾	Operational	Ongoing	ALOB/ LLOB/ Maintenance LLOB/ Maintenance
Snow storage	Use CMA/sand mixture for roadways.	Operational	Ongoing	Maintenance
Spill control	Operate pump stations to divert snowmelt to IWS Implement Spill Plan	Operational	Ongoing In effect	Fire/ AVENV
Construction sites Education/training	Require erosion and sediment control BMPs Attach Erosion and Sediment Control Plans to bid packages Restrict equipment servicing Encourage contractors to use secondary Containment Concrete cutting and washout Provide contractor/inspector training	Source control Source control Source control Source control Source control Operational	Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing	AVPMG AVPMG/ Engineering ALOB/ AVENV AVPMG/ Engineering/AVENV AVPMG/ Engineering/ AVENV AVPMG/ AVENV/ Engineering
Erosion of bare ground surfaces in non-construction areas	Implement soil erosion and control BMPs in contractor staging areas Emphasize and enforce contractor responsibility for BMPs in contractor staging areas Control erosion from temporary soil stockpiles	Source control Source control Source control	Ongoing In effect In effect	AVPMG/ AVENV/ Engineering AVPMG/ Engineering AVPMG/ Engineering
Vehicle washing and maintenance	Prohibit vehicle washing in SDS areas Place signs in key locations Clean sumps in Taxi Yard annually Sweep Taxi Yard and control litter Maintain catch basin inserts Construct a berm to prevent drainage to SDE4	Source control Operational Source control Source control Source control Source control	Ongoing In effect Ongoing Ongoing Ongoing Completed	AVENV/ Maintenance Maintenance Maintenance Maintenance Maintenance

TABLE 3

**OPERATIONAL AND SOURCE CONTROL
BMP SUMMARY^(e)**

ACTIVITY	BMP	TYPE	STATUS	RESPONSIBLE ORGANIZATION
Inappropriate connections and discharges	Inspect outfalls for evidence of illicit connections	Operational	Ongoing	AVENV
Temporary storage of surplus and used materials	Construct secondary containment for used engine fluids Engineering Yard: Place signs on surplus storage Control entry of surplus materials	Operational	Ongoing	Maintenance
Tenant activities in SDS areas	Monitor and educate tenants Deice aircraft according to procedures Encourage drip pans beneath fueling trucks if leakage is observed Sweep around dumpsters Store liquids in secondary containment Do not store used fluids or hazardous waste in SDS areas Do not maintain vehicles or equipment in SDS areas Inspect catch basin grates Require tenant water pollution control plans Encourage tenant compliance with Port SWPPP Require tenant spill control plans	Operational Operational Operational Operational Operational Operational Operational Operational Operations Operations Source control	Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing In effect	Tenant/ AVENV Tenant / AVENV Tenant / AVENV Tenant / AVENV Tenant / AVENV Tenant / AVENV Tenant / AVENV Tenant / AVENV AVENV/ Tenant AVENV Tenant/ AVENV
Other Operational BMPs	Designate a SWPPP implementation monitor Conduct regular inspections Assemble Pollution Prevention Team Conduct SDS outfall monitoring Sign catch basins (dump no waste) Establish packing material source control If possible during emergency situations, fire fighting foam is kept from discharging to the SDS Sorbent booms are deployed at most outlets and maintained	Operational Operational Operational Operational Operational Operational Operational	Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing	AVENV AVENV AVENV AVENV Maintenance AV/PMG Fire Dept. Maintenance

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TABLE 3

**OPERATIONAL AND SOURCE CONTROL
BMP SUMMARY^(a)**

ACTIVITY	BMP	TYPE	STATUS	RESPONSIBLE ORGANIZATION
Stormwater Management	Stormwater vaults are in place at the NEPL and at SDS3 to control direct runoff from the airport Stormwater is detained in Lake Reba, Tyee Pond and Northwest Ponds prior to discharge to Miller or Des Moines Creeks Temporary ponds are maintained to control runoff from construction sites	Operational Operational	Ongoing Ongoing	Maintenance Maintenance

Notes:

- (a) Excluding capital source control BMPs that have been completed.
- (b) It is anticipated that using an alternative chemical may require capital investment.

3.1.2.3 Confine parking of lavatory waste trucks to the IWS areas.

3.1.2.4 Identify and connect problem SDS areas to IWS. As problem areas are identified, these areas will be connected to the IWS or sanitary sewer where appropriate (See Table 3). Areas that have been connected to the IWS are listed in Table 5 in Section 3.15.

3.1.2.5 Fueling on taxiway Alpha will only be used as a last resort. A section of this taxiway is used as a last resort for fueling activities when necessary during peak traffic times. The drainage flows to the IWS via the North Cargo Area pump station, which with excessive flows, has the potential to overflow into the SDS. No fueling will take place on taxiway Alpha when the pump station is not in operation.

3.1.2.6 Monitor SDS outfalls during aircraft deicing events. The Port will monitor glycol in discharges from certain SDS outfalls during aircraft deicing events according to the Procedures Manual for Stormwater Monitoring. The NPDES permit requires glycol monitoring of SDE4, SDS3, and SDN4 during anti-icing/deicing events to the extent practical.

3.2 GROUND ANTI-ICING/DEICING (ROADS AND PAVED SURFACES)

3.2.1 Activities

Currently, the Port may use sand, calcium magnesium acetate (CMA), sodium acetates, and potassium acetate to remove or prevent icing on the ground surfaces, including the AOA and other road surfaces. This is a public safety action that is required by the FAA and the Port applies these materials when snowfall or freezing conditions are expected on the AOA ground surfaces. AOA deicing/anti-icing occurs only a few days each year, much less frequently than aircraft deicing.

In addition, the elevated structures on the entrance roads and those roads in the vicinity of the public garage may require deicing chemical applications. Roadways at grade are normally deiced only during extreme events, which are rare. Access roads for both the public and STIA activity may be deiced during adverse weather conditions. The Port uses a CMA/sand mixture on all vehicle roadways, including Air Cargo Road, public access roads, and the 160th Street bridge.

3.2.2 BMPs

3.2.2.1 Minimize chemical use. The Port has implemented a comprehensive strategy that reduces both the frequency of chemical use and the quantity of chemicals applied. This strategy consists of the following:

- Anti-icing application will be based on pavement temperatures and the presence of moisture.
- Remote sensing devices in the pavement will be used to obtain accurate, real time information on pavement temperature, moisture and chemical conductivity.
- Chemicals will be applied before ice forms (anti-icing) rather than after it forms (deicing).

3.2.2.2 Sodium acetate/sand or CMA/sand will be utilized as first options and if they are ineffective, chemicals will be used.

3.2.2.3 Dry deicing chemicals and roadway sand are stored under cover at the Engineering Yard in the snow equipment shed and at the Air Cargo 4 storage area. Liquid deicing chemicals are stored in secondary containment at Air Cargo 4.

3.3 SNOW STORAGE

3.3.1 Activity

Certain amounts of removed snow may be contaminated with ground or aircraft deicers. The snow storage plan prepared by the Port designates areas for snow storage and melting.

3.3.2 BMPs

3.3.2.1 Three pump stations have been installed to divert snowmelt runoff to the IWS. The three Snowmelt Runoff Facilities are:

- **North End Facility:** Pump station diverts snowmelt runoff from entering the SDS at SDN-2. This facility will store snow plowed from primarily the northern half of the terminal and air cargo area gates, roadways and taxiways. This pump station is operated and maintained by the Maintenance Department (Boiler Room Crew). This pump station is in operation year-round.
- **North Satellite Facility:** This facility stores snow plowed from areas near North Satellite. The pump station captures snowmelt runoff and diverts it to the IWS pump station near the Fire Station. This pump station is also in operation year-round.

- **South End Facility:** This facility will store snow that has been removed primarily from the areas on the southern half of the terminal. The pump station is located within the Olympic Tank Farm facility and lifts snowmelt runoff into the IWS. The pump station is in continual operation and is maintained by the Olympic Pipeline company.

Pumps will be in continuous operation unless authorized by the Surface Water Manager.

The Port may also designate other areas for snow storage in cases of high snowfall. For example, the area in front of the Northwest Airlines Hangar and an area draining to Lagoon 3 may be used. Both drain to the IWS.

3.4 SPILLS

3.4.1 Activity

Activities that could generate spills occur generally in areas that drain to the IWS and not to the storm drains. Materials of concern may include fuels, lubricants, aircraft lavatory waste, deicing fluids, food, or other material.

3.4.2 BMPs

3.4.2.1 Implement the Port's spill control plan. The Port has prepared and implemented a spill control plan as specified by the NPDES permit. The spill control plan describes procedures for response, containment, and minimization of

environmental impacts in the event of a spill. Tenant plans and BMPs are discussed in Section 3.12.

3.5 CONSTRUCTION SITES

Construction sites that disturb greater than 5 acre total land area, except operations that result in the disturbance of less than 5 acres of total land area, which are not part of the larger common plan of development or sale, require separate SWPPPs and monitoring plans as specified in Section S13 of the NPDES Permit. The Port also requires SWPPPs for construction sites less than 5 acres if they are part of the STIA Master Plan.

3.5.1 Activity

The Port regularly constructs and improves capital facilities at STIA. Construction sites may contribute pollutants via erosion and site activity. Potential pollutant sources include sediment, vehicle fuels and lubricants, concrete curing compounds, concrete cutting activities, concrete washout, dewatering, and general construction debris.

3.5.2 BMPs

3.5.2.1 Require erosion and sediment control plans. The Port and the NPDES Permit require erosion and sediment control plans for construction sites of 5 or more acres. These plans will be reviewed for completeness and consistency with BMPs described in the King County Surface Water Management Design Manual (SWM) and NPDES Permit Section S13 requirements.

3.5.2.2 The Erosion and Sediment Control Plan shall be attached to bid packages when seeking contractors to allow the contractor sufficient time to plan implementation.

3.5.2.3 Restrict servicing of construction equipment onsite to normal lubricating or fueling. Contractors will use drip pans or other containment methods during lubricating or fueling activities. More extensive maintenance activities will be prohibited. Any fuel onsite will be stored properly with secondary containment.

3.5.2.4 Encourage contractors to provide secondary containment for construction chemicals and encourage removal of wastes rather than stockpiling onsite.

3.5.2.5 Concrete cutting water effluent will be vacuumed, settled for 24 hours, and decanted into the IWS or sanitary sewer system. Settled solids will be disposed of in a decant station or the Port's designated vector waste dump area or taken offsite for appropriate disposal.

3.5.2.6 Concrete truck washout will occur only in a designated areas that do not discharge to the storm drain system.

3.5.2.7 Provide contractor/inspector training.

3.5.2.8 Soil that may be contaminated is stockpiled in the soil segregation facility while samples are analyzed to determine appropriate disposal. The soil segregation facility drains to the IWS. Stockpiles will be covered and BMPs to prevent erosion will be installed.

3.6 EROSION IN NON-CONSTRUCTION SITES

3.6.1 Activity

Certain limited areas of STIA may be subject to erosion. Significant bare areas currently include contractor staging areas. Sub-basins that have been or could be used by contractors for staging of equipment and materials are listed in Table 2.

Periodically, it becomes necessary to stockpile soils from continuing activities at STIA. Some of these soils may be contaminated by total petroleum hydrocarbons (TPH).

3.6.2 BMPs

3.6.2.1 Implement soil erosion and control BMPs in all contractor staging areas.

The Port will require contractors to implement appropriate soil erosion control procedures and BMPs identified in the SWMM.

3.6.2.2 Emphasize and enforce contractor responsibility for BMPs. The contractor will maintain BMPs while on site. The Port will maintain BMPs while the contractor is not on site. Port Engineering will conduct onsite inspections with the contractor at end of contractor's tenure to check the condition of BMPs and determine which BMPs should be retained. The Port will re-establish ground cover if another contractor is not scheduled to use the site in the immediate future. Third party oversight of contractor BMPs will be provided by a consultant retained by the Port of Seattle.

3.6.2.3 Implement soil erosion and control BMPs for temporary soil stockpiles.

Temporary soil remediation stockpiles will be lined by plastic and surrounded by berms.

3.7 VEHICLE WASHING AND MAINTENANCE

3.7.1 Activity

The rental car wash area drains to the IWS. Except for rinse water, wash water is treated and recirculated within an enclosed process. The rinse water is collected by catch basins that drain to the IWS. The Taxi Yard car wash is also connected to the sanitary sewer.

3.7.2 BMPs

3.7.2.1 Prohibit vehicle washing and maintenance in SDS areas.

3.7.2.2 Place signs in areas where tenants may inadvertently violate the vehicle washing and maintenance prohibition.

3.7.2.3 Clean the catch basin sumps in the Taxi Yard annually.

3.8.2.4 Sweep the Taxi Yard and control litter.

3.7.2.5 Maintain the catch basin inserts that have been placed in the Taxi Yard and IWS catch basins.

3.7.2.6 Construct a berm to prevent drainage to SDE4.

3.8 LANDSCAPE MANAGEMENT

3.8.1 Activity

In general, areas where fertilizers and herbicides or pesticides are used include the landscaped area along the east side of the AOA, the Port property fence, fire access roads, and the Tyee Golf Course. Landscaping and vegetation are maintained and controlled by private contractors. Herbicides and pesticides used in recent years are listed by location in Table 4. Additional chemicals may be used upon approval of the Surface Water Manager or the SWPPP Monitor. The Tyee Golf Course will maintain the facility in a manner consistent with the SWPPP.

3.8.2 BMPs

3.8.2.1 Use environmentally acceptable chemicals whenever feasible.

3.8.2.2 Conduct proper off-site disposal and cleaning of containers and application equipment, respectively.

3.8.2.3 Do not apply fertilizers and herbicides or pesticides within 50 feet of either side of a stream, surface water ditch, or storm drain inlet.

3.8.2.4 Incorporate integrated pest management BMPs for landscape maintenance into the Port's bid specifications for private landscaping services. The following BMPs may be included:

- **When disease outbreaks occur, emphasis will be given to pest management methods such as selective spraying. Whenever a pest infestation occurs, the**

TABLE 4

PESTICIDE AND HERBICIDE USE

PESTICIDE OR HERBICIDE	APPLICATION AREA
Banner, Triester, Microflo, Cidekick	Landscaped areas east side of airfield
Roundup	AOA fence
Crossbow	Along edge of maintenance road on west side of airfield
Deluxe Turf with Trimec, Mec Amine Turf Herbicide, Scott's Lawn Pro Weed and Feed, M-Pede	Landscaped lawn areas on east side of Airfield.
Embark	Around Airfield signs
Liqui System	Cracks in AOA pavement
MKO	Along fence lines and around out buildings

Note: Additional information on pesticide and herbicide use is available from the Washington State University Cooperative Extension Service of King County at (206) 296-3900.

contractor will meet with Port staff to describe its proposed management approach.

- **Apply fertilizer** to maintain a healthy, natural-appearing landscaped system.
- **Conduct weeding, blackberry removal, and pruning of dead branches** as part of a regularly scheduled maintenance plan in all landscaped areas.
- **Follow the Washington State Department of Ecology guidelines for herbicide application near water resources.** All herbicide and pesticide applications within 50 feet of a water body require a permit. Use of any herbicide or pesticide application will adhere to strict guidelines of the Department. It is also a general Port policy that applications will not occur within 50 feet of a water body, including ditches within which water is flowing at the time of application. No application will occur within 50 feet of a water body without the knowledge and approval of the Surface Water Manager or the SWPPP Monitor. If there is any question regarding whether something is or is not a water body, the contractor shall ask Port staff.
- **Apply herbicides and pesticides** at the rate and timing recommended in the instructions.
- **Trim and weed ivy-covered areas** one to two times a year in April and/or August.
- **Do not use beauty bark** in drainage ditches.
- **Maintain stream corridors** in their natural condition.

- **Use Roundup™** around fire hydrants unless within 50 feet of a water body, where vegetation shall be managed by hand.
- **Do not apply pesticides and fertilizers** on rainy days or within 24 hours of anticipated rainfall.
- **Infields are mowed** and no chemicals or fertilizers used in these areas.
- **Avoid direct application of fertilizer or pesticides over catch basin grates** and avoid overspray onto paved areas.

3.8.2.5 Control of Japanese Beetles with Pesticides. In order to control or attempt to halt importation of Japanese beetles from the eastern United States, it has become necessary for the Port to apply pesticides in certain grass-covered areas that may drain to the SDS. The Washington State Department of Agriculture has recommended to the Port that an aggressive control program be instituted. This emergency requires the application of the granular pesticides such as Merit (Imidacloprid) or MACH 2(Halofonozide) in areas within 50 feet of storm drain inlets.

The Port will implement the following BMPs:

- The pesticides will be applied only as directed according to the manufacturer's specifications.
- Application equipment and packaging will be cleaned and disposed offsite.
- Application will take place only when at least 2 days of dry weather are anticipated.
- Areas to be treated will be specifically designated.

- Catch basins and any other storm drain inlets that could receive runoff from the application areas will be sealed.
- Every effort will be made to keep chemicals from paved areas that drain to the SDS. If any paved areas receive chemicals during application, those areas will be swept and the collected granules of pesticides will be disposed of properly.
- The preferred pesticide, MACH 2, does not require irrigation to penetrate the root zone. If irrigation is necessary to assure that the chemical reaches the root zone, water will be applied in a manner that there minimizes the possibility of runoff to the SDS.

3.9 AOA MAINTENANCE

3.9.1 Activity

Improper disposal of water and sediments generated by sweeping and drainage system maintenance can be a source of pollutants.

3.9.2 BMPs

3.9.2.1 Sweep ramp areas several times per week.

3.9.2.2 Inspect catch basin sumps annually and clean as needed. A catch basin will be cleaned if the depth of deposits is equal to or greater than one-third the depth from the basin to the invert of the lowest pipe into or out of the sump.

3.9.2.3 Properly store and dispose of catch basin sediments.

3.9.2.4 Hydroblasting of runway skid-mark rubber is self-contained. When runway skid-marks are hydroblasted, the water and rubber is vacuumed by the same machine, drained, and deposited at the decant station until disposed as solid waste.

3.10 INAPPROPRIATE CONNECTIONS AND DISCHARGES

3.10.1 Activity

Certain existing or future drainage may inadvertently connect inappropriate sources to the SDS.

3.10.2 BMPs

3.10.2.1 Inspect the outfalls for evidence of inappropriate connections during dry weather. If an inappropriate connection is discovered, the Port will take appropriate measures to route the drainage to the IWS or sanitary system. The Port will notify Ecology promptly if an unpermitted, non-storm water discharge is discovered.

3.11 TEMPORARY STORAGE OF SURPLUS AND USED MATERIALS

3.11.1 Activity

Surplus vehicles and equipment that contain hydraulic fluids or other liquids can be a source of pollutants. Hazardous wastes are accumulated in IWS areas and therefore are not considered in the SWPPP.

3.11.2 BMPs

3.11.2.1 Construct secondary containment for used engine fluids. Tanks will be placed under cover where possible.

3.11.2.2 Place signs on surplus storage Engineering Yard. The yard will be equipped with a sign indicating that the Superintendent of Buildings is to be contacted before placing surplus materials in the yard. This sign will have the phone number and be updated when required.

3.11.2.3 Control entry to the Engineering Yard. The Building and Grounds Supervisors will control entry of surplus materials and ensure that the BMPs for the Port (east yard) are implemented.

3.12 TENANT ACTIVITIES IN SDS AREAS

3.12.1 Activity

Tenants may perform fueling and maintenance activities that could potentially impact storm drainage systems.

3.12.2 BMPs

3.12.2.1 Monitor and educate tenants. The Port will inform tenants periodically of Port policy regarding aircraft servicing.

3.12.2.2 Deice aircraft according to procedures. During deicing periods, Port operations staff will monitor tenant deicing activities to verify that deicing occurs in IWS areas only.

3.12.2.3 Encourage placement of drip pans beneath fueling trucks when parked or serviced, or if leakage is observed.

3.12.2.4 Sweep around dumpsters. Sweep the area around the solid waste dumpsters each time they are replaced.

3.12.2.5 Store liquids in secondary containment if liquids must be stored in SDS areas.

3.12.2.6 Prohibit storage of used fluids and hazardous wastes in SDS areas.

3.12.2.7 Do not maintain vehicles in SDS areas. No vehicle or equipment maintenance is to occur in storm drainage areas.

3.12.2.8 Inspect catch basin grates. Frequently inspect the grates of the catch basins and remove debris that has accumulated on the grate.

3.12.2.9 Require tenant Water Pollution Control Plans. The tenants with the potential for releases to the IWS or SDS will have individual Water Pollution Control Plans (WPCPs) that describe tenant BMPs. The WPCPs will be submitted to and reviewed by the Port.

3.12.2.10 Encourage tenant compliance with the Port SWPPP. Tenants will comply with the Port's SWPPP, particularly regarding aircraft servicing, vehicle maintenance, and storage activities. The Port will require tenant compliance and, if necessary, impose fines for noncompliance.

3.12.2.11 Require tenant spill control plans. Tenant fueling operations and airlines will maintain individual spill control plans as required. These plans will describe procedures to respond, contain, and minimize environmental impacts from a spill.

3.13 OTHER OPERATIONAL BMPs

The following BMPs affect all activities:

3.13.1 SWPPP Monitoring

A Port staff person will be assigned the responsibility of monitoring implementation of the SWPPP. The Monitor will report to the Chair of the SWIM. The Monitor will attend relevant Port committee meetings regarding the completion of construction projects undertaken to achieve compliance with SWPPP requirements. The Monitor will be responsible for modifying the SWPPP with the assistance of Port Environmental Management.

3.13.2 Inspections

As a minimum, the Monitor will conduct three wet and one dry season inspections in accordance with the NPDES permit. If unusual activities or discharges are noted, the Monitor will investigate the source and take appropriate steps to eliminate or control the discharge. See Section 4.1 for a description of inspections. The Monitor will ensure that appropriate written reports are prepared and filed.

3.13.3 Pollution Prevention Team

The SWIM will meet twice per year after the formal semi-annual inspections. The SWIM will review the effectiveness of SWPPP implementation and make suitable

recommendations to Port management regarding SWPPP implementation including addition, modification, and/ or deletion of BMPs.

3.13.4 Monitoring of Storm Drainage Outfalls

The Port analyzes samples from SDS outfalls obtained during storms, as required by its NPDES permit.

3.13.5 Signing of Catch Basins

Storm drains will be labeled "dump no waste, drains to stream" where wastes may be dumped inadvertently.

3.13.6 Packing Material Identification

The Port will identify likely sources of packing material and other floatables and educate tenants regarding proper storage and disposal to prevent such items from entering the SDS.

3.13.7 Control of Fire-Fighting Foam

If it is practical and does not increase the risk to property and people, fire-fighting foam will be controlled and routed away from the SDS. Foam will not be used in firefighting training sessions on the airfield.

3.13.8 Deployment of Sorbent Booms

Sorbent booms are maintained at the outlets of SDS-1, SDS-3, SDS-7, Lake Reba, the Miller Creek Detention Facility, the South Employee Parking Lot, Tye Golf Course, and the Des Moines Creek crossing under 200th Street. These booms are replaced on a monthly basis.

3.14 STORMWATER MANAGEMENT

Stormwater runoff from the airport that is not routed to the IWS is controlled by several flow control devices and detention facilities.

- A vault at the North Employee Parking Lot (NEPL) is used to control direct runoff from the parking lot area
- A vault at SDS3 with a capacity of 5.5 acre-feet detains runoff prior to discharge to Northwest Ponds
- Lake Reba retains stormwater flow from the North portion of STIA prior to discharge to Miller Creek
- Tye Pond and Northwest Ponds retain stormwater flow from the South portion of STIA prior to discharge to Des Moines Creek
- Other temporary ponds are maintained during construction activities to control runoff from temporary construction sites
- Spill control devices are installed on stormwater outfalls as shown on Figure 1

TABLE 5

SUMMARY OF COMPLETED BMPs

TYPE	BMP	STORM DRAIN SYSTEM	DATE COMPLETED	COST (if readily available)
Source Control (SC)	Terminate glycol use for ground deicing	All	12/95	--
SC	Store Chemicals in IWS Area		12/95	--
SC	Connect snow storage areas to IWS	SDE4 (008), SDN2 (007)	By 11/1/97	--
SC	Connect Port Maintenance Shop Yard to IWS	SDE4 (002)	8/96	--
SC	Connect Loading Dock Dumpster slot drain to sanitary	SDE4 (002)	10/95	\$25K
SC	Connect North Cargo Area (Area 114) to IWS via lift station	SDN2 (007)	6/97	\$188K
SC	Connect Cargo Area 4 (Area 100) to IWS	SDE4 (002)	8/96	\$13K
SC	Connect North Satellite (Area 106/107) to IWS	SDE4 (002)	10/95	\$300K
SC	Seal SDS inlet near Gate C8	SDS3 (005)	12/95	\$10K
SC	Seal SDS inlet near Gate B5	SDS3 (005)	12/95	\$10K
SC	Connect SDS area between the South Satellite and the B Concourse to the IWS	SDS1 (003)	5/97	\$149K
SC	Connect SDS area between the South Satellite and the NW Hangar to the IWS	SDS1 (003)	8/96	\$88K
SC	Connect Area 112/311 (D Concourse) to IWS	SDE4 (002)	11/95	--
SC	Connect Area 314 (C Concourse) to IWS	SDS3 (005)	11/95	--
SC	Relocate Hazardous Materials sheds		7/95	\$4K
SC	Connect Taxi Yard Wash	TY	7/95	\$30K

SUMMARY OF COMPLETED BMPs

TYPE	BMP	STORM DRAIN SYSTEM	DATE COMPLETED	COST (if readily available)
	Pad to sanitary sewer	(013)		
SC	Evaluate alternative chemicals for anti-icing and deicing	All	12/95	--
SC	Store anti-icing chemicals in IWS areas	All	12/95	--
SC	Connect airfield maintenance sediment storage yard to IWS	SDW3 (010)	7/95	--
SC	Connect Federal Express loading dock area to IWS	SDN1 (006)	7/97	Tenant Project
SC	Connect food service loading dock drain to sanitary sewer (Lufthansa)	SDN-1 (006)	9/97	Tenant
SC	Connect food service compactor area drain to sanitary sewer (Flying Food)	Other	9/98	Tenant
SC	Diversion of former Delta Hangar parking lot (now in AOA) to IWS	Undesignated	1/01	--
SC/ Treatment	Treatment of metal rooftops	SDN-1		
SC/ Treatment	Oil control or diversion to IWS for Upper and Lower Terminal Drives	SDE-4		
SC	Diversion of 0.6-acre area under S. Satellite Overhang to IWS	SDS-1	8/00	\$5K-

- Other water quality BMPs and retrofits will be designed and installed per the requirements of the Comprehensive Stormwater Management Plan, which is part of the Port's 401 permit from the Department of Ecology (see Table A-3 of CSMP).

3.15 COMPLETED BMPs

Numerous source control and treatment BMPs requiring capital improvements have been completed at STIA over the last several years. These completed BMPs are listed in Table 5.

3.16 IDENTIFICATION OF NEW BMPs

As part of the Port's annual SWPPP review and update, the Port will review existing BMPs and, as appropriate, identify and select new BMPs. Table 6 lists new BMPs that have been selected by the Port.

3.16.1 Update Contractor Specifications

The Port will review and update contractor specifications for construction sites and staging areas.

3.17 EMERGENCIES OR OTHER UNSCHEDULED ACTIVITIES

It is possible that emergencies or other unscheduled activities may occur at the airport. In each case, the Port will make every effort to provide for the control and quality of runoff and revise the SWPPP as necessary.

CHAPTER 4 SDS INSPECTIONS

The NPDES Permit requires the Port (see Appendix A) to conduct four inspections per year of the SDS areas and outfalls: three during the wet season (October 1 through June 30) and the one during the dry season (July 1 through September 30). Inspections will be conducted by the SWPPP Implementation Monitor with the assistance of Environmental Services, its staff and/or designated consultant. Appendix C includes blank and completed inspection forms. The SWPPP monitor will be responsible for preparing a written report of each inspection, distributing that report for review and comment by the SWIM, and keeping a copy of the report and the SWIM's written comments in a file that is available for review by the Department of Ecology if requested. The SWIM distributes the approved report to tenants and Port supervisors as necessary.

4.1 INSPECTIONS REQUIRED BY THE NPDES PERMIT

If, during any of the dry- or wet-season inspections, discharge conditions indicate instances of noncompliance, the Port shall sample as described below. The goal of this sampling is to determine the presence and degree of potential non-stormwater discharges. Inspections will verify that the description of potential pollutant sources required under this permit is accurate; the site map as required in the SWPPP has been updated or otherwise modified to reflect current conditions; and the controls to reduce pollutants in stormwater discharges associated with industrial activity identified in the SWPPP are being implemented and are adequate.

The dry-season inspection shall be conducted during dry weather between July 1 and September 30 each year. If discharges indicate potential concern and can readily be sampled, the inspection team shall take grab samples of the discharge as outlined below.

Insignificant discharges due to groundwater infiltration or other innocuous sources do not have to be sampled.

The wet-season inspections shall be conducted on three occasions between October 1 and June 30 each year. These inspections should coincide with a rainfall event producing discharge. If visual indicators of potential concern are present, the inspections team shall take grab samples of the discharge.

During each of these inspections, personnel shall observe permitted outfalls or designated monitoring installations. Using best professional judgment, inspection personnel should:

- Indicate if a discharge is present by estimating the depth of flow, or recording the flow rate if logged by an onsite flowmeter. Enter findings on the inspection log form. If no discharge is observed, enter “no discharge” on the log form.

- If significant discharge is present, inspect for the presence of visual indicators of potential contamination in discharges. These seven indicators include:
 - ⇒ turbidity,
 - ⇒ suspended solids,
 - ⇒ color,
 - ⇒ foam,
 - ⇒ sheen,
 - ⇒ odor, and
 - ⇒ floatables.

- Record the presence and degree of each of the seven visual indicators on the inspection log form. Enter zero to indicate complete absence. Enter a value from 1 to 5 to indicate the presence and the relative magnitude. A value of 1 indicates presence, but to a minor degree. A value of 5 indicates presence to a high degree.

- If visual indicators suggest an instance of noncompliance, take grab samples of the discharge.
 - ⇒ Collect samples and avoid entraining settled material.
 - ⇒ Use clean containers supplied by the Port's analytical laboratory.
 - ⇒ In deep manholes such as SDE4, SDN1, and SDW3, take grab samples using a proper pump (such as an automatic sampler if available).
 - ⇒ The following subbasins can be sampled accurately and safely at the final outfall: SDS1-SDS4, SDN2-SDN4, B, and D.
 - ⇒ Outfalls SDE4, SDN1, SDW3, EY and TY must not be sampled at the final outfall because of co-mingling with non-Port stormwater.
 - ⇒ Avoid sampling non-representative conditions such as standing water.

- IF samples were taken, fill out the Port's Chain-of-Custody (COC) form requesting laboratory analysis of specific parameters as appropriate, based on the visual inspections.

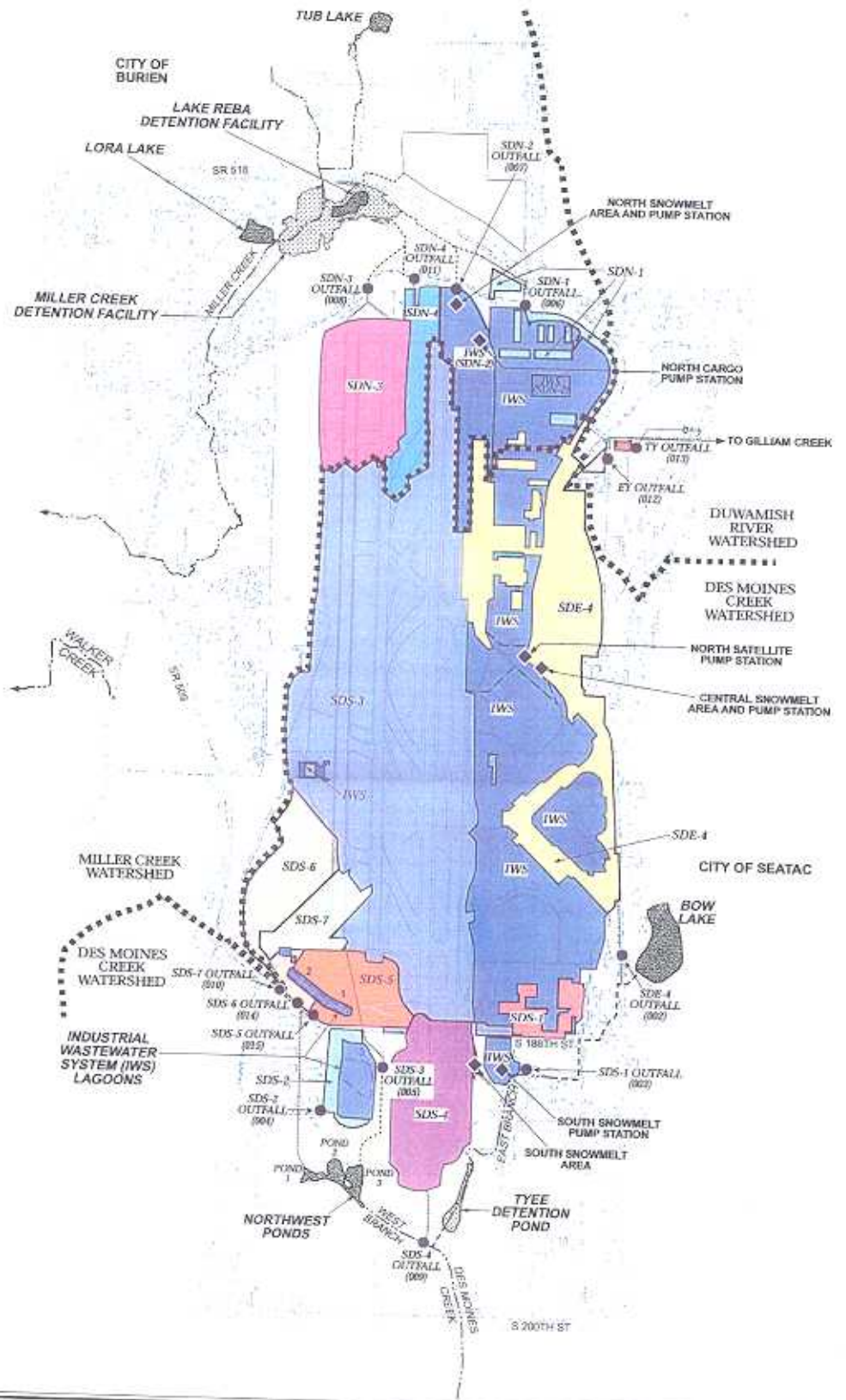
4.2 ONGOING INSPECTIONS

The SWPPP Implementation Monitor or designee will conduct frequent inspections of selected areas with particular emphasis on areas of concern, which may change with time. Inappropriate activities and/or ineffective implementation of BMPs will be discussed with the appropriate tenant or Port supervisor. A log will be kept of these inspections that indicates problems observed and corrective actions taken or prescribed. A penalty system may be implemented by the Port in the event of tenant noncompliance.

CHAPTER 5 REFERENCES

- Herrera Environmental Consultants. 2001. "Microbial Source Tracing Study Report, Seattle-Tacoma International Airport Stormwater Monitoring Program." (September).
- King County, Surface Water Management Division. 1995. "King County, Washington, Surface Water Design Manual." (November).
- Port of Seattle. 1993. "Contractors' Snow Manual for Ramp Areas," issued by Contracts Administration, Port Maintenance. (September).
- Port of Seattle. 1993a. "Task 1 Report, Field Verification and Evaluation of the Conveyance Systems (Draft)," by Anne Symonds & Associates. (July).
- Port of Seattle. 1995. "Port of Seattle, Seattle-Tacoma International Airport, Spill Prevention Control and Countermeasure Plan."
- Port of Seattle. 2000. "Comprehensive Stormwater Management Plan – Master Plan Update Improvements, Seattle-Tacoma International Airport." Parametrix. (December).
- Port of Seattle. 2000. "Stormwater Whole Effluent Toxicity (WET) Testing at Seattle-Tacoma International Airport: Final Report." (May).
- Port of Seattle. 2001. "Annual Stormwater Monitoring Report for the Period July 1, 2000 through June 30, 2001." Port of Seattle. (September).
- Washington State Department of Ecology. 1992. "Stormwater Management Manual for the Puget Sound Basin." (February).
- Washington State Department of Ecology. 1998. National Pollutant Discharge Elimination System Waste Discharge Permit. In compliance with the provisions of the State of Washington Water Pollution Control Law Chapter 90.48 RCW and the Federal Water Pollution Control Act Title 33 US Code, Section 1251. Issued to the Port of Seattle, Seattle-Tacoma International Airport. (February 20, 1998 modified).

FIGURE



AR 052646



- Sea-Tac Airport Drainage Basin Boundary
- SDS-3 Sea-Tac Airport Drainage Basin Name
- Stream
- - - Piped Stream
- Pipe (only connections between subbasins and outfalls shown)
- Permanent Water Features
- Live Storage Pool Area
- Watershed Divide
- - - - - Drainage Channel

Figure 1
Drainage Subbasins

ADDENDA

AR 052647

APPENDIX A

Excerpts from the Sea-Tac International Airport NPDES permit

Appendix A

Permit No. WA-002465-1

S12. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR AIRPORT OPERATIONS

The Permittee shall continue to maintain the existing SWPPP in accordance with the relevant and appropriate requirements of this special condition, including, but not limited to, maintaining a Pollution Prevention Team, self-inspections, annual review of the SWPPP and updates as necessary, employee training, and recordkeeping.

A. Objectives

1. To eliminate the discharges of unpermitted industrial wastewater, domestic wastewater, noncontact cooling water, or other illicit discharges to the storm drainage system;
2. To implement and maintain Best Management Practices (BMPs) to identify, reduce, eliminate, and/or prevent the discharge of stormwater pollutants;
3. To prevent violations of water quality, ground water quality, or sediment management standards; and
4. To prevent adverse water quality impacts on beneficial uses of the receiving water by controlling peak rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

B. General Requirements

1. Submission and Retention:

The Permittee shall submit an updated SWPPP to the Department for review and comment at least twice during the term of this permit. An updated SWPPP shall be submitted no later November 30, 1998, and again with the application for permit renewal required in General Condition G7. The Permittee shall include an evaluation of whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly implemented in accordance with the terms of the permit or whether additional controls are needed. The evaluation shall specifically include, but is not limited to, fecal coliform, copper, lead, and zinc. The updated

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S12. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR AIRPORT OPERATIONS (CONTINUED)

SWPPP shall include a summary of the results of the inspections required in subsection C, any incidents of noncompliance, and a certification, in accordance with General Condition G1, that the facility is in compliance with the plan.

The Permittee shall also submit that portion of the SWPPP which addresses the discharge to the City of SeaTac stormwater system to the City of SeaTac if it is modified.

The SWPPP shall be retained on-site or within reasonable access to the site.

2. Modifications:
 - a. The Permittee shall modify the SWPPP whenever there is an alteration of airfield facilities or their operation or maintenance which causes the SWPPP to be less effective in controlling pollutants.
 - b. Whenever a self-inspection reveals that the description of potential pollutant sources or the pollution prevention measures and controls identified in the SWPPP are inadequate, due to the discharge of, or the potential to discharge, a significant amount of pollutant, the SWPPP shall be modified, as appropriate, within two (2) weeks of such inspection for noncapital BMPs, and within six (6) months of such inspection for capital BMPs. The proposed capital modifications shall be submitted to the Department at least 30 days in advance of implementing the proposed changes in the plan unless the Department approves immediate implementation. The Permittee shall provide for implementation of any modifications to the SWPPP in a timely manner.
3. The Permittee may incorporate applicable portions of plans prepared for other purposes. Plans or portions of plans incorporated into a SWPPP become enforceable requirements of this permit. If other plans are referenced in the SWPPP, they must be made available per the requirements of Special Condition S3.G.
4. The Permittee shall prepare the SWPPP in accordance with the guidance provided in the *Stormwater Pollution Prevention Planning for Industrial Facilities*. The plan shall contain the following elements:
 - a. Assessment and description of existing and potential pollutant sources,
 - b. A description of selected operational BMPs,

S12. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR AIRPORT OPERATIONS (CONTINUED)

- c. A description of selected source-control BMPs,
 - d. A description of selected erosion and sediment control BMPs,
 - e. A description of selected treatment BMPs, and
 - f. An implementation schedule.
5. Applicability of Current and Future Editions of the Stormwater Management Manual for the Puget Sound Basin (SWMM):

BMPs shall be selected from the most recent published edition of the SWMM, or other manuals determined to be equivalent by the Department, available at least 120 days before the selection of the BMPs. The Permittee may develop site-specific BMPs that are appropriate for airport industrial activities with approval of the Department.

C. Implementation

The Permittee shall conduct at least four inspections per year; three during the wet season (October 1 - June 30) and one during the dry season (July 1 - September 30).

1. The wet season inspections shall be conducted during a rainfall event by personnel named in the Stormwater Pollution Prevention Plan (SWPPP) to verify that the description of potential pollutant sources required under this permit is accurate; the site map as required in the SWPPP has been updated or otherwise modified to reflect current conditions; and the controls to reduce pollutants in stormwater discharges associated with industrial activity identified in the SWPPP are being implemented and are adequate. The wet-weather inspections shall include observations of the presence of floating materials, suspended solids, oil and grease, discolorations, turbidity, odor, etc. in the stormwater discharges.
2. The dry season inspection shall be conducted by personnel named in the SWPPP. The dry season inspection shall determine the presence of unpermitted non-stormwater discharges such as domestic wastewater, noncontact cooling water, or industrial wastewater to the stormwater drainage system. If an unpermitted, non-stormwater discharge is discovered, the Permittee shall immediately notify the Department.

APPENDIX B

Incident of Noncompliance

AR 052652

Over the past three years, there was one minor spill of jet fuel, which occurred on April 28, 1999 from a 747 aircraft fuel tank expansion relief valve on a wing tip emergency relief valve . Most of the spilled fuel was contained on the airfield and recovered before reaching the drainage system. It was estimated that less than 5 gallons of fuel reached Des Moines Creek.

AR 052653

APPENDIX C

Inspections

AR 052654

BLANK FORMS

AR 052655

FORM 1
WET/DRY WEATHER INSPECTION AND PREVENTIVE MAINTENANCE REPORT

Facility Name: _____ Inspector Name: _____

Inspector Signature: _____ Date: _____

Weather Conditions: _____

SWPPP EVALUATION

Is description of potential pollutant sources in SWPPP current? Yes No

If no, list other potential pollutants: _____

Is the site map in the SWPPP correct? Yes No

If no, list necessary changes: _____

Are controls to reduce pollutants identified in the SWPPP being implemented? Yes No

If no, identify deficiencies: _____

Do the controls that have been implemented appear to be adequate? Yes No

If no, identify corrective actions and responsible personnel: _____

Conduct visual inspections of the outfalls as described in Chapter 4 of the SWPPP and complete page 2 of this form.

**FORM 1
WET/DRY WEATHER INSPECTION AND PREVENTIVE MAINTENANCE REPORT**

Outfall Name	Outfall #	Inspection point (1) manhole SDE4-47	date (2)	depth of flow (3), in.	Visual Observations**						Remarks (4)	
					Susp Solids (0-5)	Turbidity (0-5)	Color (hue)	Sheen (0-5)	Odor (type)	Foam (0-5)	floatables (0-5)	other
SDE4	002											
SDS1	003	outfall										
SDS2	004	outfall										
SDS3	005	outfall										
SDN1	006	drain inlet										
SDN2	007	manhole										
SDN3	008	outfall										
SDS4	009	outfall										
SDW3	010	outfall										
SDN4	011	outfall										
Erg Yard	012	drain inlet										
Taxi Yard	013	drain inlet										
Subbasin B	014	outfall										
Subbasin D	015	outfall										
notes: 1. Inspected visually from surface through inlets, or by pumped sample for outfalls with monitoring points requiring confined-space entry (SDE4, SDN1, SDN2, EY, TY) 2. Monthly sampling sites visited on numerous other dates during the period, noted in remarks 3. Depths of flow are approximate, unless registered by local monitoring equipment. 4. During dry season inspection note any evidence of unpermitted non-stormwater discharges. Other optional observations at non-permit locations:												
S 28th St outfall	n/a	outfall										
DM Creek above SDS1	n/a	creek										
DM Creek Weir at Golf Course	n/a	creek										
DM Creek at SDS4	n/a	creek										
L. Rebs outlet	n/a	outlet										

AR 052657

COMPLETED FORMS

AR 052658