

 COPY

Port of Seattle  
September 26, 2014

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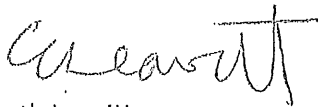
Re: 2013-2014 Annual Stormwater Monitoring Reports  
Seattle-Tacoma International Airport  
NPDES Permit WA-002465-1: Part I Special Conditions S2.F & S2.G, Part II Special  
Condition S1.G and Part III, Special Condition S1.F

Dear Mr. Abbasi:

Enclosed you will find the 2013-2014 Annual Industrial Waste Treatment Plant, Sanitary, Non-Construction Stormwater and Construction Stormwater Monitoring Reports prepared in compliance with Part I Special Condition S2.F and S2.G, Part II Special Condition S1.G and Part III Special Condition S1.F of the NPDES Permit for Seattle-Tacoma International Airport.

If you have any questions regarding this submittal, please contact Bob Duffner of my staff at (206) 787-5528.

Sincerely,



Elizabeth Leavitt  
Director, Aviation Planning & Environmental

Enclosure: 2013-2014 Annual Stormwater Monitoring Reports

Seattle-Tacoma  
International Airport  
P.O. Box 68727  
Seattle, WA 98168-0727





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# **Annual Non-Construction Stormwater Monitoring Report**

## **Seattle-Tacoma International Airport**

*For the Period July 1, 2013 through June 30, 2014*

***September 23, 2014***

Prepared by

Aviation Environmental Programs

Port of Seattle





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## EXECUTIVE SUMMARY

This Annual Stormwater Monitoring Report provides a summary of “non-construction stormwater” monitoring results conducted pursuant to Part II, Condition S1 of the National Pollutant Discharge Elimination System (NPDES) permit for the Port of Seattle’s Seattle-Tacoma International Airport (STIA) NPDES Permit WA-002465-1. Non-construction stormwater discharges authorized under Part II of the permit includes runoff associated with industrial areas at the airport and excludes construction runoff.

This report summarizes the results of stormwater sampling at outfalls listed in permit Condition S1 between July 1, 2013 and June 30, 2014 and satisfies the annual reporting requirement detailed in Part II Condition S1. G. Monitoring of construction activities, sanitary sewer discharges and the Industrial Wastewater System (IWS) are subject to other reporting requirements. Annual summaries of Part I IWS, Part I sanitary sewer monitoring results and Part III construction monitoring results are provided separately.

The Port met all required sampling and reporting requirements in the NPDES permit for the 2013-2014 data collection period. A total of 74 grab and 74 composite stormwater samples from 21 storm events were collected in the past year with results reported on quarterly Discharge Monitoring Reports (DMRs).

There were six instances of permit limit exceedances associated with 370 individual constituent analyses. In addition to routine NPDES monitoring required by Condition S1, the Port continued monitoring activities pursuant to other NPDES Part II permit conditions. These activities include sublethal and *in situ* toxicity sampling (Condition S8 and S9) and additional monitoring associated with Agreed Order 8755.

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## **1 INTRODUCTION**

This Annual Report summarizes non-construction stormwater monitoring results from the Seattle-Tacoma International Airport (STIA) as required by Part II, Condition S1.G. of the Airport's NPDES permit. Stormwater as defined in the permit fact sheet is "that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility". The Permit authorizes discharges from airport industrial activities. Airport industrial activity areas include a mix of roadway, rooftops, taxiways and runways. The purpose of this Annual Report is to present the monitoring results from the stormwater discharging from the outfalls identified in Part II of the NPDES permit. The report also describes any new initiatives and action plans to ensure compliance with permit effluent limits. This Annual Report does not address discharges to the Airport's Industrial Wastewater System (IWS) or construction-related stormwater discharges.

The report covers samples collected in the 12-month period of July 2013 through June 2014. Outfall sampling results summarized in this report include data previously submitted to Ecology in the NPDES permit Part II Discharge Monitoring Reports (DMRs), plus additional stormwater sample data such as that from quality assurance sampling and samples that were analyzed for additional parameters not required by the Permit. These additional monitoring data are presented in Appendix B of this report. Toxicity monitoring required by Part II of the NPDES permit is summarized in this report.

This report is organized into four sections following the introduction. Section 2 describes background conditions at the Airport including descriptions of each drainage subbasin and outfall sampling location. Section 3 presents all of the discharge monitoring report (DMR) related grab sample and composite sample analytical data collected during the reporting period and the rainfall totals for the period. Section 4 provides a summary of the effluent limit compliance and BMP implementation during the monitoring period. A summary and conclusion are provided in Section 5.

## **2 BACKGROUND**

### **2.1 Seattle-Tacoma International Airport Drainage**

STIA lies approximately mid-way between the cities of Seattle and Tacoma, Washington. The airport construction began in the 1940s and has expanded throughout the years and is currently the 15<sup>th</sup> busiest passenger and the 21<sup>st</sup> busiest cargo airport in the United States. The highly urbanized cities of SeaTac, Des Moines, and Burien surround the airport.

The airport has managed a storm drainage system since commissioning in the 1940s. Stormwater drainage at STIA is separated into two different collection systems, the Industrial Wastewater System (IWS) and the Storm Drainage System (SDS). The IWS receives stormwater runoff from the ramp and other areas involved with aircraft servicing and maintenance, providing treatment before discharge to Puget Sound through a separate outfall. A total of 375 acres are diverted to the IWS.

The SDS drains over 1,200 acres. Half of this area is impervious and primarily associated with airport industrial activities, with the remainder being pervious which consists of landscaped or fallow open spaces. About 25 percent of the area drained by the SDS flows to Miller Creek. This drainage area represents about 7 percent of Miller Creek's watershed. Approximately 71 percent of the total SDS area drains to the Northwest Ponds and Des Moines Creek, which represents about 21 percent of the creek's watershed.

### **2.2 STIA Storm Drainage Subbasins, Activities, and Outfall Descriptions**

The Airport's SDS is segregated into separate stormwater subbasins that each drain to individual outfall locations. The NPDES permit lists a total of 19 outfalls in three categories: Existing & New Outfalls and Subbasins, Future Outfalls to be Activated as Part of the CDP Near-Term Project Development, and Existing Outfalls and Subbasins to be Eliminated as Part of the Third Runway Project. As of June 30, 2014, 11 of the 19 outfalls are active and discharge stormwater related to industrial activity.

STIA stormwater subbasins are categorized according to their dominant activities: landside or airfield. These categories group subbasins together by similar land use and other characteristics. In general, passenger vehicle operations are absent from the airfield drainage subbasins while aircraft operations are absent from the landside subbasins. SDE4/S1 subbasin is an exception in that it includes both airfield and landside activities. Previous reports found that concentrations of TPH, TSS and other constituent concentrations were different for the landside and airfield categories (POS 1996a, 1997a.) Table 1, *STIA Subbasin Characteristics*, describes each active subbasin, receiving water, activities within each subbasin, stormwater



management BMPs, and total pervious and impervious surface areas. The physical location of the outfalls listed in Table 1 are shown on Figure 1 along with additional receiving water monitoring locations used for sublethal toxicity and *in situ* toxicity testing.

Table 1. STIA Subbasins Characteristics

Outfall Name	Receiving Water	General Category	Industrial Activity	Non-Industrial Activity	Pervious Area <sup>b</sup> (acres)	Impervious Area <sup>b</sup> (acres)	Total Area <sup>b</sup> (acres)
SDE4/S1	Des Moines Creek (East Branch)	Landside	Limited portions of the airfield taxiways.	Public roads, vehicle parking areas, rooftops (terminal, hangar, cargo) and landscaped areas.	41.71	130.47	172.18
SDD-06A	Des Moines Creek (East Branch)	Landside	Loading docks, vehicle maintenance, vehicle washing, equipment parking and maintenance.	Public roads, vehicle parking areas, rooftops (terminal, hangar, cargo) and landscaped areas.	17.08	28.35	45.4
SDN1	Miller Creek via Lake Reba	Landside	Flight service kitchen.	Public roads, building rooftops and vehicle parking.	3.8	16.0	19.8
SDS3/5	NW Ponds and Des Moines Creek West	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Perimeter road, open areas and building rooftops.	212.44	244.98	457.42
SDS4	NW Ponds and Des Moines Creek West	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Runway infield and open areas.	41.6	24.8	66.4
SDS6/7	NW Ponds and Des Moines Creek West	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Access roads, runway infield and open areas.	63.94	45.94	109.88

Table 1. STIA Subbasins Characteristics

Outfall Name	Receiving Water	General Category	Industrial Activity	Non-Industrial Activity	Pervious Area <sup>b</sup> (acres)	Impervious Area <sup>b</sup> (acres)	Total Area <sup>b</sup> (acres)
SDN2/3/4 <sup>a</sup>	Miller Creek via Lake Reba	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Perimeter road, access road, taxiway infield and open areas.	71.83	41.04	112.87
SDN3A	Miller Creek	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Perimeter road, runway infield and open areas.	22.9	8.62	31.5
SDW1A	Miller Creek	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Perimeter road, runway infield and open areas.	44.35	25.78	70.1
SDW1B	Miller Creek	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Perimeter road, runway infield and open areas.	59.7	25.0	84.7
SDW2	Walker Creek	Airfield	Ground surface deicing/anti-icing, aircraft taxi, takeoff and landings.	Perimeter road, runway infield and open areas.	27.04	10.5	37.51
Note:					<b>606.39</b>	<b>601.48</b>	<b>1207.76</b>
a) The SDN2 runoff is pumped to IWS for all flows up to the 6 month /24-hour event. The SDN2 subbasin comprises approximately 46.5 acres, 36.6 of which are impervious. This area is included in acreages reported to the IWS.							
b) Subbasin areas as described in the NPDES permit and updated annually in the Ports Stormwater Pollution Prevention Plan.							

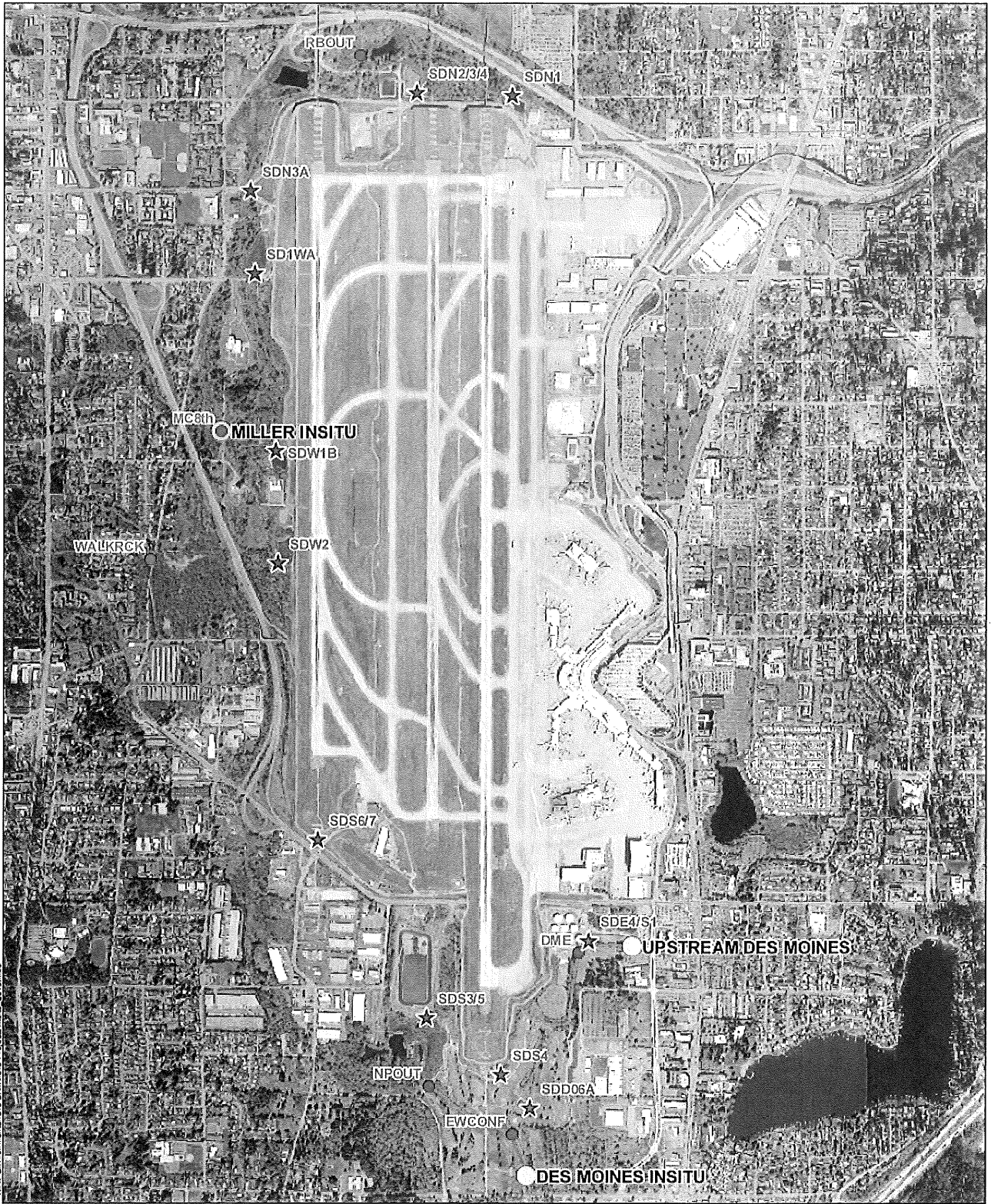


Figure 1

### **3 SAMPLING RESULTS AND DISCUSSION**

This section of the Annual Report summarizes the results of SDS outfall monitoring. All data summarized in this section has been reported to Ecology on quarterly DMRs and is included in Appendix A. Data generated from grab and composite samples are presented and discussed. These types of samples employ different protocols that represent different temporal periods of the particular stormwater discharge event and are therefore evaluated separately. Grab samples represent an instantaneous or short duration sampling period, while composites are collected over the storm event hydrograph to provide an event mean concentration (EMC).

In addition to the DMR data, this report summarizes other data collected at the outfalls listed in Part II, S1 of the NPDES permit. These other data consist of field equipment blank samples, field duplicate samples, and other parameters collected during the monitoring period. These other data are presented in Appendix B. Section 3.2 of this report summarizes sublethal toxicity and *in situ* toxicity testing at receiving water sites downstream of Port outfalls. Section 3.3 summarizes monitoring conducted in receiving waters under Agreed Order 8755.

#### **3.1 Monitoring of Non-Construction Stormwater Discharges**

##### **3.1.1 Sampling Objectives and Procedures**

Sampling protocols and locations have been selected to provide data consistent with the requirements of the NPDES permit and the representativeness criteria set forth in the *Quality Assurance Program Plan for Non-Construction Stormwater Runoff Monitoring* (QAPP) (Taylor Associates, Inc. 2011). The monitoring locations were selected to represent stormwater downstream of the last best management practice (BMP) within each subbasin.

The QAPP describes the criteria for sampling storm events and describes all relevant sampling, programming, and handling necessary to satisfy the monitoring requirements of the permit. Table 2 lists the current constituents measured or analyzed, methods used, and detection limits. The Port reports results on DMRs from storms and samples that were validated according to the representativeness criteria of the QAPP.

The Port uses telemetry-based automatic samplers to collect a grab sample then a flow-weighted composite sample during rainstorms of 0.10 inches or greater that are preceded by less than 0.10 inch of rainfall in the previous 24 hours. These rainfall and antecedent sampling conditions are specified in the NPDES permit, Part II, S1.B. Each grab or composite sample is analyzed for the constituents listed in Table 2 depending on sample type as specified in the NPDES permit.

**Table 2. Constituents, Methods and Detection Limits**

Constituent	Method	Detection limit (MDL)	Sample Type
pH	150.1 <sup>(1)</sup>	0.01 S.U.	grab
Oil & Grease - TPH (by GC)	NWTPH-Dx <sup>(3)</sup>	0.75 mg/l	grab
Turbidity	180.1 <sup>(1)</sup>	0.05 NTU	grab
Glycols, Ethylene, Propylene	GC FID <sup>(2)</sup>	10.0 mg/l	flow-wt comp.
Total Recoverable Copper	200.8 <sup>(1)</sup>	0.5 µg/l	flow-wt comp.
Total Recoverable Lead	200.8 <sup>(1)</sup>	0.1 µg/l	flow-wt comp.
Total Recoverable Zinc	200.8 <sup>(1)</sup>	4.0 µg/l	flow-wt comp.

Table Notes:

1. Method refers to EPA-600/4-79-020 (U.S. EPA 1979).
2. Analyzed by Gas Chromatograph (GC), Flame Ionization Detector (FID). MDL is 10 mg/l each for propylene and ethylene glycols.
3. Method reports both a motor oil fraction and diesel fraction. TPH-Dx is the sum of these two fractions.

### 3.1.2 Field Quality Control Samples

The Port routinely collects field duplicate and equipment blank samples during NPDES sampling events in accordance with the QAPP. Appendix B summarizes these results. The results reflect on the efficacy of the Port's "clean" sampling methods developed for stormwater monitoring relative to metals (POS 1999).

Twelve field blanks were collected in the 2013 – 2014 reporting period. Ethylene glycol and propylene glycol were non-detectable in all field blank samples. Zinc was detected on one occasion in a sample of laboratory deionized water at the detection limit (4 ug/L). Zinc was also detected twice in field blank samples at 6 ug/L and 34 ug/L. Follow-up investigation was conducted to determine the cause of elevated zinc (34 ug/L) in one field blank sample. Follow-up sampling found no zinc contamination at the field sampling location, within the sampling containers or in the laboratory deionized water so no further testing was completed. There were also no other anomalies associated with samples collected during the same storm event. Copper was detected in four field blank samples at an average concentration slightly over the detection limit (0.7 ug/L). Therefore the sample results were not qualified in relation to the field blank contamination.

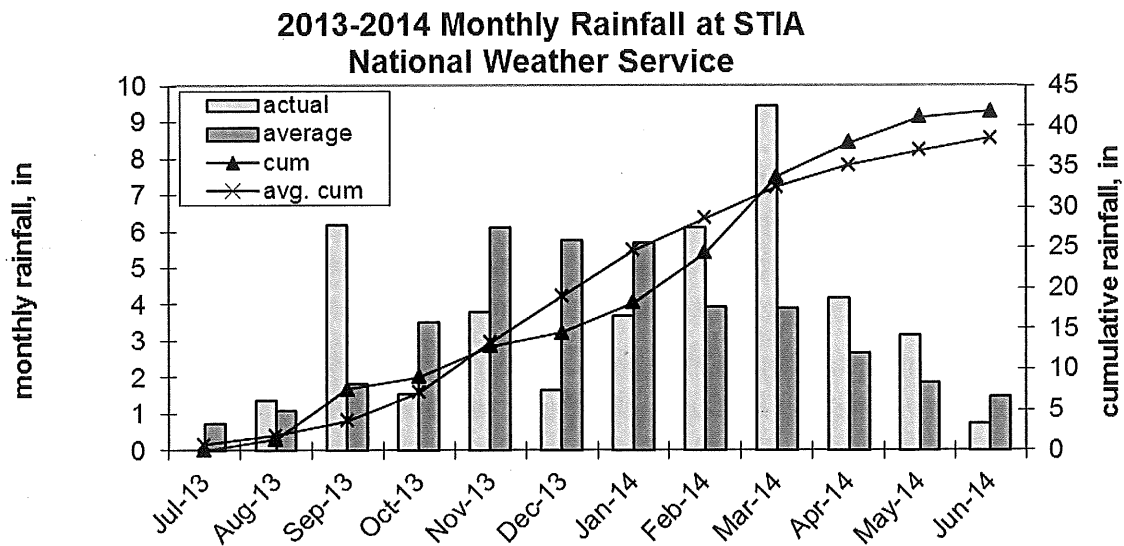
### 3.1.3 Permit Effluent Limits

The current NPDES permit specifies effluent limits for turbidity, pH, oil and grease, total copper, and total zinc at all outfalls. Effluent limits for non-construction stormwater first became effective during the previous permit on December 31, 2007. The site-specific study and subsequent derivation of site-specific water quality based effluent limits for copper and zinc are described in the 2009 NPDES Permit fact

sheet. A 25 NTU effluent limit for turbidity was added in the April 1, 2009 permit as a replacement for an earlier TSS benchmark. The permit also specifies effluent limits for ammonia and nitrates/nitrites, however monitoring for these parameters is only required if urea is applied as an anti-icing agent. Urea was not used in the reporting year and has not been used at the Airport since 1996.

### 3.1.4 Storm Events Sampled

During the current permit's annual reporting schedule (July 1, 2013 through June 30, 2014), 41.82 inches of rain fell at STIA, 3.33 inches more than the historical average of 38.49 inches and slightly more than the past monitoring year (40.82 inches). Monthly rainfall totals were well below average in July through December with no rainfall recorded in July. September 2013 and March 2014 each set new historical rainfall records with 6.17 inches falling in September, over three times the monthly norm and 9.44 inches in March, nearly two and a half times the monthly normal rainfall (Figure 2).



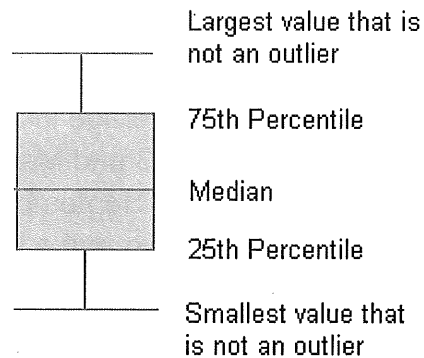
**Figure 2. Rainfall Summary**

In the 12 months ending June 30, 2013, the Port sampled 21 rainfall events with rainfall ranging from 0.11 to 3.29 inches. Dry weather preceding these events ranged from 16 hours (August 27, 2013) to 15 days (February 9, 2014). The tabular sample data in Appendix A includes storm event data such as rainfall depth, antecedent rainfall, and length of antecedent dry period<sup>1</sup>.

<sup>1</sup> The length of the dry antecedent period (the "dryant" data field in Appendix A) is the time, in hours, to the previous measurable (0.01") rainfall, which may or may not have actually produced runoff at a particular outfall.

### 3.1.5 Data Presentation Methods

Outfall sampling results for the reporting period are summarized graphically in box plots that illustrate the central tendency, spread, and skew of the stormwater data (Figures 3 through 8). For low-censored data (i.e. non-detected values), a value of one half the detection limit was assumed for any calculation purposes (i.e. median, percentiles, etc.).



The data set includes outliers and extreme values that usually represent unusual conditions or anomalies, outliers are displayed on the box plots as circles and extreme values are shown as asterisks. With the exception of pH, permit effluent limits (where applicable) are indicated in a note below each graph, solid reference lines are used to indicate the upper and lower pH effluent limit. A flat horizontal line indicates the analyte was not detected during the reporting period.

Appendix A tabulates and summarizes analytical results for each outfall for parameters required by the current permit, for the current annual reporting period July 1, 2013 through June 30, 2014. All data included in Appendix A has previously been provided to Ecology in quarterly DMRs and represents samples collected from those storms and sampling routines that met the criteria of the QAPP.

### 3.1.6 Grab Sample Results and Discussion

The following discussion includes results from 74 grab samples collected in the past year. Grab samples are analyzed for pH, TPH, and turbidity per current permit requirements, with tabular results and summary statistics contained in Appendix A.



### 3.1.6.1 pH

Figure 3 shows pH data for the current year. The median pH value from all outfalls was 7.5. Standard Units (S.U.) Sample results fell consistently within the effluent limit range of 6.5 to 8.5 with the exception of four samples collected at outfalls SDN-1, SDD-06A and SDW-2. Two of the four exceedances were at the SDN-1 outfall and were below the lower pH effluent limit range. Source-tracing to determine the cause of the low pH discovered leachate leaking from a flight kitchen soda-can recycling compactor. pH levels returned to the normal range after compactor was removed from service and taken offsite and storm drainage catch basins and piping were cleaned.

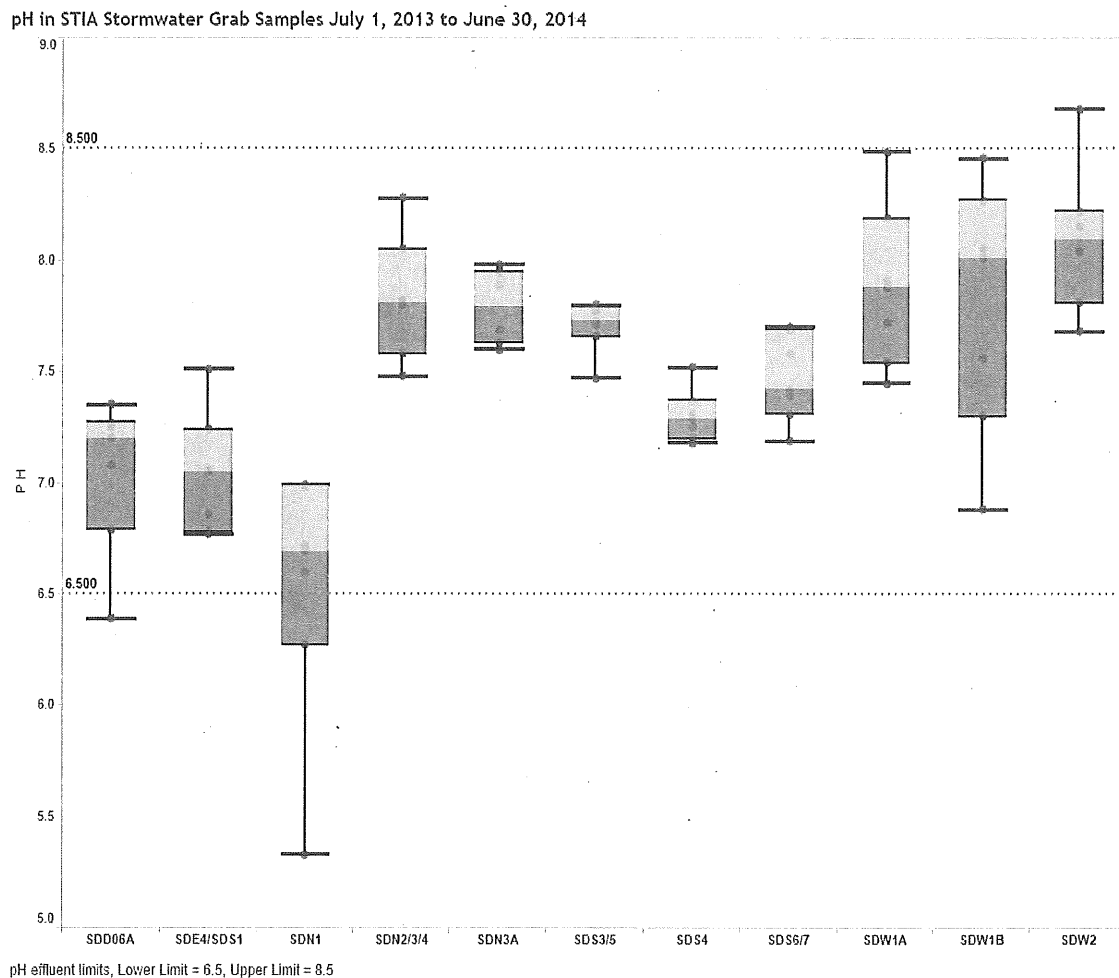


Figure 3. pH Results

### 3.1.6.2 Total Petroleum Hydrocarbons (TPH)

Figure 4 shows TPH data for the current reporting year. The estimated median TPH concentration at all outfalls was 0.15 mg/L. However, the actual median TPH concentration may have been lower since TPH was only detected in 19 of the 74 samples. TPH ranged from less than 0.15 mg/L to 6.60 mg/L. All sample results were well below the TPH effluent limit of 15 mg/L.

TPH-Dx in STIA Stormwater Grab Samples July 1, 2013 to June 30, 2014

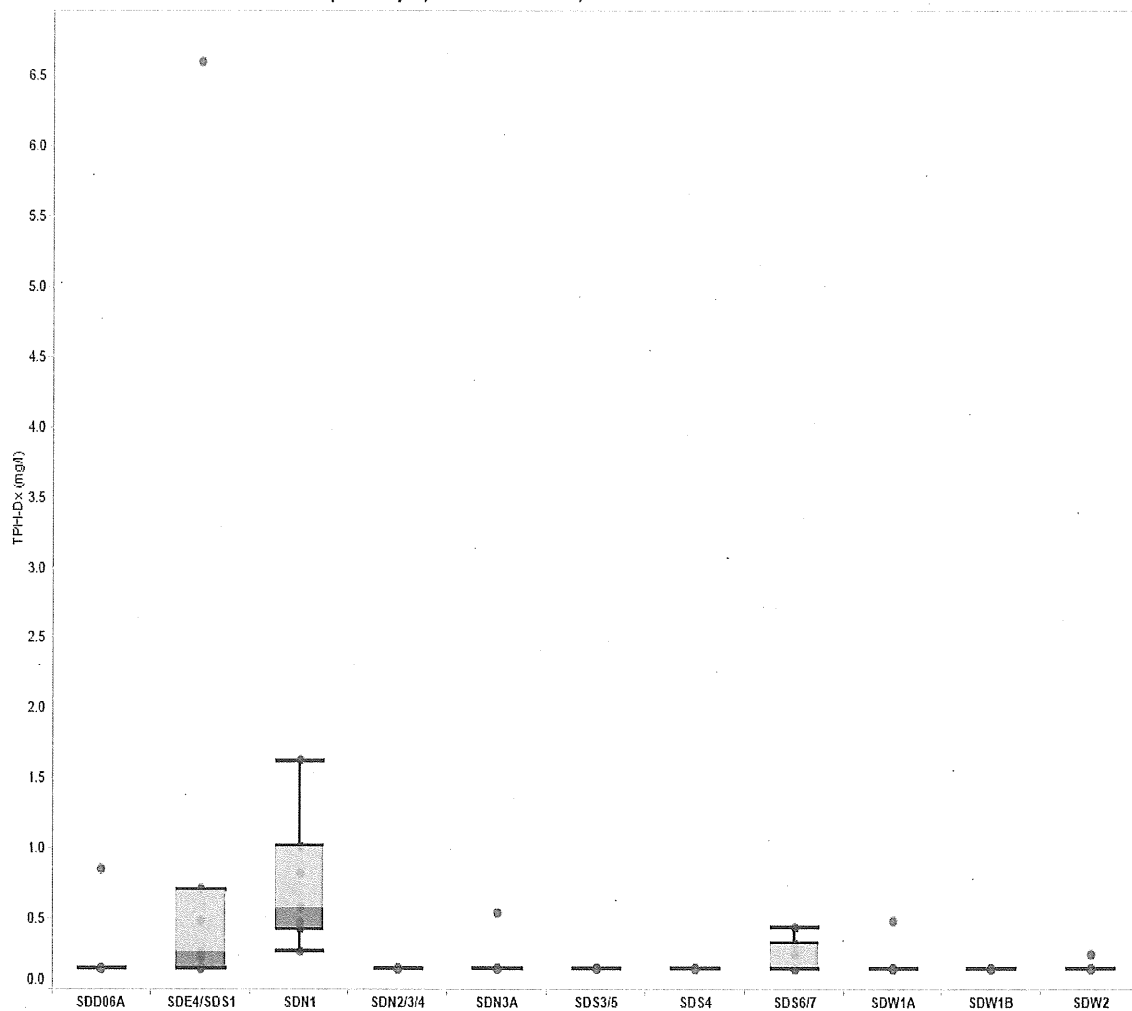


Figure 4. TPH Results

### 3.1.6.3 Turbidity

Turbidity results for the current year are shown in Figure 5. The median turbidity for all outfalls was 1.52 NTU with a range from 0.14 NTU to 16 NTU. There were no permit limit exceedances for turbidity at any outfall during the monitoring period.

Turbidity in STIA Stormwater Grab Samples July 1, 2013 to June 30, 2014

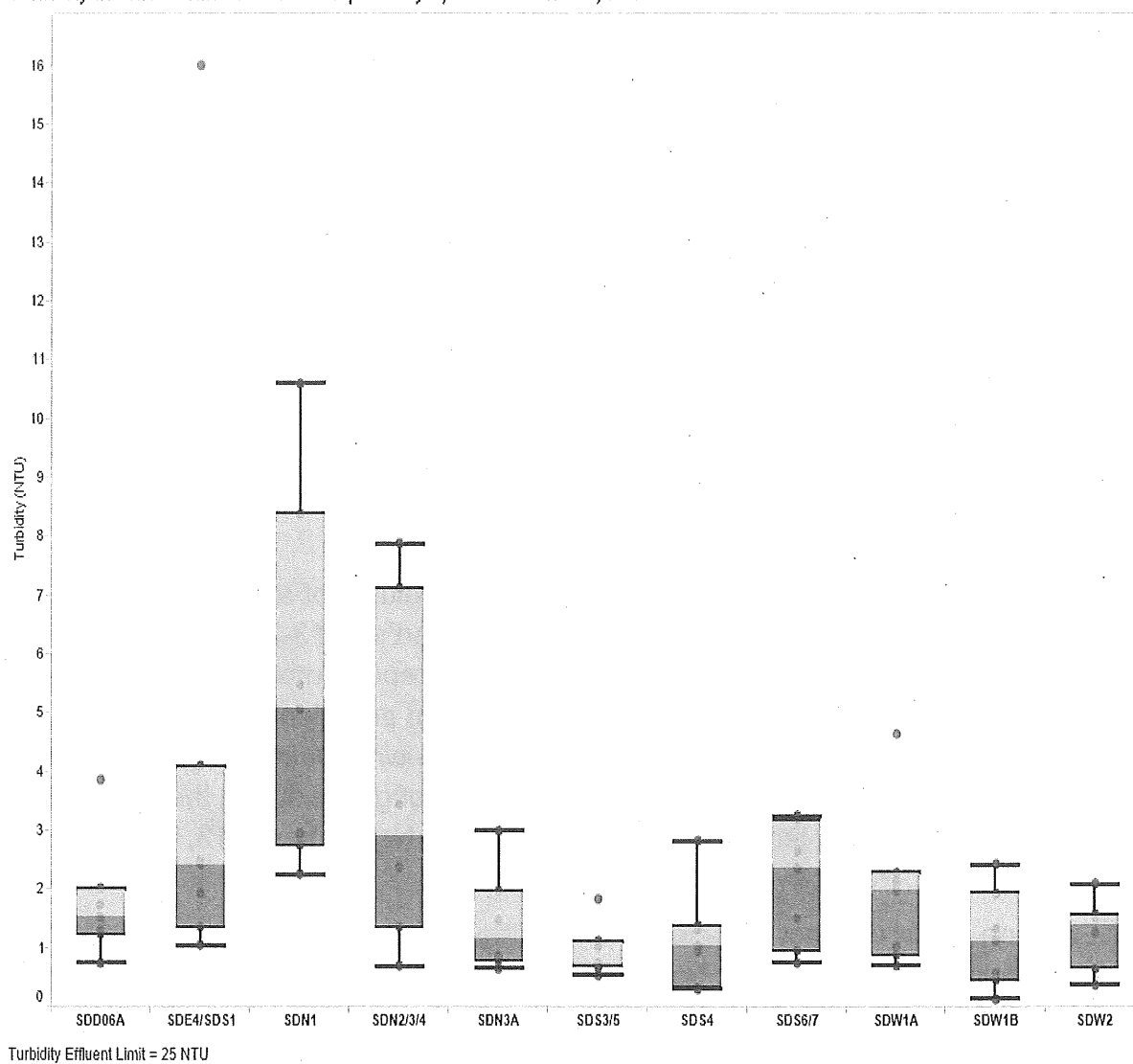


Figure 5. Turbidity Results

### **3.1.7 Composite Sample Results and Discussion**

For the 2013-2014 sampling period, the Port collected a total of 74 flow-weighted composite samples. Composite sample results are described separately from grab samples because grab samples represent an isolated segment of the storm event runoff. Composite sample results represent an average value or event-mean concentration (EMC) over a longer time period. All composite sample data contained within this report and on the DMRs met the representativeness criteria of the Port's QAPP, which provides samples comparable with EPA methods (U.S. EPA 1992).

#### **3.1.7.1 Glycols**

The Federal Aviation Administration (FAA) authorizes only specially formulated ethylene and propylene glycols for aircraft deicing and anti-icing. Port tenants perform all glycol application at STIA (applied by airlines or their ground service providers). To ensure public safety and comply with FAA regulations, aircraft pilots make the ultimate decision on whether to apply glycols or not. Monitoring for propylene and ethylene glycol is required by the NPDES permit during months when deicing and anti-icing is conducted. Glycol monitoring is required to assess track-out and sheer and drip from aircraft that are deiced within the IWS drainage area. No aircraft deicing occurs within the SDS.

The length of the deicing season and the annual volume of aircraft deicing anti-icing fluid (ADAF) (glycol) applied are reported in the Port's *2013-2014 Deicing/Anti-icing Fluids Usage Summary Report* (POS 2014). This report summarizes data provided by the airlines for the volumes of both ethylene and propylene glycol applied within the IWS. According to the *2013-2014 Deicing/Anti-icing Fluids Usage Summary Report*, airlines applied a total of 152,528 gallons of glycol during the months of April 2013, May 2013, September 2013, October 2013, November 2013, December 2013, January 2014, February 2014, and March 2014.

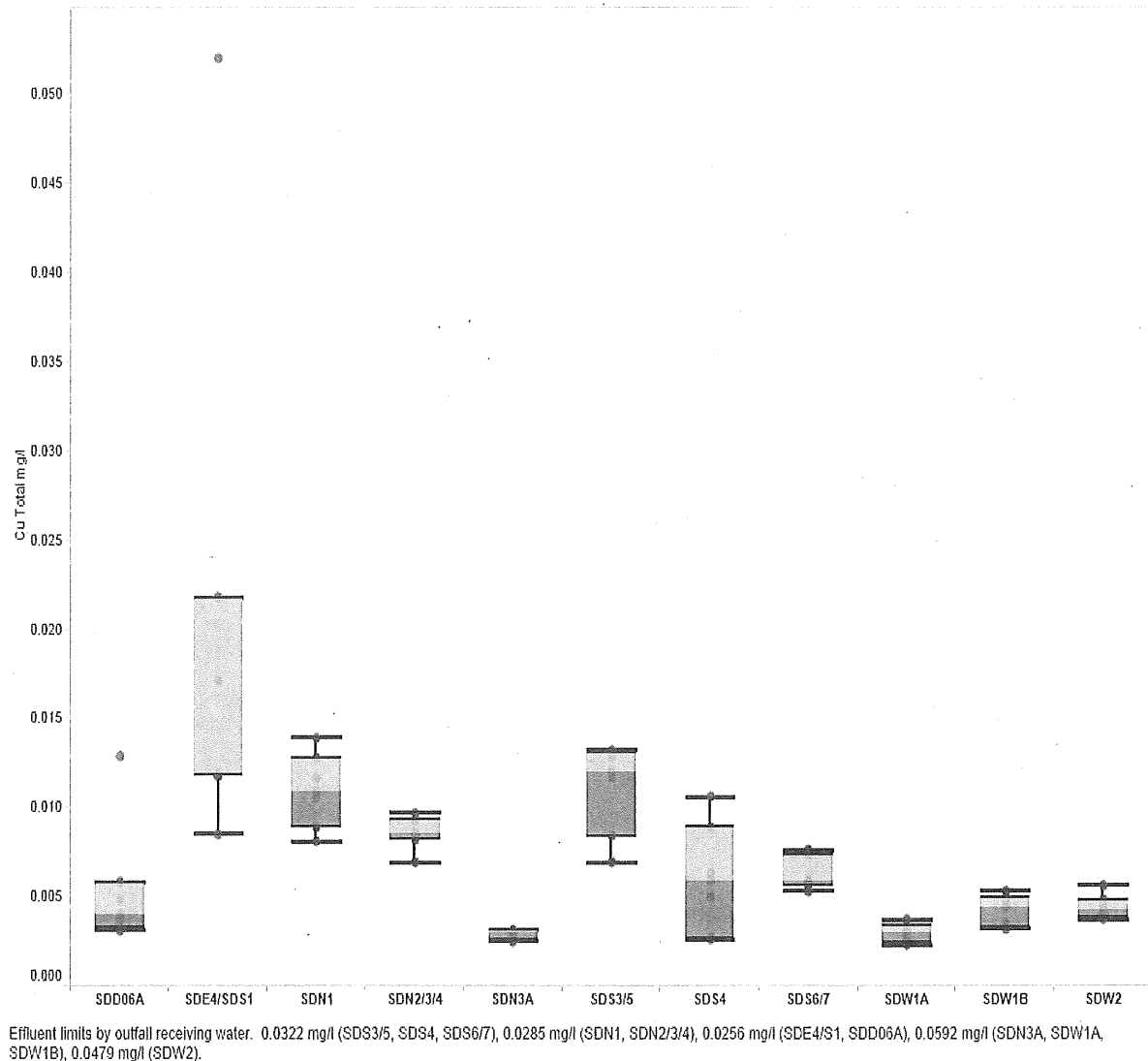
Ethylene glycol was not detected in any of the 66 samples analyzed during deicing months in 2013 and 2014. Propylene glycol was detected on three occasions, one time each at SDE4/S1, SDS3/5 and SDS4 outfalls (27 mg/L, 30, mg/L and 16 mg/L, respectively).

#### **3.1.7.2 Copper**

All data reported below are for total recoverable copper. The median copper concentration for all outfalls was 0.006 mg/L, with individual storm sample concentrations ranging from 0.002 mg/L to 0.052 mg/L. The permit effluent limit for copper at each outfall is variable based on a site-specific study and ranges from

0.026 mg/L to 0.059 mg/L depending on receiving water location. There was one exceedance of a copper effluent limit at the SDE4/S1 outfall during the reporting period as shown in Figure 6. The copper exceedance at the SDE4/S1 outfall occurred when the stormwater pond and filter vault were undergoing maintenance. Following the exceedance, the operation and maintenance procedure was re-evaluated for the SDE4/S1 pond and vault. The evaluation resulted in a revision to the O&M manual for the pond and vault to ensure stormwater receives water quality treatment throughout the O&M process.

Total Copper (mg/l) in STIA Stormwater Composite Samples July 1, 2013 to June 30, 2014



**Figure 6. Copper Results**

### 3.1.7.3 Lead

All data reported below are for total recoverable lead. The estimated median lead concentration for all outfalls was 0.0001 mg/L (Figure 7). Lead concentrations ranged from not detected to 0.0050 mg/L. Overall, lead was not detected in 43% of the 74 samples and was not detected in any sample from three outfalls (SDN-3A, SDW-1B, and SDW-2).

Total Lead (mg/L) in STIA Stormwater Composite Samples July 1, 2013 to June 30, 2014

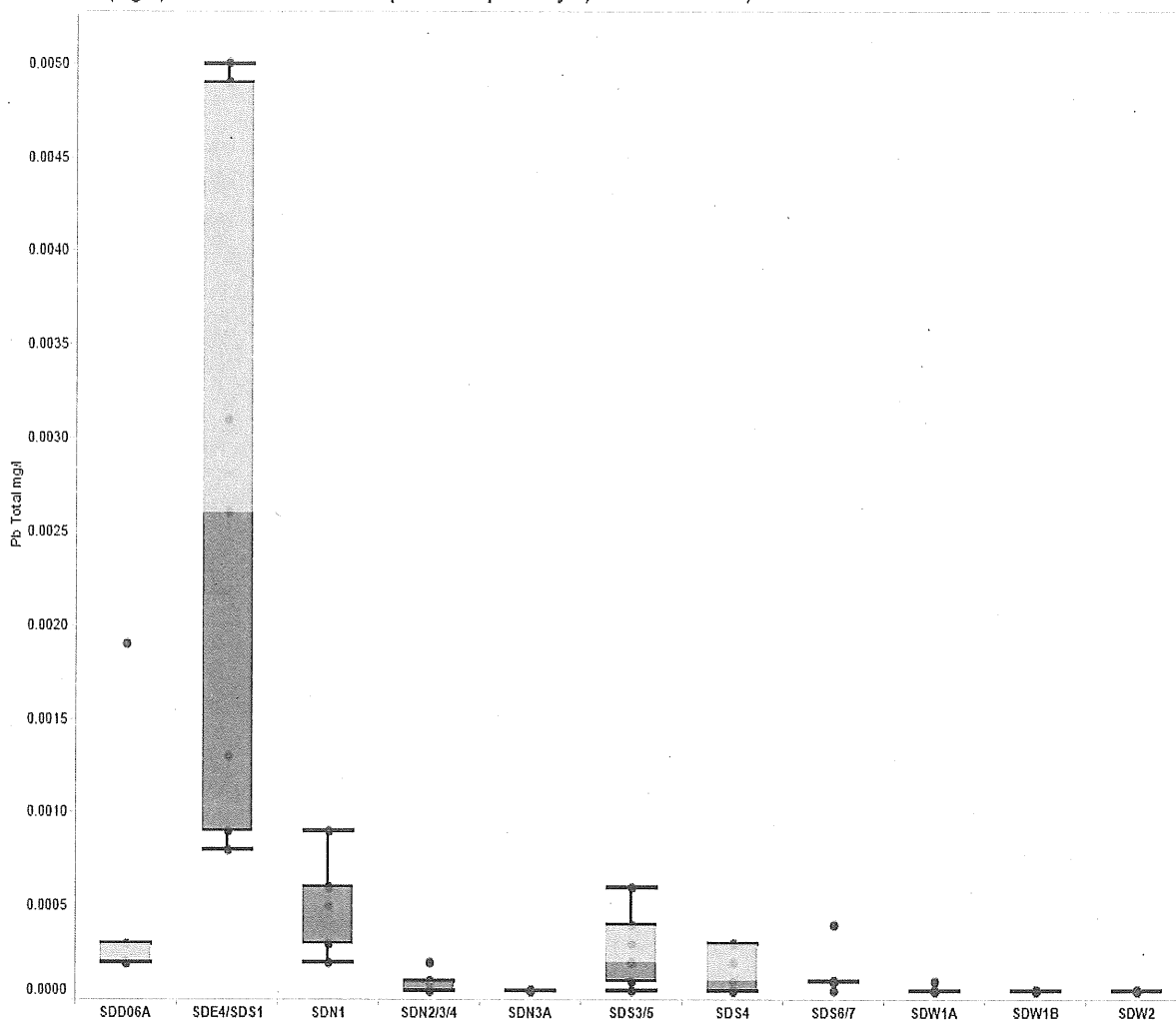


Figure 7. Lead Results

### 3.1.7.4 Zinc

All data reported are for total recoverable zinc. The median zinc concentration at all outfalls was 0.008 mg/L. Zinc concentrations ranged from not detected to 0.124 mg/L. One effluent limit exceedance occurred during the monitoring period (Figure 8) at the SDE4/S1 outfall and was associated with maintenance of the SDE4/S1 pond and filter vault as previously described in Section 3.1.7.2. Two landside subbasins, SDN-1 and SDE4/S1 had the highest range of zinc concentrations at 0.017 mg/L to 0.094 mg/L and 0.015 mg/L to 0.124 mg/L, respectively. In comparison airfield subbasin zinc concentrations range from not detected to 0.018 mg/L.

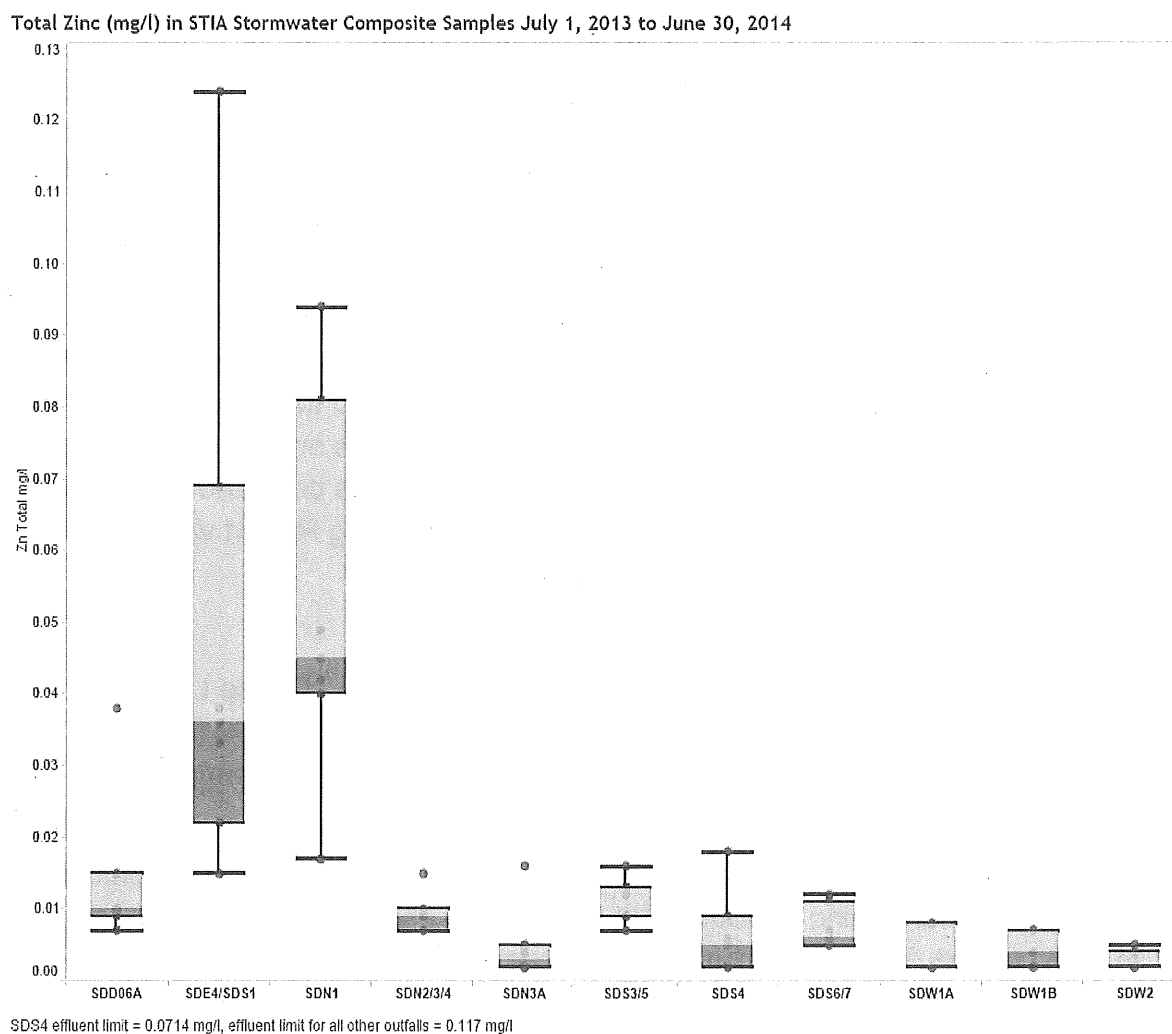


Figure 8. Zinc Results

## **3.2 Toxicity Monitoring**

The following section discusses stormwater monitoring data related to sublethal toxicity sampling as well as a description of an *in situ* monitoring program that was completed during fall season 2013 and spring season 2014.

### **3.2.1 Sublethal Toxicity Sampling**

Part II. S8.A of the permit requires sublethal toxicity testing on ambient samples from Miller Creek, Des Moines Creek, Walker Creek, Northwest Ponds, and Lake Reba biannually in the fall and spring during times of stormwater or snow melt runoff. If possible, another test is also required at stations receiving runoff from areas where deicing and anti-icing operations are occurring (winter event).

During the reporting period, samples were collected during fall 2013 only. Samples were not collected during winter deicing season because the toxicity laboratory was overwhelmed with other testing and could not accommodate additional samples during the one sampling opportunity of the season. Samples were not collected in spring 2014 because rainbow trout eggs were not available to conduct the test during times when stormwater runoff was occurring; however in-situ testing was completed during the spring as described in Section 3.2.2 below.

During fall season, samples were collected from the East Branch of Des Moines Creek (DME), downstream of the confluence of the East and West Branch of Des Moines Creek (EWConf), the outlet of Northwest Ponds (NPOUT), the outlet of Lake Reba (RBOUT), Miller Creek at 8<sup>th</sup> Avenue (MC8TH) and the headwaters of Walker Creek (WLKR). The sublethal toxicity sampling locations are shown on Figure 1. There was no toxicity associated with any of the samples collected during the fall sampling event. The Fall 2013 Sublethal Toxicity Testing Report was submitted to Ecology on January 10, 2014 (Nautilus 2013b).

### **3.2.2 In Situ Toxicity Monitoring**

During the 2013-2014 reporting period, the Port continued Phase I *in situ* testing per the *In Situ* Monitoring Plan that was submitted to Ecology in 2009 (Nautilus, 2010). Testing was conducted during the 2013 fall season and 2014 spring season at three instream locations shown on Figure 1.

The *in situ* monitoring approach utilizes the early life stage (ELS) salmonid bioassay testing procedure using rainbow trout that can be applied in a laboratory or field (i.e., *in situ*) context. The test encompasses a number of developmental milestones (e.g., hatching, yolk-sac absorption, etc.), and provides a variety of biological endpoints, such as survival and growth, that can be used to assess water quality. Phase I was originally intended to last for one year and include testing from spring and fall seasons. However, this phase is being extended to allow for additional comparison



with the sublethal testing currently being conducted by the Port at sites downstream of Port outfalls as identified in Part II, Special Condition S8 of the Permit.

In fall 2013, adverse effects on survival were observed in Miller Creek, with hatching success, post-hatch survival and cumulative survival significantly reduced compared to the controls. The rainfall total for fall 2013 was one of the smallest amounts recorded during an *in situ* exposure over the last 4 years, regardless of season. Therefore, the amount of discharge from STIA was limited; the stormwater outfall located immediately upstream of the site was only seen discharging on the day of test termination. Thus, test conditions during the fall season may have been more representative of seasonal base flow conditions. Field measurements of temperature, dissolved oxygen, pH and conductivity were collected weekly and were all within ranges tolerated by early life stages of salmonids. No evidence of adverse effects were observed in the hatch boxes deployed at Miller Creek in spring 2014, which experienced appreciably more discharge during the exposure period.

There were no adverse effects observed at Des Moines at S 200th during the fall or spring season deployments. Conversely, significant effects were observed at the Upstream Des Moines Creek site during both events. This result is consistent with previous testing events, and continues to suggest that there are concerns with water quality at this site which is located near the headwaters of Des Moines Creek, upstream of inputs from STIA property. These findings have been communicated to the City of SeaTac, who are working to identify and remove illicit discharges and connections in the watershed through the City's illicit discharge detection and elimination program.

### **3.3 Other Monitoring**

#### **3.3.1 Agreed Order 8755 Monitoring – Stormwater pH Study Results**

On January 11, 2012 the Port entered into an Agreed Order with Ecology to evaluate the cause of the pH exceedances and evaluate steps to prevent future occurrences (WDOE, 2012). The Agreed Order required the Port to monitor pH of runoff entering each pond, pH of the effluent discharged from each pond, and pH in the receiving water downstream of each pond's outlet. Study related monitoring was conducted from November 2011 through May 2012, following the sampling frequency specified in the Port's NPDES permit. The results of the study indicate that primary productivity within the ponds, through the process of photosynthesis, caused elevated pH levels at the pond outfalls. Results of the continuous pH monitoring in the receiving waters show that pH downstream from the pond discharge locations

were within the 6.5 to 8.5 range in both wet and dry weather conditions (Cardno TEC, Inc. 2012).

Following submittal of the pH Study results to Ecology in October 2012, the Port recommended continued receiving water monitoring for pH concurrent with routine NPDES storm events. The continued monitoring of pH at the pond outfall and receiving water during storm events in the 2013/2014 monitoring period continue to support the results of the pH study. The 2013/2014 monitoring results have been submitted to Ecology quarterly along with the DMRs.

#### **4 PERMIT COMPLIANCE AND BMP IMPLEMENTATION**

Condition S5.A.3 of the Airport's NPDES permit requires implementation of BMPs necessary to eliminate or reduce the potential to contaminate stormwater. During the 2013 – 2014 monitoring period overall permit compliance was high with only six instances of non-compliance out of the 370 constituents analyzed in relation to permit effluent limits (1.6%). The high level of compliance continues to demonstrate the success of the Port's Adaptive Management Stormwater Program in effectively responding to previous permit effluent limit exceedances through design and construction of new stormwater controls to meet permit limits. It also points to the effectiveness of the Port's Stormwater Pollution Prevention Program (SWPPP) in implementing effective operational source control and BMP inspection and maintenance.

## 5 SUMMARY AND CONCLUSIONS

During the reporting period from July 2013 to June 2014 the Port fulfilled requirements for outfall monitoring under the current NPDES permit by collecting a total of 74 grab samples and 74 composite stormwater samples during 21 storm events. Outfalls were sampled quarterly when discharges occurred from rain events that met the minimum rainfall criteria of 0.1 inch. There were only six instances of effluent limit exceedance associated with 370 constituents that were tested to meet the monitoring requirements of the NPDES permit. This high level of compliance is an indication that the stormwater BMPS and the overall stormwater management program are effective at mitigating impacts from Airport operations on the adjacent receiving waters.

No sublethal toxicity was found in instream samples below STIA outfalls during the monitoring period. Adverse effects were observed during the Fall 2013 *in situ* monitoring in Miller Creek; however the monitoring period was characterized by very little rainfall with no discharge from Port outfalls until the last day of the exposure period. This suggests the adverse effects were more characteristic of stream base-flow conditions vs. airport discharges. The *in situ* testing continued to be a reliable and consistent monitoring approach that is less likely to be impacted by the timing of storm events, laboratory scheduling and rainbow trout egg availability.

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## **APPENDIX A TABULAR NPDES SAMPLE DATA SUMMARIES and STATISTICS**

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# NPDES Grab Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

All Outfalls	CONCENTRATION, mg/L					
	pH	Sheen	TPH-Dx	TPH-D	TPH-MO	Turb
Count	74	74	74	74	74	74
Max	8.7		6.60	1.50	5.10	16
95th	8.3		0.84	0.32	0.55	7
75th	7.8		0.20	0.05	0.10	2
Median	7.5		0.15	0.05	0.10	1.52
25th	7.2		0.15	0.05	0.10	1
Min	5.3		0.15	0.05	0.10	0.14
SD	0.5		1.40	0.33	1.08	4
CV%	7%		188%	135%	217%	99%
#NonDetects	0	0	55	57	61	0
%NonDetects	0%	0%	74%	77%	82%	0%
#Trimmed	0	0	0	0	0	0
%Trimmed	0%	0%	0%	0%	0%	0%
SDE4/SDS1 (002)						
Count	7	7	7	7	7	7
Max	7.5		6.60	1.50	5.10	16
95th	7.4		4.83	1.11	3.73	12
75th	7.2		0.60	0.18	0.42	3
Median	7.1		0.26	0.16	0.10	2.42
25th	6.8		0.19	0.09	0.10	2
Min	6.8		0.15	0.05	0.10	1.04
SD	0.3		2.38	0.52	1.86	5
CV%	4%		194%	164%	205%	127%
#NonDetects	0	0	2	2	4	0
%NonDetects	0%	0%	29%	29%	57%	0%
#Trimmed	0	0	0	0	0	0
%Trimmed	0%	0%	0%	0%	0%	0%

# NPDES Grab Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

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	pH	Sheen	TPH-Dx	TPH-D	TPH-MO	Turb
SDS3/5 (005)	Count	7	7	7	7	7
	Max	7.8	0.15	0.05	0.10	1.83
	95th	7.8	0.15	0.05	0.10	2
	75th	7.8	0.15	0.05	0.10	1
	Median	7.7	0.15	0.05	0.10	0.74
	25th	7.7	0.15	0.05	0.10	1
	Min	7.5	0.15	0.05	0.10	0.54
	SD	0.1	0.00	0.00	0.00	0
	CV%	1%	0%	0%	0%	46%
	#NonDetects	0	0	7	7	0
	%NonDetects	0%	100%	100%	100%	0%
SDS4 (009)	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%
	Count	7	7	7	7	7
	Max	7.5	0.15	0.05	0.10	2.82
	95th	7.5	0.15	0.05	0.10	2
	75th	7.3	0.15	0.05	0.10	1
	Median	7.3	0.15	0.05	0.10	1.03
	25th	7.2	0.15	0.05	0.10	1
	Min	7.2	0.15	0.05	0.10	0.3
	SD	0.1	0.00	0.00	0.00	1
	CV%	2%	0%	0%	0%	74%
	#NonDetects	0	0	7	7	0
	%NonDetects	0%	100%	100%	100%	0%
	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\WPNPDESGrabStats

# NPDES Grab Statistics 7/1/2013 - 6/30/2014 CONCENTRATION, mg/L

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		pH	Sheen	TPH-Dx	TPH-D	TPH-MO	Turb
SDS67 (014)		Count	7	7	7	7	7
		Max	7.7	0.44	0.34	0.10	3.24
		95th	7.7	0.41	0.31	0.10	3
		75th	7.6	0.29	0.19	0.10	3
		Median	7.4	0.15	0.05	0.10	2.36
		25th	7.3	0.15	0.05	0.10	1
		Min	7.2	0.15	0.05	0.10	0.75
		SD	0.2	0.12	0.12	0.00	1
		CV%	3%	50%	88%	0%	49%
		#NonDetects	0	0	4	7	0
		%NonDetects	0%	0%	57%	100%	0%
		#Trimmed	0	0	0	0	0
		%Trimmed	0%	0%	0%	0%	0%
SDN1 (006)		Count	7	7	7	7	7
		Max	7.0	1.63	0.74	0.89	10.6
		95th	7.0	1.45	0.63	0.81	10
		75th	6.9	0.93	0.34	0.59	7
		Median	6.7	0.58	0.25	0.33	5.07
		25th	6.4	0.46	0.22	0.23	3
		Min	5.3	0.27	0.17	0.10	2.25
		SD	0.6	0.46	0.20	0.28	3
		CV%	9%	62%	60%	66%	59%
		#NonDetects	0	0	0	1	0
		%NonDetects	0%	0%	0%	14%	0%
		#Trimmed	0	0	0	0	0
		%Trimmed	0%	0%	0%	0%	0%

# NPDES Grab Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

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	pH	Sheen	TPH-Dx	TPH-D	TPH-MO	Turb
SDW2 (016)	Count	6	6	6	6	6
	Max	8.7	0.25	0.05	0.20	2.08
	95th	8.6	0.22	0.05	0.17	2
	75th	8.2	0.15	0.05	0.10	2
	Median	8.1	0.15	0.05	0.10	1.395
	25th	7.9	0.15	0.05	0.10	1
	Min	7.7	0.15	0.05	0.10	0.37
	SD	0.4	0.04	0.00	0.04	1
	CV%	4%	24%	0%	35%	51%
	#NonDetects	0	5	6	5	0
	%NonDetects	0%	83%	100%	83%	0%
	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%
SDW1B (017)	Count	7	7	7	7	7
	Max	8.5	0.15	0.05	0.10	2.41
	95th	8.4	0.15	0.05	0.10	2
	75th	8.2	0.15	0.05	0.10	2
	Median	8.0	0.15	0.05	0.10	1.12
	25th	7.4	0.15	0.05	0.10	1
	Min	6.9	0.15	0.05	0.10	0.14
	SD	0.6	0.00	0.00	0.00	1
	CV%	7%	0%	0%	0%	72%
	#NonDetects	0	7	7	7	0
	%NonDetects	0%	100%	100%	100%	0%
	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\SWNPDESGrabStats

# NPDES Grab Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

	pH	Sheen	TPH-Dx	TPH-D	TPH-MO	Turb
SDW1A (018)	Count	7	7	7	7	7
	Max	8.5		0.49	0.05	0.44
	95th	8.4		0.39	0.05	0.34
	75th	8.1		0.15	0.05	0.10
	Median	7.9		0.15	0.05	0.10
	25th	7.6		0.15	0.05	0.10
	Min	7.4		0.15	0.05	0.10
	SD	0.4		0.13	0.00	0.13
	CV%	5%		66%	0%	86%
	#NonDetects	0	0	6	7	6
SDN3A (019)	%NonDetects	0%	0%	86%	100%	86%
	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%
	Count	6	6	6	6	6
SDN3A (019)	Max	8.0		0.54	0.29	0.25
	95th	8.0		0.44	0.23	0.21
	75th	7.9		0.15	0.05	0.10
	Median	7.8		0.15	0.05	0.10
	25th	7.6		0.15	0.05	0.10
	Min	7.6		0.15	0.05	0.10
	SD	0.2		0.16	0.10	0.06
	CV%	2%		74%	109%	49%
	#NonDetects	0	0	5	5	5
	%NonDetects	0%	0%	83%	83%	83%
SDN3A (019)	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%
	Count	6	6	6	6	6
	Max	8.0		0.54	0.29	0.25
SDN3A (019)	95th	8.0		0.44	0.23	0.21
	75th	7.9		0.15	0.05	0.10
	Median	7.8		0.15	0.05	0.10
	25th	7.6		0.15	0.05	0.10
	Min	7.6		0.15	0.05	0.10
	SD	0.2		0.16	0.10	0.06
	CV%	2%		74%	109%	49%
	#NonDetects	0	0	5	5	5
	%NonDetects	0%	0%	83%	83%	83%
	#Trimmed	0	0	0	0	0
SDN3A (019)	%Trimmed	0%	0%	0%	0%	0%
	Count	6	6	6	6	6
	Max	8.0		0.54	0.29	0.25
	95th	8.0		0.44	0.23	0.21
SDN3A (019)	75th	7.9		0.15	0.05	0.10
	Median	7.8		0.15	0.05	0.10
	25th	7.6		0.15	0.05	0.10
	Min	7.6		0.15	0.05	0.10
	SD	0.2		0.16	0.10	0.06
	CV%	2%		74%	109%	49%
	#NonDetects	0	0	5	5	5
	%NonDetects	0%	0%	83%	83%	83%
	#Trimmed	0	0	0	0	0
	%Trimmed	0%	0%	0%	0%	0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\WPNPDESGrabStats

# NPDES Grab Statistics 7/1/2013 - 6/30/2014 CONCENTRATION, mg/L

SDN2/3/4 (007)										pH	Sheen	TPH-Dx	TPH-D	TPH-MO	Turb
Count										6	6	6	6	6	6
Max										8.3		0.15	0.05	0.10	7.87
95th										8.2		0.15	0.05	0.10	8
75th										8.0		0.15	0.05	0.10	6
Median										7.8		0.15	0.05	0.10	2.9
25th										7.6		0.15	0.05	0.10	2
Min										7.5		0.15	0.05	0.10	0.69
SD										0.3		0.00	0.00	0.00	3
CV%										4%		0%	0%	0%	79%
#NonDetects										0	0	6	6	6	0
%NonDetects										0%	0%	100%	100%	100%	0%
#Trimmed										0	0	0	0	0	0
%Trimmed										0%	0%	0%	0%	0%	0%
SDD06A (020)										Count	7	7	7	7	7
Max										7.3		0.86	0.31	0.55	3.86
95th										7.3		0.65	0.23	0.41	3
75th										7.3		0.15	0.05	0.10	2
Median										7.2		0.15	0.05	0.10	1.53
25th										6.9		0.15	0.05	0.10	1
Min										6.4		0.15	0.05	0.10	0.75
SD										0.3		0.27	0.10	0.17	1
CV%										5%		107%	113%	104%	56%
#NonDetects										0	0	6	6	6	0
%NonDetects										0%	0%	86%	86%	86%	0%
#Trimmed										0	0	0	0	0	0
%Trimmed										0%	0%	0%	0%	0%	0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\WNPDESGrabStats

# NPDES Grab Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

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Landside (SDE4/SDS1, SDN1, SDD06A)										
	Count	21	21	21	21	21	21	21	21	21
Max	7.5			6.60	1.50	5.10	16			
95th	7.3			1.63	0.74	0.89	11			
75th	7.2			0.71	0.25	0.52	4			
Median	7.0			0.27	0.17	0.10	2.42			
25th	6.7			0.15	0.05	0.10	2			
Min	5.3			0.15	0.05	0.10	0.75			
#NonDetects	0	0	8	8	11	0	0			
%NonDetects	0%	0%	38%	38%	52%	0%	0%			
#Trimmed	0	0	0	0	0	0	0			
%Trimmed	0%	0%	0%	0%	0%	0%	0%			
Count	53	53	53	53	53	53	53			
Airfield (SDS3/5, SDS4, SDS6/7, SDW2, SDW1B, SDW1A, SDN3A, SDN2/3/4)										
Max	8.7			0.54	0.34	0.44	7.87			
95th	8.4			0.37	0.18	0.14	4			
75th	7.9			0.15	0.05	0.10	2			
Median	7.7			0.15	0.05	0.10	1.3			
25th	7.5			0.15	0.05	0.10	1			
Min	6.9			0.15	0.05	0.10	0.14			
SD	0.4			0.08	0.06	0.05	1			
CV%	5%			48%	88%	47%	88%			
#NonDetects	0	0	47	49	50	0	0			
%NonDetects	0%	0%	89%	92%	94%	0%	0%			
#Trimmed	0	0	0	0	0	0	0			
%Trimmed	0%	0%	0%	0%	0%	0%	0%			

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\WNPDESGrabStats

SAMPLE DATA

STORM CHARACTERISTICS

CONCENTRATION, mg/L

Seq	Out fall	Sample ID	Storm Date	Dpth in	Dur hr	Maxint in/hr	24hrant in	48hrant in	Dryant hr	Ground Deice?	pH	Sheen	TPH- Dx	TPH - D	TPH - MO	Turb
1	SDE4/SDS1	SDE4/S1081513GRAB	8/14/2013	0.11	18	0.05	0	0	279	No	7.24	No Sheen	6.6	1.5	5.1	16.0
2	SDE4/SDS1	SDE4/S11102133GRAB	11/12/2013	0.5	8	0.15	0	0.01	46	No	7.51	No Sheen	0.71	0.19	0.52	1.93
3	SDE4/SDS1	SDE4/S11130133GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	6.77	No Sheen	0.22	0.12	<0.20	2.42
4	SDE4/SDS1	SDE4/S1010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	6.86	No Sheen	<0.3	<0.10	<0.20	1.04
5	SDE4/SDS1	SDE4/S1020914GRAB	2/9/2014	0.94	41	0.14	0	0	366	No	7.05	No Sheen	0.49	0.17	0.32	4.09
6	SDE4/SDS1	SDE4/S1040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	7.24	No Sheen	0.26	0.16	<0.20	2.49
7	SDE4/SDS1	SDE4/S1050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	6.78	No Sheen	<0.3	<0.10	<0.20	1.35
8	SDS3/5	SDS3/5090513GRAB	9/5/2013	0.2	2	0.08	0	0.01	25	No	7.77	No Sheen	<0.3	<0.10	<0.20	1.83
9	SDS3/5	SDS3/51102133GRAB	11/12/2013	0.5	8	0.15	0	0.01	46	No	7.71	No Sheen	<0.3	<0.10	<0.20	0.70
10	SDS3/5	SDS3/51201133GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	7.80	No Sheen	<0.3	<0.10	<0.20	0.74
11	SDS3/5	SDS3/5012914GRAB	1/28/2014	1.21	28	0.14	0	0.01	44	No	7.66	No Sheen	<0.3	<0.10	<0.20	1.02
12	SDS3/5	SDS3/5020914GRAB	2/9/2014	0.94	41	0.14	0	0	366	No	7.47	No Sheen	<0.3	<0.10	<0.20	0.54
13	SDS3/5	SDS3/5040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	7.79	No Sheen	<0.3	<0.10	<0.20	0.68
14	SDS3/5	SDS3/5050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.73	No Sheen	<0.3	<0.10	<0.20	1.12
15	SDS4	SDS4/0829133GRAB	8/29/2013	0.76	21	0.32	0.24	0.3	17	No	7.25	No Sheen	<0.3	<0.10	<0.20	1.30
16	SDS4	SDS4/1102133GRAB	11/12/2013	0.5	8	0.15	0	0.01	46	No	7.52	No Sheen	<0.3	<0.10	<0.20	0.30
17	SDS4	SDS4/1201133GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	7.37	No Sheen	<0.3	<0.10	<0.20	1.03
18	SDS4	SDS4/013114GRAB	1/31/2014	0.11	3	0.06	0	0.39	30	No	7.29	No Sheen	<0.3	<0.10	<0.20	1.38
19	SDS4	SDS4/021014GRAB	2/9/2014	0.94	41	0.14	0	0	366	No	7.20	No Sheen	<0.3	<0.10	<0.20	0.32
20	SDS4	SDS4/040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	7.31	No Sheen	<0.3	<0.10	<0.20	0.94
21	SDS4	SDS4/050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.18	No Sheen	<0.3	<0.10	<0.20	2.82
22	SDS6/7	SDS6/70828133GRAB	8/27/2013	0.3	21	0.15	0.08	0.09	16	No	7.31	No Sheen	0.44	0.34	<0.20	3.24
23	SDS6/7	SDS6/71102133GRAB	11/12/2013	0.5	8	0.15	0	0.01	46	No	7.42	No Sheen	0.25	0.15	<0.20	1.51
24	SDS6/7	SDS6/71130133GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	7.58	No Sheen	<0.3	<0.10	<0.20	0.95
25	SDS6/7	SDS6/7010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	7.70	No Sheen	<0.3	<0.10	<0.20	2.36
26	SDS6/7	SDS6/7021014GRAB	2/9/2014	0.94	41	0.14	0	0	366	No	7.19	No Sheen	0.33	0.23	<0.20	3.17
27	SDS6/7	SDS6/7040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	7.69	No Sheen	<0.3	<0.10	<0.20	0.75
28	SDS6/7	SDS6/7050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.39	No Sheen	<0.3	<0.10	<0.20	2.63
29	SDN1	SDN10920133GRAB	9/20/2013	0.11	1	0.06	0	0	105	No	6.99	No Sheen	0.48	0.24	0.24	5.47
30	SDN1	SDN11102133GRAB	11/12/2013	0.5	8	0.15	0	0.01	46	No	6.99	No Sheen	1.63	0.74	0.89	5.07
31	SDN1	SDN11130133GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	6.27	No Sheen	0.43	0.21	0.22	2.75
32	SDN1	SDN1010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	5.33	No Sheen	1.02	0.39	0.63	10.6



# NPDES Grab Sample Data 7/1/2013 - 6/30/2014

## SAMPLE DATA

## STORM CHARACTERISTICS

## CONCENTRATION, mg/L

Seq	Out fall	Sample ID	Storm Date	Dpth in	Dur hr	Maxint In/hr	24hrant in	48hrantDyent in hr	Ground Deice?	pH	Sheen	TPH- Dx	TPH - D	TPH - MO	Turb		
33	SDN1	SDN1020914GRAB	2/9/2014	0.94	41	0.14	0	0	366	No	6.60	No Sheen	0.83	0.28	0.55	8.38	
34	SDN1	SDN1041614GRAB	4/16/2014	1.18	42	0.13	0	0	170	No	6.69	No Sheen	0.58	0.25	0.33	2.25	
35	SDN1	SDN1050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	6.72	No Sheen	0.27	0.17	<0.20	2.95	
36	SDW2	SDW2110213GRAB	11/2/2013	0.5	8	0.15	0	0.01	46	No	8.04	No Sheen	0.25	<0.10	0.20	2.08	
37	SDW2	SDW2120113GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	8.22	No Sheen	<0.3	<0.10	<0.20	0.66	
38	SDW2	SDW2010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	8.15	No Sheen	<0.3	<0.10	<0.20	0.37	
39	SDW2	SDW2021414GRAB	2/14/2014	0.33	12	0.07	0.05	0.25	20	No	7.68	No Sheen	<0.3	<0.10	<0.20	1.53	
40	SDW2	SDW2040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	8.68	No Sheen	<0.3	<0.10	<0.20	1.26	
41	SDW2	SDW2050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.81	No Sheen	<0.3	<0.10	<0.20	1.57	
42	SDW1B	SDW1B093013GRAB	9/27/2013	3.29	106		0	0.01	48	No	7.30	No Sheen	<0.3	<0.10	<0.20	1.93	
43	SDW1B	SDW1B110213GRAB	11/2/2013	0.5	8	0.15	0	0.01	46	No	8.27	No Sheen	<0.3	<0.10	<0.20	1.12	
44	SDW1B	SDW1B113013GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	8.05	No Sheen	<0.3	<0.10	<0.20	0.58	
45	SDW1B	SDW1B010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	8.01	No Sheen	<0.3	<0.10	<0.20	0.46	
46	SDW1B	SDW1B030814GRAB	3/8/2014	1.25	15	0.17	0	0.01	44	No	6.88	No Sheen	<0.3	<0.10	<0.20	0.14	
47	SDW1B	SDW1B040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	8.46	No Sheen	<0.3	<0.10	<0.20	1.34	
48	SDW1B	SDW1B050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.56	No Sheen	<0.3	<0.10	<0.20	2.41	
49	SDW1A	SDW1A093013GRAB	9/27/2013	3.29	106		0	0.01	48	No	7.45	No Sheen	0.49	<0.10	0.44	4.64	
50	SDW1A	SDW1A110213GRAB	11/2/2013	0.5	8	0.15	0	0.01	46	No	8.49	No Sheen	<0.3	<0.10	<0.20	0.70	
51	SDW1A	SDW1A120113GRAB	11/30/2013	0.17	23	0.06	0.05	0.07	20	No	8.19	No Sheen	<0.3	<0.10	<0.20	1.02	
52	SDW1A	SDW1A010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	7.91	No Sheen	<0.3	<0.10	<0.20	0.88	
53	SDW1A	SDW1A021414GRAB	2/14/2014	0.33	12	0.07	0.05	0.25	20	No	7.54	No Sheen	<0.3	<0.10	<0.20	1.98	
54	SDW1A	SDW1A041614GRAB	4/16/2014	1.18	42	0.13	0	0	170	No	7.88	No Sheen	<0.3	<0.10	<0.20	2.14	
55	SDW1A	SDW1A050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.72	No Sheen	<0.3	<0.10	<0.20	2.29	
56	SDN3A	SDN3A110213GRAB	11/2/2013	0.5	8	0.15	0	0.01	46	No	7.63	No Sheen	0.54	0.29	0.25	1.97	
57	SDN3A	SDN3A121213GRAB	12/12/2013	0.3	11	0.08	0	0	230	No	7.95	No Sheen	<0.3	<0.10	<0.20	0.65	
58	SDN3A	SDN3A010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	7.89	No Sheen	<0.3	<0.10	<0.20	0.78	
59	SDN3A	SDN3A021414GRAB	2/14/2014	0.33	12	0.07	0.05	0.25	20	No	7.69	No Sheen	<0.3	<0.10	<0.20	2.99	
60	SDN3A	SDN3A040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	7.98	No Sheen	<0.3	<0.10	<0.20	0.86	
61	SDN3A	SDN3A050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	7.60	No Sheen	<0.3	<0.10	<0.20	1.47	
62	SDN2/3/4	SDN2/3/4110713GRAB	11/6/2013	1.1	27	0.21	0	0.11	32	No	7.58	No Sheen	<0.3	<0.10	<0.20	7.11	
63	SDN2/3/4	SDN2/3/4122113GRAB	12/20/2013	0.96	70	0.09	0	0.01	47	No	7.48	No Sheen	<0.3	<0.10	<0.20	0.69	
64	SDN2/3/4	SDN2/3/4012914GRAB	1/28/2014	1.21	28	0.14	0	0.01	44	No	7.82	No Sheen	<0.3	<0.10	<0.20	1.35	

# NPDES Grab Sample Data 7/1/2013 - 6/30/2014

## SAMPLE DATA

## STORM CHARACTERISTICS

## CONCENTRATION, mg/L

Seq	Out fall	Sample ID	Storm Date	Dpth in	Dur hr	Maxint in/hr	24hrant in	48hrant in	Dryant hr	Ground Deice?	pH	Sheen	TPH- Dx	TPH - D	TPH - MO	Turb
65	SDN2/3/4	SDN2/3/4021414GRAB	2/14/2014	0.33	12	0.07	0.05	0.25	20	No	7.80	No Sheen	< 0.3	< 0.10	< 0.20	3.43
66	SDN2/3/4	SDN2/3/4040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	8.05	No Sheen	< 0.3	< 0.10	< 0.20	7.87
67	SDN2/3/4	SDN2/3/4050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	8.28	No Sheen	< 0.3	< 0.10	< 0.20	2.37
68	SDD06A	SDD06A082913GRAB	8/29/2013	0.76	21	0.32	0.24	0.3	17	No	7.35	No Sheen	0.86	0.31	0.55	3.86
69	SDD06A	SDD06A110213GRAB	11/2/2013	0.5	8	0.15	0	0.01	46	No	7.25	No Sheen	< 0.3	< 0.10	< 0.20	0.75
70	SDD06A	SDD06A121213GRAB	12/12/2013	0.3	11	0.08	0	0	230	No	7.08	No Sheen	< 0.3	< 0.10	< 0.20	1.74
71	SDD06A	SDD06A010714GRAB	1/6/2014	0.78	43	0.08	0	0	78	No	7.20	No Sheen	< 0.3	< 0.10	< 0.20	1.53
72	SDD06A	SDD06A021014GRAB	2/9/2014	0.94	41	0.14	0	0	366	No	6.39	No Sheen	< 0.3	< 0.10	< 0.20	2.01
73	SDD06A	SDD06A040814GRAB	4/8/2014	0.18	10	0.06	0	0	69	No	7.27	No Sheen	< 0.3	< 0.10	< 0.20	1.31
74	SDD06A	SDD06A050814GRAB	5/8/2014	0.12	10	0.51	0	0	73	No	6.79	No Sheen	< 0.3	< 0.10	< 0.20	1.24

# NPDES Composite Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

All Outfalls	TSS		E-Glycol	P-Glycol	Total Glycol	Cu	Pb	Zn
	Turb, NTU							
Count			66	66		74	74	74
Max			5	30		0.052	0.00500	0.124
95th			5.0	5.0		0.013	0.00214	0.056
75th			5.0	5.0		0.010	0.00030	0.015
Median			5	5		0.006	0.00010	0.008
25th			5.0	5.0		0.004	0.00005	0.004
Min			5	5		0.002	0.00005	0.002
SD			0.0	5.2		0.010	0.00148	0.031
CV%			0%	83%		87%	122%	81%
#NonDetects			66	63		0	32	17
%NonDetects			100%	95%		0%	43%	23%
#Trimmed			0	0		0	0	0
%Trimmed			0%	0%		0%	0%	0%

SDE4/SDS1 (002)									
Count			6	6		7	7	7	
Max			5	27		0.052	0.00500	0.124	
95th			5.0	21.5		0.043	0.00497	0.108	
75th			5.0	5.0		0.019	0.00400	0.054	
Median			5	5		0.012	0.00260	0.036	
25th			5.0	5.0		0.012	0.00110	0.027	
Min			5	5		0.009	0.00080	0.015	
SD			0.0	9.0		0.015	0.00178	0.038	
CV%			0%	104%		78%	67%	78%	
#NonDetects			6	5		0	0	0	
%NonDetects			100%	83%		0%	0%	0%	
#Trimmed			0	0		0	0	0	
%Trimmed			0%	0%		0%	0%	0%	

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\reports\NPDESCompStats

# NPDES Composite Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

SDS3/5 (005)	CONCENTRATION, mg/L					
	TSS	Turb, NTU	E-Glycol	P-Glycol	Total Glycol	
Count			6	6		7
Max			5	30		0.013
95th			5.0	23.8		0.013
75th			5.0	5.0		0.013
Median			5	5		0.012
25th			5.0	5.0		0.010
Min			5	5		0.007
SD			0.0	10.2		0.003
CV%			0%	111%		22%
#NonDetects			6	5		0
%NonDetects			100%	83%		0%
#Trimmed			0	0		0
%Trimmed			0%	0%		0%

SDS4 (009)	CONCENTRATION, mg/L					
	TSS	Turb, NTU	E-Glycol	P-Glycol	Total Glycol	
Count			6	6		7
Max			5	16		0.011
95th			5.0	13.3		0.010
75th			5.0	5.0		0.008
Median			5	5		0.006
25th			5.0	5.0		0.004
Min			5	5		0.003
SD			0.0	4.5		0.003
CV%			0%	66%		50%
#NonDetects			6	5		0
%NonDetects			100%	83%		0%
#Trimmed			0	0		0
%Trimmed			0%	0%		0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\WNPDESCompStats

# NPDES Composite Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

SDS6/7 (014)	TSS		E-Glycol	P-Glycol	Total Glycol	Cu	Pb	Zn
	Turb, NTU							
Count			6	6		7	7	7
Max			5	5		0.008	0.00040	0.012
95th			5.0	5.0		0.008	0.00031	0.012
75th			5.0	5.0		0.007	0.00010	0.009
Median			5	5		0.006	0.00010	0.006
25th			5.0	5.0		0.006	0.00010	0.005
Min			5	5		0.005	0.00005	0.005
SD			0.0	0.0		0.001	0.00012	0.003
CV%			0%	0%		15%	87%	41%
#NonDetects			6	6		0	1	0
%NonDetects			100%	100%		0%	14%	0%
#Trimmed			0	0		0	0	0
%Trimmed			0%	0%		0%	0%	0%

SDN1 (006)	Count		6	6	7	7	7
Max			5	5		0.014	0.00090
95th			5.0	5.0		0.014	0.00081
75th			5.0	5.0		0.012	0.00060
Median			5	5		0.011	0.00060
25th			5.0	5.0		0.010	0.00040
Min			5	5		0.008	0.00020
SD			0.0	0.0		0.002	0.00023
CV%			0%	0%		19%	43%
#NonDetects			6	6		0	0
%NonDetects			100%	100%		0%	0%
#Trimmed			0	0		0	0
%Trimmed			0%	0%		0%	0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\rpts\NPDESCompStats

# NPDES Composite Statistics 7/1/2013 - 6/30/2014 CONCENTRATION, mg/L

SDW2 (016)									
Count	TSS	Turb, NTU	E- Glycol	P- Glycol	Total Glycol	Cu	Pb	Zn	
Max			6	6		6	6	6	
95th			5	5		0.006	0.00005	0.005	
75th			5.0	5.0		0.005	0.00005	0.005	
Median			5.0	5.0		0.005	0.00005	0.004	
25th			5	5		0.004	0.00005	0.002	
Min			5.0	5.0		0.004	0.00005	0.002	
SD			5	5		0.004	0.00005	0.002	
CV%			0.0	0.0		0.001	0.00000	0.001	
#NonDetects			0%	0%		16%	0%	47%	
%NonDetects			6	6		0	6	4	
#Trimmed			100%	100%		0%	100%	67%	
%Trimmed			0	0		0	0	0	
			0%	0%		0%	0%	0%	

SDW1B (017)	Count				6	6	7	7	7
	Max				5	5	0.005	0.00005	0.007
	95th				5.0	5.0	0.005	0.00005	0.007
	75th				5.0	5.0	0.005	0.00005	0.005
	Median				5	5	0.004	0.00005	0.004
	25th				5.0	5.0	0.003	0.00005	0.002
	Min				5	5	0.003	0.00005	0.002
	SD				0.0	0.0	0.001	0.00000	0.002
	CV%				0%	0%	20%	0%	56%
	#NonDetects				6	6	0	7	3
	%NonDetects				100%	100%	0%	100%	43%
	#Trimmed				0	0	0	0	0
	%Trimmed				0%	0%	0%	0%	0%

Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
C:\Env-apps\EMIS\_SQL\SurfaceWater\_SQL.mdb\prjSWNPDESCompStats

CONCENTRATION, mg/L

SDN3A (0/19)									
Count				6	6		6	6	6
Max				5	5		0.003	0.000005	0.016
95th				5.0	5.0		0.003	0.000005	0.013
75th				5.0	5.0		0.003	0.000005	0.005
Median				5	5		0.003	0.000005	0.003
25th				5.0	5.0		0.003	0.000005	0.002
Min				5	5		0.002	0.000005	0.002
SD				0.0	0.0		0.000	0.000000	0.005
CV%				0%	0%		9%	0%	106%
#NonDetects				6	6		0	6	3
%NonDetects				100%	100%		0%	100%	50%
#Trimmed				0	0		0	0	0
%Trimmed				0%	0%		0%	0%	0%

# NPDES Composite Statistics 7/1/2013 - 6/30/2014

CONCENTRATION, mg/L

SDN23/4 (007)									
	Count	TSS	Turb, NTU	E- Glycol	P- Glycol	Total Glycol	Cu	Pb	Zn
	Max			6	6		6	6	6
	95th			5	5		0.010	0.00020	0.015
	75th			5.0	5.0		0.010	0.00017	0.014
	Median			5.0	5.0		0.009	0.00010	0.010
	25th			5	5		0.009	0.00010	0.009
				5.0	5.0		0.008	0.00006	0.007
	Min			5	5		0.007	0.00005	0.007
	SD			0.0	0.0		0.001	0.00005	0.003
	CV%			0%	0%		11%	55%	31%
	#NonDetects			6	6		0	2	0
	%NonDetects			100%	100%		0%	33%	0%
	#Trimmed			0	0		0	0	0
	%Trimmed			0%	0%		0%	0%	0%

SDD06A (020)	Count																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</
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Values qualified as non-detect (<) calculated at 1/2 the reported detection limit.  
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CONCENTRATION, mg/L

Count	48	48	53	53	53
Airfield (SDS3/5, SDS4, SDS6/7, SDW2, SDW1/B, SDW1/A, SDN3A, SDN2/3/4)					
Max	5	30	0.013	0.00060	0.018
95th	5.0	5.0	0.012	0.00034	0.015
75th	5.0	5.0	0.008	0.00010	0.009
Median	5	5	0.005	0.00005	0.005
25th	5.0	5.0	0.003	0.00005	0.002
Min	5	5	0.002	0.00005	0.002
SD	0.0	3.9	0.003	0.00011	0.004
CV%	0%	68%	53%	103%	68%
#NonDetects	48	46	0	32	17
%NonDetects	100%	96%	0%	60%	32%
#Trimmed	0	0	0	0	0
%Trimmed	0%	0%	0%	0%	0%

SAMPLE DATA

STORM CHARACTERISTICS

CONCENTRATION, mg/L

NPDES Composite Sample Data 7/1/2013 - 6/30/2014

Seq	Out fall	Sample ID	Storm Date	Dpth in	Dur hr	Maxint in/hr	24hrant in	48hrant in	Dryant hr	Ground Deice?	Turb, NTU	E- Glycol	P- Glycol	Total Glycol	Cu	Pb	Zn		
1	SDE4/SDS1	SDE4/S1081613COMP	8/14/2013	0.11	18	0.05	0	0	279	EMC	No				0.052	0.005	0.124		
2	SDE4/SDS1	SDE4/S110313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	SMC	No	<10	<10		0.008	0.0008	0.015		
3	SDE4/SDS1	SDE4/S120113COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	EMC	No	<10	<10		0.012	0.0009	0.022		
4	SDE4/SDS1	SDE4/S10814COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.012	0.001	0.033		
5	SDE4/SDS1	SDE4/S1021014COMP	2/9/2014	0.94	41	0.14	0	0	366	SMC	No	<10	27		0.022	0.005	0.069		
6	SDE4/SDS1	SDE4/S1040914COMP	4/8/2014	0.18	10	0.06	0	0	69	EMC	No	<10	<10		0.017	0.003	0.038		
7	SDE4/SDS1	SDE4/S1050914COMP	5/8/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.012	0.003	0.036		
8	SDS3/5	SDS3/S090513COMP	9/5/2013	0.2	2	0.08	0	0.01	25	SMC	No				0.012	0.0003	0.009		
9	SDS3/5	SDS3/S110313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	EMC	No	<10	<10		0.013	0.0002	0.009		
10	SDS3/5	SDS3/S120113COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	EMC	No	<10	<10		0.007	<0.0001	0.009		
11	SDS3/5	SDS3/S012914COMP	1/28/2014	1.21	28	0.14	0	0.01	44	SMC	No	<10	<10		0.012	0.0002	0.013		
12	SDS3/5	SDS3/S021014COMP	2/9/2014	0.94	41	0.14	0	0	366	SMC	No	<10	30		0.013	0.0006	0.016		
13	SDS3/5	SDS3/S040914COMP	4/8/2014	0.18	10	0.06	0	0	69	EMC	No	<10	<10		0.008	0.0001	0.007		
14	SDS3/5	SDS3/S050914COMP	5/8/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.013	0.0004	0.012		
15	SDS4	SDS4/S082813COMP	8/29/2013	0.76	21	0.32	0.24	0.3	17	SMC	No				0.006	0.0002	0.009		
16	SDS4	SDS4/S10313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	EMC	No	<10	<10		0.006	0.0001	<0.004		
17	SDS4	SDS4/S120213COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	EMC	No	<10	<10		0.003	<0.0001	<0.004		
18	SDS4	SDS4/S1314COMP	1/31/2014	0.11	3	0.06	0	0.39	30	SMC	No	<10	<10		0.005	<0.0001	0.005		
19	SDS4	SDS4/S021014COMP	2/9/2014	0.94	41	0.14	0	0	366	SMC	No	<10	16		0.011	0.0003	0.018		
20	SDS4	SDS4/S040914COMP	4/8/2014	0.18	10	0.06	0	0	69	SMC	No	<10	<10		0.003	<0.0001	0.005		
21	SDS4	SDS4/S050914COMP	5/8/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.009	0.0003	0.006		
22	SDS6/7	SDS6/S082813COMP	8/27/2013	0.3	21	0.15	0.08	0.09	16	EMC	No				0.008	0.0001	0.011		
23	SDS6/7	SDS6/S110213COMP	11/2/2013	0.5	8	0.15	0	0.01	46	EMC	No	<10	<10		0.007	0.0001	0.005		
24	SDS6/7	SDS6/S120113COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	EMC	No	<10	<10		0.006	0.0001	0.006		
25	SDS6/7	SDS6/S10814COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.005	0.0001	0.005		
26	SDS6/7	SDS6/S1021014COMP	2/9/2014	0.94	41	0.14	0	0	366	SMC	No	<10	<10		0.007	0.0004	0.012		
27	SDS6/7	SDS6/S1040914COMP	4/8/2014	0.18	10	0.06	0	0	69	EMC	No	<10	<10		0.006	<0.0001	0.007		
28	SDS6/7	SDS6/S1050914COMP	5/8/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.006	0.0001	0.005		
29	SDN1	SDN1/S092113COMP	9/20/2013	0.11	1	0.06	0	0	105	EMC	No				0.008	0.0002	0.017		
30	SDN1	SDN1/S110213COMP	11/2/2013	0.5	8	0.15	0	0.01	46	EMC	No	<10	<10		0.01	0.0006	0.04		
31	SDN1	SDN1/S120113COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	SMC	No	<10	<10		0.011	0.0006	0.049		
32	SDN1	SDN1/S10814COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.014	0.0009	0.094		

R=Rejected Non-Representative Data - Refer to line comment for detail

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# NPDES Composite Sample Data 7/1/2013 - 6/30/2014

## SAMPLE DATA

## STORM CHARACTERISTICS

## CONCENTRATION, mg/L

Seq	Out fall	Sample ID	Storm Date	Dph In	Dur hr	Maxint in/hr	24hrant in	48hrant in	Dyant hr	Ground Deice?	Turb, NTU	E- Glycol	P- Glycol	Total Glycol	Cu	Pb	Zn		
33	SDN1	SDN1021014COMP	2/9/2014	0.94	41	0.14	0	0	366	SMC	No	<10	<10		0.012	0.0006	0.081		
34	SDN1	SDN1041714COMP	4/16/2014	1.18	42	0.13	0	0	170	SMC	No	<10	<10		0.013	0.0005	0.042		
35	SDN1	SDN1050914COMP	5/6/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.009	0.0003	0.045		
36	SDW2	SDW2110313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	EMC	No	<10	<10		0.004	<0.0001	<0.004		
37	SDW2	SDW2120113COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	SMC	No	<10	<10		0.004	<0.0001	0.004		
38	SDW2	SDW2010814COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.004	<0.0001	<0.004		
39	SDW2	SDW2021514COMP	2/14/2014	0.33	12	0.07	0.05	0.25	20	EMC	No	<10	<10		0.006	<0.0001	0.005		
40	SDW2	SDW2040914COMP	4/8/2014	0.18	10	0.06	0	0	69	SMC	No	<10	<10		0.004	<0.0001	<0.004		
41	SDW2	SDW2050914COMP	5/6/2014	0.12	10	0.51	0	0	73	SMC	No	<10	<10		0.005	<0.0001	<0.004		
42	SDW1B	SDW1B100113COMP	9/27/2013	3.29	106		0	0.01	48	SMC	No				0.005	<0.0001	0.007		
43	SDW1B	SDW1B110313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	SMC	No	<10	<10		0.005	<0.0001	<0.004		
44	SDW1B	SDW1B120113COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	SMC	No	<10	<10		0.004	<0.0001	0.004		
45	SDW1B	SDW1B010814COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.004	<0.0001	<0.004		
46	SDW1B	SDW1B030914COMP	3/6/2014	1.25	15	0.17	0	0.01	44	EMC	No	<10	<10		0.003	<0.0001	0.007		
47	SDW1B	SDW1B040914COMP	4/8/2014	0.18	10	0.06	0	0	69	SMC	No	<10	<10		0.003	<0.0001	<0.004		
48	SDW1B	SDW1B050914COMP	5/6/2014	0.12	10	0.51	0	0	73	SMC	No	<10	<10		0.004	<0.0001	0.004		
49	SDW1A	SDW1A100113COMP	9/27/2013	3.29	106		0	0.01	48	SMC	No				0.004	<0.0001	0.008		
50	SDW1A	SDW1A110313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	SMC	No	<10	<10		0.002	<0.0001	<0.004		
51	SDW1A	SDW1A120213COMP	11/30/2013	0.17	23	0.06	0.05	0.07	20	SMC	No	<10	<10		0.003	<0.0001	<0.004		
52	SDW1A	SDW1A010714COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.002	<0.0001	<0.004		
53	SDW1A	SDW1A021514COMP	2/14/2014	0.33	12	0.07	0.05	0.25	20	EMC	No	<10	<10		0.003	<0.0001	0.008		
54	SDW1A	SDW1A041714COMP	4/16/2014	1.18	42	0.13	0	0	170	SMC	No	<10	<10		0.003	0.0001	<0.004		
55	SDW1A	SDW1A050914COMP	5/6/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.003	<0.0001	<0.004		
56	SDN3A	SDN3A110313COMP	11/2/2013	0.5	8	0.15	0	0.01	46	SMC	No	<10	<10		0.002	<0.0001	0.004		
57	SDN3A	SDN3A121313COMP	12/12/2013	0.3	11	0.08	0	0	230	SMC	No	<10	<10		0.003	<0.0001	0.005		
58	SDN3A	SDN3A010814COMP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	<10	<10		0.003	<0.0001	0.016		
59	SDN3A	SDN3A021514COMP	2/14/2014	0.33	12	0.07	0.05	0.25	20	EMC	No	<10	<10		0.003	<0.0001	<0.004		
60	SDN3A	SDN3A040914COMP	4/8/2014	0.18	10	0.06	0	0	69	SMC	No	<10	<10		0.003	<0.0001	<0.004		
61	SDN3A	SDN3A050914COMP	5/6/2014	0.12	10	0.51	0	0	73	EMC	No	<10	<10		0.003	<0.0001	<0.004		
62	SDN2/3/4	SDN2/3/4110813COMP	11/6/2013	1.1	27	0.21	0	0.11	32	SMC	No	<10	<10		0.009	0.0001	0.009		
63	SDN2/3/4	SDN2/3/4122213COMP	12/20/2013	0.96	70	0.09	0	0.01	47	SMC	No	<10	<10		0.007	<0.0001	0.007		
64	SDN2/3/4	SDN2/3/4013014COMP	1/28/2014	1.21	28	0.14	0	0.01	44	SMC	No	<10	<10		0.008	0.0001	0.015		

# NPDES Composite Sample Data 7/1/2013 - 6/30/2014

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## SAMPLE DATA

## STORM CHARACTERISTICS

## CONCENTRATION, mg/L

Seq	Out fall	Sample ID	Storm Date	Dpth in	Dur hr	Maxint in/hr	24hrant in	48hrant in	Dryant hr	Ground Deice?	Turb, NTU	E- Glycol	P- Glycol	Total Glycol	Cu	Pb	Zn		
65	SDN2/3/4	SDN2/3/4021414COMP	2/14/2014	0.33	12	0.07	0.05	0.25	20	SMC	No	< 10	< 10		0.01	0.0002	0.01		
66	SDN2/3/4	SDN2/3/4040914COMP	4/8/2014	0.18	10	0.06	0	0	69	EMC	No	< 10	< 10		0.008	< 0.0001	0.009		
67	SDN2/3/4	SDN2/3/4050914COMP	5/8/2014	0.12	10	0.51	0	0	73	SMC	No	< 10	< 10		0.009	0.0001	0.007		
68	SDD06A	SDD06A083013C0MP	8/29/2013	0.76	21	0.32	0.24	0.3	17	EMC	No				0.013	0.002	0.038		
69	SDD06A	SDD06A110313C0MP	11/2/2013	0.5	8	0.15	0	0.01	46	EMC	No	< 10	< 10		0.006	0.0002	0.01		
70	SDD06A	SDD06A121313C0MP	12/12/2013	0.3	11	0.08	0	0	230	SMC	No	< 10	< 10		0.003	0.0002	0.01		
71	SDD06A	SDD06A010814C0MP	1/6/2014	0.78	43	0.08	0	0	78	SMC	No	< 10	< 10		0.005	0.0002	0.009		
72	SDD06A	SDD06A021014C0MP	2/9/2014	0.94	41	0.14	0	0	366	SMC	No	< 10	< 10		0.004	0.0003	0.015		
73	SDD06A	SDD06A040914C0MP	4/8/2014	0.18	10	0.06	0	0	69	EMC	No	< 10	< 10		0.003	0.0002	0.007		
74	SDD06A	SDD06A050914C0MP	5/8/2014	0.12	10	0.51	0	0	73	EMC	No	< 10	< 10		0.004	0.0002	0.01		

## APPENDIX B OTHER SAMPLE DATA



## QC Samples Blanks - 7/1/2013-6/30/2014

					Metals			Organics			TPH		
					Cu Total mg/l	Pb Total mg/l	Zn Total mg/l	E-glycol mg/l	P-glycol mg/l	Sheen N/A	TPH-D mg/l	TPH-Dx mg/l	TPH-MO mg/l
Outfall	Sample	Storm	Event Type	Type	Purpose								
SDN8	SDN8082813GRAB	8/27/2013	NPDES-Part II	EB	FluQc	< 0.00025	< 0.00005	< 0.002		No Sheen			
SDN8	SDN8110413GRAB	11/2/2013	NPDES-Part II	EB	FluQc	< 0.00025	< 0.00005	< 0.002		No Sheen			
SDN8	SDN8010814GRAB	1/6/2014	NPDES-Part II	EB	FluQc	< 0.00025	< 0.00005	0.004	< 5	5			
SDN8	SDN8041014GRAB	4/8/2014	NPDES-Part II	EB	FluQc	< 0.00025	< 0.00005	0.002		No Sheen			
SDE4/SDS1	SDE4/S1010814BLNK	1/6/2014	NPDES-Part II	FB	FluQc	0.0006	< 0.00005	0.006	< 5	No Sheen			
SDS3/5	SDS3/5040914BLNK	4/8/2014	NPDES-Part II	FB	FluQc	< 0.00025	< 0.00005	0.002	< 5	No Sheen	0.05	< 0.15	< 0.1
SDS4	SDS4050914BLNK	5/8/2014	NPDES-Part II	FB	FluQc	0.0007	0.0005	0.002	< 5	No Sheen	0.05	< 0.15	< 0.1
SDN1	SDN110413BLNK	11/2/2013	NPDES-Part II	FB	FluQc	< 0.00025	< 0.00005	0.002	< 5	No Sheen	0.56		0.6
SDW2	SDW2050914BLNK	5/8/2014	NPDES-Part II	FB	FluQc	0.0011	< 0.00005	0.002	< 5	No Sheen	0.05	< 0.15	< 0.1
SDW1A	SDW1A120213BLNK	11/30/2013	NPDES-Part II	FB	FluQc	< 0.00025	< 0.00005	0.002	< 5	No Sheen	0.05		< 0.1
SDN3A	SDN3A021514BLNK	2/14/2014	NPDES-Part II	FB	FluQc	< 0.00025	< 0.00005	0.002	< 5	No Sheen	0.4		< 0.1
SDD06A	SDD06A083013BLNK	8/29/2013	NPDES-Part II	FB	FluQc	0.0005	< 0.00005	0.034		No Sheen	0.14		< 0.1

