REVISED WORK PLAN
FOR SOURCE CONTROL MEASURE IMPLEMENTATION
AND STORMWATER SAMPLING ACTIVITIES

Wilhelm Trucking Company
3250 NW St. Helens Road
Portland, Oregon

June 26, 2015

Prepared for:

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HAI Project No. 7436

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BACKGROUND 1

2.1 Site Location and Description 1

2.2 Stormwater Management System 2

2.3 Environmental Background 6

3.0 SOURCE CONTROL MEASURE IMPLEMENTATION 8

4.0 STORMWATER SAMPLING PLAN 11

4.1 Stormwater Sampling Criteria 12

4.2 Stormwater Sample Analyses 14

4.2.1 Data Quality Assurance and Control 16

4.3 Reporting 17

5.0 LIMITATIONS AND SIGNATURES 18

6.0 GLOSSARY OF ABBREVIATIONS 19

TABLES

1 Contaminants of Interest, Method Detection and Reporting Limits, and Screening Level Values

FIGURES

1 Location Map

2 Site Vicinity Map

3 Site Map Including Stormwater Conveyance System

APPENDICES

A Stormwater Pollution Control Plan, Wilhelm Trucking Company, Revision 8, (September 30, 2013)

B Performance Stormwater Sampling, Interim Letter Report, 1st Sampling Event (March 2014)

C Overflow Bypass Field Observation Sheets

1.0 INTRODUCTION

Wilhelm Trucking Company (Wilhelm) retained Hahn and Associates, Inc. (HAI) to prepare a Work Plan for Source Control Measure Implementation and Stormwater Sampling Activities for its property located at 3250 NW St. Helens Road in Portland, Oregon (Figure 1).

HAI has prepared this Revised Work Plan to address the Oregon Department of Environmental Quality's (DEQ) comments to the original Work Plan (which was submitted to DEQ in December 2013), as outlined in DEQs May 2014 Comment Letter[1]

The DEQ and the City of Portland Bureau of Environmental Services (BES) have requested that the source control measure implementation and storm water sampling activities be performed based on Wilhelm's connection to the public stormwater conveyance system within the City of Portland's Outfall Basin No. 18, which discharges to the Willamette River. The DEQ and BES identified Wilhelm as a potentially-contributing party to the Portland Harbor sediment contamination, which is regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund).

This work plan presents: (1) a summary of the site description and background, (2) the proposed source control measure implementations at the property, and (3) the proposed methodologies for conducting the post-source control performance stormwater sampling activities.

2.0 BACKGROUND

2.1 Site Location and Description

The Wilhelm property consists of three tax lots (Tax Lots 600, 700 and 800) and is located at 3250 NW St. Helens Road, in an area zoned for Industrial Use within the City of Portland, Multnomah County, Oregon (Figures 1, 2 and 3). The tax lots are utilized as follows:

[1] Oregon Department of Environmental Quality (2014). *DEQ Comments for Source Control Evaluation at the Wilhelm Trucking Company, 3250 NW St. Helens Road, Portland, Oregon, ECSI #69*. May 15, 2014.

- Tax Lot 600 (4.83 Acres) is occupied by the Wilhelm transportation terminal and yard, including the office and truck shop building (Building No. 1), the rigging building (Building No. 2) for equipment storage, and the gravel- and asphalt-covered truck and trailer parking area.

- Tax Lot 700 (1.02 Acres) is occupied by Building K (Building No. 3) and paved parking on the northern portion of the lot, as well as a gravel-covered parking lot on the southern portion. The building is used primarily for equipment storage.

- Tax Lot 800 (1.0 Acre) is occupied by Building No. 4, which is leased to Industrial Craters & Packers, a custom crate design, manufacturing, and packing facility (e.g., for computer equipment and instrumentation). The remainder of this tax lot is gravel-, concrete-, or asphalt-covered.

The elevation range across all three tax lots of the subject property is approximately 30 to 40 feet above mean sea level (msl). Tax Lot 600 and the adjacent unpaved railroad right-of-way are situated at a lower elevation than Tax Lots 700 and 800. The Willamette River is located approximately 0.75-mile to the northeast.

2.2 Stormwater Management System

The description of the stormwater management system for each tax lot is described below. The stormwater features, including drainage basins, drainage inlet structures, and surface flow directions are shown on Figure 3.

Tax Lot 600

Two public storm sewers, which are owned and operated by BES, are present beneath Tax Lot 600. Both storm sewers discharge to the Willamette River at the City of Portland's Outfall Basin No.18:

- A 42-inch storm sewer line is located beneath the southwestern property boundary of Tax Lot 600, adjacent to the railroad easement. This storm line is the only receiving point of all stormwater from Tax Lot 600, which receives discharge from the new stormwater treatment system that drains the entire property (see below).

- A second 36-inch storm sewer is also located beneath the northeastern portion of the property, however it no longer receives any stormwater discharge from Tax Lot 600.

The land surface on Tax Lot 600 has been subdivided into seven drainage basins. Basins #1 through #6 are gently sloping toward a drainage inlet structure. Stormwater infiltrates within Basin #7, or flows along the rail spur to the adjacent rail easement where it percolates into the soil.

In the fall of 2013, the entire stormwater system on Tax Lot 600 was reengineered. The former stormwater system was decommissioned, and a new system was installed under permit from BES (Figure 3). A description of the new system is included below:

- Former drainage inlet structures #1, #2, #3, and #6 were replaced with new two-chamber storm drain catch basins designed to reduce sediment load. Stormwater is conveyed from each of these catch basins via a single piping run to a new stormwater treatment facility located in the northwestern corner of the Tax Lot.

- The new stormwater treatment facility consists of three elements:

    1. Stormwater first flows into a sedimentation interceptor manhole to further reduce sediment load, and is then conveyed into an oil/water separator.

    2. The oil/water separator consists of a 816-1 Coalescing Plate Style (CPS) unit designed to eliminate or minimize oil and grease contamination. The oil/water separator also functions as a settling tank, allowing suspended solids of various sizes to settle out of suspension before further treatment. The CPS unit holds approximately 4,000 gallons and can treat up to 292 gallons per minute. The design exceeds the minimum volume to meet common pretreatment standards.

    3. Following treatment in the oil/water separator, stormwater is then conveyed to an outlet manhole containing a check valve. This manhole serves as the compliance stormwater sampling point for the property. Stormwater is then discharged to the 42-inch storm sewer line owned and operated by BES.

    4. The system also contains an overflow bypass in the event that the stormwater volume from a large rain event would exceed the treatment capacity of the system. The overflow bypass consists of a concrete weir within the sedimentation interceptor manhole, and a separate discharge pipe leading directly to the outlet manhole. The

overflow bypass has been designed to treat the 6-month event, which volume-wise is 91% net annual (i.e., 91% of all the rainfall is treated and about 9% will bypass), and that the bypass will likely only flow during a deluge.

- Former drainage inlet structure #4 was replaced with a new two-chamber storm drain catch basin. Drainage inlet structure #5 is the previous single-chamber catch basin, and was not replaced due to the small volume of traffic in this drainage basin. The discharge lines from both catch basins were rerouted into a new sedimentation lift station manhole outfitted with a submersible pump. The lift station manhole is located in the northeastern portion of Tax Lot 600, behind the office/shop building, and pumps the accumulated stormwater via a force main to the oil/water separator discussed above.

- Former drainage inlet structure #7 was not located at the topographic low point of the drainage basin, and was therefore removed and replaced with a sealed access manhole. Stormwater from this drainage basin either percolates directly to soil in Drainage Area #7 or drains along the rail spur onto the unpaved railroad easement where it percolates.

The truck scale is located near the southwestern corner of Building No. 1 and includes an integrated sump for collection of stormwater that drips from the scale plate. The sump previously discharged to a 10-inch storm sewer that runs beneath Building No. 1; however, BES removed this line from operation. Consequently, Wilhelm requested BES approval to pump stormwater from the scale plate sump directly to the paved surface within drainage basin No. 5, where it would then flow across the pavement to catch basin #5.

The building roof downspouts discharge directly onto the adjoining paved surfaces, which then drain via overland surface flow to the associated catch basin.

In addition, the rinsate from the wash bay within Building No. 1 is collected and transferred to two water treatment tanks located along the south side of this building. Water contained in the treatment tanks is batch released, under permit, into a sanitary sewer line.

Tax Lot 700

Stormwater originating from Tax Lot 700 does not drain to a stormwater conveyance system. The southern portion of Tax Lot 700 is approximately six feet higher in elevation than the railroad easement, and the eastern side of Tax Lot 700 slopes from the gravel parking down to the easement. The land surface on the northern portion of Tax Lot 700 (i.e., north of Building K) grades from NW St. Helens Road to the unpaved railroad easement. The precipitation falling on the northern portion of Tax Lot 700 ponds in the asphalt parking and, in sufficient volume, will overflow to the adjacent unpaved railroad easement, where an apparent topographic low serves as a percolation area. Stormwater that accumulates in the railroad easement percolates directly to soil and does not drain to a stormwater conveyance system.

A small volume of stormwater on NW St. Helens Road may also flow onto and across the northern paved surface of Tax Lot 700 to the railroad easement. The southern portion of Tax Lot 700 is a gravel parking area, where precipitation percolates into the ground. The parking area slopes gradually to the north and east, and during heavy rain events some stormwater may flow from the parking area to the railroad easement. Precipitation that falls on the concrete driveway entrance (to the gravel parking area) runs off onto NW St. Helens Road.

Tax Lot 800

Stormwater originating from Tax Lot 800 does not drain to a stormwater conveyance system. The eastern portion of Tax Lot 800, behind Building No. 4, was backfilled level behind an approximately 8-foot-high retaining wall that parallels the railroad easement. A significant amount of the stormwater falling on the eastern side of Tax Lot 800, including a portion of the Building No. 4 roof, percolates into the level ground. Percolating water may drain to the topographically-low railroad easement through weep holes in the retaining wall. Precipitation falling on the small paved areas at the front of the building (along NW St. Helens Road) flows generally across the asphalt-pavement to the City of Portland street drains that are connected to a storm sewer on NW St. Helens Road, or onto the gravel parking area of Tax Lot 700.

The precipitation falling on the southwestern corner of Tax Lot 800 flows to Catch Basin No. 8, which discharges via a pipe along the southern boundary of the lot to the fill soil behind the building (to the east). A video inspection of the catch basin discharge line found that the piping terminates in the backfill

behind the building on Tax Lot 800, which qualifies the piping as an underground injection control (UIC) device. Consequently, the subsurface discharge line requires registration and investigation under the DEQ UIC Program rules. A Pre-closure Notification and UIC Decommissioning Work Plan will be prepared separately for submittal to DEQ (See Section 3.0, below for more information regarding Tax Lot 800).

2.3 Environmental Background

NPDES Permit 1200-Z

DEQ identifies the Wilhelm property as File No. 100721 under the National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater General Permit 1200-Z, which is effective July 1, 2012 through June 30, 2017. Wilhelm has implemented a Stormwater Pollution Control Plan (SWPCP) at the site since 1997 for management and sampling activities under the 1200-Z permit. The most current revision of the SWPCP (Version 8, dated September 30, 2013) includes a discussion of the new stormwater system modifications, the updated sampling requirements, and the appropriate best management practices (BMPs) for the site. A copy of the current revision of the SWPCP is included as Appendix A. The NPDES sampling, monitoring, and reporting requirements are performed by onsite Wilhelm personnel.

2006 BES Storm Sewer Sampling Activities

In 2006, BES performed an investigation to identify source contributors to sediment accumulation in the Portland Harbor upstream of City Outfall No. 18. BES prepared a report addressing the Wilhelm property and surrounding area, dated March 21, 2006, and entitled *Inline Solids Sampling in the Vicinity of Container Management Services and Wilhelm Trucking Company*. The report indicated that Wilhelm contributed to this outfall from six of its eight catch basin drainage systems. BES collected three sediment samples on the subject property in the vicinity of the railroad right-of-way, and one sample from the adjacent Container Management Services, Inc. property. The results indicated that concentrations of lead, mercury, zinc, select semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) exceeded applicable Portland Harbor Joint Source Control Strategy (JSCS) Soil/Stormwater/Sediment Screening Level Values (SLVs). Based on the analytical results, BES concluded that both Wilhelm and the adjacent Container Management property may have contributed to contamination to

the stormwater collection system. As such, DEQ[2] requested that Wilhelm conduct stormwater assessment activities at their property to determine whether they have contributed to an accumulation of hazardous contaminants in the Portland Harbor of the Willamette River.

2011-2013 HAI Stormwater Assessment Activities

In response to DEQ's request, HAI prepared a Stormwater Assessment (SWA) Work Plan[3] for the Wilhelm property, which was subsequently approved by DEQ and BES. The SWA activities were performed in 2011 and 2012, and were divided into two parts:

1. Erodible Soil and Stormwater Sediment Sampling. The erodible soil and stormwater sediment sampling activities[4], which also included a visual inspection within the 42-inch storm sewer line located beneath the Wilhelm property, were conducted in October 2011.

2. Stormwater Sampling. The stormwater sampling activities were conducted subsequent to the erodible soil and sediment sampling activities, and consisted of four separate sampling events performed from February to June 2012. A Comprehensive Stormwater Sampling Report[5] summarizing all four of the stormwater sampling events was prepared in August 2012.

Upon reviewing the analytical results from the SWA sampling activities, DEQ indicated that source control measures are required for the Wilhelm property based on the detection of bioaccumulatives and the exceedance ratios of Portland Harbor JSCS SLVs[6]. On August 29, 2013, a meeting with Wilhelm, DEQ, BES, and HAI was held at the Wilhelm property to observe the new stormwater system modifications, and to discuss the proposed source

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[2] Oregon Department of Environmental Quality (2007). *Letter Agreement for Stormwater Assessment and Source Control, Wilhelm Trucking, ECSI #69*. April 11, 2007.

[3] Hahn and Associates, Inc. (2011). *Storm Water Assessment Work Plan, Revision 2, Wilhelm Trucking Company, 3250 NW St. Helens Road, Portland, Oregon* (HAI Project No. 7436). September 30, 2011.

[4] Hahn and Associates, Inc. (2012). *Storm Water Assessment: Erodible Soil and Storm Water Sediment Sampling Report, Wilhelm Trucking Company, 3250 NW St. Helens Road, Portland, Oregon* (HAI Project No. 7436). January 12, 2012.

[5] Hahn and Associates, Inc. (2012). *Storm Water Assessment: Comprehensive Storm Water Sampling Report, 1st Through 4th Sampling Events, Wilhelm Trucking Company, 3250 NW St. Helens Road, Portland, Oregon* (HAI Project No. 7436). August 24, 2012.

[6] Oregon Department of Environmental Quality (2013). *DEQ Comments for Source Control Evaluation at the Wilhelm Trucking Company, 3250 N.W. Saint Helens Road, Portland, Oregon, ECSI #69*. August 12, 2013.

control measures (see Section 3.0) as well as the proposed post-source control performance stormwater sampling activities (see Section 4.0).

Magnus Property - Tax Lot 800

Tax Lot 800 was historically occupied by the Magnus Company (Magnus) (and National Lead), which operated a railcar journal bearing rehabilitation plant from around 1930 until 1967. The business used hemispherical furnaces to melt the lead from the surfaces of rail car journal bearings, which were then rehabilitated with a tin/lead alloy for reuse. In 1993, the EPA conducted an assessment of the former Magnus property. Elevated concentrations of lead were detected in soil and in dust contained within the building. The assessment concluded that soil contamination on the property should be mitigated, but that further investigation under the Superfund Program was not warranted. The U.S. Environmental Protection Agency (EPA) issued a letter dated March 25, 1993 stating that further investigation was not anticipated under the Federal Superfund Program. However, the property is listed on the DEQ Environmental Cleanup Site Information (ECSI) database (Site No. 69). According to the DEQ website, the property is currently identified as a "Suspect Site Requiring Further Investigation". For further discussion of the site background and environmental history of this site, refer to HAI's 2011 SWA Work Plan.

3.0 SOURCE CONTROL MEASURE IMPLEMENTATION

The previous SWA activities at the Wilhelm property indicated that concentrations of certain Portland Harbor Contaminants of Interest (COIs), most notably select heavy metals, PCBs, and PAHs, were detected above their respective SLVs in erodible soils and/or stormwater samples collected from the site. As a result, DEQ has requested that source control measures be implemented at the site to prevent future migration/mobilization of these COIs either offsite or into the BES storm sewer system.

As described in DEQs *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (updated October 2010), the following source control measures have been implemented (or are proposed) at the site since the SWA activities were conducted in 2011-2012, in order to mitigate future mobilization of the COIs at the site:

1. New Stormwater System (Installed in Fall of 2013)
   A new stormwater conveyance and treatment system was installed on Tax Lot 600 in the Fall of 2013. Notable features of the system that function as source control measures include:
   - Removal of the old catch basins that functioned as direct drainage inlets to the BES storm sewer line.
   - Installation of new two-chamber storm drain catch basins that are designed to help reduce sediment load.
   - Installation of a treatment facility containing a sedimentation interceptor manhole and an oil/water separator unit, both of which are designed to allow suspended solids to settle out of suspension before further treatment.
   - A single-point of discharge for all of the stormwater leaving the site and entering the BES 42-inch storm sewer line (see Figure 3).

2. New Asphalt Paving (Installed October 2013)
   Although the entire western portion of Tax Lot 600 was previously covered with asphalt paving, the condition of the asphalt had deteriorated over the years (i.e., potholes, cracks, etc.), especially in high-traffic areas in the central portion of the site. Therefore, in October 2013, new asphalt paving overlay was installed on those high-traffic portions of the site where the integrity of the pavement was compromised (in the western and central portions of the site). The new asphalt paving acts as a cap, precluding exposure to the COIs present in surface soils, and preventing erosion and transport of sediments.

3. Stormwater Best Management Practices (BMPs) (Ongoing)
   In order to minimize the potential for contamination of stormwater as a result of daily operations, as well as any accidental spills or releases of chemicals of concern, Wilhelm routinely employs BMPs at the property. The implementation of stormwater BMPs can limit contact of pollutant-generating materials with stormwater runoff. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of stormwater discharges. The BMPs address the following items:
   - Exposure Minimization
   - Truck Yards
   - Oil and Grease

- Oil/Water Separator
- Waste Chemicals and Material Disposal
- Erosion and Sediment Control
- Debris Control (Catch Basins)
- Dust Generation and Vehicle Tracking
- Housekeeping
- Sweeping
- Dumpsters
- Metal Roof and Siding
- Secondary Containment
- Fueling or Liquid Loading/Unloading Operations
- Spill Prevention and Response
- Preventative Maintenance
- Employee Education
- Non-stormwater Discharges

A full description of the site BMPs, including the frequency of their implementation, are detailed in the current revision of the SWPCP (Appendix A).

4. Geotextile Fabric Installation on Unpaved Areas (Contingency)
It was previously proposed that the unpaved areas of Tax Lot 600 (primarily located in the northeastern portion of the property) be covered with a permeable geotextile fabric material with at least 6 inches of crushed gravel above to hold it in place. This installation would prevent disturbance of the near-surface soils by onsite traffic and activities, and the fabric would prevent upward mobility of contaminated sediments while allowing stormwater to percolate through to the subsurface for infiltration.

Due to the cost of implementation, the need for the geotextile fabric and gravel cover placement will be will reassessed once all 4 post-source control stormwater sampling events have been conducted. Based on the results of the first post-source sampling event already conducted in March 2014 (See Section 4.0, below), the new treatment system and asphalt paving appear to be working extremely well to reduce contaminant

concentrations, and installation of geotextile/gravel may not be necessary.

5. Tax Lot 800, Catch Basin 8 and Vicinity (Proposed Spring/Summer 2015)
As previously mentioned, the discharge line for Catch Basin 8 (CB-8), located on the southwestern portion of Tax Lot 800, qualifies as a UIC device. As such, it is proposed that the discharge line be registered and decommissioned in accordance with DEQs UIC Program regulations. In order to do so, the storm water runoff currently collected by CB-8 will need to be rerouted to an appropriate onsite discharge option. HAI and Wilhelm are currently working with a stormwater engineer to determine the best course of action for future stormwater discharge at the CB-8 location. Once an appropriate solution has been selected and implemented (planned for Spring/Summer 2015), the UIC will be decommissioned, and the results and new stormwater discharge details will be provided to DEQ.

   In addition, DEQ has requested additional surficial soil sampling of the unpaved areas at Tax Lot 800 located adjacent to the driveways and NW St Helens Road. Since previous preliminary erodible soil sampling conducted by HAI in 2011 indicated that elevated concentrations of COIs are present at these areas, the need for additional soil sampling is deemed redundant. Instead of additional sampling, it is proposed that these unpaved areas be capped with new asphalt pavement to preclude future erosion and/or offsite mobilization of exposed soils. It is anticipated that the paving/capping work be conducted in conjunction with the CB-8 stormwater reengineering / discharge line decommissioning work in Spring/Summer 2015.

4.0 STORMWATER SAMPLING PLAN

The objective of the post-source control performance stormwater sampling activities is two-fold:

1. To confirm the effectiveness of the source control measures implemented at the Wilhelm property in reducing contaminant concentrations and/or load in stormwater.

2. To provide current site discharge data to determine if contaminant concentrations fall within the ”typical” range for industrial sites, and to evaluate the need for additional source control measures.

In order to meet these objectives, it is proposed that four (4) stormwater sampling events be conducted during the 2013-2014 and 2014-2015 rain years. The results of the stormwater sampling will be compared to the JSCS SLVs, as well as the previous stormwater sampling results collected prior to the implementation of the source control measures at the site (during the 2011-2012 rain year as part of the SWA activities).

As of the date of the Revised Work Plan (March 2015), one post-source control implementation stormwater sample event has been conducted at the site (on March 28, 2014). The results of this sampling event have been previously submitted to DEQ, and are included as Appendix B. The stormwater testing results from the March 28, 2014 sampling event indicate that the source control measures implemented at the site (new stormwater treatment system, asphalt pavement cap, and ongoing BMPs at the site) have been quite effective in reducing sediment load and contaminant concentrations (most notably TSS and heavy metals).

4.1 Stormwater Sampling Criteria

The preparation of this work plan, as well as implementation of stormwater sampling activities, will be completed in accordance with the following guidance documents:

- DEQ and U.S. Environmental Protection Agency (EPA) Region X, *Portland Harbor Joint Source Control Strategy*, Appendix D, Framework for Portland Harbor Storm Water Screening Evaluations, Final, December 2005.
- DEQ, *Guidance for Evaluating the Stormwater Pathway at Upland Sites*, January 2009, updated October 2010.

Stormwater Sampling Location

As part of the new stormwater system modifications, a new permanent compliance stormwater sampling point was established. The monitoring point is located in the northwestern corner of Tax Lot 600, within the outlet manhole, located downgradient of the treatment facility and immediately prior to the outfall into the BES 42-inch storm sewer line (Figure 3).

Stormwater Sampling Schedule

Stormwater samples will be collected from at least four separate storm events during the 2013-2014 and 2014-2015 rain years, the first of which was already conducted on March 28, 2014.

Storm Event Criteria and Selection

Rainfall data for the stormwater sampling events will be obtained from the City of Portland's HYDRA Network (http://or.water.usgs.gov/non-usgs/bes/yeon.rain) for Rain Gage No. 121 located at 3395 NW Yeon Street (the gage located closest to the Wilhelm property). The data table for Station No. 121 presents historical rainfall data on an hourly basis, as well as a daily total amount. Target storm event criteria will be monitored prior to sampling events to ensure the following:

- Each anticipated sampling event was preceded by a 24-hour dry period (<0.1 inch of rainfall).
- Each anticipated sampling event had a predicted rainfall of 0.2 inch or greater within a 24-hour period, and
- Each anticipated sampling event had an expected duration of at least 3 hours.

During sampling, qualitative observations will be made regarding amount of flow and the area drained to ensure that (1) water runoff was adequate for sample collection, (2) was representative of stormwater runoff, and (3) was consistent with other sites undergoing stormwater screening evaluations. All sampling observations and details will be recorded on stormwater sample field logs for each sampling event, along with the rainfall data sheet for each sampling event.

DEQ has indicated that the stormwater samples should not be collected within the first 30 minutes of flow during a rainfall event (representing "first flush" conditions), but should be collected during the end of a three hour rainfall flow event to allow for sufficient flow normalization from the site and through the new stormwater treatment system.

DEQ has also requested that at least one sample should include an overflow event from the treatment system overflow bypass. As of the date of this Revised Work Plan (March 2015), HAI has observed the overflow bypass during 2 large rain events: 1) the first on March 28, 2014, when a total of 1.86 inches of rain fell during an approximate 15 hour storm event, and 2) the second on October 22, 2014, when a total of 1.85 inches of rain fell during an approximate 12 hour storm event. During the onsite observations for both events, the overflow bypass was not flowing, indicating that the treatment system is functioning as designed. Field notes for the onsite overflow bypass observations are included as Appendix C.

Based on this information (combined with the design specifications for the treatment system overflow bypass), it is unlikely that system overflow will occur, especially for durations necessary for documentation and sampling. However, HAI will continue to target large rain events, and to observe the overflow bypass

for flow. If overflow is observed, a sample of the overflow will be collected and analyzed.

Stormwater Sampling Methodology

As recommended by DEQ, the stormwater samples will be collected using "grab sample" collection procedures outlined in the following guidance:

- Washington Department of Ecology, *How To Do Stormwater Sampling: A Guide for Industrial Facilities*, Publication #02-10-071, December 2002 (revised March 2010).

Disposable nitrile gloves will be worn during all sampling activities. All of the stormwater samples will be collected using a decontaminated stainless steel sampling cup (attached to an extendable pole if necessary) before being transferred into the appropriate sample jars. Care will be taken to ensure that only water collected directly from the compliance sampling point out-flow will be captured. The stormwater samples will be observed for the potential presence of contamination (i.e., odor, sheen, floating debris, water clarity, etc.). The observations of each stormwater sample will be noted in the field by the HAI field representative and recorded on the sampling field log.

The stormwater samples will be transferred into laboratory-supplied jars that are appropriate for the analyses of the selected contaminants of interest (COIs). The stormwater samples will not be field filtered. All of the sample containers will be immediately capped, labeled, and placed on ice in a thermally-insulated cooler to chill them to 4°±2°C for shipment to the laboratory.

4.2 Stormwater Sample Analyses

The stormwater samples will be transported under chain-of-custody documentation in a thermally-insulated cooler to Apex Laboratories, LLC of Tigard, Oregon, an Oregon-certified analytical laboratory.

The following Portland Harbor COI analyses have been proposed for the four post-source control performance stormwater sampling events:

Parameter	Analytical Method
Total Petroleum Hydrocarbons (TPH), quantified as diesel- and heavy oil-range organics	Northwest Method (NW) TPH-Dx
Eleven (11) select heavy metals (total basis): antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc.	EPA Method 6020
Polychlorinated Biphenyls (PCBs)	EPA Method 8082A
Polynuclear Aromatic Compounds (PAHs)	EPA Method 8270C-SIM
Total Organic Carbon (TOC)	Standard Method 5310C
Total Suspended Solids (TSS)	Standard Method 2540D

The analytical results of the four previous stormwater sampling events conducted during the 2011-2012 SWA activities (prior to the implementation of the source control measures at the Wilhelm site), did not detect the presence of many of the Portland Harbor COIs above laboratory reporting limits and/or the SLVs. These COIs include organochlorine pesticides, VOCs, SVOCs (except for PAHs), and gasoline-range TPH. Consequently, sampling for these COIs for the upcoming post-source control sampling events is not proposed.

The stormwater testing results will be compared to the Screening Level Values (SLVs) presented in Appendix D: Storm Water Data Reporting and Screening Table for Portland Harbor Sites, the template for which is provided in DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (January 2009, updated October 2010).

The analytical laboratory will be directed to meet the lowest achievable method detection limit (MDL) ranges for each constituent (provided by DEQ) in order that analytical results meet the established SLVs and are useful for source control evaluation purposes. A detailed list of the proposed COIs with the associated SLVs, laboratory MDLs, and method reporting limits (MRLs) for each constituent is provided in Table 1.

In the event of matrix interferences in the samples, the laboratory will be directed *not* to dilute the samples to meet the MDLs, but instead to use sample cleanup

methods such as silica gel, sulfuric acid, gel permeation chromatography (GPC), and/or other similar chemical methods to minimize matrix interferences that could result in higher laboratory MRLs.

4.2.1 Data Quality Assurance and Control

Laboratory data will be recorded by a computer system that collects and compiles raw data. The analytical laboratory will conduct necessary quality assurance/quality control (QA/QC) calculations that will be summarized in final laboratory reports. All final laboratory reports will be included as an appendix or appendices to the sampling event reports. In addition, all analytical data will be summarized in tabular form.

Analytical data will be assessed to ensure that they are of acceptable quality. This assessment will include a review of the following:

- Sampling dates
- Dates of analysis
- Requested analyses
- Chain-of-custody documentation
- Sample preservation
- Holding times
- Laboratory duplicates
- Laboratory control samples
- Method blanks
- Surrogate recoveries
- Matrix spike results
- Matrix spike/matrix spike duplicate analyses
- Method reporting limits or method detection limits above requested levels
- Any additional comments or difficulties reported by the laboratory
- Overall laboratory assessment of data quality

Following data evaluation and reporting, all project-generated and compiled data and information will be reconciled with the project objectives to assess the overall success of the sampling activities. This data assessment, including points of achievement and departure from project-specific objectives, will be discussed in the QA/QC section of the sampling event reports.

4.3 Reporting

As four separate stormwater sampling events will be conducted, the analytical results of the first three events will be presented to DEQ in interim reports. The first storm water sampling event (March 28, 2014) is included in Appendix B. Upon completion of the four stormwater sampling events, a final comprehensive report will compile all of the information from the interim reports for the first three events, plus the results of the fourth sampling event. The stormwater sampling reports will address the reporting requirements presented in Appendix A, Section 7.8, of DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (January 2009, updated October 2010). Each of the reports will be submitted to DEQ within 30 days of receipt of the final laboratory reports or as part of a quarterly report.

The three interim stormwater sampling reports and the comprehensive report for all four events will include the following:

- Discussion of sampling activities and any deviations from the sampling plan.
- Field documentation (e.g., field notes and photos).
- A rainfall distribution graph for each storm event for the timeframe that begins 24 hours prior to the storm event, with an indication of when sampling took place.
- Copies of original laboratory reports and chain-of-custody documentation.
- Data summaries in both electronic and hard copies, using the data summary and screening tables provided in Appendix D of the DEQ *Guidance for Evaluating the Stormwater Pathway at Upland Sites*, October 2010. The tables will clearly identify the sampling location(s), unit of measurement, compounds detected, and laboratory method detection limits (MDLs) for those compounds not detected, and JSCS screening level values (SLVs). Detected compounds will be in bold text and compounds exceeding SLVs will be shaded for easy reference.
- Discussion of compounds detected, compounds detected above the SLV, and the magnitude of SLV exceedance.
- Screening of the analytical results using the charts presented in Appendix E: Tool For Evaluating Stormwater Data of the DEQ *Guidance for Evaluating the Stormwater Pathway at Upland Sites*, October 2010.
- Discussion of findings, recommendations for further stormwater sampling and/or additional source control measures (if warranted), and a determination for DEQ long-term Stormwater Source Control Decision (SWSCD) for the property.

5.0 LIMITATIONS AND SIGNATURES

The information presented in this work plan was collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This plan and the conclusions and/or recommendations contained in it are based solely upon research and/or observations, and physical sampling and analytical activities that were conducted.

The information presented in this work plan is based only upon activities witnessed by HAI or its contractors, and/or upon information provided to HAI by the Client and/or its contractors. The analytical data presented in this work plan document only the concentrations of the target analytes in the particular sample, and not the property as a whole.

Unless otherwise specified in writing, this work plan has been prepared solely for the use by the Client and for use only in connection with the evaluation of the subject property. Any other use by the Client or any use by any other person shall be at the user's sole risk, and HAI shall have neither liability nor responsibility with respect to such use..

Hahn and Associates, Inc.

Prepared by:	Reviewed by:
Mike Krzeminski	Gary L. Walvatne, R.G.
Sr. Project Manager	Senior Associate

Date June 26, 2015

Expires: 31 May 2016

6.0 GLOSSARY OF ABBREVIATIONS

BES	City of Portland - Bureau of Environmental Services
bgs	below existing ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COI	contaminants of interest
DEQ	Oregon Department of Environmental Quality
ECSI	Environmental Cleanup Site Information
EPA	U.S. Environmental Protection Agency
HAI	Hahn and Associates, Inc.
JSCS	Portland Harbor Joint Source Control Strategy
MDL	laboratory method detection limit
MRL	laboratory method reporting limit
mL	milliliter
NPDES	National Pollutant Discharge Elimination System
NW	Northwest Method
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
ppb	parts per billion
ppm	parts per million
SLVs	screening level values
SWA	Stormwater Assessment
SWPCP	Stormwater Pollution Control Plan
SWSCD	Stormwater Source Control Decision
SVOCs	semi-volatile organic compounds
TOC	Total Organic Carbon
TPH	total petroleum hydrocarbons
TSS	Total Suspended Solids
μg/L	micrograms per Liter
UIC	underground injection control
VOCs	volatile organic compounds

TABLES

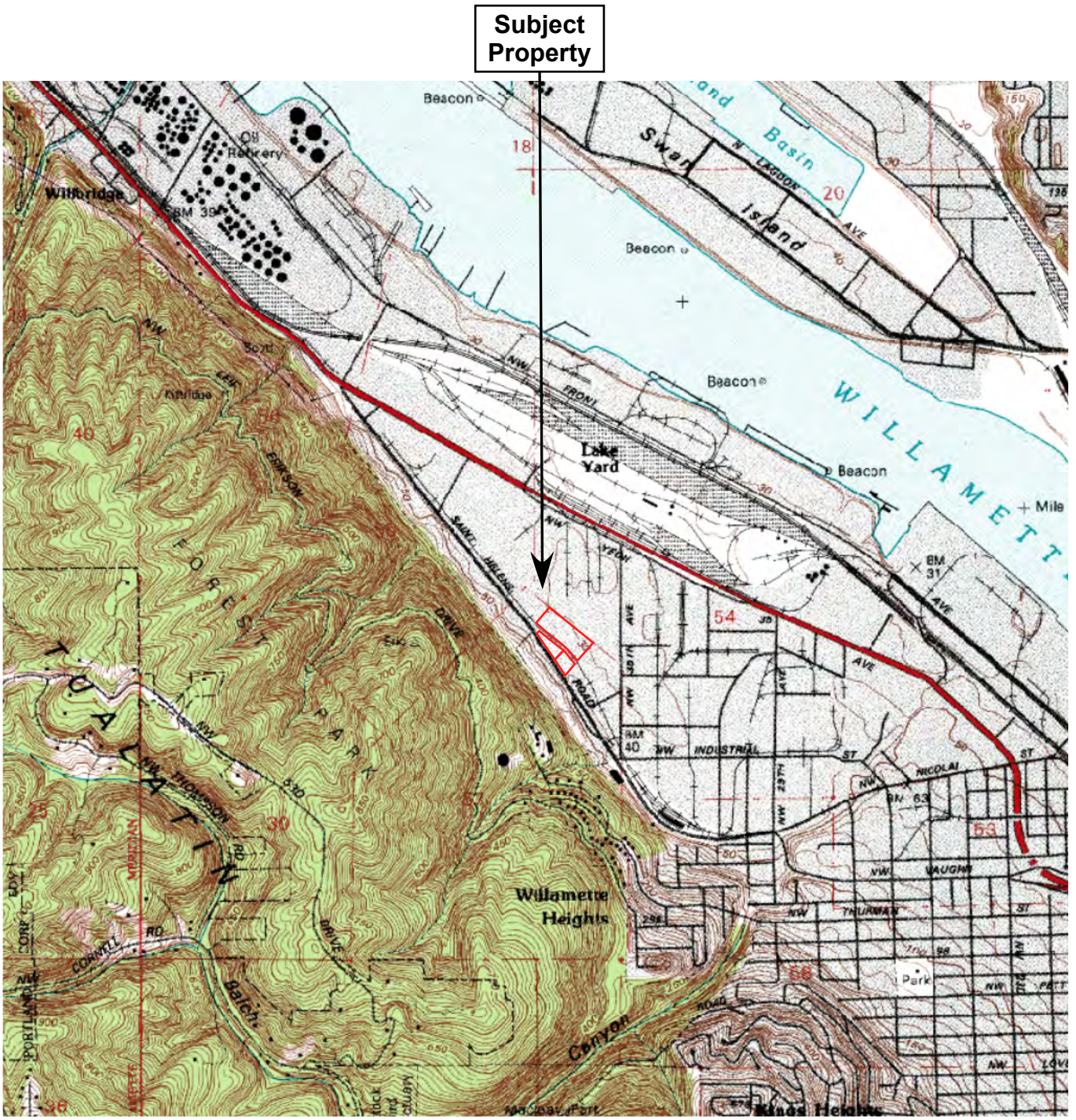
TABLE 1
APEX Labratories - Contaminants of Interest, Method Detection and Reporting Limits, and Screening Level Values

Contaminant of Interest (COI)	Method	Stormwater Samples		
		Screening Level Value, SLV (ppb)	Method Detection Limit, MDL (ppb)	Method Reporting Limit, MRL (ppb)
TPH as Diesel	NW TPH-Dx	No SLV	100	200
TPH as Oil		No SLV	200	400
Phthalate Esters	EPA 8270C			
Dimethylphthalate		3	0.5	1
Diethylphthalate		3	0.5	1
Di-n-butylphthalate		3	0.5	1
Butylbenzylphthalate		3	0.5	1
Di-n-octylphthalate		3	0.5	1
bis(2-Ethylhexyl)phthalate		2.2	0.5	1
PAHs	EPA 8270 SIM			
Acenaphthene		0.2	0.01	0.02
Acenaphthylene		0.2	0.01	0.02
Anthracene		0.2	0.01	0.02
Benzo(a)anthracene		0.018	0.01	0.02
Benzo(a)pyrene		0.018	0.01	0.02
Benzo(b)fluoranthene		0.018	0.01	0.02
Benzo(g,h,i)perylene		0.2	0.01	0.02
Benzo(k)fluoranthene		0.018	0.01	0.02
Chrysene		0.018	0.01	0.02
Dibenz(a,h)anthracene		0.018	0.01	0.02
Fluoranthene		0.2	0.01	0.02
Fluorene		0.2	0.01	0.02
Indeno(1,2,3-cd)pyrene		0.018	0.01	0.02
2-Methylnaphthalene		0.2	0.02	0.04
Naphthalene		0.2	0.02	0.04
Phenanthrene		0.2	0.01	0.02
Pyrene		0.2	0.01	0.02
PCBs	EPA 8082			
Aroclor 1016		0.96	0.02	0.04
Aroclor 1221		0.034	0.02	0.04
Aroclor 1232		0.034	0.02	0.04
Aroclor 1242		0.034	0.02	0.04
Aroclor 1248		0.034	0.02	0.04
Aroclor 1254		0.033	0.02	0.04
Aroclor 1260		0.034	0.02	0.04
Total PCBs		0.000064		
Total Metals (As, Cd, Cr, Cu, Fe, Pb, Mo, Mn, Ni, Se, Ag, and Zn)	EPA6010/6020			
Antimony		6	0.5	1
Arsenic		0.045	0.045	0.05
Cadmium		0.094	0.04	0.2
Chromium, total		100	0.5	1
Copper		2.7	0.5	1
Lead		0.54	0.1	0.2
Mercury		0.77	0.04	0.08
Nickel		16	0.5	1
Selenium		5	0.5	1
Silver		0.12	0.1	0.2
Zinc		36	2	4
Total Suspended Solids, TSS	SM2540D	No SLV		
Total Organic Carbon, TOC	SM5310C	No SLV		

Notes:

TPH = total petroleum hydrocarbons
PCBs = polychlorinated biphenyls
PAHs = polynuclear aromatic hydrocarbons
Total Metals: As = arsenic, Cd = cadmium, Cr = chromium, Cu = copper, Fe = iron,
Pb = lead, Mn = manganese, Hg = mercury, Mo = molybdenum, Ni = nickel,
Se = selenium, Ag = silver, Zn = zinc
ppb = parts per billion (ug/kg or ug/L)

FIGURES



Note: Base Map from the Portland (1990), Oregon USGS 7.5-Minute Quadrangle

Contour Interval: 10 Feet

NORTH

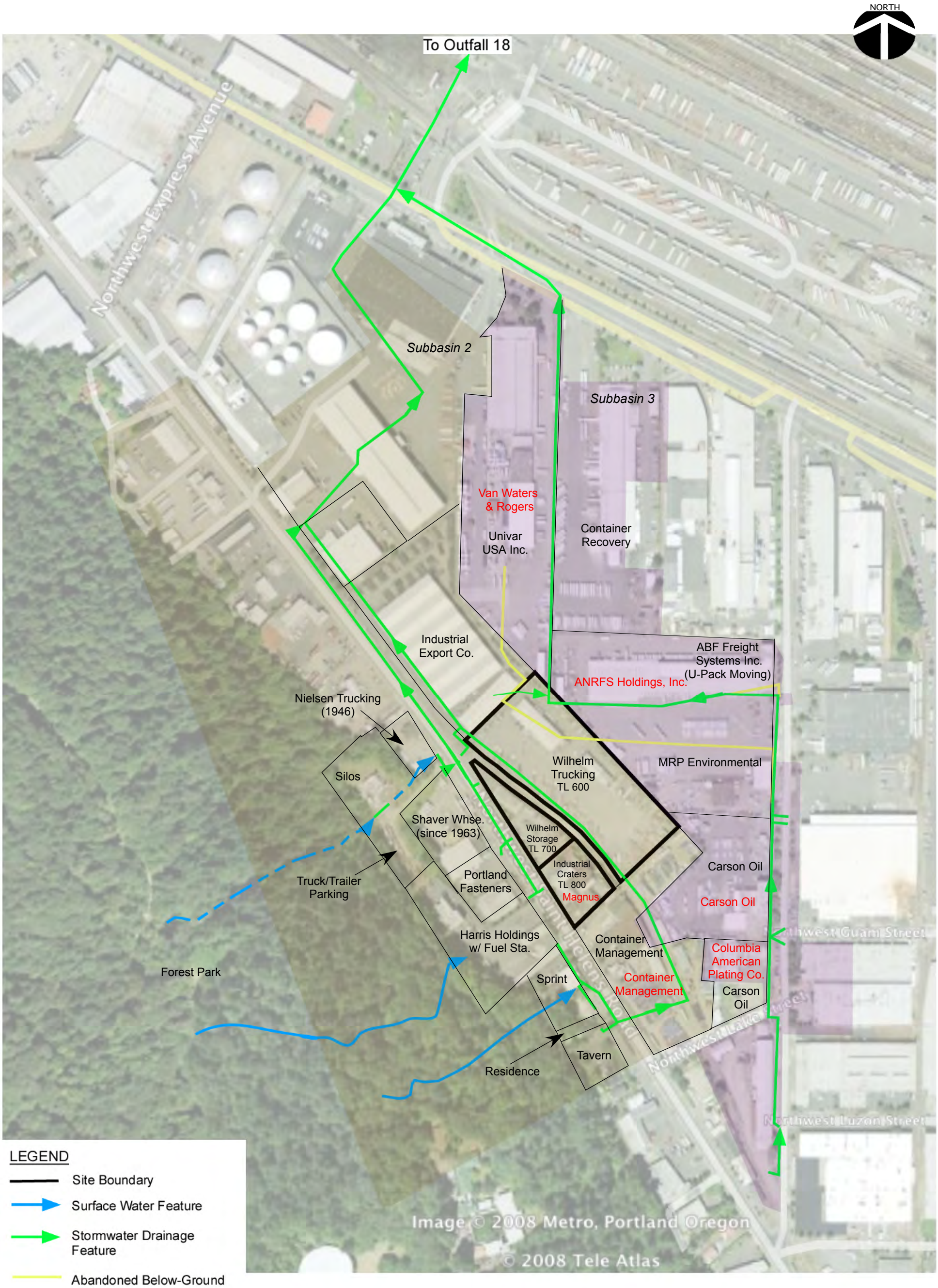
0 1000 2000 4000

1"=2000' Scale in Feet

FIGURE 1 – Location Map

Post-Source Control Stormwater Sampling
Wilhelm Trucking Company
3250 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436 March 2015



LEGEND

- Site Boundary
- Surface Water Feature
- Stormwater Drainage Feature
- Abandoned Below-Ground Pipe
- Outfall 18 Subbasin 2
- Outfall 18 Subbasin 3

NOTES:
- Current Property Occupant or Owner is in black type.
- DEQ Environmental Cleanup Site Information (ECSI) File is in red type.
- Only properties and ECSI sites that are located adjacent or "up-gradient" within the stormwater drainage lines shared by Wilhelm are indicated herein.

1"=150'

0 75 150 300
Scale in Feet

FIGURE 2
Site Vicinity Map
Source Control Measure Work Plan
Wilhelm Trucking Company
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436 March 2015

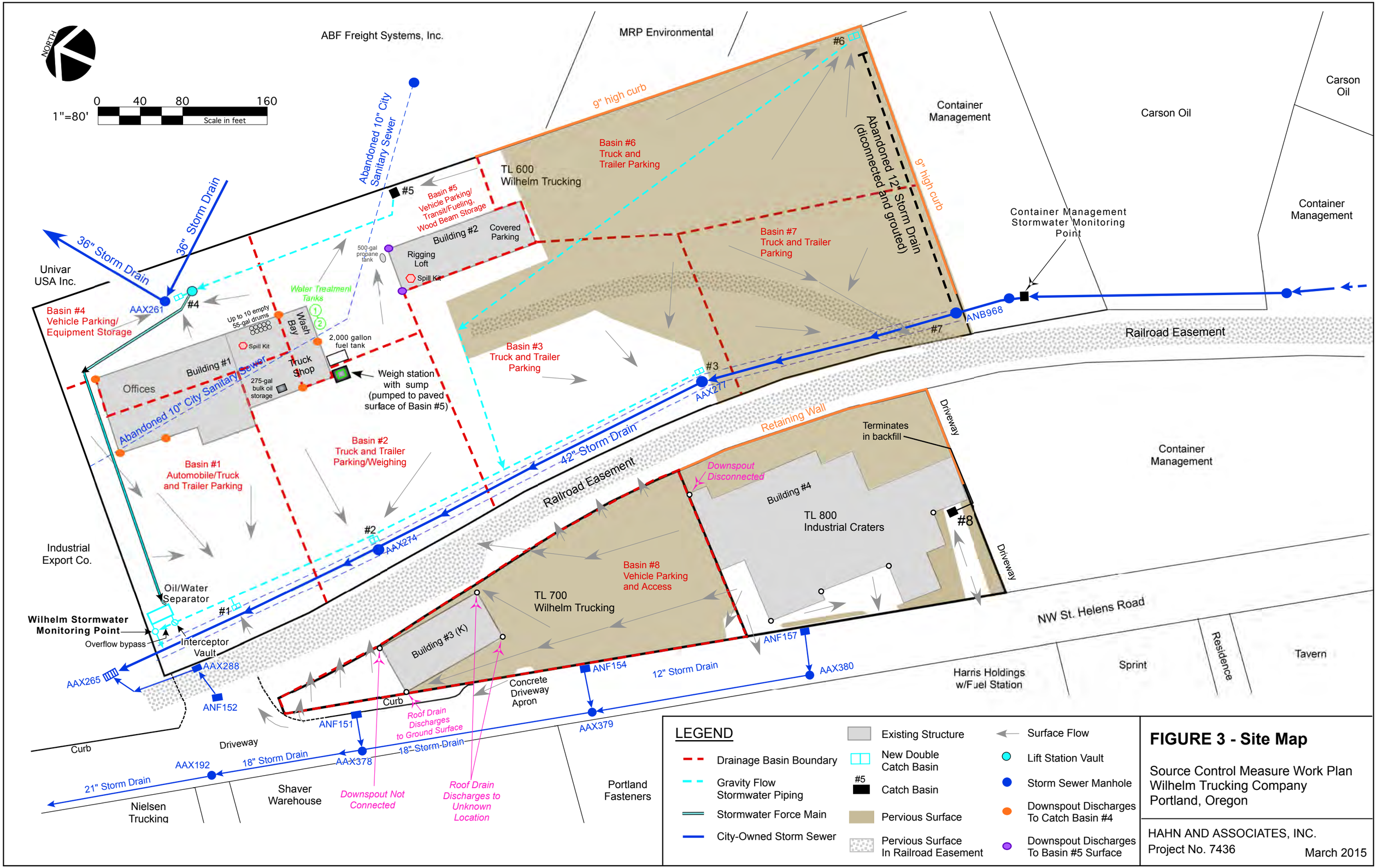


FIGURE 3 - Site Map

Source Control Measure Work Plan
Wilhelm Trucking Company
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436
March 2015

APPENDIX A

Stormwater Pollution Control Plan
Revision 8 (September 30, 2013)

STORMWATER POLLUTION CONTROL PLAN

FOR

WILHELM TRUCKING COMPANY
PORTLAND, OREGON

Site Name	Wilhelm Trucking Company
Site Operator	Wilhelm Trucking Company
(Rev. #8) Prepared by	Hahn and Associates, Inc.
NPDES General Permit	1200-Z (Effective 07/01/2012 to 06/30/2017)
File (Permit) #	100721
Contact Person	Robert J. Wilhelm, Jr.
Contact Phone Number	Phone: (503) 227-0561
Site Mailing Address	Wilhelm Trucking Company 3250 N.W. St. Helens Road P.O. Box 10363 Portland, OR 97296-0363
Site Physical Address	3250 N.W. St. Helens Road Portland, OR 97296-0363 45° 32'44.03″ N, 122° 43'22.46″ W
County	Multnomah County
Date of Latest Revision	September 30, 2013

Authorship

Wilhelm Trucking ("Wilhelm") developed the original SWPCP in March, 1997, and prepared the first three revisions as well. Hahn and Associates, Inc (HAI) prepared the last five revisions, including this most recent revision (i.e., Revision #8), of the SWPCP for Wilhelm. The table in the Revision Schedule (page iii) summarizes the authorship history for the SWPCP. HAI prepared the current revision of the SWPCP to meet the requirements of Industrial Stormwater General Permit Number 1200-Z, which is effective July 1, 2012 through June 30, 2017.

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 persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name of Official: Mr. Robert J. Wilhelm, Jr.

Signature of Official: Robert J. Wilhelm Jr.

Date: 9/30/2013

Introduction

This Stormwater Pollution Control Plan (SWPCP) was prepared to fulfill the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) General Permit 1200-Z, administered by the Oregon Department of Environmental Quality (DEQ) for stormwater discharges to surface waters or to conveyance systems leading to surface waters. Wilhelm Trucking Company falls under the following Standard Industrial Classification (SIC) and sector of industrial activity (from the 1200-Z Permit):

SIC Code	Description
4213	Trucking without storage

Accordingly, Wilhelm implements the general permit conditions of the 1200-Z Permit.

Plan Objective

This Stormwater Pollution Control Plan (SWPCP) has been developed to guide and assist Wilhelm in preventing stormwater pollution at their facility.

The preparation of this SWPCP was conducted in accordance with good engineering practices and is certified by the responsible Wilhelm official. The objective of the plan is to identify and evaluate sources of pollutants associated with industrial activities that may affect the quality of stormwater discharged from the site.

The SWPCP is a technical guidance document to assist Wilhelm personnel to:

- Identify potential pollutants that could be present in stormwater discharges;
- Identify areas of the site where a reasonable potential exists for stormwater runoff to adjacent surface water;
- Evaluate stormwater pollution control strategies;
- Maintain existing controls; and
- Develop new controls for the site, if appropriate.

The control measures outlined in the SWPCP are intended to meet the stormwater discharge benchmarks specified in the NPDES Permit. If stormwater analysis detects pollutant concentrations that exceed permit parameter guidelines, please refer to Section 10.2, *Exceeding Benchmark Values*. In addition, approved changes shall be implemented and incorporated into the SWPCP.

This SWPCP will be used in conjunction with the site's spill contingency plan.

REVISION SCHEDULE

This *Stormwater Pollution Control Plan* (SWPCP) shall be updated to reflect and incorporate changes in site conditions or government regulations. The approval for each Revision covers only that revision.

All revisions to the SWPCP shall be documented on the SWPCP revision documentation form shown below. The authorized facility representative who approves the SWPCP shall be an individual accountable for the management of the Wilhelm. The signature of this representative attests that the SWPCP revision information is true and accurate.

Revision Table

Number	Date	Author	Approved by
0	March 26, 1997	Wilhelm Trucking	DEQ
1	October 1, 1997	Wilhelm Trucking	DEQ
2	June 19, 1998	Wilhelm Trucking	DEQ
3	February 14, 2002	Wilhelm Trucking	DEQ
4	June 6, 2003	Hahn and Associates, Inc.	DEQ
5	September 19, 2007	Hahn and Associates, Inc.	City of Portland
6	February 16, 2009	Hahn and Associates, Inc.	City of Portland
7	March 31, 2012	Hahn and Associates, Inc.	City of Portland
7a	May 21, 2012	Hahn and Associates, Inc.	City of Portland
8	September 30, 2013	Hahn and Associates, Inc.	City of Portland
9			
10			

TABLE OF CONTENTS

1. SITE DESCRIPTION 1
- **1.1. Site Description 1**
- **1.2. Activities Description 2**
- **1.3. Buildings 2**
- **1.4. Significant Materials 3**
- **1.5. Potential Pollutants 4**

2. GENERAL LOCATION MAP 7

3. SITE MAP 7

4. IMPERVIOUS AREAS 7

5. RECEIVING WATERS 7

6. MONITORING LOCATIONS 8

7. SITE CONTROLS 9
- **7.1. Stormwater Management 9**
- **7.2. Stormwater Best Management Practices 9**
  - Minimize Exposure 10
  - Truck Yards 10
  - Oil and Grease 11
  - Oil/Water Separator 11
  - Waste Chemicals and Material Disposal 12
  - Erosion and Sediment Control 12
  - Debris Control (Catch Basins) 12
  - Dust Generation and Vehicle Tracking 12
  - Housekeeping / Sweeping / Dumpsters 13
  - Metal Roof and Siding 13
  - Tank Containment 13
  - Fueling or Liquid Loading/Unloading Operations 14
  - Spill Prevention and Response 15
  - Preventative Maintenance 15
  - Employee Education 15
  - Non-Stormwater Discharges 15
  - Stormwater Diversion 15

8. PROCEDURES AND SCHEDULES 15
- **8.1. Spill Prevention and Response Procedures 15**
  - Spill Response Actions 15
  - Spill Prevention General Guidelines 16
  - Spill Response 16
- **8.2. Reports and Regulatory Notifications 17**
- **8.3. Spill Emergency Contacts 18**
- **8.4. Preventative Maintenance 19**
  - Monthly Inspection 19
  - Maintenance Procedures 19
- **8.5. Employee Training and Awareness Program 20**

9. MONITORING INFORMATION 21
9.1. Stormwater Discharge Benchmarks 21
9.2. Stormwater Sampling Frequency 24
9.3. Visual Monitoring 25
9.4. Monitoring Site/Sampling Point 26
Sampling/Monitoring Criteria 26
Sampling/Monitoring Frequency 26
Monitoring Variance 27
Monitoring Waivers 27

10. RECORDKEEPING 28
10.1. Forms 28
Monthly Inspections 29
Employee Education 30
10.2. Reporting 30
Discharge Monitoring Report 30
Permit Compliance 30
Permit Noncompliance 31
Exceeding Benchmark Values 32
10.3. Record Retention 32

11. PLAN REVIEW 32

LIST OF TABLES

Table 1. Emergency Contacts 18
Table 2. Benchmark Monitoring Parameters 23
Table 3. Monitoring Schedule 25

LIST OF FIGURES

Figure 1. General Location Map
Figure 2. Site Map

LIST OF APPENDICES

Appendix A. NPDES 1200-Z Stormwater Discharge Permit
Appendix B. Stormwater Sample Collection Procedures
Appendix C. Stormwater Monitoring Forms and Logs
Appendix D. Oregon DEQ Spill/Release Report
Appendix E. Site Upgrades Plan Sheets
Appendix F. Oregon DEQ Industrial Stormwater Best Management Practices Manual

LIST OF ACRONYMS

1200-Z	DEQ General Permit for Industrial Activities
AST	aboveground storage tank
BES	City of Portland Bureau of Environmental Services
BMP	Best Management Practice
counts/100 mL	counts per 100 milliliters
CPS	Coalescing Plate Style
DEQ	Oregon Department of Environmental Quality
DMR	Discharge Monitoring Report
HAI	Hahn and Associates, Inc.
mg/L	milligram per liter
NPDES	National Pollutant Discharge Elimination System
SWPCP	Stormwater Pollution Control Plan
TSS	total suspended solids
UIC	Underground Injection Control
U.S. EPA	U.S. Environmental Protection Agency
Wilhelm	Wilhelm Trucking Company

1. SITE DESCRIPTION

1.1. SITE DESCRIPTION

Wilhelm Trucking Company maintains a transportation terminal at 3250 NW St. Helens Road, Portland, Oregon (Figure 1). Wilhelm Trucking Company purchased the property in 1954 and has operated the terminal since that date. The property is located on the east side of NW St. Helens Road and is surrounded by other industrial properties.

The Wilhelm Trucking Company property is comprised of Tax Lots 600, 700, and 800, which total 6.85 acres in area (Figure 2) per City of Portland tax assessor records (www.portlandmaps.com). The area of each parcel is presented in this table:

Tax Lot	Area (acre)	Area (square feet)
600	4.83	210,395
700	1.02	44,431
800	1.00	43,560

Wilhelm Trucking Company operations take place on Tax Lots 600 (the "yard") and 700, while Tax Lot 800 is leased to a tenant, Industrial Craters & Packers. These parcels are covered with impervious areas (e.g., buildings, asphalt, and concrete pavement) and pervious areas (e.g., gravel).

This Stormwater Pollution Control Plan (SWPCP) addresses only the management of stormwater falling on Tax Lot 600. Wilhelm Trucking Company has previously received coverage under the State of Oregon General Permit 1200-Z for industrial stormwater discharge from Tax Lot 600 to the Willamette River through City of Portland Outfall No. 18. The Oregon Department of Environmental Quality (DEQ) established the 1200-Z Permit under delegated authority of the federal Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) from the U.S. Environmental Protection Agency (U.S. EPA). The City of Portland Bureau of Environmental Services (BES) acts as DEQ's agent in implementing the 1200-Z Permit within the city. Stormwater on Tax Lots 700 and 800 is not discharged off-site through a NPDES outfall.

1.2. ACTIVITIES DESCRIPTION

General business activities at the site include parking for tractors and trailers, unloading equipment for temporary storage, loading equipment for departure, maintenance of equipment, and fueling of trucks.

General vehicle traffic may occur throughout the Wilhelm Trucking Company yard on Tax Lot 600 and in the parking areas of Tax Lot 700. Trucks and trailers are typically parked in the yard, on Tax Lot 600, which has the largest open area of the three tax lots for maneuvering and parking vehicles. Tax Lot 700 may also be used as a parking area for trucks, trailers, and employee personal vehicles. Loading and unloading takes place near Buildings 1, 2, and/or in the yard.

A mobile fueling truck, having a 1,500-gallon diesel tank, is used to fuel each tractor in the yard. The diesel tank truck is filled at a neighboring company's fueling service.

Equipment repair and maintenance normally takes place in the truck shop located in building No. 1. Materials used for maintenance are stored inside the shop building (e.g., new and used motor and gear oil, antifreeze, and solvents.)

Power washing of equipment takes place in a bay located in the truck shop on the south side of Building No.1. An outside company performs exterior washing of tractors at the far eastern gravel area in the Wilhelm Trucking Company yard. The outside company typically washes 4 trucks per week.

1.3. BUILDINGS

Four buildings are present on Tax Lots 600, 700, and 800:

Building No. 1

The Shop and Office Building is located on Tax Lot 600. It is an approximately 17,256-square-foot, concrete-block structure with a tarred roof that includes offices, a truck shop, and storage areas. The southern portion of Building No. 1 consists of a wash bay with a corrugated metal roof, as well as corrugated metal and plastic siding on its southern wall; the eastern and western ends of the wash bay are open for vehicle access.

Building No. 2

The Rigging Loft is located on Tax Lot 600. It is an approximately 3,280-square-foot, metal-framed structure with corrugated metal roofing and siding that is used for the storage of rigging equipment. An open-sided covered parking addition, with a corrugated metal roof, adjoins the southern wall of Building No. 2.

Building No. 3

The third building on the Wilhelm properties is known as Building K and is located on Tax Lot 700. It is an approximately 5,000-square foot warehouse with a composition roof. It is used primarily for storage of Wilhelm-owned equipment and materials.

Building No. 4

The former Magnus Company building is located on Tax Lot 800. The building was renovated for tenant activities; it is presently leased by Industrial Craters & Packers.

1.4. SIGNIFICANT MATERIALS

The following significant materials are handled on Tax Lot 600 in conjunction with normal business activities:

No. 2 Diesel: Diesel fuel is brought on-site in Wilhelm Trucking Company's 1,500-gallon-capacity tank truck. Diesel is stored in this tanker truck until needed for fueling equipment. In addition, diesel fuel is stored in a 2,000-gallon, dual-compartment aboveground storage tank (AST) located south of the wash bay adjacent to Building No. 1; the diesel fuel compartment capacity of this tank is 500 gallons. Emergency shutoff switches are located at the stationary storage tank, the inside southwest wall of the wash bay, and the outside southeast wall of the wash bay.

Unleaded Gasoline: Unleaded gasoline is delivered on-site by an approved vendor and stored in a 2,000-gallon, dual-compartment AST located south of the wash bay adjacent to Building No. 1; the unleaded gasoline compartment capacity of this tank is 1,500 gallons. Emergency shutoff switches are located at the stationary storage tank, the inside southwest wall of the wash bay, and the outside southeast wall of the wash bay. Unleaded gasoline is used to fuel smaller vehicles.

Motor and Gear Oil: New oil is stored in 55-gallon drums and in a 275-gallon bulk storage tank located along the east wall of the maintenance shop in Building No. 1. Used oil is collected inside the truck shop and is stored in 55-gallon drums. During the winter, the used oil is burned to heat the truck shop area.

Antifreeze: New antifreeze is stored in a 55-gallon drum inside the truck shop in Building No. 1. Used antifreeze is collected and stored in a 55-gallon container for disposal by an approved vendor.

Degreasers and Solvents: Small quantities of brake cleaners, soap, and degreasers are used and stored on-site in the truck shop in Building No. 1. The degreaser station is maintained by an approved vendor.

1.5. POTENTIAL POLLUTANTS

The possible sources of potential pollutants to stormwater on the site include the accidental spilling or release of materials that are carried by the vehicles or handled on-site, and the wash-off of the accumulated mix of materials from the travel path of vehicles and open parking and storage areas.

An accidental spill could occur at virtually any point where vehicles are present or materials are handled. The most likely locations of accidental spills are near the truck shop area (Building No.1) and while fueling equipment in the yard.

The wash-off of pollutants from vehicle operation would most likely occur from paved surfaces of the yard area.

The following is a discussion of the potential pollutants identified in each drainage basin on Tax Lot 600 and the pathways through which stormwater may be impacted by these pollutants:

Basin #1

The approximate area of Basin #1 is 32,000 square feet of impervious surfaces. Basin #1 is located at the entrance to the truck yard and comprised of asphalt parking and a portion of the office building roof. The asphalt-paved lot is used for employee automobile and truck and trailer parking. The roof downspouts were previously connected for direct discharge to the storm sewer, but the piping was disconnected and plugged to allow roof stormwater to discharge onto the asphalt parking. Potential pollutants identified for Basin #1 include the following: **Total Suspended Solids (TSS)**, which may originate from the basin's surface in the form of weathered asphalt, or may be transported onto the property as particulate matter by vehicle and trailer tires; **Oil and Grease***,* which may be released by the automobiles, trucks, and trailers that park in or drive through Basin #1; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the automobiles, trucks, and trailers that occupy this area. Basin #1 drains to Catch Basin #1, which discharges stormwater via a new gravity-flow pipeline to the new oil-water separator in Basin #1 (see Figure 2).

Basin #2

Basin #2 is approximately 27,700 square feet in area and consists of an impervious asphalt-paved area used for truck and trailer parking, including a scale for weighing trucks, and a portion of the truck shop roof. The roof downspouts were previously connected for direct discharge to the storm sewer, but the piping was disconnected and plugged to allow roof stormwater to discharge onto the asphalt parking. Potential pollutants identified for Basin #2 include the following: **TSS**, which may

originate from the basin's surface in the form of weathered asphalt, or may be transported onto the property as particulate matter by vehicle and trailer tires; **Oil and Grease***,* which may be released from the vehicles and trailers that park, drive though, or weigh in this area; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the vehicles and trailers that occupy this area. Basin #2 drains to Catch Basin #2, which discharges stormwater via a new gravity-flow pipeline to the new oil-water separator in Basin #1 (see Figure 2).

Basin #3

Basin #3 drains an approximately 40,800-square-foot area that is used for truck and trailer parking. Approximately 25,800-square feet of basin #3 consists of an impervious asphalt-paved surface while the remaining 15,000-square-foot area is pervious gravel surfaces, including the terminus of the Wilhelm rail spur. Potential pollutants identified for Basin #3 include the following: **TSS**, which may originate from the basin's surfaces in the form of weathered asphalt or gravel material, or may be transported onto the property as particulate matter by vehicle or trailer tires; **Oil and Grease***,* which may be released from the automobiles, trucks, and trailers that park in and drive through Basin #3; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the trucks and trailers that occupy this area. Basin #3 drains into Catch Basin #3, which discharges stormwater via a new gravity-flow pipeline to the oil-water separator in Basin #1 (see Figure 2).

Basin #4

Basin #4 is an approximately 20,400-square-foot area covered by impervious surfaces, including an asphalt-paved area used for vehicle parking and miscellaneous equipment storage, as well as a portion of the Building No. 1 office area roof. The roof downspouts were previously connected for direct discharge to the storm sewer, but the piping was disconnected and plugged to allow roof stormwater to discharge onto the asphalt parking. Potential pollutants identified for Basin #4 include the following: **TSS**, which may originate from the basin's surfaces in the form of weathered asphalt or gravel material, or which may be transported onto the property as particulate matter by vehicle or trailer tires; **Oil and Grease***,* which may be released from the vehicles and equipment that park in and drive through Basin #4; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the vehicles and equipment located in this area. Basin #4 drains to Catch Basin #4, which discharges to an adjacent, new lift station that transfers stormwater via a force main to the oil-water separator in Basin #1 (see Figure 2).

Basin #5

Basin #5 consists of an approximately 22,600-square-foot, asphalt-paved area used predominately for vehicle parking and access, and for the storage of wooden beams, as well as the Building No. 2 roof. This basin also includes a 2,000-gallon, dual-compartment (diesel and unleaded gasoline) AST used for vehicle fueling, a 500-gallon propane tank that supplies lift trucks, and two 3,000-gallon water-holding tanks used for the treatment of water drained from the wash bay (located within Building No. 1) prior to its discharge to the sanitary sewer system. Potential pollutants identified for Basin #5 include the following: **TSS***,* which may originate from the basin's surface in the form of weathered asphalt, or which may be transported onto the property as particulate matter by vehicle tires that park, access, or fuel in the area; **Oil and Grease***,* which may be released from the vehicles that park, access, or fuel in Basin #5; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the vehicles and equipment located in this area, as well as stormwater falling on the metal roofing of the Building No. 1 wash bay and Building No. 2, both of which discharge through downspouts that drain directly to the ground surface in Basin #5. Catch Basin #5 discharges via pipeline to the new lift station located adjacent to Catch Basin #4 (see Figure 2).

In addition, a sump underneath the scale plate in Basin #2 collects stormwater, which is pumped to the paved surface of Basin #5, where it flows across the pavement to Catch Basin #5. This stormwater may be impacted by TSS, Oil and Grease, and Metals.

Basin #6

Basin #6 drains an approximately 39,295-square-foot pervious gravel area that is used for truck and trailer parking. Potential pollutants identified for Basin #6 include the following: **TSS***,* which may originate from the basin's surface in the form of gravel material, or which may be transported onto the property as particulate matter by truck and trailer tires that access and park in this area; **Oil and Grease**, which may be released from the trucks and trailers that park in and drive through Basin #6; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the trucks and trailers located in this area. Basin #6 drains into Catch Basin #6, which discharges stormwater via a new gravity-flow pipeline to the oil-water separator in Basin #1 (see Figure 2). Up until August 2013, Catch Basin #6 drained to Grate-Covered Access Point #7, where stormwater discharged to the 42-inch-diameter storm sewer along the west side of the truck yard. However, due to 2013 site upgrades, the 12" storm drain for Catch Basin #6 was disconnected, plugged, and abandoned in place (see Figure 2).

Basin #7

Basin #7 consists of an approximately 27,600-square-foot area used for truck and trailer parking. Pervious gravel and weathered asphalt cover the entire basin, which includes a rail spur from the rail easement adjacent to the western boundary of Tax Lot 600. Potential pollutants identified for Basin #7 include the following: **TSS***,* which may originate from the basin's surface in the form of weathered asphalt or gravel material, or which may be transported onto the property as particulate matter by vehicle tires that park, access, or fuel in the area; **Oil and Grease***,* which may be released from the vehicles that park, access, or fuel in Basin #7; and **Metals***,* which may impact stormwater through the contact of precipitation with the metal surfaces of the vehicles and equipment located in this area. As Basin #7 is not paved, the stormwater infiltrates into the ground or runs off along the rail spur to the adjacent railroad easement where it will also infiltrate.

2. GENERAL LOCATION MAP

Figure 1, General Location Map, uses a topographic map base to present the location of the site in relation to major transportation routes, surface waters, and other relevant features.

3. SITE MAP

Figure 2, Site Map, illustrates Tax Lots 600, 700, and 800, which comprise the Wilhelm Trucking Company property. In addition, the site map presents the drainage basins on Tax Lot 600 and the stormwater conveyance structures that discharge to city storm sewers.

4. IMPERVIOUS AREAS

Approximately 128,500 square feet (or 61%) of the terminal yard (Tax Lot 600) is covered by impervious surfaces.

5. RECEIVING WATERS

Tax Lot 600: Catch Basins #1 through #6 collect stormwater from the terminal yard (Tax Lot 600), which is discharged under the 1200-Z Permit to the city storm sewer along the western side of the yard. This storm sewer ultimately transfers the stormwater to the Willamette River via City of Portland Outfall No. 18.

Tax Lot 700: Most of the northern portion of Tax Lot 700 is covered by impervious pavement and Building No. 3; consequently, much of the stormwater falling on the

northern portion runs off onto the adjacent railroad easement, where it percolates into the ground. Stormwater falling on the southern portion of Tax Lot 700 percolates into the gravel parking area with minor runoff toward the unpaved railroad easement.

Tax Lot 800: A significant amount of the stormwater falling on the eastern side of Tax Lot 800, including a portion of the Building No. 4 roof, percolates into the ground, or runs off to the adjacent unpaved railroad easement. The stormwater falling on the western side of Tax Lot 800 (including the remaining portion of the Building No. 4 roof) runs off onto the gravel parking area of Tax Lot 700, or to the City of Portland street drains that are connected to a storm sewer on NW St. Helens Road. Catch Basin #8 is situated in the southwestern portion of the Tax Lot 800 and discharges via piping to the backfill behind the building. *Consequently, Catch Basin #8 is not connected to the city storm sewer system.*

Catch Basin #8 discharges via a pipe that runs along the south side of Building No. 4 and then into the subsurface behind the east side of the building. Prior to construction of the retaining wall along the railroad easement, the drain pipe is believed to have discharged stormwater onto the ground surface behind Building No. 4, which formerly sloped to the east (i.e., away from the back of the building). Wilhelm contracted a video inspection of the drain pipe, which determined that the terminus of the pipe is partially crushed. It was surmised that the drain pipe was buried during the backfilling behind the retaining wall. This inadvertently created a legacy underground injection control (UIC); Wilhelm Trucking has discussed UIC decommissioning with DEQ.

At present, Catch Basin #8 is filled with sediment and does not appear to discharge stormwater; consequently, stormwater falling on the southwest corner of Tax Lot 800 percolates into the ground surface of the drainage basin. In the future, the pipe which drains Catch Basin #8 will be decommissioned. In conjunction with the UIC decommissioning, another solution for stormwater management will be developed for the Catch Basin #8 area and may include on-site percolation in accordance with the City of Portland's stormwater management hierarchy.

6. MONITORING LOCATIONS

Catch Basins #1 through #6 discharge, via a new oil-water separator located in Basin #1, to a 42-inch storm sewer that is located along the entire length of the west side of the terminal yard. A sampling point is located just downstream of the oil-water separator, prior to discharge of the stormwater into the storm sewer. The new stormwater management system, including the monitoring location, is illustrated on Figure 2, Site Map.

7. SITE CONTROLS

7.1. STORMWATER MANAGEMENT

As required by Schedule A of the NPDES permit, a description of the stormwater contamination controls appropriate for the site and a time line for their implementation is included in this section. The site control measures discussed in this and following sections includes the following:

- Stormwater Best Management Practices (BMPs)
- Spill Prevention and Response Procedures
- Preventative Maintenance Program
- Employee Training and Awareness

7.2. STORMWATER BEST MANAGEMENT PRACTICES

Wilhelm Trucking Company employs Best Management Practices (BMPs) to minimize the potential for contamination of stormwater as a result of daily operations, as well as any accidental spills or releases of chemicals of concern.

The implementation of stormwater BMPs can limit contact of pollutant-generating materials with stormwater runoff. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of stormwater discharges. BMPs include treatment systems, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

The 1200-Z permit requires the facility to employ the following types of BMPs that are appropriate for the site. A schedule for implementation of these practices is to be included in the SWPCP if the practice has not already been established.

- Minimize Exposure
- Truck Yards
- Oil and Grease
- Oil/Water Separator
- Waste Chemicals and Material Disposal
- Erosion and Sediment Control
- Debris Control (Catch Basins)
- Dust Generation and Vehicle Tracking
- Housekeeping

- Sweeping
- Dumpsters
- Metal Roof and Siding Coating
- Tank Containment
- Fueling or Liquid Loading/Unloading Operations
- Spill Prevention and Response
- Preventative Maintenance
- Employee Education
- Non-stormwater Discharges
- Implementation Schedule

Additional BMPs that may be applicable as site activities are modified may be found in the DEQ guidance document entitled *Best Management Practices for Storm Water Discharges Associated with Industrial Activities*, February 2013. (Appendix F)

Minimize Exposure

All hazardous materials are stored and labeled to prevent leaks and spills from contaminating the stormwater. The following procedures were implemented to minimize chances of contact between potential pollutants and stormwater:

Much of the maintenance, repair, and cleaning activities are performed inside the shop or the wash bay in Building No. 1. The floors in the wash bay area slope toward a trench drain in the middle of the bay. A sump pump collects the water/oil mixture and transfers it to a 3,500 gallon holding tank for separation.

Regular fueling of trucks takes place with a nozzle that requires an operator to hold the nozzle in the open position. This makes it necessary for someone to be present during the fueling process, which should facilitate a quicker response should a spill occur. Spill cleanup equipment is readily available in Building No. 2. Small spills are collected by means of rags that are collected and sent to an off-site vendor for washing, as well as spill pads if a larger spill occurred.

Truck Yards

Trucking firms typically use fifth-wheel hitching mechanisms to attach semi-tractors to semi-trailers. These have a coating of grease on them to facilitate the attachment process during connection of trucks to the trailers. The greasy hitches are exposed to stormwater when nothing is attached to the trailers, allowing the stormwater run-off to pick up the oil and grease.

To reduce the amount of grease on fifth wheel hitching mechanisms (which are exposed to stormwater and ambient conditions), Wilhelm will manufacture or purchase a quick install cover to slip over the hitch, and ensure that all operators of the equipment are instructed to place the cover over the hitches when they are not being used.

Oil and Grease

Water from the wash bay area is collected by means of a sump pump, into a 3,000-gallon AST. The oil separates and floats to the top of the water collected in the tank. Clean water is transferred via a pipeline and discharged to a second 3,000-gallon holding tank. This water is released to the sanitary sewer system under a batch discharge permit.

In order to comply with its Permit 400-047, the Wilhelm Trucking Company collects samples from the release tank for laboratory analyses; the analytical results are forwarded with a Batch Discharge Request to the City of Portland's Bureau of Environmental Services, which reviews the data and determines whether a batch discharge permit may be issued.

Oil/Water Separator

In 2013, Wilhelm installed an 816-1 Coalescing Plate Style (CPS) oil/water separator to eliminate or minimize oil and grease contamination of stormwater discharges (see plan sheet #2 of Appendix X). Oil/water separators function as a settling tank, allowing suspended solids of various sizes to settle out of suspension before further treatment. Oil droplets coalesce as they contact the plates mounted in the vault and then float to the surface for removal. The installed CPS unit holds approximately 4,000 gallons; the design exceeds the minimum volume to meet common pretreatment standards.

Without regular maintenance, oil/water separators may not be sufficiently effective in achieving oil and TPH removal down to required levels. Accordingly, the oil/water separator will be managed using the BMPs listed below:

- Inspections of the interceptor manhole, where all stormwater flows before transfer to the oil/water separator, will be conducted during storm events, as appropriate, to observe overflows. If water flows over the weir in the interceptor manhole, bypassing the oil/water separator, this overflow will documented.
- Inspect oil/water separators monthly during the wet season to ensure proper operation, and, during and immediately after a large storm event of ≥1 inch per 24 hours.

- The oil/water separator will be cleaned regularly to keep accumulated oil from escaping during storms. As needed, the oil-water separator will be cleaned by the start of the rainy season to remove material that has accumulated during the dry season, after all spills, and after a significant storm. Coalescing plates may be cleaned in-situ or after removal from the separator. A vacuum truck may be used for oil, sludge, and washwater removal. Replace wash water in the separator with clean water before returning it to service.
    - Remove the accumulated oil when the thickness reaches 1 inch. Also remove sludge deposits when the thickness reaches 6 inches.
    - Replace oil absorbent pads before their sorbed oil content reaches capacity.
- Designated employees will be trained on appropriate oil/water separator operation, inspection, record keeping, and maintenance procedures.

Waste Chemicals and Material Disposal

All waste is recycled and properly disposed of to eliminate exposure of pollutants to stormwater.

Erosion and Sediment Control

Proper use of pavement and gravel has been employed to minimize the erosion of soil on the Wilhelm Trucking Company property. Based on prior TSS benchmark exceedences (2nd stormwater collection, 2011) that were most likely due to degraded asphalt, Wilhelm began repair and replacement of asphalt pavement in September 2012. Following construction of the new stormwater management system during the summer of 2013, Wilhelm repaired and replaced additional areas of asphalt pavement in the truck yard, particularly in Basins #1, #2, #3, and #4.

Debris Control (Catch Basins)

Catch basins are used to eliminate or minimize debris in stormwater discharges. Wilhelm recently installed five (5) new two-chambered catch basins (CB's 1, 2, 3, 4, and 6). All six catch basins (1, 2, 3, 4, 5, and 6) will discharge to the new oil/water separator, which provides for a single discharge point to the City of Portland's storm sewer. Combining the outfalls offers the benefits of simplified compliance and monitoring, as well as readily facilitates subsequent treatment or polishing. These catch basins are properly designed for the flow-through rate and when properly maintained can reduce sediment, total suspended solids, and oil and grease levels in the stormwater discharge significantly.

Dust Generation and Vehicle Tracking

Portions of the driveways and parking areas (61%) are paved to help reduce dust

generation and vehicle tracking. Asphalt repair was performed in 2012 and 2013 to help further mitigate dust generation.

Housekeeping / Sweeping / Dumpsters

Wilhelm Trucking Company has a well-maintained schedule for the housekeeping inspection. Trash is collected from open areas and dumpsters on a regular basis.

Based on the **Oregon DEQ Industrial Stormwater Best Management Practices Manual**, good housekeeping protocol includes:

- Orderly storage of bags, drums, and piles of materials and chemicals; prompt cleanup of spilled liquids;
- Frequent sweeping, vacuuming, or other cleanup methods for accumulated dry chemicals and materials can cut down on possible stormwater contamination;
- Proper disposal of toxic and hazardous wastes, and
- Removal of accumulated scrap and spare parts.

Wilhelm Trucking performs frequent sweeping to remove scrap, spare parts, road and parking lot dust, and to reduce potential opportunities for stormwater contamination.

Good control measures will be implemented when dumping the contents of the sweeper, as well as proper disposal methods for the emptied contents, to ensure that there is no adverse environmental impact after the initial clean-up.

Covers are on all of the dumpsters and are closed when wastes are not being discharged into them.

Metal Roof and Siding

Runoff from buildings with corrugated galvanized sheet metal roofs and/or siding has the potential to produce zinc and iron pollutants.

At an unspecified date in the future, Wilhelm proposes to clean and paint the exposed galvanized sheet with enamel paint. Any liquids used in cleaning will be contained and/or collected and disposed of properly along with a regular inspection and maintenance program involving the building conditions.

Secondary Containment

Secondary containment is provided for all regulated containers and will also be in place during refueling activities involving transfers of fuel to/from trucks, the mobile refueler, or portable containers.

If the container cannot be stored under adequate cover or a roof, the containment area surrounding the tank must hold 110% of the contents of the largest tank.

Secondary containment must be impermeable to the materials being stored, reducing the potential for water contamination. This may include berms, dikes, liners, vaults, and double-walled tanks.

In light of the new stormwater management system, Wilhelm reviewed BMPs for all outdoor operations, including the fuel tank area. Although there have not been any releases from the aboveground storage tank (AST) in the fuel area, Wilhelm recently constructed a concrete secondary containment around their 2,000-gallon, dual-compartment (diesel and unleaded gasoline) AST used for vehicle fueling. This containment can hold 111% of the contents of the AST.

Any drainage valves provided to the secondary containment will be liquid tight and able to be locked in the fully closed position.

Wilhelm will routinely monitor tanks and containers to ensure that they are not leaking.

Fueling Operations

Poorly designed fueling environments and conditions can result in gasoline and diesel fuel spills or other liquids contacting stormwater and entering the site runoff. The Wilhelm fueling area is operated to minimize contact between spilled fuel, leaked fluids, and stormwater.

BMPs taken directly from the Oregon DEQ Industrial Stormwater Best Management Practices (2013) are listed below:

- Use a damp cloth on the pumps and a damp mop on the pavement for area clean up.
- Clean up spills immediately:
- Spread absorbent material and sweep it up with a broom. Perform a hazardous waste determination on the absorbed material.
- Dispose of the absorbed material properly.
- Ensure that the overfill nozzle protection is in working order.
- Do not try to top off tanks. Stop filling when the dispensing nozzle shuts off the first time.

- Remove any nozzle-locking mechanism which allows the fuel to stay on with the operator absent. The operator should be present at all times to ensure that overfilling and spillage does not occur.
- Provide an easily accessible and well-marked emergency shutoff for pumps with plainly written instructions on how to operate the shutoff.
- Never hose down the fueling area.
- Do not drain spills to the sanitary or stormwater sewers.
- Ensure that the fueling area has an undamaged continuous paved or otherwise impervious surface.
- Ensure that spill cleanup materials are readily available.
- Provide well-placed, understandable instructions on the proper procedures to follow in the event of an emergency, including reporting information.

Spill Prevention and Response

Please Refer to SWPCP Section 8.1.

Preventative Maintenance

Please Refer to SWPCP Section 8.4.

Employee Education

Please Refer to SWPCP Section 10.1.

Non-Stormwater Discharges

The NPDES permit does not authorize non-stormwater discharges and, consequently, no industrial activity typically occurs outdoors, except vehicle fueling, that could contaminate stormwater.

Stormwater Diversion

The graded slope of the drainage basins diverts stormwater to catch basins. Fueling stations are located at significant distance from the catch basins in order to facilitate capture of any accidental spill or release of fuel.

8. PROCEDURES AND SCHEDULES

8.1. SPILL PREVENTION AND RESPONSE PROCEDURES

Spill Response Actions

Wilhelm may manage spill prevention and response procedures, or contact Metro Rooter & Plumbing, which handles accidental spills and cleanup. Metro Rooter's

contact information is provided below:

Metro Rooter & Plumbing **10630 NE Marx St.** **Portland, OR 97220** **503-253-4828** **24-hour Emergency Response Number: 503-252-6144**

Spill Prevention General Guidelines

Wilhelm is committed to spill prevention and recognizes that the primary causes of spill incidents are operational errors and equipment failures. Operational errors can generally be minimized through proper training of on-site personnel, employee understanding and appreciation of the importance of spill prevention and proper supervision, and adherence to the prescribed spill prevention procedures. Employees shall practice proper housekeeping methods, immediately clean up small spills and leaks should they occur during operational activities, and follow the spill prevention procedures outlined in the company spill contingency plan.

Prevent Spills

Spills can be prevented or minimized by utilizing the following practices:

- Carefully transfer fuels, oils, and/or solvents into storage tanks that are properly designed and placed within secondary containment structures, preferably in a covered area.
- Store motor oils and hydraulic oils in labeled containers within secondary containment structures, preferably in covered areas, and properly dispose of such materials (never on the ground or in a stormwater catch basin).
- Maintain and repair equipment to reduce fuel and oil leaks.

Employees must be familiar with spill control equipment location and use. Maintain spill response equipment and use it only for emergency response to spills. Decontaminate or replace equipment and supplies immediately after any response.

Spill Response

In the Event of a Spill

In the event of a spill, the Compliance Administrator listed in the spill contingency plan will be notified (503-227-0561 during regular work hours, 503-780-8954 during off hours). The Administrator will follow the procedures described in the site's spill contingency plan and will determine the appropriate actions to be taken.

In the event of a major or catastrophic spill that poses an immediate, significant safety hazard, such as fire or explosion, initial responses generally should include the following steps:

- Personal safety and protection of life and limb take precedence over environmental protection
- Initiate evacuation by activating the fire alarm system. Direct personnel away from spill area. Secure the area.
- Immediately notify the local Fire Department by dialing 9-1-1.
- Stop the spill flow when possible without undue risk of personal injury.
- If fire or explosion is possible, do not allow smoking, open flames, or equipment that might produce sparks or static electricity in the spill area.
- Notify the Compliance Administrator as soon as safely possible. The Administrator will follow the procedures described in the site's spill contingency plan and will determine the appropriate actions to be taken. The Administrator will also be responsible for reporting the spill to the proper regulatory agencies.

Spill Response Kits

Spill response kits kept on site should be checked regularly and restocked as necessary. Existing spill kits can be used for initial control of spills from fuel transfer activities, manufacturing equipment failures, and incidental spill/leaks associated with the storing/handling of containerized oil and lubricants.

The emphasis of initial spill response is safety, then isolation and containment, using diking materials and drain covers, until the response contractor can be summoned.

Decontaminate or replace equipment and supplies in the spill kits immediately after any response.

8.2. REPORTS AND REGULATORY NOTIFICATIONS

The Compliance Administrator will review the cause of the release, response actions, cleanup and other pertinent issues. This information is used to evaluate materials handling procedures, training requirements, and emergency response procedures in the event that modification of procedures may reduce the chance of similar incidents from recurring.

If a spill has impacted or may impact a nearby body of surface water, the Site Coordinator should immediately call the **Oregon Emergency Management Division** at **(800) 452-0311** and the **National Response Center at (800) 424-8802**. When reporting a spill or release, the following information shall be provided:

- Name and telephone number of the person reporting the spill or release
- Name and address of the facility
- Time, date, and duration of the spill or release
- Type of spill or release
- Quantity and type of hazardous materials involved
- Number of persons, if any, exposed or injured and
- Potential off-site hazards to human health or the environment

The Oregon DEQ Spill Notification Report (Appendix D) form should be used to document the spill. A spill should be reported if it meets the following criteria:

- any amount of oil to waters of the state;
- oil spills on land in excess of 42 gallons;
- hazardous materials that are equal to, or greater than, the quantity listed in the Code of Federal Regulations, 40 CFR Part 302 (List of Hazardous Substances and Reportable Quantities), and amendments adopted before July 1, 2002.

This Spill Report should be delivered to DEQ within 15 working days of the incident.

8.3. SPILL EMERGENCY CONTACTS

This section provides telephone numbers of key personnel who should be notified in case of a release, as well as the numbers of regulatory agencies that may have to be notified depending upon the magnitude and severity of the release.

Table 1. Emergency Contacts

Local Fire Department
9-1-1
City of Portland Bureau of Environmental Services Spill Hotline
(503) 823-7180

Wilhelm Contact

Compliance Administrator	Desk (503) 241-6163 Cell (503) 780-8954

Jurisdictional Agencies

Oregon Emergency Management Division	(800) 452-0311
National Response Center	(800) 424-8802

Chemical Emergencies

Chemical Transportation Emergency Center (CHEMTREC)	(800) 424-9300
Department of Environmental Quality (DEQ) **Northwest Region Office** 2020 SW 4th Avenue, Suite 400 Portland, Oregon 97201	(503) 229-5263

8.4. PREVENTATIVE MAINTENANCE

The preventative maintenance program ensures the effective operation of management practices, structural and non-structural control measures, and the treatment facilities used to comply with the requirements of the 1200-Z Permit. The preventative maintenance program consists of site inspection and maintenance procedures described below.

Monthly Inspection

The 1200-Z Permit requires a Monthly Inspection of all areas where spills of significant materials could potentially occur, or where industrial activities have the potential to impact stormwater (i.e., outdoor areas). All stormwater control or treatment features, such as catch basins and the oil/water separator, are to be inspected at the same time.

In addition, inspection of areas where potential spills of significant materials could impact stormwater runoff, control structures, and any treatment facilities will also be made at the same time. The Monthly Inspection may occur at the same time as the Visual Monitoring discussed in Section 9.3, but it may also occur at a different time and can take place in any type of weather. The recordkeeping requirements for the Monthly Inspections are discussed in Section 10, and the inspections are to be documented on the *Stormwater System Monthly Inspection Log* provided in Appendix C.

Maintenance Procedures

The operations of various elements in this system are ensured to succeed by carrying out preventative maintenance activities. The company performs monthly and yearly inspections on equipment. Wilhelm Trucking Company has a

computerized Maintenance Program, while other inspections are performed by Metro Rooter and Plumbing.

Maintenance activities performed by the Wilhelm Trucking Company include:

- Regular cleaning of working areas and the terminal yard
- Driver's Vehicle Inspection Reports
- Regular Safety/Housekeeping Inspections
- Preventative maintenance is performed on equipment to prevent leakage or spills

Maintenance activities performed by Metro Rooter and Plumbing include (upon request):

- Removal of accumulated solids from the sump catch basin in the wash bay.
- Removal of the water/oil mixture in the basin of the hydraulic lift.
- Removal of the contaminated absorbent booms generated by the Oil-Water Separator.
- Collection and recycling, or disposal, of anti-freeze, empty spray cans, and other cleaning materials.

Maintenance work completed will be documented on the *Stormwater System Preventative Maintenance and Repair Log* provided in Appendix C. Recordkeeping requirements are discussed in Section 10.

8.5. EMPLOYEE TRAINING AND AWARENESS PROGRAM

An Employee Training and Awareness Program will be implemented to inform personnel of the goals and components of the SWPCP. The purpose of this program is to inform personnel of the SWPCP, spill response procedures, materials management practices, and good housekeeping measures that will prevent pollution of stormwater runoff. This program should be implemented by providing training for employees on use of the SWPCP and its components, and may include presentations to employees at safety or other meetings, posting good housekeeping signs, and/or conducting specific training sessions.

The formal training is to be conducted on at least an annual basis for any employees who work in areas where stormwater is exposed to industrial activities, or who conduct duties related to the implementation of the SWPCP. For new employees that meet the above criteria, training must occur within 30 calendar days of hiring.

Use the *Employee Training Log* (Appendix C) to document training activities.

Documentation of employee training must be kept and made available on site for review upon request by DEQ and BES.

New Employee Orientation

Education and training will occur within 30 calendar days of hiring a new employee who works in areas where stormwater is exposed to industrial activities or who conducts duties related to the implementation of the SWPCP.

Monthly Training

Employees involved at this site attend monthly training to review the goals and objectives of the SWPCP. These meetings will also cover safety issues (e.g., accidents, incidents), spill response procedures, and good housekeeping. Employees are encouraged to propose suggestions to improve the environmental performance of the business. Wilhelm Trucking Company has a monthly Safety Bonus Program as an added incentive to avoid incidents and accidents.

Twice a month, a safety bulletin is provided with each employee paycheck.

Specific training in materials handling practices, the operation of stormwater pollution control structures, and procedures for taking stormwater samples and observations will be given to the employee(s) responsible for these functions. Employees are trained on approved work processes, appropriate spill response activities, and effective communication to address the requirements of the spill contingency plan.

As prescribed in Schedule A of Permit 1200-Z, training will be conducted at least on an annual basis.

9. MONITORING INFORMATION

9.1. STORMWATER DISCHARGE BENCHMARKS

The stormwater samples will be collected at the monitoring location identified on the Site Map (Figure 2). Samples may be collected by grab or other method and all samples should be representative of the discharge from the site. Time- or flow-weighted compositing of samples may be used, except when sampling for pH and oil & grease. Samples for all parameters must be collected from the same storm event.

The stormwater discharge benchmarks are guideline concentrations, rather than limits. If a benchmark is exceeded, it is not a permit violation, but it does indicate whether site controls are effectively reducing the pollutant concentrations in stormwater discharged off-site. If benchmarks are not achieved, a tiered corrective action response is initiated, as prescribed in Schedule A of Permit 1200-Z (see Appendix A, pp. 16-18).

The NPDES General Permit 1200-Z establishes the following benchmarks for

stormwater discharge that are applicable to Wilhelm. Stormwater discharged from the site shall be sampled for water quality analysis for the constituents listed in Table 2.

Every two years, Oregon DEQ is required to assess water quality and report to EPA on the condition of Oregon's waters, and subsequently prepare an Integrated Report that meets the requirements of the federal Clean Water Act (CWA). As of the writing of this plan, the 303(d) list of Impairment Pollutants for the Willamette River has not yet been finalized by DEQ. When this occurs, Wilhelm Trucking will abide by the requirements of any new pollutants and/or benchmarks, including necessary revisions of the SWPCP.

Table 2. Benchmark Monitoring Parameters

PARAMETER	BENCHMARK	FREQUENCY
Cadmium*	No benchmark; data collection only	Eight times over the first three years of permit coverage
Chromium*	No benchmark; data collection only	Eight times over the first three years of permit coverage
Nickel*	No benchmark; data collection only	Eight times over the first three years of permit coverage
Iron*	1.0 mg/L	Two times per year, all five years of permit coverage
Total Copper*	0.020 mg/L	Four times per year, all five years of permit coverage, unless waiver applies
Total Lead*	0.040 mg/L	Four times per year, all five years of permit coverage, unless waiver applies
Total Zinc*	0.12 mg/L	Four times per year, all five years of permit coverage, unless waiver applies
pH*	5.5 to 9.0 S.U.	Four times per year, all five years of permit coverage, unless waiver applies
Total Suspended Solids (TSS)*	100 mg/L	Four times per year, all five years of permit coverage, unless waiver applies
Total Oil & Grease*	10 mg/L	Four times per year, all five years of permit coverage, unless waiver applies
Oil & Grease Sheen (visual)	No Visible Sheen	Once per month (when discharging)
Floating Solids associated with industrial activities (visual)	No Visible Discharge	Once per month (when discharging)
Aldrin	0.003 mg/L	Two times per year, all five years of permit coverage
DDT	0.0011 mg/L	Two times per year, all five years of permit coverage
DDT Metabolite (DDE)	0.00001 mg/L	Two times per year, all five years of permit coverage
Dieldrin	0.0025 mg/L	Two times per year, all five years of permit coverage
Total PCB (based on the sum of the following Aroclors: 1016, 1221, 1232, 1242, 1248, 1254, and 1260)	0.002 mg/L	Two times per year, all five years of permit coverage

Table 2. Benchmark Monitoring Parameters (continued)

PARAMETER	BENCHMARK	FREQUENCY
Pentachlorophenol	0.02 mg/L	Two times per year, all five years of permit coverage
Polynuclear Aromatic Hydrocarbons	(See Footnote 1)	Two times per year, all five years of permit coverage

*Two samples on or before December 31 and two samples on or after January 1.
mg/L = milligram per liter
counts/100 mL = counts per 100 milliliters
S.U. = standard unit

Footnote 1: Polynuclear Aromatic Hydrocarbons:	**Concentration**
Acenaphthene	0.095 mg/L
Anthracene	2.9 mg/L
Benz(a)anthracene	0.001 mg/L
Benzo(a)pyrene	0.001 mg/L
Benzo(b)fluoranthene 3,4	0.001 mg/L
Benzo(k)fluoranthene	0.001 mg/L
Chrysene	0.001 mg/L
Dibenz(a,h)anthracene	0.001 mg/L
Fluoranthene	0.014 mg/L
Fluorene	0.39 mg/L
Indeno(1,2,3-cd)pyrene	0.001 mg/L
Pyrene	0.29 mg/L

9.2. STORMWATER SAMPLING FREQUENCY

Stormwater samples will be collected in accordance with the frequency prescribed in Schedule B, Table 4, of NPDES General Permit 1200-Z. Stormwater monitoring is composed of two general elements: 1) Visual Monitoring, and 2) Stormwater Sampling. In addition, a Monthly Inspection of stormwater structures is required as part of a Preventative Maintenance Program. Visual Monitoring is discussed in Section 9.3; Stormwater Sampling is discussed in Section 9.4; and the Monthly Inspections are discussed in Section 8.4. The three stormwater monitoring/inspection elements are summarized below:

Table 3. Monitoring Schedule

Required Monitoring and Locations	Frequency	Timing/ Condition
Monthly Inspections Stormwater Exposure Areas • Industrial activity • Potential spills • Significant materials storage Stormwater Control Measures • Catch basins • Treatment facilities • Structures	Monthly	Can occur during dry weather
Visual Monitoring Outfalls, Discharge Points, or Monitoring Locations • Floating solids • Oil and grease	Monthly	Must occur during a discharge event
Stormwater Sampling • Collect Representative Samples	Four (4) times per monitoring year	Must occur during a discharge event

9.3. VISUAL MONITORING

Visual Monitoring is to be completed once per month (during those months when stormwater discharge occurs) at the discharge Monitoring Point identified in this SWPCP where stormwater sampling will occur (Section 6).

Visual Monitoring, as well as stormwater sampling, must take place when rainfall, runoff, and discharge are all occurring at the site. According to the NPDES General Permit provisions, visual observations shall be made **monthly**, when stormwater discharge is occurring. Visual observations of stormwater discharge may occur during monthly inspections

Visual Monitoring will be conducted for the following parameters:

- Floating Solids (associated with industrial activities)
- Oil and Sheen

Visual Monitoring observations should be documented on the *Stormwater Visual Monitoring Log* in Appendix C. In addition to required visual data, the observer should record the date, time, rainfall amount, and other pertinent information, and initial the report. If oil sheen or floating solids is observed at the monitoring point, an investigation should be made of the drainage features, and other possible contributors in order to

determine the source of the problem, and then correct it.

9.4. MONITORING SITE/SAMPLING POINT

Stormwater runoff shall be monitored at Catch Basin #1, which is the only stormwater Monitoring Point (Figure 2). This sampling point is representative of the possible contribution of pollutants from the Wilhelm yard.

Sampling/Monitoring Criteria

DEQ recommends, and Wilhelm follows, the stormwater sampling methodology presented in the State of Washington Department of Ecology guidance document, entitled *How to do Stormwater Sampling – A Guide for Industrial Facilities*, revised March 2010. This guidance indicates that the storm event to be sampled should meet the following two conditions:

- The storm event sampled should be preceded by at least 24 hours of no greater than a trace of precipitation.
- The storm event sampled should produce at least 0.1 inches of rain in a 24-hour period, or the storm event should have an intensity equal to 0.1 inches/day preceding sample collection.

All sampling will be conducted in accordance with the procedures specified in Appendix B, or in the Stormwater Sampling Guidance document, which goes into further details about sampling methods.

The facility may rely on the City of Portland HYDRA Rainfall Network web site (http://or.water.usgs.gov/non-usgs/bes/) to obtain rainfall amounts at rain gage Station No. 121, which is located nearby at 3395 NW Yeon Street. The data table for Station No. 121 presents historical rainfall data on an hourly basis, as well as a daily total amount.

Sampling/Monitoring Frequency

Stormwater shall be monitored four times per year. The storm year sampling period is from July 1st to June 30th. Grab samples must be representative of the discharge and collected at least 14 calendar days apart. Two samples must be collected on or before December 31st (during the first half of the water year) and two samples must be collected after January 1st (during the second half of the water year). Stormwater sampling must take place when rainfall, runoff, and discharge are occurring at the site, and within the first 12 hours that discharge occurs.

Sampling is not required outside of regular business hours or during unsafe conditions.

Monitoring Variance

If a sample collection event is missed, a sampling variance may be requested by July 31 of the monitoring year if one of the following criteria is met:

- State or Federal authorities declare the year a drought year
- Demonstrate that rainfall in the area of the site is 20% or more below the three-year average rainfall for that area
- Demonstrate to DEQ that samples were unable to be collected due to infrequent storm events of sufficient magnitude to produce run-off; supporting data and analysis must be submitted to DEQ.

Monitoring Waivers

Monthly visual inspections are *not* allowed to be waived.

If the geometric mean of *four consecutive sampling results* is below the statewide benchmarks in Schedule A.9 of the permit, the permit registrant is not required to monitor for these pollutant(s) for the remainder of the permit term. The permit registrant must submit to DEQ the analytical laboratory results from the four sampling events.

- Results from sampling events cannot be averaged.
- Monitoring waivers may be allowed for individual parameters.

To request a monitoring waiver, the analytical results from the last four sampling events must be submitted to DEQ with a request to exercise a monitoring waiver. If DEQ does not comment within 30 days, the monitoring waiver is deemed approved. Further, the Benchmark Compliance Evaluation described above is not required if DEQ grants a monitoring waiver.

If exceedance(s) is attributed solely to the presence of the pollutant(s) in natural background and is not associated with industrial activities at the site, DEQ will consider these samples as meeting the benchmarks for the purpose of granting a monitoring waiver. The permit registrant must submit a Natural Background Waiver report to DEQ that explains (with supporting evidence) why the exceedances are due to natural background conditions and includes any data collected by the permit registrant or others that describe the levels of natural background pollutants in the discharge.

10. RECORDKEEPING

10.1. FORMS

Documentation of the stormwater sampling, visual monitoring, and the monthly inspections must be recorded and maintained at the facility. In addition to the monitoring forms, copies of the sample chain-of-custody (see Appendix B) and the laboratory report for each sampling event must be maintained. These forms and records do not need to be submitted to the regulatory agency, but must be made available at the facility if requested by DEQ.

Stormwater monitoring activities, including the stormwater sampling and visual monitoring events should be fully documented using the two forms provided in Appendix C: *Stormwater Sample Field Log* and *Stormwater Visual Monitoring Log*.

The forms must be filled out, including the following information as appropriate:

- The date, exact place, method, and time of sampling/monitoring
- The individual who performed the sampling/monitoring
- Sample number, types of sample containers, and analytical parameters
- Field measurement results (e.g., pH)
- Sample collection methodology, including a note regarding whether it was possible to collect an oil and grease sample properly
- The amount of flow at the outfall/sample point
- Whether sheen and/or floating solids are present at the outfall/sample point
- Date and time that rainfall (storm event) began
- Date and time that discharge began at the outfall
- Duration of the storm event, in hours
- Inches of rainfall during the storm event
- Inches of rain during a 24-hour period, and source of rainfall information
- Number of dry days before the day the sample was collected, or a statement that there was at least one day of no measurable precipitation before sampling
- Unusual circumstances that may affect the sample results
- A note that rainfall, site runoff, and discharge were all occurring at the time of sampling/monitoring
- Any corrective actions taken based on observations

Monthly Inspections

The Monthly Inspections required under the Preventative Maintenance program (Section 8.4) must also be documented, as well as any maintenance, repair, or corrective actions taken with respect to any stormwater structures/features. The Monthly Inspections and maintenance/repair activities should be fully documented using the following forms provided in Appendix C: *Stormwater System Monthly Inspection Log*; and *Stormwater System Maintenance and Repair Log*. These forms must be filled out completely and include the following information where appropriate:

- Monthly inspections of stormwater control/treatment structures and equipment
- Maintenance or repairs of stormwater control and treatment facilities
- Spills or leaks of significant materials/potential pollutants that have impacted stormwater runoff
- Any corrective actions taken regarding stormwater or stormwater structures
- Use the *Stormwater System Monthly Inspection Log* whenever stormwater control or treatment facilities are inspected. Record the identity, description, and status of the facilities and note any initial action, such as cleaning or repairing, and any follow-up.
- Any spills or leaks of significant materials/potential pollutants that impacted stormwater runoff since the previous inspection should also be noted on this log, as well as the corrective actions taken and measures implemented to prevent future problems of the same nature.

Use the *Stormwater System Maintenance and Repair Log* (Appendix C) to document any cleaning, maintenance, or repair of the stormwater control and treatment facilities at the site (i.e. catch basins, retention pond, etc.) with a description of the specific action taken.

Any spills or leaks of significant materials that have impacted, or have the potential to impact, stormwater quality should be addressed, and documentation of the incident and the corrective actions should be prepared and retained.

Documentation and logs of preventative maintenance Monthly Inspections and of spills/leaks must be kept and made available on site for review upon request by DEQ.

Employee Education

The 1200-Z Permit requires the facility to develop and implement an Employee Education Program. The purpose of this program is to inform personnel of the SWPCP, spill response procedures, materials management practices, and good housekeeping measures that will prevent pollution of stormwater runoff. For training requirements and schedules, see Section 8.5. Use the *Employee Training Log* (Appendix C) to document the training activities. Documentation of employee training must be kept and made available on site for review upon request by DEQ.

10.2. REPORTING

Discharge Monitoring Report

By July 31st of each year, a Discharge Monitoring Report (DMR) that records the stormwater sampling and visual monitoring results for the previous storm year monitoring period (July 1 to June 30) must be prepared and submitted to DEQ. The report must include stormwater analytical data and monthly visual monitoring data. Variance is allowed if official drought or infrequent or insufficient storm events to produce runoff.

A DEQ-approved DMR form must be used, an example of which is included in Appendix C. An electronic version of the DMR (Word or Adobe format) can be downloaded from the DEQ website (Oregon DEQ DMR report).

On the DMR, the detected levels (or method reporting levels if not detected) must be entered for each of the parameters tested. Non-detections must be reported as "ND" with the detection limit in parentheses, e.g., ND (0.005 mg/L). The geometric mean of the four sampling events is then calculated and entered for each parameter (the DEQ Excel version of the DMR form calculates the geometric mean for you). In calculating the geometric mean, one-half of the method detection limit or reporting level is to be used for non-detections.

On the 2nd page of the DMR form, the results of the monthly Visual Monitoring are recorded. An entry for each month must be made. For months where no measurable discharge occurred, the entry should be recorded as "No Discharge" (ND).

Permit Compliance

Unless otherwise approved in writing by DEQ, the following permit compliance conditions and schedule will apply:

- If submission of SWPCP revisions is required, the permittee must submit the revised pages of the SWPCP or site map to DEQ no later than 30 days after making the revisions.
- The permittee is expected to meet the compliance dates established in the permit schedule. Either prior to or no later than 14 days following any lapsed compliance date, the permittee shall submit to the DEQ a notice of compliance or noncompliance which includes the cause of noncompliance, any remedial actions taken, and the probability of meeting the timeline of the established schedule.

Permit Noncompliance

Any noncompliance with 1200-Z Permit, which may endanger human health or the environment, must be reported to the DEQ within 24 hours from the time that the facility becomes aware of the circumstances. The following shall be included as circumstances that must be reported:

- Any unanticipated bypass that exceeds effluent limitations in the Permit.
- Any upset that exceeds effluent limitations in the Permit
- Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in this permit (if any).
- NOTE: The DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

An oral report shall be given by telephone within 24 hours from the time of first knowledge of the incident. A written report shall follow the oral report within 5 working days, and shall contain:

- A description of the noncompliance and its cause
- The period of noncompliance, including exact dates and times
- The estimated time noncompliance is expected to continue if it has not been corrected
- Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
- Public notification steps taken (General Condition B.7)

Other instances of noncompliance, which do not endanger human health or the environment, must be reported to the DEQ at the time of submittal of the DMR. Examples of noncompliance to be reported at this time would be along the lines of a missed inspection or monitoring events and non-compliant visual monitoring results. The report should contain information on the items listed above.

Exceeding Benchmark Values

The stormwater discharge benchmarks are guideline concentrations, rather than limits. If a benchmark is exceeded, it is not a permit violation, but it does indicate whether site controls are effectively reducing the pollutant concentrations in stormwater discharged off-site. If benchmarks are not achieved, a tiered corrective action (Tier I or II) response is initiated, as prescribed in Schedule A.10, A.11, or A.12 of Permit 1200-Z (Appendix A, pp. 16-18).

If benchmark values are exceeded, the following tasks must be completed within 30 days of receiving the analytical laboratory data:

- Investigate the cause of the elevated pollutant levels.
- Remedy the cause, if easily done so.
- Review this SWPCP to determine if BMPs are working property and whether any alternative or additional Best Management Practices (BMPs), spill prevention and response procedures, or employee education procedures should be implemented.

10.3. RECORD RETENTION

The facility is required to retain for a minimum of three years all records related to the NPDES Stormwater Discharge Permit No. 1200-Z, including:

- All monitoring information (i.e. field logs, laboratory reports, etc.)
- Inspection logs
- Maintenance and repair logs
- Discharge Monitoring Report (DMR) copies (see Section 10.2)
- Permit application records
- Spills or leaks of significant materials that have impacted, or have the potential to impact, stormwater quality
- Any other documentation of compliance with Permit requirements.

This period of record retention may be extended by a request of the DEQ.

11. PLAN REVIEW

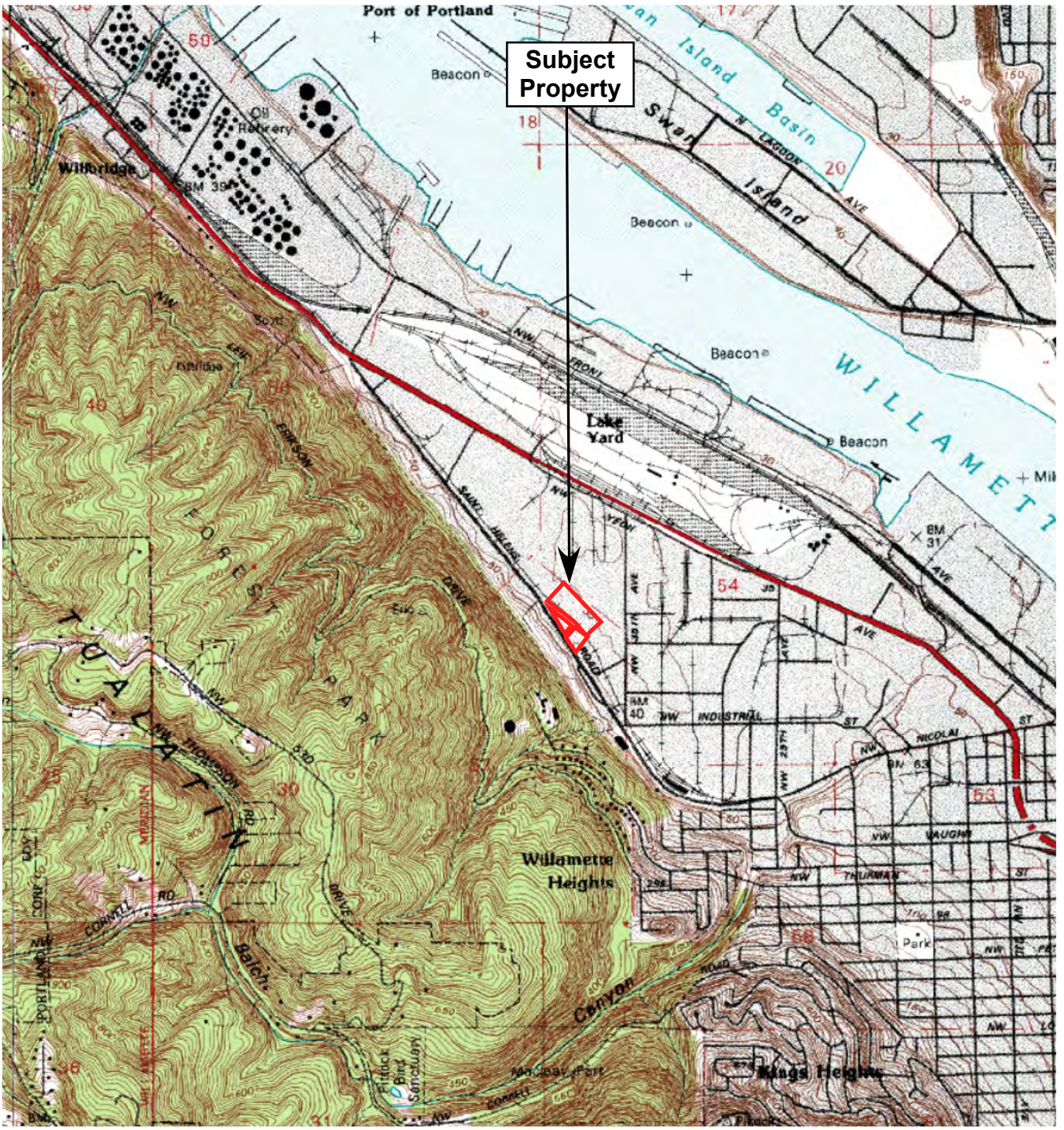
Key personnel at Wilhelm involved with design evaluation shall be familiar with all sections of the SWPCP and shall fully review the SWPCP each year before the rainy season begins. If plan modifications occur during the annual review or any other time, all personnel must be notified before changes are implemented.

The SWPCP shall be amended within 30 days of a change in the facility design, construction, operation or maintenance that materially affects the discharge of stormwater runoff from the facility. This SWPCP will be maintained on site and will be made available for review upon request by the U.S. EPA, the Oregon DEQ, and Portland Bureau of Environmental Services (BES). A copy of this SWPCP is also maintained on file at BES.

FIGURES

Figure 1. General Location Map

Figure 2. Site Map



Note: Base Map from the Portland (1990), Oregon
USGS 7.5-Minute Quadrangle
Contour Interval: 10 Feet

NORTH

0 1000 2000 4000
1"=2000' Scale in feet

FIGURE 1
General Location Map

Storm Water Pollution Control Plan
Wilhelm Trucking Company
3250 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436
September 2013

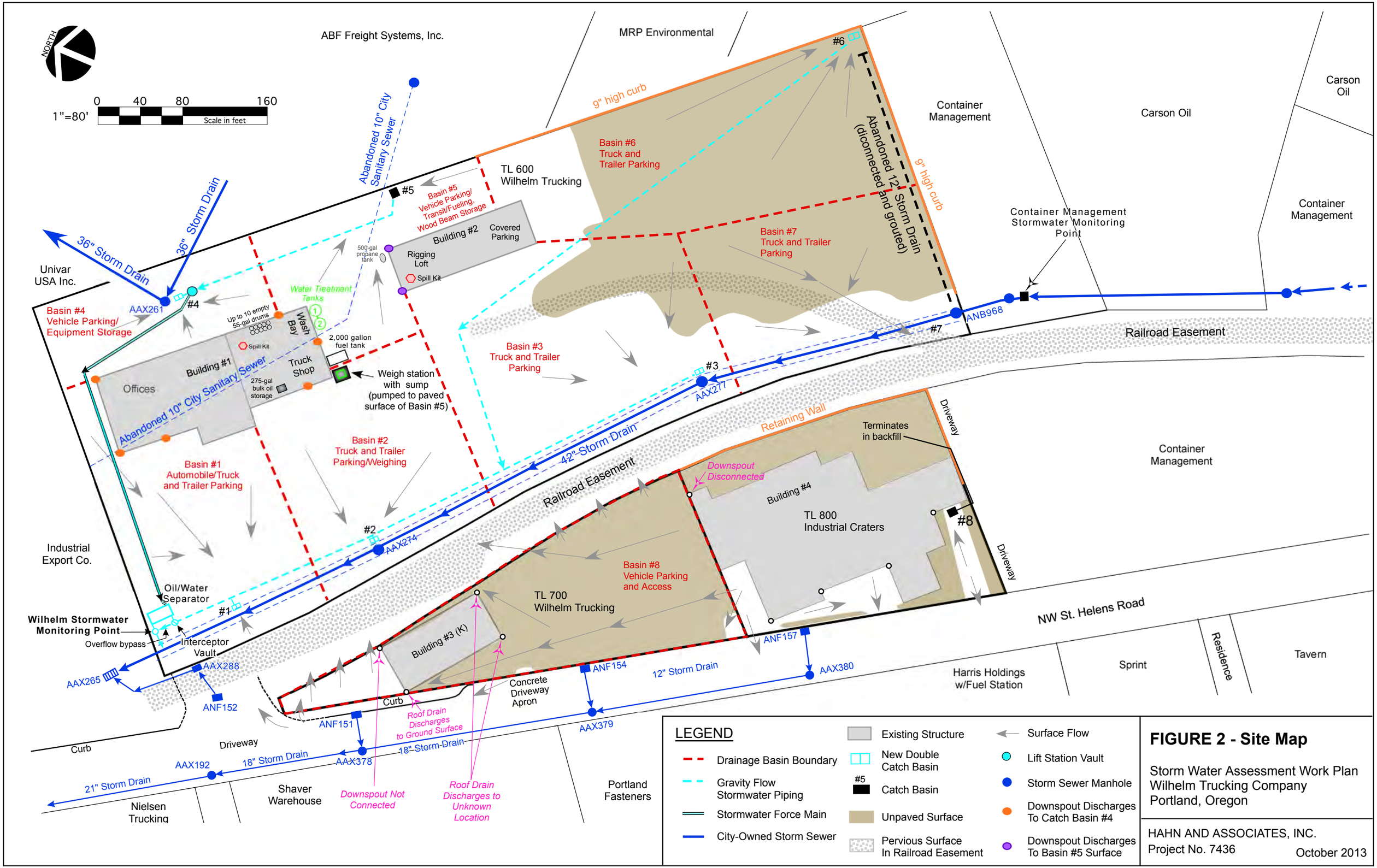


FIGURE 2 - Site Map

Storm Water Assessment Work Plan
Wilhelm Trucking Company
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436
October 2013

APPENDICES

Appendix A. NPDES General Permit 1200-Z

Appendix B. Stormwater Sample Collection Procedures

Appendix C. Stormwater Monitoring Forms and Logs

Appendix D. Oregon DEQ Spill/Release Report

Appendix E. Site Upgrades Plan Sheets

Appendix F. Oregon DEQ Industrial Stormwater Best Management Practices Manual

APPENDIX A

NPDES 1200-Z Stormwater Discharge Permit

GENERAL PERMIT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORMWATER DISCHARGE PERMIT

Department of Environmental Quality
811 S.W. Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5630 or 1-800-452-4011 toll free in Oregon
Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

SOURCES THAT ARE REQUIRED TO OBTAIN COVERAGE UNDER THIS PERMIT

A facility that may discharge stormwater from a point source to surface waters or to conveyance systems that discharge to surface waters of the state and

1) The stormwater is associated with an industrial activity identified in *Table 1: Sources Covered* on p. 3; or
2) The facility is notified in writing by the Director that coverage under this permit is required for its stormwater discharges (see Note 1 below).

Note 1:

1) Facility is designated by the Director as needing a stormwater permit pursuant to 40 CFR §122.26(a)(9)(i)(D). Facility discharges stormwater associated with an industrial activity that is not described in *Table 1: Sources Covered* on p. 3 below.
2) Facilities may apply for conditional exclusion from the requirement to obtain coverage under this permit if there is no exposure of industrial activities and materials to stormwater pursuant to 40 CFR §122.26(g); see Permit Coverage and Exclusion from Coverage on p. 5 below.
3) The following activities are not required to obtain coverage under this permit:
   - (i) Construction activities; asphalt mix batch plants; concrete batch plants; and Standard Industrial Classification code 14, Mining and Quarrying of Nonmetallic Minerals, Except Fuels, and industrial stormwater discharges to the Columbia Slough Watershed or to conveyances leading to the Columbia Slough. These activities are required to obtain coverage under separate general permits.
   - (ii) Any source that has obtained an individual NPDES permit for the discharge, unless the source is otherwise eligible for coverage under this permit and DEQ has approved the source's application for coverage under it.
   - (iii) Any source that discharges to a sanitary sewer system and the discharge is approved by the sanitary sewer operator.

_____
Greg Aldrich, Administrator
Water Quality Division

Issuance Date: Oct. 1, 2011
Amended Date: March 28, 2012

PERMITTED ACTIVITIES

Until this permit expires, is modified or revoked, the permit registrant is authorized to construct, install, modify, or operate stormwater treatment or control facilities, and to discharge stormwater and non-stormwater discharges specifically authorized by the permit to public waters in conformance with all the requirements, limitations, and conditions set forth in the following schedules:

		Page
Permit Coverage and Exclusion From Coverage		5
Schedule A -	Technology Based Limitations, Water Quality Based Limitations, Stormwater Pollution Control Plan, Benchmarks and Corrective Actions	10
Schedule B -	Monitoring and Reporting Requirements	19
Schedule C -	Compliance Schedules	N/A
Schedule D-	Special Conditions	25
Schedule E -	Sector Specific Requirements	28
Schedule F -	General Conditions	90

Unless specifically authorized by this permit, by regulation issued by EPA, by another NPDES permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited, including discharges to an underground injection control system.

Schedule F contains General Conditions that are included in all general permits issued by DEQ. Should conflicts arise between Schedule F and any other schedule of the permit, the requirements in Schedule F will not apply.

Table 1. Sources Covered

Types of Industrial Sources Required to Obtain Coverage Under this Permit
Facilities with the following primary Standard Industrial Classification (SIC) codes: 10 Metal Mining 12 Coal Mining 13 Oil and Gas Extraction 20 Food and Kindred Products 21 Tobacco Products 22 Textile Mill Products 23 Apparel and Other Finished Products Made From Fabrics and Similar Material 24 Lumber and Wood Products, Except Furniture and 2491 Wood Preserving. (Activities with SIC 2411 Logging that are defined in 40 CFR §122.27 as silvicultural point source discharges are covered by this permit.) 25 Furniture and Fixtures 26 Paper and Allied Products 27 Printing, Publishing and Allied Industries 28 Chemicals and Allied Products (excluding 2874 Phosphate Fertilizer Manufacturing) 29 Petroleum Refining and Related Industries 30 Rubber and Miscellaneous Plastics Products 31 Leather and Leather Products 32 Stone, Clay, Glass, and Concrete Products 33 Primary Metal Industries 34 Fabricated Metal Products, Except Machinery and Transportation Equipment 35 Industrial and Commercial Machinery and Computer Equipment 36 Electronic and Other Electrical Equipment and Components, Except Computer Equipment 37 Transportation Equipment 38 Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks 39 Miscellaneous Manufacturing Industries 4221 Farm Product Warehousing and Storage 4222 Refrigerated Warehousing and Storage 4225 General Warehousing and Storage 5015 Motor Vehicle Parts, Used 5093 Scrap and Waste Materials
Facilities with the following primary SIC codes that have vehicle maintenance shops (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations: 40 Railroad Transportation 41 Local and Suburban Transit and Interurban Highway Passenger Transportation 42 Motor Freight Transportation and Warehousing (excluding 4221 Farm Product Warehousing and Storage, 4222 Refrigerated Warehousing and Storage, and 4225 General Warehousing and Storage) 43 United States Postal Service 44 Water Transportation 45 Transportation by Air 5171 Petroleum Bulk Stations and Terminals, except as provided in Note 1 below.
Facilities storing, transferring, formulating, or packaging bulk petroleum products or vegetable oils, except as provided in the note below.
Steam Electric Power Generation including coal handling sites
Landfills, land application sites and open dumps
Hazardous Waste Treatment, Storage and Disposal Facilities.
Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, recycling, and reclamation of municipal or domestic sewage (including land dedicated to the disposal of sewage sludge that are located within the confines of the facility) with the design flow capacity of 1.0 mgd or more, or required to have a pretreatment program under 40 CFR §403.

Note 1: Exemption for facilities storing, transferring, formulating, or packaging bulk petroleum products or vegetable oils:

A discharge permit is not needed if discharges are only from:

1) Stormwater that contacts oil-filled electrical equipment in transformer substations that are equipped with properly functioning oil spill prevention measures such as containment areas or oil/water separators.
2) Stormwater that contacts petroleum product receiving or dispensing areas or product dispensing equipment from which product is dispensed to final users, whether or not the stormwater is treated by an oil/water separator.
3) Stormwater that collects in a secondary containment area at a petroleum product dispensing site, where the secondary containment area is associated with storage tanks from which product is dispensed only to final users, and the discharge from the containment area is treated by an oil/water separator.
4) Stormwater that collects in a secondary containment area at a bulk petroleum product storage site, where the total storage capacity at the site does not exceed 150,000 gallons, and the discharge from the containment area is treated by an oil/water separator. A site with multiple containment areas is considered a single site for determining total storage capacity.

PERMIT COVERAGE AND EXCLUSION FROM COVERAGE

1. **New Discharger to Impaired Waters** (see Schedule D.3, Definitions)
   a. A new discharger to an impaired water without a Total Maximum Daily Load (TMDL) for pollutant(s) must meet the following conditions to obtain coverage under this permit, cease the discharge or obtain an individual permit:
      i. Prevent all exposure to stormwater of the pollutant(s) for which the waterbody is impaired and document in the Stormwater Pollution Control Plan (SWPCP) procedures taken to prevent exposure onsite;
      ii. Document in SWPCP that the pollutant(s) for which the waterbody is impaired is not present at the site, or
      iii. Provide data and other technical information that demonstrates that the discharge is not expected to cause or contribute to an exceedance of the water quality standard for which the waterbody is impaired at the point of discharge to the waterbody if the pollutant(s) for which the waterbody is impaired are likely to be present at the site and DEQ has not issued a TMDL for the pollutant(s).
   b. A new discharger to an impaired water with a TMDL for pollutant(s) must meet the following conditions to obtain coverage under the permit:
      i. DEQ presumes that compliance with the terms and conditions of the permit complies with the TMDL and will grant the owner or operator coverage under the permit, unless the TMDL establishes wasteload allocation(s) and additional requirements for industrial stormwater discharges.
      ii. DEQ will inform the applicant if any additional limits or controls are necessary to be consistent with the assumptions of the wasteload allocation(s) in the TMDL(s), or if coverage under an individual permit is necessary.
   c. Conditions 1.a and b above do not apply if the waterbody is impaired for:
      i. Biological communities and no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment; or
      ii. Temperature, hydrologic modifications, or impaired hydrology.

2. **New Application for Permit Coverage**
   a. The following facilities that are required to obtain coverage under this permit must:
      i. New facility – Submit to DEQ or Agent (see Schedule D.4 for description of Agent) at least 60 calendar days before the planned activity that requires permit coverage, unless a later date is approved by DEQ or Agent, a complete application that includes the following:
         1. DEQ-approved application form;
         2. One paper copy and one electronic PDF of the SWPCP. If an Agent is receiving the application materials, submit two copies of the SWPCP; and
         3. Applicable permit fees.
      ii. Existing facility with stormwater discharges associated with industrial activities identified in *Table 1: Sources Covered* on p. 3 and operating without coverage under any NPDES permit for those discharges – Immediately submit to DEQ or Agent, unless a later date is approved by DEQ or Agent, a complete application that includes the following:
         1. DEQ-approved application form;
         2. One paper copy and one electronic PDF of the SWPCP. If an Agent is receiving the application materials, submit two copies of the SWPCP; and
         3. Applicable permit fees.
      iii. Existing facility that is designated by the Director as needing a stormwater permit pursuant to 40 CFR §122.26(a)(9)(i)(D) or is conducting an industrial activity that is not described in *Table 1: Sources Covered* on p. 3 that is notified by the Director that coverage under this permit is required (see Note 1 of the cover page of the permit) – Within 90 calendar days of

being notified by DEQ that permit coverage is required, submit to DEQ or Agent a complete application that includes the following:
1. DEQ-approved application form;
2. One paper copy and one electronic PDF of the SWPCP. If an Agent is receiving the application materials, submit two copies of the SWPCP; and
3. Applicable permit fees.

iv. Existing facility operating under permit coverage that intends to change industrial processes at the site to a new primary industrial sector – Submit to DEQ or Agent at least 60 calendar days before the planned change, unless a later date is approved by DEQ or Agent, a complete application that includes the following:
1. DEQ-approved application form;
2. One paper copy and one electronic PDF of the SWPCP. If an Agent is receiving the application materials, submit two copies of the SWPCP; and
3. Applicable permit fees.

v. Existing facility whose stormwater discharges are authorized by an individual NPDES permit and seeks coverage under this permit – Submit to DEQ or Agent a complete application that includes the following:
1. DEQ-approved application form;
2. One paper copy and one electronic PDF of the SWPCP. If an Agent is receiving the application materials, submit two copies of the SWPCP; and
3. Applicable permit fees.

b. Registration
i. Prior to granting the applicant registration under this permit, DEQ will provide a 30-calendar day public review period. DEQ will respond in writing to any public comments on the applicant's SWPCP.
ii. DEQ or Agent will notify the applicant in writing if registration is granted or denied.
iii. If registration is denied or the applicant does not wish to be regulated by this permit, the applicant may apply for an individual permit in accordance with OAR 340-045-0030.

3. Renewal Application Requirements for Facilities that DID NOT Exceed Benchmark(s) Based on the 4th year Benchmark Evaluation of Data Collected by July 2011 pursuant to Schedule A.10 of 1200-Z permit that expires in June 2012.

a. To ensure uninterrupted permit coverage for industrial stormwater discharges, an owner or operator of a facility registered under the 1200-Z permit that expires on June 30, 2012 must submit to DEQ or Agent, by March 31, 2012, unless a later date is approved in writing by DEQ or Agent, a complete application that includes the following:
i. DEQ-approved renewal application form; and
ii. One paper copy and one electronic PDF of an updated SWPCP that meets the requirements of the new permit. If an Agent is receiving the application materials, submit two copies of the SWPCP.

b. Registration
i. Prior to granting the applicant registration under this permit, DEQ will provide a 30-calendar day public review period.
ii. DEQ or Agent will notify the applicant in writing if registration is approved or denied.
iii. If registration is denied or the applicant does not wish to be regulated by this permit, the applicant may apply for an individual permit in accordance with OAR 340-045-0030. If the applicant applies for an individual permit in accordance with OAR 340-045-0030, the applicant's coverage under this permit will continue until DEQ grants or denies the applicant's individual permit application.

4. Renewal Application Requirements for Facilities that Exceed Benchmark(s) based on the 4th year Benchmark Evaluation of Data Collected by July 2011 pursuant to Schedule A.10 of 1200-Z permit that expires in June 2012.

a. To ensure uninterrupted permit coverage for industrial stormwater discharges, an owner or operator of a facility registered under the 1200-Z permit that expires on June 30, 2012 must submit to DEQ or Agent, by March 31, 2012, unless a later date is approved in writing by DEQ or Agent, a complete application that includes the following:
   i. DEQ-approved renewal application form; and
   ii. One paper copy and one electronic PDF of an updated SWPCP that meets the requirements of the new permit. If an Agent is receiving the application materials, submit two copies of the SWPCP.
      1. The owner or operator must include additional treatment measures in the SWPCP, which may include a combination of source control and treatment measures, with the goal of achieving the benchmark(s) in Schedule A.9 of the permit in future discharges. Include in the SWPCP the rationale for the selection of the treatment measures and the projected reduction of pollutant concentration(s). A licensed professional engineer (PE) or certified engineering geologist (CEG) shall design and stamp the portion of the SWPCP that addresses the treatment measures.
      2. The owner or operator may request a waiver including the additional treatment measures in the SWPCP if:
         (a) The benchmark exceedance(s) is attributed solely to the presence of the pollutant(s) in natural background and is not associated with industrial activities at the site (see Schedule D.3, Definitions). The updated SWPCP must include the investigation and analysis used to demonstrate that the exceedances are due to natural background conditions and include any data collected by the permit registrant or others (including literature studies) that describe the levels of natural background pollutants in the discharge.
         (b) Owner or operator implements or has implemented volume reduction measures, such as low impact development practices, that have or will result in reductions of the mass load of pollutants in the discharge below the mass equivalent of the benchmarks in Schedule A.9 of the permit. The updated SWPCP must include data and analysis to support this determination, including the description of the measure(s), date(s) implemented or expected to be implemented and the mass load analysis.

b. Registration
   i. Prior to granting the applicant registration under this permit, DEQ will provide a 30-calendar day public review period. DEQ will respond in writing to any public comments on the applicant's updated SWPCP.
   ii. DEQ or Agent will notify the applicant in writing if registration is approved or denied.
   iii. If registration is denied or the applicant does not wish to be regulated by this permit, the applicant may apply for an individual permit. If the applicant applies for an individual permit in accordance with OAR 340-045-0030, the applicant's coverage under this permit will continue until DEQ grants or denies the applicant's individual permit application.

5. Name Change or Transfer of Permit Coverage

a. For a name change or transfer of permit coverage between legal entities, the owner or operator must submit to DEQ or Agent within 30 calendar days of the name change or planned transfer, a complete application that includes the following:
   i. DEQ-approved Name Change or Permit Transfer application form;
   ii. An updated SWPCP, if revisions are necessary to address changed conditions. Submit one paper copy and one electronic PDF of the SWPCP. If an Agent is receiving the application materials, submit two copies of the SWPCP; and

iii. Applicable permit fees.

b. DEQ or Agent will notify the applicant in writing if the transfer is approved or denied. DEQ will transfer coverage under the permit after DEQ approves the application.

c. For a name change or transfer of permit coverage between legal entities that intend to change industrial processes at the site to a new primary industrial sector, the owner or operator must submit a new application for coverage under this permit as required in condition 2.a.iv above.

6. "No Exposure" Conditional Exclusion from Permit Coverage

a. An owner or operator that applies under 40 CFR §122.26(g)(2) for a "no exposure" conditional exclusion from coverage under this permit must:

i. Protect industrial materials and activities from exposure to rain, snow, snow melt, and runoff by using a storm resistant shelter, except as provided in the Environmental Protection Agency (EPA) Guidance Manual for Conditional Exclusion from Stormwater Permitting Based on "No Exposure" of Industrial Activities to Stormwater (EPA 833-B-00-001, June 2000). Storm resistant shelters with unsealed zinc or copper roofing materials are not eligible for the "no exposure" conditional exclusion.

ii. Ensure that contaminated soil or materials from previous operations is not exposed.

iii. Complete and sign a certification, on a form approved by DEQ, that there is no stormwater exposure to industrial materials and activities from the entire facility, except as provided in 40 CFR §122.26(g)(2). The EPA Guidance Manual (EPA 833-B-00-001) may be used to determine whether the no exposure criteria are met.

iv. Submit the signed certification to DEQ or Agent once every five years. If DEQ or Agent does not comment on the "no exposure" certification within 30 days, the "no exposure" conditional exclusion is deemed approved. DEQ or Agent may notify the applicant in writing or by email of its approval. The owner or operator must keep a copy of the certification on site and any notification of approval on site.

v. Allow DEQ or Agent to inspect the facility to determine compliance with the "no exposure" conditions, and allow DEQ or Agent to make any "no exposure" inspection reports available to the public upon request.

vi. Submit a copy of the "no exposure" certification to the municipal separate storm sewer system (MS4) operator (i.e., local municipality, district), upon their request, if facility discharges through an MS4; and allow inspection and public reporting by the MS4 operator.

b. Limitations for obtaining or maintaining the exclusion:

i. This exclusion is available on a facility-wide basis only, not for individual outfalls.

ii. If industrial materials or activities become exposed to rain, snow, snow melt, or runoff, the conditions for this exclusion no longer apply. In such cases, the discharge becomes subject to enforcement for un-permitted discharge. Any conditionally exempt discharger who anticipates changes in circumstances must apply for and obtain permit coverage before the change of circumstances.

iii. DEQ or Agent retains the authority to make a determination that the "no exposure" conditional exclusion no longer applies and require the owner or operator to obtain permit coverage.

7. Authorized Non-Stormwater Discharges

a. Subject to the terms and conditions of the permit, the following non-stormwater discharges are authorized:

i. Discharges from fire-fighting activities.

ii. Fire hydrant flushings.

iii. Potable water, including water line flushings.

iv. Uncontaminated condensate from air conditioners, coolers and other compressors, and from outside storage of refrigerated gases and liquids.

v. Irrigation drainage.
vi. Landscape watering, provided that all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions.
vii. Pavement wash waters where no detergents or hot water are used, no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed), and surfaces are swept before washing.
viii. Vehicle washing that does not use detergents or hot water unless the 1700-A NPDES permit is required for the discharge.
ix. Routine external building washdown that does not use detergents or hot water.
x. Uncontaminated ground water or spring water.
xi. Foundation or footing drains where flows are not contaminated with process materials.
xii. Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).

b. Piping and drainage systems for interior floor drains and process wastewater discharge points must be separated from the storm drainage system to prevent inadvertent discharge of pollutants to waters of the state, unless the process wastewater discharge is authorized by another NPDES permit that allows commingled outfalls. Discharge from floor drains to the stormwater drainage system is a violation of this permit.

c. Any other wastewater discharge or disposal, including stormwater mixed with wastewater, must be permitted in a separate permit, unless the wastewater is reused or recycled without discharge or disposal, or discharged to the sanitary sewer with approval from the sanitary sewer system operator.

8. Limitations on Coverage

a. Pursuant to OAR 340-045-0033(10), DEQ may deny permit coverage to an applicant or revoke a permit registrant's coverage under the permit and require the owner or operator to apply for and obtain an individual permit.

b. Coverage under this permit is not available under the following circumstances:

i. The discharges are regulated by another NPDES permit, except a Municipal Separate Storm Sewer System (MS4) permit.
ii. The discharges were included in a permit that has been or is in the process of being denied, terminated or revoked unless the source is otherwise eligible for coverage under this permit and DEQ approves the source's application to register under it and simultaneously revokes coverage under the other permit.
iii. New discharger to waters designated as Outstanding Resource Waters for antidegradation purposes under 40 CFR 131.13(a)(3) and OAR 340-041-0004.

c. Any operator not wishing to be covered or limited by this general permit may make application for an individual NPDES permit in accordance with the procedures in OAR 340-045-0030.

SCHEDULE A

TECHNOLOGY BASED EFFLUENT LIMITATIONS

1. **Narrative Technology-Based Effluent Limits**

   The permit registrant must meet the following narrative technology based effluent limits and any additional sector specific limits in Schedule E of the permit.

   a. Minimize exposure - Minimize exposure of manufacturing, processing, material storage areas, including loading and unloading, disposal, cleaning, maintenance and fixed fueling areas, to rain, snow, snowmelt and runoff. To the extent technologically available and economically practicable and achievable in light of best industry practice, the permit registrant must do the following:

      i. Locate materials and activities indoors or protect them with storm resistant covers if stormwater from affected areas discharges to surface waters. Acceptable covers include, but are not limited to, permanent structures such as roofs or buildings and temporary covers such as tarps;

      ii. Use grading, berming, or curbing to divert stormwater away from these areas and prevent stormwater contamination;

      iii. Store all hazardous substances (see Schedule D.3, Definitions) within berms or other secondary containment devices to prevent leaks and spills from contaminating stormwater. If the use of berms or secondary containment devices is not possible, then store hazardous substances in areas that do not drain to the storm sewer system;

      iv. Locate materials, equipment and activities in containment and diversion systems, including the storage of leaking or leak-prone vehicles and/or equipment awaiting maintenance, to prevent leaks and spills from contaminating stormwater;

      v. Use drip pans or absorbents under or around leaking or leak-prone vehicles/equipment or store indoors. Drain fluids from equipment and vehicles prior to on-site storage or disposal;

      vi. Perform all cleaning operations indoors, under cover or in bermed areas that prevent runoff and run-on and also captures overspray;

      vii. Clean up spills or leaks promptly using absorbents or other effective methods to prevent discharge of pollutants and use spill/overflow protection equipment, and

      viii. Ensure that all washwater drains to a proper collection system such as a closed-loop system or sanitary sewer and not discharged to the stormwater drainage system unless the washwater is an authorized non-stormwater discharge listed in condition 7 of the Permit Coverage and Exclusion from Coverage section of the permit.

   b. Oil and Grease - Employ oil/water separators, booms, skimmers or other methods to eliminate or minimize oil and grease contamination of stormwater discharges.

   c. Waste Chemicals and Material Disposal - Recycle or properly dispose of wastes to eliminate or minimize exposure of pollutants to stormwater. Cover all waste contained in bins or dumpsters where there is a potential for drainage of stormwater through the waste to prevent exposure of stormwater to these pollutants. Acceptable covers include, but are not limited to, storage of bins or dumpsters under roofed areas and use of lids or temporary covers such as tarps.

   d. Erosion and Sediment Control - Stabilize exposed areas and contain runoff using structural and nonstructural controls to minimize erosion of soil at the site and sedimentation. Employ erosion control methods such as vegetating exposed areas, graveling or paving to minimize erosion of soil at the site. Employ sediment control methods such as detention facilities, vegetated filter strips, bioswales, flow velocity dissipation devices or other permanent erosion or sediment controls to minimize sediment loads in stormwater discharges. For activities that involve land disturbance, the permit registrant must contact the local municipality to determine if there are other applicable requirements related to stormwater control.

e. Debris Control - Employ screens, booms, settling ponds, or other methods to eliminate or minimize waste, garbage and floatable debris in stormwater discharges and ensure that this debris is not discharged to receiving waters.

f. Dust Generation and Vehicle Tracking of Industrial Materials - Minimize generation of dust and off-site tracking of raw, final or waste materials.

g. Housekeeping - Routinely clean all exposed areas that may contribute pollutants to stormwater using such measures as sweeping at regular intervals, litter pick-up, keeping materials orderly and labeled, prompt clean up of spills and leaks, proper maintenance of vehicles and stowing materials in appropriate containers.

h. Spill Prevention and Response Procedure - Minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans that include methods for spill prevention and clean-up and notification procedures. At a minimum, the permit registrant must implement the following:

   i. Procedures for plainly labeling containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides," etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;

   ii. Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;

   iii. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills and other releases. Make the methods and procedures available to appropriate personnel. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures. Have the necessary clean-up material on-site and readily available, and

   iv. Procedures for notification of appropriate facility personnel, emergency agencies, and regulatory agencies. Contact information must be in locations that are readily accessible and available.

i. Preventative Maintenance - Regularly inspect, clean, maintain, and repair all industrial equipment and systems and materials handling and storage areas that are exposed to stormwater to avoid situations that may result in leaks, spills, and other releases of pollutants discharged to receiving waters. Clean, maintain and repair all control measures, including stormwater structures, catch basins, and treatment facilities to ensure effective operation and in a manner that prevents the discharge of pollution.

j. Employee Education - Develop and maintain an employee orientation and education program to inform personnel on the components and goals of the SWPCP. Train all employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel). Training must cover both the specific control measures used to achieve the narrative technology based effluent limits such as spill response procedures and good housekeeping practices, and the monitoring, inspection, reporting and documentation requirements in the permit. The education and training must occur within 30 calendar days of hiring an employee who works in areas where stormwater is exposed to industrial activities or conducts duties related to the implementation of the SWPCP, and annually thereafter.

k. Non-Stormwater Discharges - Eliminate any non-stormwater discharges not authorized by a NPDES permit (see condition 7 of the Permit Coverage and Exclusion from Coverage section of the permit for a list of authorized non-stormwater discharges).

2. **Numeric Technology Based Effluent Limits based on Stormwater Specific Effluent Limitations Guidelines** - The permit registrant with the following activities must comply with the applicable limitations:

Table 2. Numeric Effluent Limits based on Effluent Limit Guidelines

Regulated Activity	40 CFR Part/Subpart	Effluent Limit
Runoff from asphalt emulsion facilities	Part 443, Subpart A	See Schedule E.D.1
Runoff from material storage piles at cement manufacturing facilities	Part 411, Subpart C	See Schedule E.E.3
Runoff from hazardous waste landfills	Part 445, Subpart A	See Schedule E.K.3
Runoff from non-hazardous waste landfills	Part 445, Subpart B	See Schedule E.L.7
Runoff from coal storage piles at steam electric generating facilities	Part 423	See Schedule E.O.5

3. **Control Measures for Technology Based Effluent Limits**
   a. The permit registrant must select, design, install, implement and maintain control measures to meet the narrative and numeric technology based effluent limits in Schedule A.1, A.2 and Schedule E of the permit and described these measures in the SWPCP.
   b. For technology based effluent limits that require permit registrants to minimize pollutants in the discharge, permit registrants must reduce or eliminate pollutants to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice. In selecting the appropriate control measures to meet these limits, permit registrant may consider the age of the equipment and facilities involved, the processes employed, the engineering aspects of the application of various types of control techniques, the pollutant reductions likely to be achieved, any adverse environmental or energy effects of potential measures, and the costs of achieving pollutant reductions.
   c. The permit registrant must select, design, install, implement and maintain the control measures in accordance with good engineering practices and manufacturer's specifications. If the permit registrant deviates from manufacturer's specifications provide justification for such deviation in the SWPCP.
   d. DEQ or Agent may require the permit registrant to take corrective actions to meet the narrative and numeric technology based effluent limits in Schedule A.1, A.2 and Schedule E of the permit.
      i. If the permit registrant is failing to implement the control measures in the SWPCP, they must take corrective actions and implement the measures before the next storm event if practicable, unless otherwise approved by DEQ or Agent.
      ii. If modifications to the control measures are necessary to meet the technology limits in the permit, permit registrant must revise SWPCP within 30 days, unless otherwise approved by DEQ or Agent. Permit registrant must implement the corrective actions before the next storm event if practicable or no later than 60 days from discovering the violation, unless a later date is approved by DEQ or Agent.

WATER QUALITY BASED EFFLUENT LIMITATIONS

4. Water Quality Standards

a. The permit registrant must not cause or contribute to a violation of instream water quality standards as established in OAR 340-041.

b. If at any time the permit registrant becomes aware, or DEQ or Agent determines, that the discharge causes or contributes to an exceedance of water quality standards, permit registrant must take the following corrective actions:

   i. Within 24 hours of discovering the violation:
      1. Investigate the conditions that triggered the violation and
      2. Review the SWPCP and the selection, design, installation and implementation of control measures to ensure compliance with the permit.

   ii. Within 30 days of the discovering the violation, submit a Water Quality Standards Corrective Action report to DEQ or Agent that documents the following:
      1. The results of the investigation, including the date the violation discovered and a brief description of the conditions that triggered the violation;
      2. Corrective actions taken or to be taken, including date corrective action completed or expected to be completed, and
      3. Document whether SWPCP revisions are necessary. If permit registrant determines that SWPCP revisions are necessary based on the corrective action review, submit a revised SWPCP to DEQ or Agent with the report.

   iii. Permit registrant must implement the corrective actions before the next storm event if practicable or no later than 60 days from discovering the violation, unless a later date is approved by DEQ or Agent.

c. DEQ may impose additional water quality-based limitations on a site-specific basis, or require the permit registrant to obtain coverage under an individual permit, if information in the application, required reports, or from other sources indicates that the discharge is causing or contributing to a violation of water quality standards, either in the receiving waterbody or a downstream waterbody. If DEQ determines that additional site specific requirements are necessary, DEQ will require the permit registrant to revise the SWPCP. DEQ will hold a 30-calendar day public review period on the revised SWPCP.

5. Discharges to Impaired Waters.

a. Existing Discharger to an Impaired Water with a TMDL for Pollutant(s) - DEQ presumes that compliance with the terms and conditions of the permit complies with the TMDL, unless the TMDL establishes wasteload allocation(s) and additional requirements for industrial stormwater discharges. Permit registrant must meet Schedule A.4 and B.1.b of the permit. DEQ will inform the permit registrant if any additional limits or controls are necessary to be consistent with the assumptions of the wasteload allocation(s) in the TMDL(s), or if coverage under an individual permit is necessary. If DEQ determines that additional site specific requirements are necessary, DEQ will require the permit registrant revise the SWPCP to incorporate the requirements. DEQ will hold a 30-calendar day public review period on the revised SWPCP.

b. Existing Discharger to an Impaired Water without a TMDL for Pollutant(s) - Permit registrant that discharges to an impaired water on the 303(d) list in effect at the time of permit assignment without a TMDL for the pollutant(s) must meet Schedule A.4 and B.1.b of the permit.

c. New Discharger to an Impaired Water - New discharges to impaired waters authorized to discharge under this permit must implement and maintain any control measures or conditions on the site that enabled the permit registrant to become eligible for permit coverage and modify such measures or conditions as necessary pursuant to corrective action requirements in the permit. Permit registrant must meet Schedule A.4 and B.1.b of the permit.

STORMWATER POLLUTION CONTROL PLAN

6. Preparation and Implementation of SWPCP

a. The SWPCP must be prepared by a person knowledgeable in stormwater management and familiar with the facility.
b. The SWPCP must be signed and certified in accordance with 40 CFR §122.22.
c. Permit registrants must implement the SWPCP and any revisions to the plan. Failure to implement any of the control measures or practices described in the SWPCP is a violation of the permit.
d. The SWPCP must be kept current and updated as necessary to reflect any changes to the site. Update the SWPCP within 30 days of making the changes.

7. Required Elements

a. Title Page - The title page of the SWPCP must contain the following information:
   i. Name of the site.
   ii. Name of the site operator or owner.
   iii. The name of the person(s) preparing the SWPCP.
   iv. Site or file number as indicated on the permit.
   v. Contact person's name and telephone number.
   vi. Physical address, including county, and mailing address if different.
b. Site Description - The SWPCP must contain the following information, including any information required in Schedule E of the permit:
   i. A general location map showing the location of the site in relation to surrounding properties, transportation routes, surface waters and other relevant features.
   ii. A site map including the following:
      1. drainage patterns;
      2. drainage and discharge structures (piping, ditches, etc.);
      3. outline of the drainage area for each stormwater outfall;
      4. paved areas and buildings within each drainage area;
      5. areas used for outdoor manufacturing, treatment, storage, or disposal of significant materials;
      6. existing structural control measures for minimizing pollutants in stormwater runoff;
      7. structural features that reduce flow or minimize impervious areas;
      8. material handling and access areas;
      9. hazardous waste treatment, storage and disposal facilities;
      10. location of wells including waste injection wells, seepage pits, drywells, etc.;
      11. location of springs, wetlands and other surface waterbodies both on site and adjacent to the site;
      12. location of groundwater wells;
      13. location and description of authorized non-stormwater discharges;
      14. location of sampling points; and
      15. location of spill prevention and cleanup materials.
   iii. A description of industrial activities conducted at the site and significant materials stored, used, treated or disposed of in a manner that allows exposure to stormwater. Include in the description the methods of storage, usage, treatment or disposal.
   iv. For each area of the site where a reasonable potential exists for contributing pollutants to stormwater runoff, a description of the potential pollutant sources that could be present in stormwater discharges.
   v. A description of control measures installed and implemented to meet the technology and water quality based requirements in Schedule A.1 –A.5 and any applicable sector specific requirements in Schedule E of the permit. Include in the description how the stormwater

control measures address potential pollutant sources from industrial activities and significant materials on-site, spills and leaks and authorized non-stormwater discharges.

vi. An estimate of the amount of impervious surface area (including paved areas and building roofs) and the total area drained by each stormwater outfall to be reported in area units.

vii. The name(s) of the receiving water(s) for stormwater drainage. If drainage is to a municipal storm sewer system, the name(s) of the ultimate receiving waters and the name of the municipality.

viii. The identification of the discharge outfall(s) and the point(s) where stormwater monitoring will occur as required by Schedule B.2.c. If multiple discharge outfalls exist but will not all be monitored, include a description of the outfalls and data or analysis supporting that the outfalls are representative as described in Schedule B.2.c.ii of the permit.

c. Procedures and Schedules -The SWPCP must contain the following information to meet the technology based effluent limits in Schedule A.1 of the permit

i. Spill Prevention and Response Procedure - Procedures for preventing and responding to spills and clean-up and notification procedures. Spills prevention plans required by other regulations may be substituted for this provision provided that stormwater management concerns are adequately addressed and the plan is kept onsite and included with the SWPCP. The location of clean-up materials must either be shown on the site drawings or indicated in the text of the SWPCP.

ii. Preventative Maintenance - Preventative maintenance procedures for conducting inspections, maintenance and repairs to prevent leaks, spills, and other releases and a schedule for regular pickup and disposal of waste materials, and inspections for leaks and conditions of drums, tanks and containers.

iii. Employee Education – Schedule for employee training.

d. Monitoring - If an existing facility is renewing their coverage under this permit and included the benchmarks in the SWPCP used for the prior permit, update the SWPCP to reflect the new benchmarks in Schedule A.9 and any applicable sector specific benchmarks in Schedule E of the permit.

8. SWPCP Revisions

a. Permit registrants must prepare SWPCP revisions in compliance with condition A.6 and clearly identify changes to activities on site and control measures.

b. Submission of all SWPCP revisions is not required. SWPCP revisions must be submitted only if they are made for any of the following reasons:

i. Change in site contact(s);

ii. In response to a corrective action or inspection;

iii. Changes to the site or control measures that may significantly change the nature of pollutants present in stormwater discharge; or significantly increase the pollutant(s) levels, discharge frequency, discharge volume or flow rate, and

iv. Changes to the monitoring locations or outfalls.

c. If submission of SWPCP revisions is required, permit registrant must submit the revised pages of the SWPCP or site map to DEQ or Agent within 30 days of making the revisions.

d. Review of the revisions by DEQ or Agent prior to implementation is not required, except revision to location of monitoring locations. If the permit registrant does not receive a response to the revisions from DEQ or Agent within 30 days of receipt, the proposed revisions are deemed accepted.

e. DEQ or Agent may require the permit registrant revise the SWPCP at any time. The permit registrant must submit the revisions within 30 days, unless a later date is approved by DEQ or Agent.

f. SWPCP revisions are not subject to public notice and comment unless they are made in response to the water quality based effluent limit requirements in Schedule A.4 and A.5 of the permit.

STORMWATER DISCHARGE BENCHMARKS

9. Benchmarks

Benchmarks and reference concentrations for impairment pollutants are guideline concentrations, not limitations; a benchmark or reference concentration exceedance, therefore, is not a permit violation. They are designed to assist the permit registrant in determining whether its site controls are effectively reducing pollutant concentrations in stormwater discharged from the site. For facilities that are subject to federal limitations in Schedule A.2 of the permit, benchmarks apply to only those pollutants that are not limited by the federal regulations.

The following statewide benchmarks apply to each point source discharge of stormwater associated with industrial activity:

Table 3. Statewide Benchmarks

Parameter	Benchmark
Total Copper	0.020 mg/L
Total Lead	0.040 mg/L
Total Zinc	0.12 mg/L
pH*	5.5 – 9.0 SU
Total Suspended Solids*	100 mg/L
Total Oil & Grease*	10 mg/L
E. coli**	406 counts/100 ml

* See Schedule A.2 for list of facilities subject to federal limitations.

** The benchmark for E. coli applies only to active landfills and sewage treatment plants.

See Schedule E of the permit for the sector specific benchmarks that apply to certain industrial sectors/subsectors.

CORRECTIVE ACTIONS FOR IMPAIRMENT POLLUTANTS AND BENCHMARKS EXCEEDANCES

10. Tier I Corrective Action Response to Exceedances of Impairment Pollutants and Benchmarks:

a. If stormwater sampling results exceed any of the statewide benchmarks in Schedule A.9 of the permit, sector specific benchmarks in Schedule E of the permit, or reference concentrations for impairment pollutants identified in the permit assignment letter, the permit registrant must within 30 calendar days of obtaining the monitoring results:
   i. Investigate the cause of the elevated pollutant levels.
   ii. Review the SWPCP and the selection, design, installation and implementation of control measures to ensure compliance with the permit. If permit registrant determines that SWPCP revisions are necessary based on corrective action review, submit the revised pages of the SWPCP to DEQ or Agent, including a schedule for implementing the control measures.
   iii. Summarize the following information in a Tier I report that is retained on site and submitted to DEQ or Agent upon request:
      1. The results of the investigation.
      2. Corrective actions taken or to be taken, including date corrective action completed or expected to be completed. Where the permit registrant determines that corrective action is not necessary, provide the basis for this determination.

3. Document whether SWPCP revisions are necessary.

b. Implement the corrective actions before the next storm event if possible or as soon as practicable.
c. Permit registrants are exempt from the Tier I corrective action requirements for exceedances of benchmark parameters addressed by the Tier II corrective actions requirements in Schedule A.11 and A.12 below.

11. Tier II Corrective Actions for Facilities that exceeded Benchmarks based on 4th year Benchmark Compliance Evaluation required by 1200-Z permit that expires June 2012 (see Condition 4 of Permit Coverage and Exclusion section)

a. Permit registrants are exempt from the Tier II corrective action requirements in condition A.12 of the permit.
b. No later than two years after obtaining permit coverage, the permit registrant must install and implement the stormwater treatment measures.
c. After the stormwater treatment measures are implemented, if sampling results continue to exceed the same benchmark parameter(s) that triggered the Tier II corrective action requirements, permit registrant must within 30 days of obtaining the sample results, evaluate whether the treatment measures were properly installed, maintained and implemented and whether modifications to these measures are necessary. Summarize these findings in a Tier II Benchmark Exceedance report that is retained on site and submitted to DEQ or Agent annually with the Discharge Monitoring Report form.

12. Tier II Corrective Action Response based on 2nd year Geometric Mean Benchmark Evaluation:

a. Permit registrants must evaluate the sampling results collected during the 2nd year of permit coverage and determine if the geometric mean of the samples collected at each monitored outfall exceeds any statewide benchmark in Schedule A.9 of the permit. The permit registrant must report this information in Discharge Monitoring Report form for that monitoring year. Permit registrants are not required to conduct this evaluation for the benchmark parameter(s) where DEQ has granted a monitoring waiver in Schedule B.4 of the permit.
b. For the pH benchmark Tier II corrective action requirements are triggered if more than three samples collected during the first two years of permit coverage are outside of the pH benchmark range.
c. If the geometric mean of the sampling results for any outfall monitored exceeds any statewide benchmark (or if more than three samples for any outfall are outside of the pH benchmark range), permit registrant must:
   i. <u>Revised SWPCP</u>
      1. Revise the SWPCP to include additional stormwater treatment measures, which may include a combination of source control and treatment measures, with the goal of achieving the benchmark(s) in Schedule A.9 of the permit in future discharges. Include in the SWPCP the rationale for the selection of the measures, the projected reduction of pollutant concentration(s) and the schedule for implementing these measures.
      2. Have a licensed professional engineer (PE) or certified engineering geologist (CEG) design and stamp the portion of the SWPCP that addresses the stormwater treatment measures.
      3. Submit the revised SWCP to DEQ or Agent by December 31st of the 3rd year of permit coverage. If the permit registrant does not receive a response from DEQ or Agent within 30 days of receipt, the proposed revisions are deemed accepted.
   ii. <u>Tier II Deadline</u> - Implement the treatment measures by June 30th of the 4th year of permit coverage.
   iii. After the stormwater treatment measures are implemented, if sampling results continue to exceed the same benchmark parameter(s) that triggered the Tier II corrective action requirements, permit registrant must within 30 days of obtaining the sample results, evaluate

whether the treatment measures were properly installed, maintained and implemented and whether modifications to these measures are necessary. Summarize these findings in a Tier II Benchmark Exceedance report that is retained on site and submitted to DEQ or Agent annually with the Discharge Monitoring Report form.

d. Tier II Waiver - Permit registrants may request a waiver from the requirements in Schedule A.12.c above if:
   i. The benchmark exceedance(s) is attributed solely to the presence of the pollutant(s) in natural background and is not associated with industrial activities at the site (see Schedule D.3, Definitions). The Tier II waiver report must include the investigation and analysis used to demonstrate that the exceedances are due to natural background conditions and include any data collected by the permit registrant or others (including literature studies) that describe the levels of natural background pollutants in the discharge.
   ii. Permit registrant implements or has implemented volume reduction measures, such as low impact development practices, that have or will result in reductions of the mass load of pollutants in the discharge below the mass equivalent of the benchmarks in Schedule A.9 of the permit. The Tier II Waiver report must include data and analysis to support this determination, including the description of the measure(s), date(s) implemented or expected to be implemented and the mass load analysis.
   iii. Permit registrant must submit a Tier II Waiver report to DEQ or Agent by December 31st of the 3rd year of permit coverage. DEQ or Agent will grant or deny the waiver request within 60 days of its receipt.

13. Permit Compliance

a. Any noncompliance with any of the requirements of this permit constitutes a violation of the Clean Water Act. Failure to take any required corrective actions in Schedule A.10 through A.12 of the permit constitute an independent, additional violation of this permit and the Clean Water Act. Any actions and time periods specified for remedying noncompliance do not absolve parties of the initial underlying violations.
b. Where corrective action is triggered by an event that does not itself constitute a violation, such as a benchmark exceedance, there is no permit violation for the corrective actions provided that the permit registrant takes the corrective action within the deadlines identified in the permit.
c. A new permit registrant with a new facility (that begins operation after July 1, 2012) or an existing facility (that was in operation before July 1, 2012 without a stormwater discharge permit) must implement stormwater control measures to meet new technology and water quality based requirements in Schedule A.1 – A.5, including applicable sector specific requirements in Schedule E of the permit, within 90 days of receiving permit coverage. Control measures that require capital improvements must be completed in accordance with the schedule set forth in the SWPCP, but must be completed within two years of receiving permit coverage.

SCHEDULE B
MONITORING REQUIREMENTS

1. **Pollutant Parameters**
   a. Benchmarks - Permit registrants must monitor for the benchmark pollutants identified in Schedule A.9 of the permit. Permit registrants must also monitor for benchmarks specified for industrial sector(s), both the primary industrial activity and any co-located industrial activities, applicable to the discharge in Schedule E of the permit.
   b. Impairment Pollutants
      i. Permit registrants that discharge to an impaired water without a TMDL for pollutant(s), must monitor for impairment pollutants for which a standard analytical method exists (see 40 CFR Part 136). Permit registrants that discharge to an impaired water with a TMDL are not required to monitor for impairment pollutant addressed by the TMDL, unless the TMDL establishes wasteload allocation(s) and additional requirements for industrial stormwater discharges.
      ii. Before granting coverage under the permit, DEQ will identify in the permit assignment letter the impairment pollutants that the permit registrants is required to monitor and reference concentrations for these pollutants. The reference concentrations will be based on the acute aquatic life criteria, if criteria are approved for the pollutant. If there is not an acute criteria for the pollutant, DEQ will use the chronic criteria. If there is not a chronic criteria for the pollutant, DEQ will use the human health criteria.
         1. If the pollutant for which the waterbody is impaired is suspended solids, turbidity or sediment/sedimentation, permit registrants must monitor for Total Suspended Solids (TSS).
         2. If the pollutant for which the waterbody is impaired is expressed in the form of an indicator or surrogate pollutant, permit registrants must monitor for that indicator or surrogate pollutant.
         3. No monitoring is required when a waterbody's impairment is due to one of the following:
            (a) Biological communities are impaired but no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment.
            (b) When a waterbody's impairment is related to hydrologic modifications, impaired hydrology, or temperature.
   c. Numeric Effluent limits pursuant to Federal Effluent Limit Guidelines - Permit registrants subject to effluent limit guidelines must monitor for the parameters in Schedule A.2 of the permit at each outfall containing the discharges from activities identified in the guidelines.
   d. Additional pollutants - There are no benchmarks, reference concentrations or numeric effluent limits for these pollutants. The purpose of this monitoring is to determine to what extent the pollutants are present in industrial stormwater discharges.
      i. Permit registrants must monitor for cadmium, nickel, chromium.
      ii. Permit registrants with the Industrial Sector M (Auto Salvage Facilities, SIC code 5015) as a primary industrial activity and any co-located industrial activities must sample for mercury.
      iii. Permit registrants with the Sector N (Scrap Recycling Facilities, SIC code 5093), as a primary industrial activity and any co-located industrial must sample for mercury and PCBs.

2. **Sampling Procedures**
   a. Grab Sampling
      i. For each outfall monitored, collect a single grab sample of stormwater discharge or a series of composite samples. Grab composite or time or flow weighted composite samples may be used as an alternative, except when monitoring for pH, oil and grease and E. coli. Samples must be collected from same storm event.

ii. Permit registrants may use a single grab sample to satisfy multiple pollutant parameter monitoring requirements (e.g., required to monitor for zinc as benchmark and impairment pollutant).

b. Representative Sample - Samples must be representative of the discharge. Unless approved in writing by DEQ or Agent, all samples must be taken at monitoring points specified in the SWPCP before the stormwater joins or is diluted by stormwater from a different drainage area of the facility or areas outside the facility; wastewater, or any other wastestream, body of water or substance unless:
   i. Otherwise approved in writing by DEQ or Agent; or
   ii. On-site stormwater flows are combined to utilize a common treatment facility (for example, filter or settling pond). In this case, monitor the discharge from the treatment facility.

c. Multiple Point Source Discharges - Each stormwater outfall must be monitored unless:
   i. Outfall serves an area with no exposure of stormwater to industrial activities; or
   ii. Outfall has effluent that is substantially similar to the effluent(s) of a monitored outfall and the same BMPs are implemented and maintained at the similar outfalls or drainage areas that lead to the outfalls. Substantially similar effluent(s) are discharges from drainage areas serving comparable activities where the discharges are expected to be similar in composition. The determination of substantial similarity or effluent(s) must be based on past monitoring or an analysis of industrial activities and site characteristics. The data or analysis supporting that the outfalls are representative must be included in the SWPCP. This provision does not apply to outfall(s) covered by a numeric effluent limit.

d. Timing - Monitor the discharge during the first 12 hours of the discharge event, which is a measureable storm event resulting in an actual discharge from a site. If it is not practicable to collect the sample within this period, collect the sample as soon as practicable and provide documentation with the Discharge Monitoring Report form why it was not practicable to take samples within the period. Permit registrant is not required to sample outside of regular business hours or during unsafe conditions. Regular business hours are from 8 am to 5 pm on week days, unless the permit registrant specifies different hours in the SWPCP.

e. Monitoring Frequency - Permit registrants must monitor their stormwater discharge according to the frequency described in Table 4 below unless a monitoring variance or waiver is granted by DEQ or Agent.
   i. Monitoring year is from July 1st to June 30th. The stormwater samples must be collected at least 14 days apart.
   ii. Permit registrant may collect more samples than the minimum frequency described below, but must report this additional data in the Discharge Monitoring Report form. These additional samples must be included to establish a monitoring waiver in Schedule B.4 or to conduct the geometric mean evaluation in Schedule A.12 of the permit.
   iii. Exceedance of Numeric Effluent Limit in Schedule A.2 of the permit - Conduct follow-up monitoring of any pollutant that exceeds the numeric effluent limit(s) within 30 days (or during the next measurable storm event should none occur within 30 days) of receiving the monitoring results. If the follow-up monitoring exceeds the numeric effluent limit, the permit registrant must monitor the discharge four times per year until compliance with the numeric effluent limit.

Table 4: Monitoring Frequency

Pollutant Category	Minimum Frequency
Benchmarks in Schedule A.9, and any applicable sector specific benchmarks in Schedule E	Four times per Year Two samples on or before Dec. 31 and two samples on or after Jan. 1.
Impairment Pollutants, if applicable	Two times per Year One sample on or before Dec. 31 and one sample on or after Jan. 1.
Numeric Effluent Limits Guidelines, if applicable	One time per Year, unless exceedance occurs
Additional Pollutants:	
Mercury and PCBs for facilities with SIC 5093	Four times over the first three years of permit coverage Two samples on or before Dec. 31 and two samples on or after Jan.1.
Mercury for facilities with SIC 5015	Four times over the first three years of permit coverage Two samples on or before Dec. 31 and two samples on or after Jan. 1.
Cadmium, Chromium and Nickel	Eight times over the first three years of permit coverage Two samples on or before Dec. 31 and two samples on or after Jan. 1.

3. **Monitoring Variance**
   a. Permit registrants that obtain permit coverage after April 1st are granted a monitoring variance for any applicable impairment pollutants, additional pollutants or sector specific benchmarks or numeric effluent limitations for the remainder of the monitoring year, which ends on June 30th. For new facilities that were not registered under the previous permit or existing facilities that obtained a monitoring waiver for benchmarks(s) in the previous permit, this variance also applies to the benchmarks in Schedule A.9.
   b. Permit registrants may request a monitoring variance for missed samples due to no discharge from the site if one of the following criteria is met:
      i. State or federal authorities declared the year a drought year.
      ii. Demonstrate that rainfall in the area where the permit registrant's facility is located was 20% or more below the three-year average rainfall for that area.

iii. Demonstrate to DEQ or Agent's satisfaction that discharge did not occur due to use of on-site retention system or other stormwater treatment system, or infrequent storm events of sufficient magnitude to produce run-off during normal business hours and safe conditions.

For each missed sample, report in the Discharge Monitoring Report form that no discharge occurred and include supporting data and analysis demonstrating why the monitoring did not occur.

4. Monitoring Waiver

a. Benchmark and Impairment Pollutant Monitoring

i. A monitoring waiver may be requested in the following circumstances:

1. If the geometric mean of four consecutive sampling results is below the statewide benchmarks in Schedule A.9 of the permit, sector specific benchmarks in Schedule E of the permit, or reference concentrations for impairment pollutants identified in the permit assignment letter, the permit registrant is not required to monitor for these pollutant(s) for the remainder of the permit term. The permit registrant must submit to DEQ or Agent the analytical laboratory results from the four sampling events.
   (a) Results from sampling events cannot be averaged.
   (b) Monitoring waivers may be allowed for individual parameters.
2. If the exceedance(s) is attributed solely to the presence of the pollutant(s) in natural background and is not associated with industrial activities at the site, DEQ or Agent will consider these samples as being below the benchmark(s) or reference concentrations for impairment pollutant(s). Permit registrant must submit a Natural Background Waiver report to DEQ that describes the investigation and analysis to demonstrate that the exceedances are due to natural background conditions and includes any data collected by the permit registrant or others (including literature studies) that describe the levels of natural background pollutants in the discharge.
3. If a facility is inactive and unstaffed and no industrial materials or activities are exposed to stormwater, the permit registrant is not required to conduct monitoring for the remainder of the permit term.
   (a) Permit registrant must provide documentation with the DMR indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to precipitation, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii).
   (b) The statement must be signed and certified in accordance with Schedule F of the permit.

ii. The permit registrant must submit to DEQ or Agent a request to exercise the monitoring waiver based on the conditions above and include the documentation to support the request. If DEQ or Agent does not comment within 30 calendar days, the monitoring waiver is deemed approved.

1. There is no reduction in monitoring allowed for:
   (a) Visual observations, unless the site is inactive or unstaffed and there are no industrial materials or activities exposed to stormwater and permit registrant meets requirements in Schedule B.4.a.i.3 of the permit.
   (b) Monitoring for federal numeric effluent limit guidelines.
2. Revocation of Monitoring Waiver
   (a) The permit registrant must reinstate the monitoring of stormwater discharge if:
      (i) Prior monitoring efforts used to establish the monitoring waiver were improper or sampling results were incorrect;
      (ii) Changes to site conditions are likely to affect stormwater discharge characteristics;
      (iii) Additional monitoring occurs and the sampling results exceed benchmark(s), or

(iv) For inactive or unstaffed sites, the facility becomes active and/or staffed or industrial materials or activities become exposed to stormwater

(b) DEQ or Agent will notify the permit registrant in writing if the monitoring waiver is revoked.

5. **Additional Monitoring**- DEQ may notify permit registrants in writing of additional discharge monitoring requirements. Any such notice will state the reasons for the monitoring, locations and pollutants to be monitored, frequency and period of monitoring, sample types and reporting requirements.

6. **A New Permit Registrant Discharging to Clackamas River, McKenzie River above Hayden Bridge (River Mile 15) or North Santiam River** (For potential or existing dischargers that did not have a permit prior to January 28, 1994, and existing dischargers that have a NPDES stormwater discharge permit but request an increased load limitation.)
   a. Not later than 180 calendar days after obtaining permit coverage, permit registrant must submit to DEQ a monitoring and water quality evaluation program. This program must be effective in evaluating the in-stream impacts of the discharge as required by OAR 340-041-0350.
   b. Within 30 calendar days of DEQ approval, the permit registrant must implement the monitoring and water quality evaluation program.

INSPECTIONS

7. **Permit registrant must meet the following inspection requirements:**
   a. Conduct inspections on a monthly basis when the facility is in operation of areas where industrial materials or activities are exposed to stormwater and areas where stormwater control measures, structures, catch basins, and treatment facilities are located.
      i. Inspect the facility for the following:
         1. Industrial materials, residue, or trash that may have or could come into contact with stormwater;
         2. Leaks or spills from industrial equipment, drums, tanks, and other containers;
         3. Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site, excluding employee only entrances and exits;
         4. Tracking or blowing of raw, final, or waste materials;
         5. Evidence of, or the potential for, pollutants entering the drainage system;
         6. Evidence of pollutants discharging to receiving waters at all outfall(s), unless outfalls are representative as described in Schedule B.2.c.ii, and the condition of and around the outfall;
         7. Presence of floating solids (associated with industrial activity), foam, visible oil sheen, discoloration of the stormwater discharge at all outfall(s), unless outfalls are representative as described in Schedule B.2.c.ii. Conduct visual observations when stormwater discharge is occurring during regular business hours and safe conditions, and
         8. Properly functioning stormwater control measures.
      ii. Exception for inactive or unstaffed sites as long as there are no industrial materials or activities exposed to stormwater. If circumstances change and industrial materials or activities become exposed to stormwater or the facility becomes active and/or staffed, this exception no longer applies and permit registrant must immediately resume monthly facility inspections.
      iii. For exceptionally large facilities where monthly inspections of all areas identified above are infeasible, DEQ or Agent may approve in writing a modified inspection frequency.

b. Document the following in an inspection report that is retained on-site and submitted to DEQ or Agent upon request:
   i. The inspection date and time;
   ii. Control measures needing cleaning, replacement, maintenance, reconditioning or repair;
   iii. The condition of the drainage/conveyance system and need for maintenance;
   iv. Previously unidentified sources of pollutants, and
   v. Stormwater discharge observations and whether discharge contained floating solids (associated with industrial activity), foam, visible oil sheen, and was discolored. If these pollutants are present in the discharge, describe corrective action taken or will be taken to remedy the problem.

REPORTING AND RECORDKEEPING REQUIREMENTS

8. Reporting Monitoring Data

a. The permit registrant must submit a DEQ-approved Discharge Monitoring Report (DMR) form to DEQ or Agent by July 31st of each year. Identify in the DMR the sampling results for the previous monitoring year and include the laboratory results from the testing laboratory.
b. The permit registrant must report the minimum detection level and analytical methods for the parameters analyzed. Non-detections must be reported as "ND" with the detection level in mg/L parentheses, e.g., ND (0.005 mg/L). In calculating the geometric mean, one-half of the detection level must be used for non-detections.

9. Exceedance Report for Numeric Effluent Limits

If follow-up monitoring pursuant to Schedule B.2.e.iii of the permit exceeds a numeric effluent limit, permit registrant must submit an Exceedance Report to DEQ or Agent no later than 30 calendar days after receiving the lab results. The report must include the monitoring data from this monitoring event and the preceding monitoring event(s) and an explanation of the situation; what the permit registrant has done to correct the violation or intends to do if the corrective actions are not complete.

10. Record Keeping Procedures- Permit registrant must record and maintain at the facility the following information. All records must be retained by the permit registrant for at least three (3) years and made available to DEQ, Agent or local municipality upon request.

a. A copy of the SWPCP and any revisions, corrective actions reports, and monthly inspection reports.
b. Inspection, maintenance, repair and education activities.
c. Spills or leaks of significant materials (See Schedule D.3, Definitions) that impacted or had the potential to impact stormwater or surface waters. Include the corrective actions to clean up the spill or leak as well as measures to prevent future problems of the same nature.

SCHEDULE D
SPECIAL CONDITIONS

1. **Releases in Excess of Reportable Quantities.** This permit does not relieve the permit registrant of the reporting requirements of 40 CFR §117 Determination of Reportable Quantities for Hazardous Substances and 40 CFR §302 Designation, Reportable Quantities, and Notification.

2. **Availability of SWPCP and Monitoring Data.** The Stormwater Pollution Control Plan (SWPCP) or stormwater monitoring data must be made available to government agencies responsible for stormwater management in the permit registrant's area.

3. **Definitions**
   a. Capital Improvements means the following improvements that require capital expenditures:
      i. Treatment best management practices including but not limited to settling basins, oil/water separation equipment, grassy swales, detention/retention basins, and media filtration devices.
      ii. Manufacturing modifications that incur capital expenditures, including process changes for reduction of pollutants or wastes at the source.
      iii. Concrete pads, dikes and conveyance or pumping systems utilized for collection and transfer of stormwater to treatment systems.
      iv. Roofs and appropriate covers for manufacturing areas.
      v. Volume reduction measures, including low impact development control measures.
   b. Best Management Practices (BMPs**)** – schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR 122.2.
   c. Co-located Industrial Activities means any industrial activities, excluding the primary industrial activity(ies), located on-site that are defined by the stormwater regulations at 122.26(b)(14)(i - ix, xi) and OAR 340-045-0033(5), and identified in *Table 1: Sources Covered* on page 3 of the permit. An activity at a facility is not considered co-located if the activity, when considered separately, does not meet the description of a category of industrial activity covered by the stormwater regulations or identified in Table 1 of the permit.
   d. Control Measure means any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to waters of the state.
   e. Existing Discharger means an operator applying for coverage under this permit for discharges authorized previously under an NPDES general or individual permit.
   f. Impaired Waters means those waters identified by a State or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards for one or more pollutants. This may include both waters with approved TMDLs, and those for which a TMDL has not yet been approved.
   g. Hazardous Substances as defined in 40 CFR §302 Designation, Reportable Quantities, and Notification.
   h. High Quality Waters means those waters that meet or exceed levels that are necessary to support the propagation of fish, shellfish, and wildlife; recreation in and on the water; and other designated beneficial uses for a given pollutant. Waters identified on the 303(d) list as not meeting applicable state water quality standards for a given pollutant are not high quality waters.
   i. Industrial Activity means the categories of industrial activities included in the definition of "stormwater discharges associated with industrial activity" as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).
   j. Industrial Stormwater means stormwater runoff from industrial activity.

k. Material Handling Activities include the storage, loading and unloading, transportation or conveyance of raw material, intermediate product, finished product, by-product or waste product.
l. Minimize means reduce or eliminate, or both, to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.
m. New Discharger means a facility from which there is a discharge, that did not commence the discharge at a particular site prior to August 13, 1979, that is not a new source, and that has never received a finally effective NPDES permit for discharges at that site. See 40 CFR 122.2.
n. New Source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of that commenced: after promulgation of standards of performance under section 306 of the CWA that are applicable to such source, or after proposal of standards of performance in accordance with section 306 of the CWA that are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal. See 40 CFR 122.2.
o. Outstanding Resource Waters means those waters designated by the commission where existing high quality waters constitute an outstanding state or national resource based on their extraordinary water quality or ecological values or where special water quality protection is needed to maintain critical habitat areas.
p. No exposure means all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. See 40 CFR 122.26(g).
q. Natural background pollutants include substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity on the site, or pollutants in run-on from neighboring sources that are not naturally occurring.
r. Operator means any entity with a stormwater discharge associated with industrial activity that meets either of the following two criteria:
    i. The entity has operational control over industrial activities, including the ability to modify those activities; or
    ii. The entity has day-to-day operational control of activities at a facility necessary to ensure compliance with the permit (e.g., the entity is authorized to direct workers at a facility to carry out activities required by the permit).
s. Point Source Discharge means a discharge from any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, or conduit.
t. Primary industrial activity means any activities performed on-site that are (1) identified by the facility's primary SIC code; or (2) included in the narrative descriptions of 122.26(b)(14)(i), (iv), (v), or (vii), and (ix). Narrative descriptions in 40 CFR 122.26(b)(14) identified above include: (i) activities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards; (iv) hazardous waste treatment storage, or disposal facilities including those that are operating under interim status or a permit under subtitle C of the Resource Conservation and Recovery Act (RCRA); (v) landfills, land application sites and open dumps that receive or have received industrial wastes; (vii) steam electric power generating facilities; and (ix) sewage treatment works with a design flow of 1.0 mgd or more.
u. Significant Materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical that a facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ash, slag, and sludge that have the potential to be released with stormwater discharges.
v. Stormwater Associated With Industrial Activity includes, but is not limited to, stormwater discharges from the following:
    i. Industrial plant yards;

ii. Immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
iii. Material handling sites (Material handling activities include the storage, loading and unloading, transportation or conveyance of raw material, intermediate product, finished product, by-product or waste product.);
iv. Refuse sites;
v. Sites used for the application or disposal of process waste waters (as defined in 40 CFR § 401);
vi. Sites used for storage or maintenance of material handling equipment;
vii. Sites used for residual treatment, storage, or disposal; shipping and receiving areas;
viii. Manufacturing buildings;
ix. Storage areas (including tank farms) for raw materials, and intermediate and finished products;
x. Areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. Significant materials includes, but are not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical that a facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ash, slag, and sludge that have the potential to be released with stormwater discharges; and
xi. Stormwater run-on that commingles with stormwater discharges associated with industrial activity at the facility.

w. Stormwater Conveyance means a sewer, ditch, or swale that is designed to carry stormwater; a stormwater conveyance may also be referred to as a storm drain or storm sewer.
x. Total Maximum Daily Load (TMDL) is the sum of the individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources and background. See OAR 340-041-0002(65) and OAR 340-042-0030(15).
y. Treatment measures mean Best Management Practices that are intended to remove pollutants from stormwater. These measures include, but are not limited to: settling basins, oil/water separation equipment, detention/retention basins, media filtration devices, electrocoagulation, constructed wetlands and bioswales.
z. Wasteload Allocation (WLA) means the portion of receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation. See OAR 340-041-0002(67).

4. **Local Public Agencies Acting as DEQ's Agent**

DEQ has authorized certain local governments and special districts to act as its Agent in implementing portions of this permit. The Agent may be authorized to conduct the following activities, including but not limited to: application and SWPCP review, inspections, monitoring data review, stormwater and wastewater monitoring, and verification and approval of no-exposure certifications. Where DEQ has entered into such an agreement, DEQ or its Agent will notify the permit registrant of where to submit no-exposure certifications, and other notifications or correspondence associated with this permit.

SCHEDULE E
SECTOR SPECIFIC REQUIREMENTS

1. **Sector Specific Requirements**
   Permit registrants must meet the sector-specific requirements in Schedule E of the permit associated with their primary industrial activity and any co-located industrial activities, as defined in Schedule D of the permit. The sector-specific requirements apply to the areas of the facility where the sector-specific activities occur. Facilities may be subject to more than one sector/subsector requirement.
2. These sector-specific requirements in Schedule E are in addition to the requirements in Schedule A and B of the permit.
3. If there is a conflict with requirements in the "Sources that are Required to Obtain Coverage under the Permit" section or the "Permit Coverage and Exclusion from Coverage" section of the permit, the requirements in Schedule E will not apply.
4. Table E-1 below identifies the sectors/subsectors that are required to meet the sector specific requirements in Schedule E of the permit.

Table E-1. Sectors of Industrial Activity with Sector Specific Requirements

SIC Code or Activity Code	Activity Represented
SECTOR A: TIMBER PRODUCTS	
2421	General Sawmills and Planing Mills
2411	Log Storage and Handling
2426	Hardwood Dimension and Flooring Mills
2429	Special Product Sawmills, Not Elsewhere Classified
2431-2439 (except 2434)	Millwork, Veneer, Plywood, and Structural Wood
2448	Wood Pallets and Skids
2449	Wood Containers, Not Elsewhere Classified
2451, 2452	Wood Buildings and Mobile Homes
2493	Reconstituted Wood Products
2499	Wood Products, Not Elsewhere Classified
2441	Nailed and Lock Corner Wood Boxes and Shook
SECTOR B: PAPER AND ALLIED PRODUCTS	
2631	Paperboard Mills
2611	Pulp Mills
2621	Paper Mills
2652-2657	Paperboard Containers and Boxes
2671-2679	Converted Paper and Paperboard Products, Except Containers and Boxes

Table E-1. Sectors of Industrial Activity with Sector Specific Requirements

SIC Code or Activity Code	Activity Represented
SECTOR C: CHEMICALS AND ALLIED PRODUCTS	
2873-2879	Agricultural Chemicals
2812-2819	Industrial Inorganic Chemicals
2841-2844	Soaps, Detergents, and Cleaning Preparations; Perfumes, Cosmetics, and Other Toilet Preparations
2821-2824	Plastics Materials and Synthetic Resins, Synthetic Rubber, Cellulosic and Other Manmade Fibers Except Glass
2833-2836	Medicinal Chemicals and Botanical Products; Pharmaceutical Preparations; in vitro and in vivo Diagnostic Substances; and Biological Products, Except Diagnostic Substances
2851	Paints, Varnishes, Lacquers, Enamels, and Allied Products
2861-2869	Industrial Organic Chemicals
2891-2899	Miscellaneous Chemical Products
3952 (limited to list of inks and paints)	Inks and Paints, Including China Painting Enamels, India Ink, Drawing Ink, Platinum Paints for Burnt Wood or Leather Work, Paints for China Painting, Artist's Paints and Artist's Watercolors
2911	Petroleum Refining
SECTOR D: ASPHALT PAVING AND ROOFING MATERIALS AND LUBRICANTS	
2951, 2952	Asphalt Paving and Roofing Materials
2992, 2999	Miscellaneous Products of Petroleum and Coal
SECTOR E: GLASS, CLAY, CEMENT, CONCRETE, AND GYPSUM PRODUCTS (some 1200-A)	
3251-3259	Structural Clay Products
3261-3269	Pottery and Related Products
3271-3275	Concrete, Gypsum, and Plaster Products
3211	Flat Glass
3221, 3229	Glass and Glassware, Pressed or Blown
3231	Glass Products Made of Purchased Glass
3241	Hydraulic Cement
3281	Cut Stone and Stone Products
3291-3299	Abrasive, Asbestos, and Miscellaneous Nonmetallic Mineral Products
SECTOR F: PRIMARY METALS	
3312-3317	Steel Works, Blast Furnaces, and Rolling and Finishing Mills
3321-3325	Iron and Steel Foundries
3351-3357	Rolling, Drawing, and Extruding of Nonferrous Metals
3363-3369	Nonferrous Foundries (Castings)
3331-3339	Primary Smelting and Refining of Nonferrous Metals

Table E-1. Sectors of Industrial Activity with Sector Specific Requirements

SIC Code or Activity Code	Activity Represented
3341	Secondary Smelting and Refining of Nonferrous Metals
3398, 3399	Miscellaneous Primary Metal Products
SECTOR G: METAL MINING (ORE MINING AND DRESSING)	
1021	Copper Ore and Mining Dressing Facilities
1011	Iron Ores
1021	Copper Ores
1031	Lead and Zinc Ores
1041, 1044	Gold and Silver Ores
1061	Ferroalloy Ores, Except Vanadium
1081	Metal Mining Services
1094, 1099	Miscellaneous Metal Ores
SECTOR H: COAL MINES AND COAL MINING-RELATED FACILITIES	
1221-1241	Coal Mines and Coal Mining-Related Facilities
SECTOR I: OIL AND GAS EXTRACTION AND REFINING	
1311	Crude Petroleum and Natural Gas
1321	Natural Gas Liquids
1381-1389	Oil and Gas Field Services
SECTOR J: MINERAL MINING AND DRESSING- Discharges Covered by 1200-A General Permit	
SECTOR K: HAZARDOUS WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES	
HZ	Hazardous Waste Treatment, Storage, or Disposal Facilities
SECTOR L: LANDFILLS, LAND APPLICATION SITES, AND OPEN DUMPS	
LF	All Landfill, Land Application Sites and Open Dumps
LF	All Landfill, Land Application Sites and Open Dumps, except Municipal Solid Waste Landfill (MSWLF) Areas Closed in Accordance with 40 CFR 258.60
SECTOR M: AUTOMOBILE SALVAGE YARDS	
5015	Automobile Salvage Yards
SECTOR N: SCRAP RECYCLING FACILITIES	
5093	Scrap Recycling and Waste Recycling Facilities except Source-Separated Recycling
5093	Source-separated Recycling Facility
SECTOR O: STEAM ELECTRIC GENERATING FACILITIES	
SE	Steam Electric Generating Facilities, including coal handling sites

Table E-1. Sectors of Industrial Activity with Sector Specific Requirements

SIC Code or Activity Code	Activity Represented
SECTOR P: LAND TRANSPORTATION AND WAREHOUSING	
4011, 4013	Railroad Transportation
4111-4173	Local and Highway Passenger Transportation
4212-4231	Motor Freight Transportation and Warehousing
4311	United States Postal Service
5171	Petroleum Bulk Stations and Terminals
SECTOR Q: WATER TRANSPORTATION	
4412-4499	Water Transportation Facilities
SECTOR R: SHIP AND BOAT BUILDING AND REPAIRING YARDS	
3731, 3732	Ship and Boat Building or Repairing Yards
SECTOR S: AIR TRANSPORTATION FACILITIES	
4512-4581	Air Transportation Facilities
SECTOR T: TREATMENT WORKS	
TW	Treatment Works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR Part 403.
SECTOR U: FOOD AND KINDRED PRODUCTS	
2041-2048	Grain Mill Products
2074-2079	Fats and Oils Products
2011-2015	Meat Products
2021-2026	Dairy Products
2032-2038	Canned, Frozen, and Preserved Fruits, Vegetables, and Food Specialties
2051-2053	Bakery Products
2061-2068	Sugar and Confectionery Products
2082-2087	Beverages
2091-2099	Miscellaneous Food Preparations and Kindred Products
2111-2141	Tobacco Products

Table E-1. Sectors of Industrial Activity with Sector Specific Requirements

SIC Code or Activity Code	Activity Represented
SECTOR V: TEXTILE MILLS, APPAREL, AND OTHER FABRIC PRODUCT MANUFACTURING; LEATHER AND LEATHER PRODUCTS	
2211-2299	Textile Mill Products
2311-2399	Apparel and Other Finished Products Made from Fabrics and Similar Materials
3131-3199	Leather and Leather Products (note: see Sector Z1 for Leather Tanning and Finishing)
SECTOR X: PRINTING AND PUBLISHING	
2711-2796	Printing, Publishing, and Allied Industries
SECTOR Y: RUBBER, MISCELLANEOUS PLASTIC PRODUCTS, AND MISCELLANEOUS MANUFACTURING INDUSTRIES	
3011	Tires and Inner Tubes
3021	Rubber and Plastics Footwear
3052, 3053	Gaskets, Packing and Sealing Devices, and Rubber and Plastic Hoses and Belting
3061, 3069	Fabricated Rubber Products, Not Elsewhere Classified
3081-3089	Miscellaneous Plastics Products
3931	Musical Instruments
3942-3949	Dolls, Toys, Games, and Sporting and Athletic Goods
3951-3955 (except 3952 – see Sector C)	Pens, Pencils, and Other Artists' Materials
3961, 3965	Costume Jewelry, Costume Novelties, Buttons, and Miscellaneous Notions, Except Precious Metal
3991-3999	Miscellaneous Manufacturing Industries
SECTOR Z: LEATHER TANNING AND FINISHING	
3111	Leather Tanning and Finishing
SECTOR AA: FABRICATED METAL PRODUCTS	
3411-3499 (except 3479)	Fabricated Metal Products, Except Machinery and Transportation Equipment, and Coating, Engraving, and Allied Services.
3911-3915	Jewelry, Silverware, and Plated Ware
3479	Fabricated Metal Coating and Engraving

Subpart A – Sector A – Timber Products.

E.A.1 Additional Technology-Based Effluent Limits.

E.A.1.1 Good Housekeeping. In areas where storage, loading and unloading, and material handling occur, perform good housekeeping to limit the discharge of wood debris, minimize the leachate generated from decaying wood materials, and minimize the generation of dust.

E.A.2 Additional SWPCP Requirements.

E.A.2.1 Drainage Area Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: processing areas, treatment chemical storage areas, treated wood and residue storage areas, wet decking areas, dry decking areas, untreated wood and residue storage areas, and treatment equipment storage areas.

E.A.2.2 Inventory of Exposed Materials. Where such information exists, if your facility has used chlorophenolic, creosote, or chromium-copper-arsenic formulations for wood surface protection or preserving, document in your SWPCP the following: areas where contaminated soils, treatment equipment, and stored materials still remain and the management practices employed to minimize the contact of these materials with stormwater runoff.

E.A.2.3 Description of Stormwater Management Controls. Document measures implemented to address the following activities and sources: log, lumber, and wood product storage areas; residue storage areas; loading and unloading areas; material handling areas; chemical storage areas; and equipment and vehicle maintenance, storage, and repair areas. If your facility performs wood surface protection and preservation activities, address the specific control measures, including any BMPs, for these activities.

E.A.3 Sector-Specific Benchmarks

Table E.A-1 identifies benchmarks that apply to the specific subsectors of Sector A. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, which describe your site activities.

Table E.A-1

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
General Sawmills and Planing Mills (SIC 2421)	Chemical Oxygen Demand (COD)	120.0 mg/L
Hardwood Dimension and Flooring Mills; Special Products Sawmills, not elsewhere classified; Millwork, Veneer, Plywood, and Structural Wood; Wood Pallets and Skids; Wood Containers, not elsewhere classified; Wood Buildings and Mobile Homes; Reconstituted Wood Products; and Wood Products Facilities not elsewhere classified (SIC 2426, 2429, 2431-2439 (except 2434), 2441, 2448, 2449, 2451, 2452, 2493, and 2499)	Chemical Oxygen Demand (COD)	120.0 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart B – Sector B – Paper and Allied Products.

E.B.1 Sector-Specific Benchmarks.

Table E.B-1 identifies benchmarks that apply to the specific subsectors of Sector B. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.B-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Paperboard Mills (SIC Code 2631)	Chemical Oxygen Demand (COD)	120 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart C – Sector C – Chemical and Allied Products Manufacturing, and Refining.

E.C.1 Sector-Specific Benchmarks

Table E.C-1 identifies benchmarks that apply to the specific subsectors of Sector C. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.C-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Agricultural Chemicals (SIC 2873-2879)	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Total Iron	1.0 mg/L
	Phosphorus	2.0 mg/L
Industrial Inorganic Chemicals (SIC 2812-2819)	Total Aluminum	0.75 mg/ L
	Total Iron	1.0 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
Soaps, Detergents, Cosmetics, and Perfumes (SIC 2841-2844)	Nitrate plus Nitrite Nitrogen	0.68 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart D – Sector D – Asphalt Paving and Roofing Materials and Lubricant Manufacturing.

E.D.1 Effluent Limitations Based on Effluent Limitations Guidelines

Table E.D-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table E.D-1[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from asphalt emulsion facilities.	Total Suspended Solids (TSS)	23.0 mg/L, daily maximum 15.0 mg/L, 30-day avg.
	pH	6.0 - 9.0 s.u.
	Oil and Grease	15.0 mg/L, daily maximum
		10 mg/L, 30-day avg.

[1]Monitor annually.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart E – Sector E – Glass, Clay, Cement, Concrete, and Gypsum Products.

E.E.1 Additional Technology-Based Effluent Limits.

E.E.1.1 Good Housekeeping Measures. With good housekeeping, prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), kiln dust, fly ash, settled dust, or other significant material in stormwater from paved portions of the site that are exposed to stormwater. Consider sweeping regularly or using other equivalent measures to minimize the presence of these materials. Indicate in your SWPCP the frequency of sweeping or equivalent measures. Determine the frequency based on the amount of industrial activity occurring in the area and the frequency of precipitation, but it must be performed at least once a week if cement, aggregate, kiln dust, fly ash, or settled dust are being handled or processed. You must also prevent the exposure of fine granular solids (cement, fly ash, kiln dust, etc.) to stormwater, where practicable, by storing these materials in enclosed silos, hoppers, or buildings, or under other covering.

E.E.2 Additional SWPCP Requirements.

E.E.2.1 Drainage Area Site Map. Document in the SWPCP the locations of the following, as applicable: bag house or other dust control device; recycle/sedimentation pond, clarifier, or other device used for the treatment of process wastewater; and the areas that drain to the treatment device.

E.E.3 Sector-Specific Benchmarks.

Table E.E-1 identifies benchmarks that apply to the specific subsectors of Sector E. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, which describe your site activities.

Table E.E-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration
Clay Product Manufacturers (SIC 3251-3259, 3261-3269)	Total Aluminum	0.75 mg/L
Concrete and Gypsum Manufacturers (SIC 3271-3275)	Total Iron	1.0 mg/L

E.E.4 Effluent Limitations Based on Effluent Limitations Guidelines

Table E.E-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table E.E-2[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from material storage piles at cement manufacturing facilities	Total Suspended Solids (TSS)	50 mg/L, daily maximum
	pH	6.0 - 9.0 s.u.

[1]Monitor annually.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart F – Sector F – Primary Metal

E.F.1 Additional Technology-Based Effluent Limits

E.F.1.1 Good Housekeeping Measures. As part of your good housekeeping program, include a cleaning and maintenance program for all impervious areas of the facility where particulate matter, dust, or debris may accumulate, especially areas where material loading and unloading, storage, handling, and processing occur; and, where practicable, the paving of areas where vehicle traffic or material storage occur but where vegetative or other stabilization methods are not practicable (institute a sweeping program in these areas too). For unstabilized areas where sweeping is not practicable, consider using stormwater management devices such as sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection, or other equivalent measures that effectively trap or remove sediment.

E.F.2 Additional SWPCP Requirements.

E.F.2.1 Drainage Area Site Map. Identify in the SWPCP where any of the following activities may be exposed to precipitation or surface runoff: storage or disposal of wastes such as spent solvents and baths, sand, slag and dross; liquid storage tanks and drums; processing areas including pollution control equipment (e.g., baghouses); and storage areas of raw material such as coal, coke, scrap, sand, fluxes, refractories, or metal in any form. In addition, indicate where an accumulation of significant amounts of particulate matter could occur from such sources as furnace or oven emissions, losses from coal and coke handling operations, etc., and could result in a discharge of pollutants to waters of the United States.

E.F.2.2 Inventory of Exposed Material. Include in the inventory of materials handled at the site that potentially may be exposed to precipitation or runoff, areas where deposition of particulate matter from process air emissions or losses during material-handling activities are possible

E.F.3 Additional Inspection Requirements. As part of conducting your monthly inspections address all potential sources of pollutants, including (if applicable) air pollution control equipment (e.g., baghouses, electrostatic precipitators, scrubbers, and cyclones), for any signs of degradation (e.g., leaks, corrosion, or improper operation) that could limit their efficiency and lead to excessive emissions. Consider monitoring air flow at inlets and outlets (or use equivalent measures) to check for leaks (e.g., particulate deposition) or blockage in ducts. Also inspect all process and material handling equipment (e.g., conveyors, cranes, and vehicles) for leaks, drips, or the potential loss of material; and material storage areas (e.g., piles, bins, or hoppers for storing coke, coal, scrap, or slag, as well as chemicals stored in tanks and drums) for signs of material losses due to wind or stormwater runoff.

E.F.4 Sector-Specific Benchmarks.

Table E.F-1 identifies benchmarks that apply to the specific subsectors of Sector F. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.F-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration
Steel Works, Blast Furnaces, and Rolling and Finishing Mills (SIC 3312-3317)	Total Aluminum	0.75 mg/L
Iron and Steel Foundries (SIC 3321-3325)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart G – Sector G – Metal Mining.

E.G.1 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

E.G.1.1 Mining operation - Consists of the active and temporarily inactive phases, and the reclamation phase, but excludes the exploration and construction phases.

E.G.1.2 Exploration phase - Entails exploration and land disturbance activities to determine the viability of a site. The exploration phase is not considered part of "mining operations."

E.G.1.3 Construction phase - Includes the building of site access roads and removal of overburden and waste rock to expose mineable minerals. The construction phase is not considered part of "mining operations."

E.G.1.4 Active phase - Activities including the extraction, removal or recovery of metal ore. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a). The active phase is considered part of "mining operations."

E.G.1.5 Reclamation phase - Activities undertaken, in compliance with applicable mined land reclamation requirements, following the cessation of the "active phase", intended to return the land to an appropriate post-mining land use in order to meet applicable Federal and State reclamation requirements. The reclamation phase is considered part of "mining operations."

E.G.1.6 Active metal mining facility - A place where work or other activity related to the extraction, removal, or recovery of metal ore is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a).

E.G.1.7 Inactive metal mining facility - A site or portion of a site where metal mining and/or milling occurred in the past but is not an active facility as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable State or Federal agency. An inactive metal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an NPDES industrial stormwater permit.

E.G.1.8 Temporarily inactive metal mining facility - A site or portion of a site where metal mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable State or Federal agency.

E.G.1.9 Final Stabilization - A site or portion of a site is "finally stabilized" when it has implemented all applicable Federal and State reclamation requirements.

E.G.2 Technology-Based Effluent Limits for Clearing, Grading, and Excavation Activities.

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of mining activities are covered under this permit.

E.G.2.1 Management Practices for Clearing, Grading, and Excavation Activities.

E.G.2.1.1 Selecting and installing control measures. For all areas affected by clearing, grading, and excavation activities, you must select, design, install, and implement control measures that meet applicable effluent limits in Schedule A of the permit.

E.G.2.1.2 Good Housekeeping. Litter, debris, and chemicals must be prevented from becoming a pollutant source in stormwater discharges.

E.G.2.1.3 Retention and Detention of Stormwater Runoff. For drainage locations serving more than one acre, sediment basins and/or temporary sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for side slope boundaries as necessary based on individual site conditions) of the development area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided. You are required to remove sediment from sediment traps or sedimentation ponds when design capacity has been reduced by 50 percent. Due to high sediment discharges from some Sector G facilities, permittees may need to implement a combination of structural BMP approaches to sufficiently decrease discharge of sediment from their facilities.

E.G.2.2 Inspection of Clearing, Grading, and Excavation Activities.

E.G.2.2.1 Inspection Frequency. Inspections must be conducted either at least once every 7 calendar days, or at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. Inspection frequency may be reduced to at least once every month if the entire site is temporarily stabilized, if runoff is unlikely due to winter (e.g., site is covered with snow or ice) or frozen conditions, or construction is occurring during seasonal dry periods in arid areas and semi-arid areas.

E.G.2.2.2 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to surface waters of the state, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

E.G.2.2.3 Inspection Reports. For each inspection required above, you must complete an inspection report. At a minimum, the inspection report must include the information required in Schedule B.7 of the permit.

E.G.2.3 Requirements for Cessation of Clearing, Grading, and Excavation Activities.

E.G.2.3.1 Inspections and Maintenance. Inspections and maintenance of control measures, including BMPs, associated with clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of a mining operation must continue until final stabilization has been achieved on all portions of the disturbed area, or until the commencement of the active mining phase for those areas that have been temporarily stabilized as a precursor to mining.

E.G.2.3.2 Temporary Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where clearing, grading and/or excavation activities have temporarily ceased, but in no case more than 14 days after the clearing, grading and/or excavation activities in that portion of the site have temporarily ceased. In arid, semiarid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has temporarily ceased, temporary vegetative stabilization measures must be initiated as soon as practicable. Until temporary vegetative stabilization is achieved, interim measures such as erosion control blankets with an appropriate seed base and tackifiers must be employed. In areas of the site, where exploration and/or construction has permanently ceased prior to active mining, temporary stabilization measures must be implemented to minimize mobilization of sediment or other pollutants until such time as the active mining phase commences.

E.G.2.3.3 Final Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where exploration and/or construction activities have permanently ceased, but in no case more than 14 days after the exploration and/or construction activity in that portion of the site has permanently ceased. In arid, semiarid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has permanently ceased, final vegetative stabilization measures must be initiated as soon as possible. Until final stabilization is achieved temporary stabilization measures, such as erosion control blankets with an appropriate seed base and tackifiers, must be used.

E.G.3 Additional Technology-Based Effluent Limits.

E.G.3.1 Stormwater Controls. Apart from the control measures you implement to meet your effluent limits, consider implementing the following control measures at your site. The potential pollutants identified in Schedule E.G.4.3 shall determine the priority and appropriateness of the control measures selected.

E.G.3.1.1 Stormwater Diversions: Consider diverting stormwater away from potential pollutant sources. Following are some options: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

E.G.3.1.2 Capping: When capping is necessary to minimize pollutant discharges in stormwater, identify the source being capped and the material used to construct the cap.

E.G.3.1.3 Treatment: If treatment of stormwater (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is necessary to protect water quality, describe the type and location of treatment used. Passive and/or active treatment of stormwater runoff is encouraged where practicable. Treated runoff may be discharged as a stormwater source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

E.G.3.2 Certification of Discharge Testing. Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-stormwater discharges such as seeps or adit discharges, or discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 440), such as mine drainage or process water. Alternatively (if applicable), you may keep a certification with your SWPCP consistent with Schedule E.G.4.5.

E.G.4 Additional SWPCP Requirements.

E.G.4.1 Nature of Industrial Activities. Briefly document in your SWPCP the mining and associated activities that can potentially affect the stormwater discharges covered by this permit, including a general description of the location of the site relative to major transportation routes and communities**.**

E.G.4.2 Site Map. Document in your SWPCP the locations of the following (as appropriate): mining or milling site boundaries; access and haul roads; outline of the drainage areas of each stormwater outfall within the facility with indications of the types of discharges from the drainage areas; location(s) of all permitted discharges covered under an individual NPDES permit, outdoor equipment storage, fueling, and maintenance areas; materials handling areas; outdoor manufacturing, outdoor storage, and material disposal areas; outdoor chemicals and explosives storage areas; overburden, materials, soils, or waste storage areas; location of mine drainage (where water leaves mine) or other process water; tailings piles and ponds (including proposed ones); heap leach pads; off-site points of discharge for mine drainage and process water; surface waters; boundary of tributary areas that are subject to effluent limitations guidelines; and location(s) of reclaimed areas.

E.G.4.3 Potential Pollutant Sources. For each area of the mine or mill site where stormwater discharges associated with industrial activities occur, identify the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. Consider these factors: the mineralogy of the ore and waste rock (e.g., acid forming); toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. Also include a summary of any existing ore or waste rock or overburden characterization data and test results for potential generation of acid rock. If any new data is acquired due to changes in ore type being mined, update your SWPCP with this information.

E.G.4.4 Documentation of Control Measures. Document all control measures that you implement consistent with Schedule E.G.3.1. If control measures are implemented or planned but are not listed in Schedule E.G.3.1 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in your SWPCP.

E.G.4.5 Certification of Permit Coverage for Commingled Non-Stormwater Discharges: If you are able, consistent with Schedule E.G.3.2 above, to certify that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate NPDES permit, and

that permit subjects the non-stormwater portion to effluent limitations prior to any commingling, retain such certification with your SWPCP. This certification must identify the non-stormwater discharges, the applicable NPDES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

E.G.5 Additional Inspection Requirements.

Except for areas of the site subject to clearing, grading, and/or excavation activities conducted as part of the exploration and construction phase, which are subject to Schedule E.G.2.2.1, inspect sites at least monthly unless adverse weather conditions make the site inaccessible. Sites which discharge to waters which are impaired for sediment or nitrogen must be inspected monthly.

E.G.6 Monitoring and Reporting Requirements.

E.G.6.1 Benchmark Monitoring for Active Copper Ore Mining and Dressing Facilities. Active copper ore mining and dressing facilities, must sample and analyze stormwater discharges for the pollutants listed in Table E.G-1.

Table E.G-1

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Active Copper Ore Mining and Dressing Facilities (SIC 1021)	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L

E.G.6.2 Benchmark Monitoring Requirements for Discharges From Waste Rock and Overburden Piles at Active Metal Mining Facilities. For discharges from waste rock and overburden piles, perform benchmark monitoring once in the first year for the parameters listed in Table E.G-2, and twice annually in all subsequent years of coverage under this permit for any parameters for which the benchmark has been exceeded. You are also required to conduct analytic monitoring for the parameters listed in Table E.G-3 in accordance with the requirements in Schedule E.G.4.3. DEQ may also notify you that you must perform additional monitoring to accurately characterize the quality and quantity of pollutants discharged from your waste rock and overburden piles.

Table E.G-2.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration
Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores, Except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099)	Turbidity	50 NTU
	Hardness (as $CaCO_3$; calc. from Ca, Mg)[1]	no benchmark value
	Total Antimony	0.64 mg/L
	Total Arsenic	0.15 mg/ L

Table E.G-2.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration
Note: when analyzing hardness for a suite of metals, it is more cost effective to add analysis of calcium and magnesium, and have hardness calculated than to require hardness analysis separately.	Total Beryllium	0.13 mg/L
	Total Cadmium	0.001 mg/L
	Total Iron	1.0 mg/L
	Total Mercury	0.0014 mg/L
	Total Nickel	0.5 mg/L
	Total Selenium	0.005 mg/L
	Total Silver	0.0005 mg/L

E.G.6.3 Additional Analytic Monitoring Requirements for Discharges From Waste Rock and Overburden Piles at Active Metal Mining Facilities. In addition to the monitoring required in Schedule E.G.6.2 for discharges from waste rock and overburden piles, you must also conduct monitoring for additional parameters based on the type of ore you mine at your site. Where a parameter in Table E.G-3 is the same as a pollutant you are required to monitor for in Table E.G-2 (i.e., for all of the metals, you must use the corresponding benchmark in Table E.G-2 and you may use any monitoring results conducted for Schedule E.G.6.2 to satisfy the monitoring requirement for that parameter for Schedule E.G.6.3. For radium and uranium, which do not have corresponding benchmarks in Table E.G-2, there are no applicable benchmarks.)

Table E.G-3. Additional Monitoring Requirements for Discharges from Waste Rock and Overburden Piles

Supplemental Requirements			
Type of Ore Mined	Pollutants of Concern		
	Total Suspended Solids (TSS)	pH	Metals, Total
Tungsten Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Nickel Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Aluminum Ore	X	X	Iron
Mercury Ore	X	X	Nickel (H)
Iron Ore	X	X	Iron (Dissolved)
Platinum Ore			Cadmium (H), Copper (H), Mercury, Lead (H), Zinc (H)
Titanium Ore	X	X	Iron, Nickel (H), Zinc (H)
Vanadium Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Molybdenum	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Mercury, Zinc (H)
Uranium, Radium, and Vanadium Ore	X	X	Chemical Oxygen Demand, Arsenic, Radium (Dissolved and Total), Uranium, Zinc (H)

Note: An "X" indicated for TSS and/or pH means that you are required to monitor for those parameters. (H) indicates that hardness must also be measured when this pollutant is measured.

E.G.6.4 Inactive and Unstaffed Sites –As a Sector G facility, if you are seeking to exercise a monitoring or inspection waiver, you are conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to stormwater" in Schedule B.4 of the permit. This exemption is conditioned on the following:

- If circumstances change and your facility becomes active and/or staffed, this exception no longer applies and you must immediately begin complying with the monitoring and inspection requirements; and
- DEQ retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above an applicable water quality standard, including designated uses.

Table E.G-4. Applicability of the Permit to Stormwater Runoff From Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation

Discharge/Source of Discharge	Note/Comment
Piles	
Waste rock/overburden	If composed entirely of stormwater and not combining with mine drainage. See note below.
Topsoil	--
Roads constructed of waste rock or spent ore	
Onsite haul roads	If composed entirely of stormwater and not combining with mine drainage. See note below.
Offsite haul and access roads	--
Roads not constructed of waste rock or spent ore	
Onsite haul roads	Except if mine drainage is used for dust control
Offsite haul and access roads	--
Milling/concentrating	
Runoff from tailings dams and dikes when constructed of waste rock/tailings	Except if process fluids are present and only if composed entirely of stormwater and not combining with mine drainage. See Note below.
Runoff from tailings dams/dikes when not constructed of waste rock and tailings	Except if process fluids are present
Concentration building	If stormwater only and no contact with piles
Mill site	If stormwater only and no contact with piles
Ancillary areas	
Office and administrative building and housing	If mixed with stormwater from the industrial area
Chemical storage area	--
Docking facility	Except if excessive contact with waste product that would otherwise constitute mine drainage
Explosive storage	--
Fuel storage (oil tanks/coal piles)	--
Vehicle and equipment maintenance area/building	--
Parking areas	But coverage unnecessary if only employee and visitor-type parking
Power plant	
Truck wash area	Except when excessive contact with waste product that would otherwise constitute mine drainage

Table E.G-4. Applicability of the Permit to Stormwater Runoff From Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation

Reclamation-related areas	
Any disturbed area (unreclaimed)	Only if not in active mining area
Reclaimed areas released from reclamation requirements prior to Dec. 17, 1990	--
Partially/inadequately reclaimed areas or areas not released from reclamation requirements	--

Note: Stormwater runoff from these sources are subject to the NPDES program for stormwater unless mixed with discharges subject to 40 CFR Part 440 that are regulated by another permit prior to mixing. Non-stormwater discharges from these sources are subject to NPDES permitting and may be subject to the effluent limitation guidelines under 40 CFR Part 440. Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless: (1) it drains naturally (or is intentionally diverted) to a point source; and (2) combines with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit would be available if the discharge composed entirely of stormwater does not combine with other sources of mine drainage that are not subject to 40 CFR Part 440, as well as meeting other eligibility criteria contained in the permit.

E.G.7. Termination of Permit Coverage

E.G.7.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Schedule E.G.7.2.

E.G.7.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990. A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if: (1) stormwater runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards, (2) soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart H – Sector H – Coal Mines and Coal Mining-Related Facilities.

E.H.1 Definitions

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

E.H.1.1 Mining operation - Consists of the active and temporarily inactive phases, and the reclamation phase, but excludes the exploration and construction phases.

E.H.1.2 Exploration phase - Entails exploration and land disturbance activities to determine the financial viability of a site. The exploration phase is not considered part of "mining operations."

E.H.1.3 Construction phase - Includes the building of site access roads and removal of overburden and waste rock to expose mineable coal. The construction phase is not considered part of "mining operations."

E.H.1.4 Active phase - Activities including the extraction, removal or recovery of coal. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 434.11(b). The active phase is considered part of "mining operations."

E.H.1.5 Reclamation phase - Activities undertaken, in compliance with applicable mined land reclamation requirements, following the cessation of the "active phase", intended to return the land to an appropriate post-mining land use. The reclamation phase is considered part of "mining operations."

E.H.1.6 Active coal mining facility - A place where work or other activity related to the extraction, removal, or recovery of coal is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 434.11(b).

E.H.1.7 Inactive coal mining facility - A site or portion of a site where coal mining and/or milling occurred in the past but is not an active facility as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable State or Federal agency. An inactive coal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an NPDES industrial stormwater permit.

E.H.1.8 Temporarily inactive coal mining facility - A site or portion of a site where coal mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable State or Federal agency.

E.H.1.9 Final Stabilization - A site or portion of a site is "finally stabilized" when it has implemented all applicable Federal and State reclamation requirements.

E.H.2 Technology-Based Effluent Limits for Clearing, Grading, and Excavation Activities.

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of mining activities are covered under this permit.

E.H.2.1 Management Practices for Clearing, Grading, and Excavation Activities.

E.H.2.1.1 Selecting and installing control measures. For all areas affected by clearing, grading, and excavation activities, you must select, design, install, and implement control measures that meet applicable Part 2 effluent limits.

E.H.2.1.2 Good Housekeeping. Litter, debris, and chemicals must be prevented from becoming a pollutant source in stormwater discharges.

E.H.2.1.3 Retention and Detention of Stormwater Runoff. For drainage locations serving more than one acre, sediment basins and/or temporary sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and side slope boundaries as necessary based on individual site conditions) of the development area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided. You are required to remove sediment from sediment traps or sedimentation ponds when design capacity has been reduced by 50 percent. Due to high sediment discharges from some Sector H facilities, permittees may need to implement a combination of structural BMP approaches to sufficiently decrease discharge of sediment from their facilities.

E.H.2.2 Inspection of Clearing, Grading, and Excavation Activities.

E.H.2.2.1 Inspection Frequency. Inspections must be conducted either at least once every 7 calendar days, or at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. Inspection frequency may be reduced to at least once every month if the entire site is temporarily stabilized, if runoff is unlikely due to winter (e.g., site is covered with snow or ice) or frozen conditions, or construction is occurring during seasonal dry periods in arid areas and semi-arid areas.

E.H.2.2.2 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

E.H.2.3 Requirements for Cessation of Clearing, Grading, and Excavation Activities.

E.H.2.3.1 Inspections and Maintenance. Inspections and maintenance of control measures, including BMPs, associated with clearing, grading, and/or excavation activities being conducted as part of the exploration and construction phase of a mining operation

must continue until final stabilization has been achieved on all portions of the disturbed area.

E.H.2.3.2 Temporary Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where clearing, grading and/or excavation activities have temporarily ceased, but in no case more than 14 days after the clearing, grading and/or excavation activities in that portion of the site have temporarily ceased. In arid, semiarid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has temporarily ceased, temporary vegetative stabilization measures must be initiated as soon as practicable. Until temporary vegetative stabilization is achieved, interim measures such as erosion control blankets with an appropriate seed base and tackifiers must be employed. In areas of the site, where exploration and/or construction has permanently ceased prior to active mining, temporary stabilization measures must be implemented to minimize mobilization of sediment or other pollutants until such time as the active mining phase commences.

E.H.2.3.3 Final Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where exploration and/or construction activities have permanently ceased, but in no case more than 14 days after the exploration and/or construction activity in that portion of the site has permanently ceased. In arid, semiarid, and drought-stricken areas, or in areas subject to snow or freezing conditions, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has permanently ceased, temporary vegetative stabilization measures must be initiated as soon as possible. Until final stabilization is achieved temporary stabilization measures, such as erosion control blankets with an appropriate seed base and tackifiers, must be used.

E.H.3 Additional Technology-Based Effluent Limits.

E.H.3.1 Good Housekeeping Measures. As part of your good housekeeping program, consider using sweepers and covered storage, watering haul roads to minimize dust generation, and conserving vegetation (where possible) to minimize erosion.

E.H.3.2 Preventive Maintenance. Perform inspections or other equivalent measures of storage tanks and pressure lines of fuels, lubricants, hydraulic fluid, and slurry to prevent leaks due to deterioration or faulty connections.

E.H.4 Additional SWPCP Requirements.

E.H.4.1 Other Applicable Regulations. Most active coal mining-related areas (SIC Codes 1221-1241) are subject to sediment and erosion control regulations of the U.S. Office of Surface Mining (OSM) that enforces the Surface Mining Control and Reclamation Act (SMCRA). OSM has granted authority to most coal-producing states to implement SMCRA through State SMCRA regulations. All SMCRA requirements regarding control of stormwater-related pollutant discharges must be addressed and then documented with the SWPCP (directly or by reference).

E.H.4.2 Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: haul and access roads; railroad spurs, sliding, and internal

hauling lines; conveyor belts, chutes, and aerial tramways; equipment storage and maintenance yards; coal handling buildings and structures; and inactive mines and related areas; acidic spoil, refuse, or unreclaimed disturbed areas; and liquid storage tanks containing pollutants such as caustics, hydraulic fluids, and lubricants.

E.H.4.3 Potential Pollutant Sources. Document in your SWPCP the following sources and activities that have potential pollutants associated with them: truck traffic on haul roads and resulting generation of sediment subject to runoff and dust generation; fuel or other liquid storage; pressure lines containing slurry, hydraulic fluid, or other potential harmful liquids; and loading or temporary storage of acidic refuse or spoil.

E.H.5 Additional Inspection Requirements.

E.H.5.1 Inspections of Active Mining-Related Areas. Except for areas of the site subject to clearing, grading, and/or excavation activities conducted as part of the exploration and construction phase, which are subject to Schedule E.H.2.2.1, perform monthly inspections of active mining areas covered by this permit, corresponding with the inspections as performed by SMCRA inspectors, of all mining-related areas required by SMCRA. Also maintain the records of the SMCRA authority representative.

E.H.5.2 Sediment and Erosion Control. Meet SMCRA inspection requirements for sediment and erosion control measures for areas subject to SMCRA authority.

E.H.5.3 Site Inspections. Your inspection program must include inspections for pollutants entering the drainage system from activities located on or near coal mining-related areas. Among the areas to be inspected are haul and access roads; railroad spurs, sliding, and internal hauling lines; conveyor belts, chutes, and aerial tramways; equipment storage and maintenance yards; coal handling buildings and structures; and inactive mines and related areas.

E.H.6 Sector-Specific Benchmarks.

Table E.H-1 identifies benchmarks that apply to the specific subsectors of Sector H. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.H-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Coal Mines and Related Areas (SIC 1221-1241)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L

E.H.6.1 Inactive and Unstaffed Sites –If you are seeking to exercise a monitoring or inspection waiver for inactive and unstaffed sites (including temporarily inactive sites), you are conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to stormwater" in Schedule B.4 of the permit.

E.H.6.1.1 If circumstances change and your facility becomes active and/or staffed, this exception no longer applies and you must immediately begin complying with the monitoring and inspection; and

E.H.6.1.2 DEQ retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause or contribute to an instream excursion above an applicable water quality standard, including designated uses.

E.H.7 Termination of Permit Coverage

E.H.7.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed.

E.H.7.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990. A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if: (1) stormwater runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards, (2) soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart I – Sector I – Oil and Gas Extraction.

E.I.1 Additional Technology-Based Effluent Limits.

E.I.1.1 Vegetative Controls. Implement vegetative practices designed to preserve existing vegetation, where attainable, and revegetate open areas as soon as practicable after grade drilling. Consider the following (or equivalent measures): temporary or permanent seeding, mulching, sod stabilization, vegetative buffer strips, and tree protection practices. Begin implementing appropriate vegetative practices on all disturbed areas within 14 days following the last activity in that area.

E.I.2 Additional SWPCP Requirements.

E.I.2.1 Drainage Area Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: Reportable Quantity (RQ) releases; locations used for the treatment, storage, or disposal of wastes; processing areas and storage areas; chemical mixing areas; construction and drilling areas; all areas subject to the effluent guidelines requirements for "No Discharge" in accordance with 40 CFR 435.32; and the structural controls to achieve compliance with the "No Discharge" requirements.

E.I.2.2 Potential Pollutant Sources. Also document in your SWPCP the following sources and activities that have potential pollutants associated with them: chemical, cement, mud, or gel mixing activities; drilling or mining activities; and equipment cleaning and rehabilitation activities. In addition, include information about the reportable quantity (RQ) release that triggered the permit application requirements: the nature of the release (e.g., spill of oil from a drum storage area), amount of oil or hazardous substance released, amount of substance recovered, date of the release, cause of the release (e.g., poor handling techniques and lack of containment in the area), areas affected by the release (i.e., land and water), procedure to clean up release, actions or procedures implemented to prevent or improve response to a release, and remaining potential contamination of stormwater from release (taking into account human health risks, the control of drinking water intakes, and the designated uses of the receiving water).

E.I.2.3 Erosion and Sedimentation Control. Unless covered by the NPDES Construction Stormwater 1200-C General Permit, the additional documentation requirements for sediment and erosion controls for well drillings and sand/shale mining areas include the following:

E.I.2.3.1 Site Description. Also include a description in your SWPCP of the nature of the exploration activity, estimates of the total area of site and area disturbed due to exploration activity, an estimate of runoff coefficient of the site, a site drainage map, including approximate slopes, and the names of all receiving waters.

E.I.2.3.2 Vegetative Controls. Document vegetative practices used in the SWPCP.

E.I.3 Additional Inspection Requirements.

All erosion and sedimentation control measures must be inspected every 7 days.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart K – Sector K – Hazardous Waste Treatment, Storage, or Disposal Facilities.

E.K.1 Definitions.

K.1.1 *Contaminated stormwater* - stormwater that comes into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater as defined in E.K.1.4. Some specific areas of a landfill that may produce contaminated stormwater include (but are not limited to) the open face of an active landfill with exposed waste (no cover added); the areas around wastewater treatment operations; trucks, equipment, or machinery that has been in direct contact with the waste; and waste dumping areas.

K.1.2 *Drained free liquids* - aqueous wastes drained from waste containers (e.g., drums) prior to landfilling.

K.1.3 *Landfill* - an area of land or an excavation in which wastes are placed for permanent disposal, but that is not a land application or land treatment unit, surface impoundment, underground injection well, waste pile, salt dome formation, salt bed formation, underground mine, or cave as these terms are defined in 40 CFR 257.2, 258.2, and 260.10.

K1.4 *Landfill wastewater* - as defined in 40 CFR Part 445 (Landfills Point Source Category), all wastewater associated with, or produced by, landfilling activities except for sanitary wastewater, non-contaminated stormwater, contaminated groundwater, and wastewater from recovery pumping wells. Landfill wastewater includes, but is not limited to, leachate, gas collection condensate, drained free liquids, laboratory derived wastewater, contaminated stormwater, and contact washwater from washing truck, equipment, and railcar exteriors and surface areas that have come in direct contact with solid waste at the landfill facility.

K.1.5 *Leachate* - liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

K.1.6 *Non-contaminated stormwater* - stormwater that does not come into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater as defined in E.K.1.4. Non-contaminated stormwater includes stormwater that flows off the cap, cover, intermediate cover, daily cover, and/or final cover of the landfill.

E.K.2 Sector-Specific Benchmarks.

Table E.K-1 identifies benchmarks that apply to the specific subsectors of Sector K. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, which describe your site activities.

Table E.K-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
ALL - Industrial Activity Code "HZ". Benchmarks only applicable to discharges not subject to effluent limitations in 40 CFR Part 445 Subpart A.	Ammonia	2.14 mg/L
	Total Magnesium	0.064 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L
	Total Arsenic	0.15 mg/L
	Total Cadmium	0.001 mg/L
	Total Cyanide	0.022 mg/ L
	Total Nickel	0.5 mg/L
	Total Mercury	0.0014 mg/ L
	Total Selenium	0.005 mg/L
	Total Silver	0.0005 mg/L

E.K.3 Effluent Limitations Based on Effluent Limitations Guidelines

Table E.K-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 8.K-2[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart A.	Biochemical Oxygen Demand (BOD_5)	220 mg/L, daily maximum
		56 mg/L, monthly avg. maximum
	Total Suspended Solids (TSS)	88 mg/L, daily maximum
		27 mg/L, monthly avg. maximum
	Ammonia	10 mg/L, daily maximum
		4.9 mg/L, monthly avg. maximum
	Alpha Terpineol	0.042 mg/L, daily maximum
		0.019 mg/L, monthly avg. maximum
	Aniline	0.024 mg/L, daily maximum
		0.015 mg/L, monthly avg. maximum
	Benzoic Acid	0.119 mg/L, daily maximum
		0.073 mg/L, monthly avg. maximum
	Naphthalene	0.059 mg/L, daily maximum
		0.022 mg/L, monthly avg. maximum
	p-Cresol	0.024 mg/L, daily maximum
		0.015 mg/L, monthly avg. maximum
	Phenol	0.048 mg/L, daily maximum
		0.029 mg/L, monthly avg. maximum
	Pyridine	0.072 mg/L, daily maximum

Table 8.K-2[1]		
Industrial Activity	**Parameter**	**Effluent Limit**
		0.025 mg/L, monthly avg. maximum
	Total Arsenic	1.1 mg/L, daily maximum
		0.54 mg/L, monthly avg. maximum
	Total Chromium	1.1 mg/L, daily maximum
		0.46 mg/L, monthly avg. maximum
	Total Zinc	0.535 mg/L, daily maximum
		0.296 mg/L, monthly avg. maximum
	pH	Within the range of 6-9 standard pH units (s.u.)

[1] Monitor annually. As set forth at 40 CFR Part 445 Subpart A, these numeric limitations apply to contaminated stormwater discharges from hazardous waste landfills subject to the provisions of RCRA Subtitle C at 40 CFR Parts 264 (Subpart N) and 265 (Subpart N) except for any of the following facilities:

(a) landfills operated in conjunction with other industrial or commercial operations when the landfill receives only wastes generated by the industrial or commercial operation directly associated with the landfill;

(b) landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes generated by the industrial or commercial operation directly associated with the landfill and also receives other wastes, provided that the other wastes received for disposal are generated by a facility that is subject to the same provisions in 40 CFR Subchapter N as the industrial or commercial operation or that the other wastes received are of similar nature to the wastes generated by the industrial or commercial operation;

(c) landfills operated in conjunction with Centralized Waste Treatment (CWT) facilities subject to 40 CFR Part 437, so long as the CWT facility commingles the landfill wastewater with other non-landfill wastewater for discharge. A landfill directly associated with a CWT facility is subject to this part if the CWT facility discharges landfill wastewater separately from other CWT wastewater or commingles the wastewater from its landfill only with wastewater from other landfills; or

(d) landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes from public service activities, so long as the company owning the landfill does not receive a fee or other remuneration for the disposal service.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart L – Sector L – Landfills, Land Application Sites, and Open Dumps.

E.L.1 Definitions.

E.L.1.1 Contaminated stormwater - stormwater that comes into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater. Some areas of a landfill that may produce contaminated stormwater include (but are not limited to) the open face of an active landfill with exposed waste (no cover added); the areas around wastewater treatment operations; trucks, equipment, or machinery that has been in direct contact with the waste; and waste dumping areas.

E.L.1.2 Drained free liquids - aqueous wastes drained from waste containers (e.g., drums) prior to landfilling.

E.L.1.3 Landfill wastewater - as defined in 40 CFR Part 445 (Landfills Point Source Category) all wastewater associated with, or produced by, landfilling activities except for sanitary wastewater, non-contaminated stormwater, contaminated groundwater, and wastewater from recovery pumping wells. Landfill process wastewater includes, but is not limited to, leachate; gas collection condensate; drained free liquids; laboratory-derived wastewater; contaminated stormwater; and contact washwater from washing truck, equipment, and railcar exteriors and surface areas that have come in direct contact with solid waste at the landfill facility.

E.L.1.4 Leachate - liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

E.L.1.5 Non-contaminated stormwater - stormwater that does not come into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater. Non-contaminated stormwater includes stormwater that flows off the cap, cover, intermediate cover, daily cover, and/or final cover of the landfill.

E.L.2 Additional Technology-Based Effluent Limits.

E.L.2.1 Preventive Maintenance Program. As part of your preventive maintenance program, maintain the following: all elements of leachate collection and treatment systems, to prevent commingling of leachate with stormwater; the integrity and effectiveness of any intermediate or final cover (including repairing the cover as necessary), to minimize the effects of settlement, sinking, and erosion.

E.L.2.2 Erosion and Sedimentation Control. Provide temporary stabilization (e.g., temporary seeding, mulching, and placing geotextiles on the inactive portions of stockpiles) for the following: materials stockpiled for daily, intermediate, and final cover; inactive areas of the landfill or open dump; landfills or open dump areas that have gotten final covers but where vegetation has yet to establish itself; and land application sites where waste application has been completed but final vegetation has not yet been established.

E.L.2.3 Unauthorized Discharge Test Certification. The discharge test and certification must also be conducted for the presence of leachate and vehicle washwater.

E.L.3 Additional SWPCP Requirements.

E.L.3.1 Drainage Area Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: active and closed landfill cells or trenches, active and closed land application areas, locations where open dumping is occurring or has occurred, locations of any known leachate springs or other areas where uncontrolled leachate may commingle with runoff, and leachate collection and handling systems.

E.L.3.2 Summary of Potential Pollutant Sources. Document in your SWPCP the following sources and activities that have potential pollutants associated with them: fertilizer, herbicide, and pesticide application; earth and soil moving; waste hauling and loading or unloading; outdoor storage of significant materials, including daily, interim, and final cover material stockpiles as well as temporary waste storage areas; exposure of active and inactive landfill and land application areas; uncontrolled leachate flows; and failure or leaks from leachate collection and treatment systems.

E.L.4 Additional Inspection Requirements.

E.L.4.1 Inspections of Active Sites. Except in arid and semi-arid climates, inspect operating landfills, open dumps, and land application sites at least once every 7 days. Focus on areas of landfills that have not yet been finally stabilized; active land application areas, areas used for storage of material and wastes that are exposed to precipitation, stabilization, and structural control measures; leachate collection and treatment systems; and locations where equipment and waste trucks enter and exit the site. Ensure that sediment and erosion control measures are operating properly. For stabilized sites and areas where land application has been completed, or where the climate is arid or semi-arid, conduct inspections at least once every month.

E.L.4.2 Inspections of Inactive Sites. Inspect inactive landfills, open dumps, and land application sites at least monthly. Qualified personnel must inspect landfill (or open dump) stabilization and structural erosion control measures, leachate collection and treatment systems, and all closed land application areas.

E.L.5 Additional Post-Authorization Documentation Requirements.

E.L.5.1 Recordkeeping and Internal Reporting. Keep records with your SWPCP of the types of wastes disposed of in each cell or trench of a landfill or open dump. For land application sites, track the types and quantities of wastes applied in specific areas.

E.L.6 Sector-Specific Benchmarks

Table E.L-1 identifies benchmarks that apply to the specific subsectors of Sector L. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, which describe your site activities.

Table E.L-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration[1]
All Landfill, Land Application Sites and Open Dumps, except Municipal Solid Waste Landfill (MSWLF) Areas Closed in Accordance with 40 CFR 258.60 (Industrial Activity Code "LF")	Total Iron	1.0 mg/L

[1]Benchmark monitoring required only for discharges not subject to effluent limitations in 40 CFR Part 445 Subpart B (see Table L-2 below).

E.L.7. Effluent Limitations Based on Effluent Limitations Guidelines

Table E.L-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table E.L-2[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from non-hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart B.	Biochemical Oxygen Demand (BOD_5)	140 mg/L, daily maximum
		37 mg/L, monthly avg. maximum
	Total Suspended Solids (TSS)	88 mg/L, daily maximum
		27 mg/L, monthly avg. maximum
	Ammonia	10 mg/L, daily maximum
		4.9 mg/L, monthly avg. maximum
	Alpha Terpineol	0.033 mg/L, daily maximum
		0.016 mg/L monthly avg. maximum
	Benzoic Acid	0.12 mg/L, daily maximum
		0.071 mg/L, monthly avg. maximum
	p-Cresol	0.025 mg/L, daily maximum
		0.014 mg/L, monthly avg. maximum
	Phenol	0.026 mg/L, daily maximum
		0.015 mg/L, monthly avg. maximum
	Total Zinc	0.20 mg/L, daily maximum
		0.11 mg/L, monthly avg. maximum
	pH	Within the range of 6-9 standard pH units (s.u.)

[1] Monitor annually. As set forth at 40 CFR Part 445 Subpart B, these numeric limitations apply to contaminated stormwater discharges from MSWLFs that have not been closed in accordance with 40 CFR 258.60, and to contaminated stormwater discharges from those landfills that are subject to the provisions of 40 CFR Part 257 except for discharges from any of the following facilities:
(a) landfills operated in conjunction with other industrial or commercial operations, when the landfill receives only wastes generated by the industrial or commercial operation directly associated with the landfill;
(b) landfills operated in conjunction with other industrial or commercial operations, when the landfill receives wastes generated by the industrial or commercial operation directly associated with the landfill and also receives other wastes, provided that the other wastes received for disposal are generated by a facility that is subject to the same provisions in 40 CFR Subchapter N as the industrial or commercial operation, or that the other wastes received are of similar nature to the wastes generated by the industrial or commercial operation;
(c) landfills operated in conjunction with CWT facilities subject to 40 CFR Part 437, so long as the CWT facility commingles the landfill wastewater with other non-landfill wastewater for discharge. A landfill directly associated with a CWT facility is subject to this part if the CWT facility discharges landfill wastewater separately from other CWT wastewater or commingles the wastewater from its landfill only with wastewater from other landfills; or
(d) landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes from public service activities, so long as the company owning the landfill does not receive a fee or other remuneration for the disposal service.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart M – Sector M – Automobile Salvage Yards.

E.M.1 Additional Technology-Based Effluent Limits.

E.M.1.1 Spill and Leak Prevention Procedures. Drain vehicles intended to be dismantled of all fluids upon arrival at the site (or as soon thereafter as feasible), or employ some other equivalent means to prevent spills and leaks.

E.M.1.2 Employee Training. If applicable to your facility, address the following areas (at a minimum) in your employee training program: proper handling (collection, storage, and disposal) of oil, used mineral spirits, anti-freeze, mercury switches, and solvents.

E.M.1.3 Management of Runoff. Consider the following management practices: berms or drainage ditches on the property line (to help prevent run-on from neighboring properties); berms for uncovered outdoor storage of oily parts, engine blocks, and above-ground liquid storage; installation of detention ponds; and installation of filtering devices and oil and water separators.

E.M.2 Additional SWPCP Requirements.

E.M.2.1 Drainage Area Site Map. Identify locations used for dismantling, storage, and maintenance of used motor vehicle parts. Also identify where any of the following may be exposed to precipitation or surface runoff: dismantling areas, parts (e.g., engine blocks, tires, hub caps, batteries, hoods, mufflers) storage areas, and liquid storage tanks and drums for fuel and other fluids.

E.M.2.2 Potential Pollutant Sources. Assess the potential for the following to contribute pollutants to stormwater discharges: vehicle storage areas, dismantling areas, parts storage areas (e.g., engine blocks, tires, hub caps, batteries, hoods, mufflers), and fueling stations.

E.M.3 Additional Inspection Requirements. Immediately (or as soon thereafter as feasible) inspect vehicles arriving at the site for leaks. Inspect monthly for signs of leakage all equipment containing oily parts, hydraulic fluids, any other types of fluids, or mercury switches. Also, inspect monthly for signs of leakage all vessels and areas where hazardous materials and general automotive fluids are stored, including, but not limited to, mercury switches, brake fluid, transmission fluid, radiator water, and antifreeze.

E.M.4 Sector-Specific Benchmarks.

Table E.M-1 identifies benchmarks that apply to the specific subsectors of Sector M. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.M-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Automobile Salvage Yards (SIC 5015)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart N – Sector N – Scrap Recycling and Waste Recycling Facilities.

E.N.1 Additional Technology-Based Effluent Limits.

E.N.1.1 Scrap and Waste Recycling Facilities (Non-Source Separated, Nonliquid Recyclable Materials). Requirements for facilities that receive, process, and do wholesale distribution of nonliquid recyclable wastes (e.g., ferrous and nonferrous metals, plastics, glass, cardboard, and paper). These facilities may receive both nonrecyclable and recyclable materials. This section is not intended for those facilities that accept recyclables only from primarily non-industrial and residential sources.

E.N.1.1.1 Inbound Recyclable and Waste Material Control Program. Minimize the chance of accepting materials that could be significant sources of pollutants by conducting inspections of inbound recyclables and waste materials. Following are some control measure options: (a) provide information and education to suppliers of scrap and recyclable waste materials on draining and properly disposing of residual fluids (e.g., from vehicles and equipment engines, radiators and transmissions, oil filled transformers, and individual containers or drums) and removal of mercury switches from vehicles before delivery to your facility; (b) establish procedures to minimize the potential of any residual fluids from coming into contact with precipitation or runoff; (c) establish procedures for accepting scrap lead-acid batteries (additional requirements for the handling, storage, and disposal or recycling of batteries are contained in the scrap lead-acid battery program provisions in Schedule E.N.3.1.6); (d) provide training targeted for those personnel engaged in the inspection and acceptance of inbound recyclable materials; and (e) establish procedures to ensure that liquid wastes, including used oil, are stored in materially compatible and non-leaking containers and are disposed of or recycled in accordance with the Resource Conservation and Recovery Act (RCRA).

E.N.1.1.2 Scrap and Waste Material Stockpiles and Storage (Outdoor). Minimize contact of stormwater runoff with stockpiled materials, processed materials, and nonrecyclable wastes. Following are some control measure options: (a) permanent or semi-permanent covers; (b) sediment traps, vegetated swales and strips, catch basin filters, and sand filters to facilitate settling or filtering of pollutants; (c) dikes, berms, containment trenches, culverts, and surface grading to divert runoff from storage areas; (d) silt fencing; and (e) oil and water separators, sumps, and dry absorbents for areas where potential sources of residual fluids are stockpiled (e.g., automobile engine storage areas).

E.N.1.1.3 Stockpiling of Turnings Exposed to Cutting Fluids (Outdoor Storage). Minimize contact of surface runoff with residual cutting fluids by: (a) storing all turnings exposed to cutting fluids under some form of permanent or semi-permanent cover, or (b) establishing dedicated containment areas for all turnings that have been exposed to cutting fluids. Any containment areas must be constructed of concrete, asphalt, or other equivalent types of impermeable material and include a barrier (e.g., berms, curbing, elevated pads) to prevent contact with stormwater run-on. Stormwater runoff from these areas can be discharged, provided that any runoff is first collected and treated by an oil and water separator or its equivalent. You must regularly

maintain the oil and water separator (or its equivalent) and properly dispose of or recycle collected residual fluids.

E.N.1.1.4 Scrap and Waste Material Stockpiles and Storage (Covered or Indoor Storage). Minimize contact of residual liquids and particulate matter from materials stored indoors or under cover with surface runoff. Following are some control measure options: (a) good housekeeping measures, including the use of dry absorbents or wet vacuuming to contain, dispose of, or recycle residual liquids originating from recyclable containers, or mercury spill kits for spills from storage of mercury switches; (b) not allowing washwater from tipping floors or other processing areas to discharge to the storm sewer system; and (c) disconnecting or sealing off all floor drains connected to the storm sewer system.

E.N.1.1.5 Scrap and Recyclable Waste Processing Areas. Minimize surface runoff from coming in contact with scrap processing equipment. Pay attention to operations that generate visible amounts of particulate residue (e.g., shredding) to minimize the contact of accumulated particulate matter and residual fluids with runoff (i.e., through good housekeeping, preventive maintenance, etc.). Following are some control measure options: (a) regularly inspect equipment for spills or leaks and malfunctioning, worn, or corroded parts or equipment; (b) establish a preventive maintenance program for processing equipment; (c) use dry-absorbents or other cleanup practices to collect and dispose of or recycle spilled or leaking fluids or use mercury spill kits for spills from storage of mercury switches; (d) on unattended hydraulic reservoirs over 150 gallons in capacity, install protection devices such as low-level alarms or equivalent devices, or secondary containment that can hold the entire volume of the reservoir; (e) containment or diversion structures such as dikes, berms, culverts, trenches, elevated concrete pads, and grading to minimize contact of stormwater runoff with outdoor processing equipment or stored materials; (f) oil and water separators or sumps; (g) permanent or semi-permanent covers in processing areas where there are residual fluids and grease; (h) retention or detention ponds or basins; sediment traps, and vegetated swales or strips (for pollutant settling and filtration); (i) catch basin filters or sand filters.

E.N.1.1.6 Scrap Lead-Acid Battery Program. Properly handle, store, and dispose of scrap lead-acid batteries. Following are some control measure options (a) segregate scrap lead-acid batteries from other scrap materials; (b) properly handle, store, and dispose of cracked or broken batteries; (c) collect and dispose of leaking lead-acid battery fluid; (d) minimize or eliminate (if possible) exposure of scrap lead-acid batteries to precipitation or runoff; and (e) provide employee training for the management of scrap batteries.

E.N.1.1.7 Spill Prevention and Response Procedures. (See also Schedule A.1.h) Install alarms and/or pump shutoff systems on outdoor equipment with hydraulic reservoirs exceeding 150 gallons in the event of a line break. Alternatively, a secondary containment system capable of holding the entire contents of the reservoir plus room for precipitation can be used. Use a mercury spill kit for any release of mercury from switches, anti-lock brake systems, and switch storage areas.

E.N.1.1.8 Supplier Notification Program. As appropriate, notify major suppliers which scrap materials will not be accepted at the facility or will be accepted only under certain conditions.

E.N.1.2 Waste Recycling Facilities (Liquid Recyclable Materials).

E.N.1.2.1 Waste Material Storage (Indoor). Minimize or eliminate contact between residual liquids from waste materials stored indoors and from surface runoff. The plan may refer to applicable portions of other existing plans, such as Spill Prevention, Control, and Countermeasure (SPCC) plans required under 40 CFR Part 112. Following are some control measure options (a) procedures for material handling (including labeling and marking); (b) clean up spills and leaks with dry absorbent materials, a wet vacuum system; (c) appropriate containment structures (trenching, curbing, gutters, etc.); and (d) a drainage system, including appurtenances (e.g., pumps or ejectors, manually operated valves), to handle discharges from diked or bermed areas. Drainage should be discharged to an appropriate treatment facility or sanitary sewer system, or otherwise disposed of properly. These discharges may require coverage under a separate NPDES wastewater permit or industrial user permit under the pretreatment program.

E.N.1.2.2 Waste Material Storage (Outdoor). Minimize contact between stored residual liquids and precipitation or runoff. The plan may refer to applicable portions of other existing plans, such as SPCC plans required under 40 CFR Part 112. Discharges of precipitation from containment areas containing used oil must also be in accordance with applicable sections of 40 CFR Part 112. Following are some control measure options (a) appropriate containment structures (e.g., dikes, berms, curbing, pits) to store the volume of the largest tank, with sufficient extra capacity for precipitation; (b) drainage control and other diversionary structures; (c) corrosion protection and/or leak detection systems for storage tanks; and (d) dry-absorbent materials or a wet vacuum system to collect spills.

E.N.1.2.3 Trucks and Rail Car Waste Transfer Areas. Minimize pollutants in discharges from truck and rail car loading and unloading areas. Include measures to clean up minor spills and leaks resulting from the transfer of liquid wastes. Following are two control measure options: (a) containment and diversionary structures to minimize contact with precipitation or runoff, and (b) dry clean-up methods, wet vacuuming, roof coverings, or runoff controls.

E.N.1.3 Recycling Facilities (Source-Separated Materials). The following identifies considerations for facilities that receive only source-separated recyclables, primarily from non-industrial and residential sources.

E.N.1.3.1 Inbound Recyclable Material Control. Minimize the chance of accepting nonrecyclables (e.g., hazardous materials) that could be a significant source of pollutants by conducting inspections of inbound materials. Following are some control measure options: (a) providing information and education measures to inform suppliers of recyclables about acceptable and non-acceptable materials, (b) training

drivers responsible for pickup of recycled material, (c) clearly marking public drop-off containers regarding which materials can be accepted, (d) rejecting nonrecyclable wastes or household hazardous wastes at the source, and (e) establishing procedures for handling and disposal of nonrecyclable material.

E.N.1.3.2 Outdoor Storage. Minimize exposure of recyclables to precipitation and runoff. Use good housekeeping measures to prevent accumulation of particulate matter and fluids, particularly in high traffic areas. Following are some control measure options (a) provide totally enclosed drop-off containers for the public; (b) install a sump and pump with each container pit and treat or discharge collected fluids to a sanitary sewer system; (c) provide dikes and curbs for secondary containment (e.g., around bales of recyclable waste paper); (d) divert surface water runoff away from outside material storage areas; (e) provide covers over containment bins, dumpsters, and roll-off boxes; and (f) store the equivalent of one day's volume of recyclable material indoors.

E.N.1.3.3 Indoor Storage and Material Processing. Minimize the release of pollutants from indoor storage and processing areas. Following are some control measure options (a) schedule routine good housekeeping measures for all storage and processing areas, (b) prohibit tipping floor washwater from draining to the storm sewer system, and (c) provide employee training on pollution prevention practices.

E.N.1.3.4 Vehicle and Equipment Maintenance. Following are some control measure options for areas where vehicle and equipment maintenance occur outdoors (a) prohibit vehicle and equipment washwater from discharging to the storm sewer system, (b) minimize or eliminate outdoor maintenance areas whenever possible, (c) establish spill prevention and clean-up procedures in fueling areas, (d) avoid topping off fuel tanks, (e) divert runoff from fueling areas, (f) store lubricants and hydraulic fluids indoors, and (g) provide employee training on proper handling and storage of hydraulic fluids and lubricants.

E.N.2 Additional SWPCP Requirements.

E.N.2.1 Drainage Area Site Map. Document in your SWPCP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: scrap and waste material storage, outdoor scrap and waste processing equipment; and containment areas for turnings exposed to cutting fluids.

E.N.2.2 Maintenance Schedules/Procedures for Collection, Handling, and Disposal or Recycling of Residual Fluids at Scrap and Waste Recycling Facilities. If you are subject to Schedule E.N.1.1.3, your SWPCP must identify any applicable maintenance schedule and the procedures to collect, handle, and dispose of or recycle residual fluids.

E.N.3 Sector-Specific Benchmarks.

Table E.N-1 identifies benchmarks that apply to the specific subsectors of Sector N. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.N-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Scrap Recycling and Waste Recycling Facilities except Source-Separated Recycling (SIC 5093)	Chemical Oxygen Demand (COD)	120 mg/L
	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart O – Sector O – Steam Electric Generating Facilities.

E.O.1 Additional Technology-Based Effluent Limits. The following good housekeeping measures are required in addition to Schedule A.4 of permit:

E.O.1.1 Fugitive Dust Emissions. Minimize fugitive dust emissions from coal handling areas. To minimize the tracking of coal dust offsite, consider procedures such as installing specially designed tires or washing vehicles in a designated area before they leave the site and controlling the wash water.

E.O.1.2 Delivery Vehicles. Minimize contamination of stormwater runoff from delivery vehicles arriving at the plant site. Consider procedures to inspect delivery vehicles arriving at the plant site and ensure overall integrity of the body or container and procedures to deal with leakage or spillage from vehicles or containers.

E.O.1.3 Fuel Oil Unloading Areas. Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Consider using containment curbs in unloading areas, having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and using spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

E.O.1.4 Chemical Loading and Unloading. Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Consider using containment curbs at chemical loading and unloading areas to contain spills, having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and loading and unloading in covered areas and storing chemicals indoors.

E.O.1.5 Miscellaneous Loading and Unloading Areas. Minimize contamination of precipitation or surface runoff from loading and unloading areas. Consider covering the loading area; grading, berming, or curbing around the loading area to divert run-on; locating the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

E.O.1.6 Liquid Storage Tanks. Minimize contamination of surface runoff from above-ground liquid storage tanks. Consider protective guards around tanks, containment curbs, spill and overflow protection, dry cleanup methods, or equivalent measures.

E.O.1.7 Large Bulk Fuel Storage Tanks. Minimize contamination of surface runoff from large bulk fuel storage tanks. Consider containment berms (or their equivalent). You must also comply with applicable State and Federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

E.O.1.8 Spill Reduction Measures. Minimize the potential for an oil or chemical spill, or reference the appropriate part of your SPCC plan. Visually inspect as part of your routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to stormwater, and make any necessary repairs immediately.

E.O.1.9 Oil-Bearing Equipment in Switchyards. Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Consider using level grades and gravel surfaces to retard flows and limit the spread of spills, or collecting runoff in perimeter ditches.

E.O.1.10 Residue-Hauling Vehicles. Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds.

E.O.1.11 Ash Loading Areas. Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water before departure of each loaded vehicle.

E.O.1.12 Areas Adjacent to Disposal Ponds or Landfills. Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

E.O.1.13 Landfills, Scrap yards, Surface Impoundments, Open Dumps, General Refuse Sites. Minimize the potential for contamination of runoff from these areas.

E.O.2 Additional SWPCP Requirements.

E.O.2.1 Drainage Area Site Map. Document in your SWPCP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

E.O.3 Additional Inspection Requirements.

E.O.3.1 Inspection. Inspect the following areas monthly: coal handling areas, loading or unloading areas, switchyards, fueling areas, bulk storage areas, ash handling areas, areas adjacent to disposal ponds and landfills, maintenance areas, liquid storage tanks, and long term and short term material storage areas.

E.O.4 Sector-Specific Benchmarks

Table E.O-1 identifies benchmarks that apply to the specific subsectors of Sector O. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, which describe your site activities.

Table E.O-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Steam Electric Generating Facilities (Industrial Activity Code “SE”)	Total Iron	1.0 mg/L

E.O.5 Effluent Limitations Based on Effluent Limitations Guidelines

Table E.O-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table E.O-2[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from coal storage piles at Steam Electric Generating Facilities	TSS	50 mg/l[2]
	pH	6.0 min - 9.0 max

[1] Monitor annually.
[2] If your facility is designed, constructed, and operated to treat the volume of coal pile runoff that is associated with a 10-year, 24-hour rainfall event, any untreated overflow of coal pile runoff from the treatment unit is not subject to the 50 mg/L limitation for total suspended solids.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart P – Sector P – Land Transportation and Warehousing.

E.P.1 Additional Technology-Based Effluent Limits.

E.P.1.1 Good Housekeeping Measures. In addition to the Good Housekeeping requirements in Schedule A.4 of the permit, you must do the following:

E.P.1.1.1 Vehicle and Equipment Storage Areas. Minimize the potential for stormwater exposure to leaky or leak-prone vehicles/equipment awaiting maintenance. Consider the following (or other equivalent measures): use of drip pans under vehicles/equipment, indoor storage of vehicles and equipment, installation of berms or dikes, use of absorbents, roofing or covering storage areas, and cleaning pavement surfaces to remove oil and grease.

E.P.1.1.2 Fueling Areas. Minimize contamination of stormwater runoff from fueling areas. Consider the following (or other equivalent measures): Covering the fueling area; using spill/overflow protection and cleanup equipment; minimizing stormwater run-on/runoff to the fueling area; using dry cleanup methods; and treating and/or recycling collected stormwater runoff.

E.P.1.1.3 Material Storage Areas. Maintain all material storage vessels (e.g., for used oil/oil filters, spent solvents, paint wastes, hydraulic fluids) to prevent contamination of stormwater and plainly label them (e.g., “Used Oil,” “Spent Solvents,” etc.). Consider the following (or other equivalent measures): storing the materials indoors; installing berms/dikes around the areas; minimizing runoff of stormwater to the areas; using dry cleanup methods; and treating and/or recycling collected stormwater runoff.

E.P.1.1.4 Vehicle and Equipment Cleaning Areas. Minimize contamination of stormwater runoff from all areas used for vehicle/equipment cleaning. Consider the following (or other equivalent measures): performing all cleaning operations indoors; covering the cleaning operation, ensuring that all washwater drains to a proper collection system (i.e., not the stormwater drainage system); treating and/or recycling collected washwater, or other equivalent measures.

E.P.1.1.5 Vehicle and Equipment Maintenance Areas. Minimize contamination of stormwater runoff from all areas used for vehicle/equipment maintenance. Consider the following (or other equivalent measures): performing maintenance activities indoors; using drip pans; keeping an organized inventory of materials used in the shop; draining all parts of fluid prior to disposal; prohibiting wet clean up practices if these practices would result in the discharge of pollutants to stormwater drainage systems; using dry cleanup methods; treating and/or recycling collected stormwater runoff, minimizing run on/runoff of stormwater to maintenance areas.

E.P.1.1.6 Locomotive Sanding (Loading Sand for Traction) Areas. Consider the following (or other equivalent measures): covering sanding areas; minimizing stormwater run on/runoff; or appropriate sediment removal practices to minimize the offsite transport of sanding material by stormwater.

E.P.1.2 Employee Training. Address the following activities, as applicable: used oil and spent solvent management; fueling procedures; general good housekeeping practices; proper painting procedures; and used battery management.

E.P.2 Additional SWPCP Requirements.

E.P.2.1 Drainage Area Site Map. Identify in the SWPCP the following areas of the facility and indicate whether activities occurring there may be exposed to precipitation/surface runoff: Fueling stations; vehicle/equipment maintenance or cleaning areas; storage areas for vehicle/equipment with actual or potential fluid leaks; loading/unloading areas; areas where treatment, storage or disposal of wastes occur; liquid storage tanks; processing areas; and storage areas.

E.P.2.2 Potential Pollutant Sources. Assess the potential for the following activities and facility areas to contribute pollutants to stormwater discharges: Onsite waste storage or disposal; dirt/gravel parking areas for vehicles awaiting maintenance; illicit plumbing connections between shop floor drains and the stormwater conveyance system(s); and fueling areas. Describe these activities in the SWPCP.

E.P.3 Additional Inspection Requirements. Inspect all the following areas/activities: storage areas for vehicles/equipment awaiting maintenance, fueling areas, indoor and outdoor vehicle/equipment maintenance areas, material storage areas, vehicle/equipment cleaning areas and loading/unloading areas.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart Q – Sector Q – Water Transportation.

E.Q.1 Additional Technology-Based Effluent Limits.

E.Q.1.1 Good Housekeeping Measures. You must implement the following good housekeeping measures in addition to requirements in Schedule A.1 of the permit:

E.Q.1.1.1 Pressure Washing Area. Collect or contain the discharges from the pressures washing area so that they are not co-mingled with stormwater discharges authorized by this permit.

E.Q.1.1.2 Blasting and Painting Area. Minimize the potential for spent abrasives, paint chips, and overspray to discharge into receiving waters or the storm sewer systems. Consider containing all blasting and painting activities or use other measures to minimize the discharge of contaminants (e.g., hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris). When necessary, regularly clean stormwater conveyances of deposits of abrasive blasting debris and paint chips.

E.Q.1.1.3 Material Storage Areas. Store and plainly label all containerized materials (e.g., fuels, paints, solvents, waste oil, antifreeze, batteries) in a protected, secure location away from drains. Minimize the contamination of precipitation or surface runoff from the storage areas. Specify which materials are stored indoors, and consider containment or enclosure for those stored outdoors. If abrasive blasting is performed, discuss the storage and disposal of spent abrasive materials generated at the facility. Consider implementing an inventory control plan to limit the presence of potentially hazardous materials onsite.

E.Q.1.1.4 Engine Maintenance and Repair Areas. Minimize the contamination of precipitation or surface runoff from all areas used for engine maintenance and repair. Consider the following (or their equivalents): performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts of fluid prior to disposal, prohibiting the practice of hosing down the shop floor, using dry cleanup methods, and treating and/or recycling stormwater runoff collected from the maintenance area.

E.Q.1.1.5 Material Handling Area. Minimize the contamination of precipitation or surface runoff from material handling operations and areas (e.g., fueling, paint and solvent mixing, disposal of process wastewater streams from vessels). Consider the following (or their equivalents): covering fueling areas, using spill and overflow protection, mixing paints and solvents in a designated area (preferably indoors or under a shed), and minimizing runoff of stormwater to material handling areas.

E.Q.1.1.6 Drydock Activities. Routinely maintain and clean the drydock to minimize pollutants in stormwater runoff. Address the cleaning of accessible areas of the drydock prior to flooding, and final cleanup following removal of the vessel and raising the dock. Include procedures for cleaning up oil, grease, and fuel spills occurring on the drydock. Consider the following (or their equivalents): sweeping rather than hosing off debris and spent blasting material from accessible areas of the drydock prior to

flooding and making absorbent materials and oil containment booms readily available to clean up or contain any spills.

E.Q.1.2 Employee Training. At a minimum, address the following activities (as applicable): used oil management, spent solvent management, disposal of spent abrasives, disposal of vessel wastewaters, spill prevention and control, fueling procedures, general good housekeeping practices, painting and blasting procedures, and used battery management.

E.Q.1.3 Preventive Maintenance. As part of your preventive maintenance program, perform timely inspection and maintenance of stormwater management devices (e.g., cleaning oil and water separators and sediment traps to ensure that spent abrasives, paint chips, and solids will be intercepted and retained prior to entering the storm drainage system), as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

E.Q.2 Additional SWPCP Requirements.

E.Q.2.1 Drainage Area Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: fueling; engine maintenance and repair; vessel maintenance and repair; pressure washing; painting; sanding; blasting; welding; metal fabrication; loading and unloading areas; locations used for the treatment, storage, or disposal of wastes; liquid storage tanks; liquid storage areas (e.g., paint, solvents, resins); and material storage areas (e.g., blasting media, aluminum, steel, scrap iron).

E.Q.2.2 Summary of Potential Pollutant Sources. Document in the SWPCP the following additional sources and activities that have potential pollutants associated with them: outdoor manufacturing or processing activities (e.g., welding, metal fabricating) and significant dust or particulate generating processes (e.g., abrasive blasting, sanding, and painting.)

E.Q.3 Additional Inspection Requirements.

Inspect pressure washing area; blasting, sanding, and painting areas; material storage areas; engine maintenance and repair areas; material handling areas; drydock area; and general yard area.

E.Q.4 Sector-Specific Benchmarks.

Table E.Q-1 identifies benchmarks that apply to the specific subsectors of Sector Q. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.Q-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Water Transportation Facilities (SIC 4412-4499)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart R – Sector R – Ship and Boat Building and Repair Yards.

E.R.1 Additional Technology-Based Effluent Limits.

E.R.1.1 Good Housekeeping Measures.

E.R.1.1.1 Pressure Washing Area. If pressure washing is used to remove marine growth from vessels, the discharged water must be permitted as a process wastewater by a separate NPDES permit.

E.R.1.1.2 Blasting and Painting Area. Minimize the potential for spent abrasives, paint chips, and overspray to discharging into the receiving water or the storm sewer systems. Consider containing all blasting and painting activities, or use other measures to prevent the discharge of the contaminants (e.g., hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris). When necessary, regularly clean stormwater conveyances of deposits of abrasive blasting debris and paint chips.

E.R.1.1.3 Material Storage Areas. Store and plainly label all containerized materials (e.g., fuels, paints, solvents, waste oil, antifreeze, batteries) in a protected, secure location away from drains. Minimize the contamination of precipitation or surface runoff from the storage areas. If abrasive blasting is performed, discuss the storage and disposal of spent abrasive materials generated at the facility. Consider implementing an inventory control plan to limit the presence of potentially hazardous materials onsite.

E.R.1.1.4 Engine Maintenance and Repair Areas. Minimize the contamination of precipitation or surface runoff from all areas used for engine maintenance and repair. Consider the following (or their equivalents): performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts of fluid prior to disposal, prohibiting the practice of hosing down the shop floor, using dry cleanup methods, and treating and/or recycling stormwater runoff collected from the maintenance area.

E.R.1.1.5 Material Handling Area. Minimize the contamination of precipitation or surface runoff from material handling operations and areas (e.g., fueling, paint and solvent mixing, disposal of process wastewater streams from vessels). Consider the following (or their equivalents): covering fueling areas, using spill and overflow protection, mixing paints and solvents in a designated area (preferably indoors or under a shed), and minimizing stormwater run-on to material handling areas.

E.R.1.1.6 Drydock Activities. Routinely maintain and clean the drydock to minimize pollutants in stormwater runoff. Clean accessible areas of the drydock prior to flooding and final cleanup following removal of the vessel and raising the dock. Include procedures for cleaning up oil, grease, or fuel spills occurring on the drydock. Consider the following (or their equivalents): sweeping rather than hosing off debris and spent blasting material from accessible areas of the drydock prior to flooding, and having absorbent materials and oil containment booms readily available to clean up and contain any spills.

E.R.1.2 Employee Training. As part of your employee training program, address, at a minimum, the following activities (as applicable): used oil management, spent solvent management, disposal

of spent abrasives, disposal of vessel wastewaters, spill prevention and control, fueling procedures, general good housekeeping practices, painting and blasting procedures, and used battery management.

E.R.1.3 Preventive Maintenance. As part of your preventive maintenance program, perform timely inspection and maintenance of stormwater management devices (e.g., cleaning oil and water separators and sediment traps to ensure that spent abrasives, paint chips, and solids will be intercepted and retained prior to entering the storm drainage system), as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

E.R.2 Additional SWPCP Requirements.

E.R.2.1 Drainage Area Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: fueling; engine maintenance or repair; vessel maintenance or repair; pressure washing; painting; sanding; blasting; welding; metal fabrication; loading and unloading areas; treatment, storage, and waste disposal areas; liquid storage tanks; liquid storage areas (e.g., paint, solvents, resins); and material storage areas (e.g., blasting media, aluminum, steel, scrap iron).

E.R.2.2 Potential Pollutant Sources. Document in your SWPCP the following additional sources and activities that have potential pollutants associated with them (if applicable): outdoor manufacturing or processing activities (e.g., welding, metal fabricating) and significant dust or particulate generating processes (e.g., abrasive blasting, sanding, and painting).

E.R.2.3 Documentation of Good Housekeeping Measures. Document in your SWPCP any good housekeeping measures implemented to meet the effluent limits in Schedule E.R.1.1.

E.R.2.3.1 Blasting and Painting Areas. Document in the SWPCP any standard operating practices relating to blasting and painting (e.g., prohibiting uncontained blasting and painting over open water or prohibiting blasting and painting during windy conditions, which can render containment ineffective).

E.R.2.3.2 Storage Areas. Specify in your SWPCP which materials are stored indoors, and consider containment or enclosure for those stored outdoors.

E.R.3 Additional Inspection Requirements.

Include the following in all monthly inspections: pressure washing area; blasting, sanding, and painting areas; material storage areas; engine maintenance and repair areas; material handling areas; drydock area; and general yard area.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart S – Sector S – Air Transportation.

E.S.1 Additional Technology-Based Effluent Limits.

E.S.1.1 Good Housekeeping Measures.

E.S.1.1.1 Aircraft, Ground Vehicle and Equipment Maintenance Areas. Minimize the contamination of stormwater runoff from all areas used for aircraft, ground vehicle and equipment maintenance (including the maintenance conducted on the terminal apron and in dedicated hangers). Consider the following practices (or their equivalents): performing maintenance activities indoors; maintaining an organized inventory of material used in the maintenance areas; draining all parts of fluids prior to disposal; prohibiting the practice of hosing down the apron or hanger floor; using dry cleanup methods; and collecting the stormwater runoff from the maintenance area and providing treatment or recycling.

E.S.1.1.2 Aircraft, Ground Vehicle and Equipment Cleaning Areas. Clearly demarcate these areas on the ground using signage or other appropriate means. Minimize the contamination of stormwater runoff from cleaning areas.

E.S.1.1.3 Aircraft, Ground Vehicle and Equipment Storage Areas. Store all aircraft, ground vehicles and equipment awaiting maintenance in designated areas only and minimize the contamination of stormwater runoff from these storage areas. Consider the following control measures, including any BMPs (or their equivalents): storing aircraft and ground vehicles indoors; using drip pans for the collection of fluid leaks; and perimeter drains, dikes or berms surrounding the storage areas.

E.S.1.1.4 Material Storage Areas. Maintain the vessels of stored materials (e.g., used oils, hydraulic fluids, spent solvents, and waste aircraft fuel) in good condition, to prevent or minimize contamination of stormwater. Also plainly label the vessels (e.g., “used oil,” “Contaminated Jet A,” etc.). Minimize contamination of precipitation/runoff from these areas. Consider the following control measures (or their equivalents): storing materials indoors; storing waste materials in a centralized location; and installing berms/dikes around storage areas.

E.S.1.1.5 Airport Fuel System and Fueling Areas. Minimize the discharge of fuel to the storm sewer/surface waters resulting from fuel servicing activities or other operations conducted in support of the airport fuel system. Consider the following control measures (or their equivalents): implementing spill and overflow practices (e.g., placing absorptive materials beneath aircraft during fueling operations); using only dry cleanup methods; and collecting stormwater runoff.

E.S.1.1.6 Source Reduction. Minimize, and where feasible eliminate, the use of urea and glycol-based deicing chemicals, in order to reduce the aggregate amount of deicing chemicals used and/or lessen the environmental impact. Chemical options to replace ethylene glycol, propylene glycol and urea include: potassium acetate; magnesium acetate; calcium acetate; and anhydrous sodium acetate.

E.S.1.1.6.1 Runway Deicing Operation: Minimize contamination of stormwater runoff from runways as a result of deicing operations. Evaluate whether

over-application of deicing chemicals occurs by analyzing application rates, and adjust as necessary, consistent with considerations of flight safety. Also consider these control measure options (or their equivalents): metered application of chemicals; pre-wetting dry chemical constituents prior to application; installing a runway ice detection system; implementing anti-icing operations as a preventive measure against ice buildup.

E.S.1.1.6.2 Aircraft Deicing Operations. Minimize contamination of stormwater runoff from aircraft deicing operations. Determine whether excessive application of deicing chemicals occurs and adjust as necessary, consistent with considerations of flight safety. This evaluation should be carried out by the personnel most familiar with the particular aircraft and flight operations in question (versus an outside entity such as the airport authority). Consider using alternative deicing/anti-icing agents as well as containment measures for all applied chemicals. Also consider these control measure options (or their equivalents) for reducing deicing fluid use: forced-air deicing systems, computer-controlled fixed-gantry systems, infrared technology, hot water, varying glycol content to air temperature, enclosed-basket deicing trucks, mechanical methods, solar radiation, hangar storage, aircraft covers, and thermal blankets for MD-E0s and DC-9s. Also consider using ice-detection systems and airport traffic flow strategies and departure slot allocation systems.

E.S.1.1.7 Management of Runoff. Where deicing operations occur, implement a program to control or manage contaminated runoff to minimize the amount of pollutants being discharged from the site. Consider these control measure options (or their equivalents): a dedicated deicing facility with a runoff collection/ recovery system; using vacuum/collection trucks; storing contaminated stormwater/deicing fluids in tanks and releasing controlled amounts to a publicly owned treatment works; collecting contaminated runoff in a wet pond for biochemical decomposition (be aware of attracting wildlife that may prove hazardous to flight operations); and directing runoff into vegetative swales or other infiltration measures. Also consider recovering deicing materials when these materials are applied during non-precipitation events (e.g., covering storm sewer inlets, using booms, installing absorptive interceptors in the drains, etc.) to prevent these materials from later becoming a source of stormwater contamination. Used deicing fluid should be recycled whenever possible.

E.S.1.2 Deicing Season. You must determine the seasonal timeframe (e.g., December- February, October - March, etc.) during which deicing activities typically occur at the facility. Implementation of control measures, including any BMPs, facility inspections and monitoring must be conducted with particular emphasis throughout the defined deicing season. If you meet the deicing chemical usage thresholds of 100,000 gallons glycol and/or 100 tons of urea, the deicing season you identified is the timeframe during which you must obtain the four required benchmark monitoring event results for deicing-related parameters, i.e., BOD, COD, ammonia and pH.

E.S.2 Additional SWPCP Requirements.

The airport authority and tenants of the airport are encouraged to work in partnership in the development of the SWPCP. Tenants of the airport facility include air passenger or cargo companies, fixed based operators and other parties who have contracts with the airport authority to conduct business operations on airport property and whose operations result in stormwater discharges associated with industrial activity. An airport tenant may obtain authorization under this permit and develop a SWPCP for discharges from his/her own areas of the airport.

E.S.2.1 Drainage Area Site Map. Document in the SWPCP the following areas of the facility and indicate whether activities occurring there may be exposed to precipitation/surface runoff: aircraft and runway deicing operations; fueling stations; aircraft, ground vehicle and equipment maintenance/cleaning areas; storage areas for aircraft, ground vehicles and equipment awaiting maintenance.

E.S.2.2 Potential Pollutant Sources. In your inventory of exposed materials, describe in your SWPCP the potential for the following activities and facility areas to contribute pollutants to stormwater discharges: aircraft, runway, ground vehicle and equipment maintenance and cleaning; aircraft and runway deicing operations (including apron and centralized aircraft deicing stations, runways, taxiways and ramps). If you use deicing chemicals, you must maintain a record of the types (including the Material Safety Data Sheets [MSDS]) used and the monthly quantities, either as measured or, in the absence of metering, as estimated to the best of your knowledge. This includes all deicing chemicals, not just glycols and urea (e.g., potassium acetate), because large quantities of these other chemicals can still have an adverse impact on receiving waters. Tenants or other fixed-based operations that conduct deicing operations must provide the above information to the airport authority for inclusion with any comprehensive airport SWPCPs.

E.S.2.3 Vehicle and Equipment Washwater Requirements. Attach to or reference in your SWPCP, a copy of the NPDES permit issued for vehicle/equipment washwater or, if an NPDES permit has not been issued, a copy of the pending application. If an industrial user permit is issued under a local pretreatment program, include a copy in your SWPCP. In any case, if you are subject to another permit, describe your control measures for implementing all non-stormwater discharge permit conditions or pretreatment requirements in your SWPCP. If washwater is handled in another manner (e.g., hauled offsite, retained onsite), describe the disposal method and attach all pertinent documentation/information (e.g., frequency, volume, destination, etc.) in your SWPCP.

E.S.2.4 Documentation of Control Measures Used for Management of Runoff: Document in your SWPCP the control measures used for collecting or containing contaminated melt water from collection areas used for disposal of contaminated snow.

E.S.3 Sector-Specific Benchmarks.

Table E.S-1 identifies benchmarks that apply to the specific subsectors of Sector S. These benchmarks apply to both your primary industrial activity and any co-located industrial activities, unless a facility has an Individual NPDES Permit for de-icing activities.

Table E.S-1.

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Where a single permittee, or a combination of permitted facilities, use more than 100,000 gallons of glycol-based deicing chemicals and/or 100 tons or more of urea on an average annual basis, monitor these parameters in outfalls that collect runoff from areas where deicing activities occur (SIC 4512-4581) and when deicing activities are occurring.	Biochemical Oxygen Demand (BOD_5)	30 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L
	Ammonia	2.14 mg/L
	pH	5.5 - 9.0 s.u.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart T – Sector T – Treatment Works.

E.T.1 Additional Technology-Based Effluent Limits.

E.T.1.1 Control Measures. In addition to the other control measures, consider the following: routing stormwater to the treatment works; or covering exposed materials (i.e., from the following areas: grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; and septage or hauled waste receiving station).

E.T.1.2 Employee Training. At a minimum, training must address the following areas when applicable to a facility: petroleum product management; process chemical management; spill prevention and controls; fueling procedures; general good housekeeping practices; and proper procedures for using fertilizer, herbicides, and pesticides.

E.T.2 Additional SWPCP Requirements.

E.T.2.1 Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; septage or hauled waste receiving station; and storage areas for process chemicals, petroleum products, solvents, fertilizers, herbicides, and pesticides.

E.T.2.2 Potential Pollutant Sources. Document in your SWPCP the following additional sources and activities that have potential pollutants associated with them, as applicable: grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; septage or hauled waste receiving station; and access roads and rail lines.

E.T.3 Additional Inspection Requirements.

Include the following areas in all inspections: access roads and rail lines; grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; and septage or hauled waste receiving station.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart U – Sector U – Food and Kindred Products.

E.U.1 Additional Technology-Based Limitations.

E.U.1.1 Employee Training. Address pest control in your employee training program.

E.U.2 Additional SWPCP Requirements.

E.U.2.1 Drainage Area Site Map. Document in your SWPCP the locations of the following activities if they are exposed to precipitation or runoff: vents and stacks from cooking, drying, and similar operations; dry product vacuum transfer lines; animal holding pens; spoiled product; and broken product container storage areas.

E.U.2.2 Potential Pollutant Sources. Document in your SWPCP, in addition to food and kindred products processing-related industrial activities, application and storage of pest control chemicals (e.g., rodenticides, insecticides, fungicides) used on plant grounds.

E.U.3 Additional Inspection Requirements.

Inspect on a monthly basis, at a minimum, the following areas where the potential for exposure to stormwater exists: loading and unloading areas for all significant materials; storage areas, including associated containment areas; waste management units; vents and stacks emanating from industrial activities; spoiled product and broken product container holding areas; animal holding pens; staging areas; and air pollution control equipment.

E.U.4 Sector-Specific Benchmarks.

Table E.U-1 identifies benchmarks that apply to the specific subsectors of Sector U. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.U-1.

Subsector (You may be subject to requirements for more than one Sector / Subsector)	Parameter	Benchmark Monitoring Concentration
Fats and Oils Products (SIC 2074-2079)	Biochemical Oxygen Demand (BOD_5)	30 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart V – Sector V – Textile Mills, Apparel, and Other Fabric Products.

E.V.1 Additional Technology-Based Limitations.

E.V.1.1 Good Housekeeping Measures.

E.V.1.1.1 Material Storage Areas. Plainly label and store all containerized materials (e.g., fuels, petroleum products, solvents, and dyes) in a protected area, away from drains. Minimize contamination of the stormwater runoff from such storage areas. Also consider an inventory control plan to prevent excessive purchasing of potentially hazardous substances. For storing empty chemical drums or containers, ensure that the drums and containers are clean (consider triple-rinsing) and that there is no contact of residuals with precipitation or runoff. Collect and dispose of washwater from these cleanings properly.

E.V.1.1.2 Material Handling Areas. Minimize contamination of stormwater runoff from material handling operations and areas. Consider the following (or their equivalents): use of spill and overflow protection; covering fueling areas; and covering or enclosing areas where the transfer of material may occur. When applicable, address the replacement or repair of leaking connections, valves, transfer lines, and pipes that may carry chemicals, dyes, or wastewater.

E.V.1.1.3 Fueling Areas. Minimize contamination of stormwater runoff from fueling areas. Consider the following (or their equivalents): covering the fueling area, using spill and overflow protection, minimizing run-on of stormwater to the fueling areas, using dry cleanup methods, and treating and/or recycling stormwater runoff collected from the fueling area.

E.V.1.1.4 Above-Ground Storage Tank Area. Minimize contamination of the stormwater runoff from above-ground storage tank areas, including the associated piping and valves. Consider the following (or their equivalents): regular cleanup of these areas; including measures for tanks, piping and valves explicitly in your SPCC program; minimizing runoff of stormwater from adjacent areas; restricting access to the area; inserting filters in adjacent catch basins; providing absorbent booms in unbermed fueling areas; using dry cleanup methods; and permanently sealing drains within critical areas that may discharge to a storm drain.

E.V.1.2 Employee Training. As part of your employee training program, address, at a minimum, the following activities (as applicable): use of reused and recycled waters, solvents management, proper disposal of dyes, proper disposal of petroleum products and spent lubricants, spill prevention and control, fueling procedures, and general good housekeeping practices.

E.V.2 Additional SWPCP Requirements.

E.V.2.1 Potential Pollutant Sources. Document in your SWPCP the following additional sources and activities that have potential pollutants associated with them: industry-specific significant materials and industrial activities (e.g., backwinding, beaming, bleaching, backing bonding, carbonizing, carding, cut and sew operations, desizing, drawing, dyeing locking, fulling, knitting, mercerizing, opening, packing, plying, scouring, slashing, spinning, synthetic-felt

processing, textile waste processing, tufting, turning, weaving, web forming, winging, yarn spinning, and yarn texturing).

E.V.2.2 Description of Good Housekeeping Measures for Material Storage Areas. Document in the SWPCP your containment area or enclosure for materials stored outdoors.

E.V.3 Additional Inspection Requirements.

Inspect, at least monthly, the following activities and areas (at a minimum): transfer and transmission lines, spill prevention, good housekeeping practices, management of process waste products, and all structural and nonstructural management practices.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart X – Sector X – Printing and Publishing.

E.X.1 Additional Technology-Based Effluent Limits.

E.X.1.1 Good Housekeeping Measures.

E.X.1.1.1 Material Storage Areas. Plainly label and store all containerized materials (e.g., skids, pallets, solvents, bulk inks, hazardous waste, empty drums, portable and mobile containers of plant debris, wood crates, steel racks, and fuel oil) in a protected area, away from drains. Minimize contamination of the stormwater runoff from such storage areas. Also consider an inventory control plan to prevent excessive purchasing of potentially hazardous substances.

E.X.1.1.2 Material Handling Area. Minimize contamination of stormwater runoff from material handling operations and areas (e.g., blanket wash, mixing solvents, loading and unloading materials). Consider the following (or their equivalents): using spill and overflow protection, covering fueling areas, and covering or enclosing areas where the transfer of materials may occur. When applicable, address the replacement or repair of leaking connections, valves, transfer lines, and pipes that may carry chemicals or wastewater.

E.X.1.1.3 Fueling Areas. Minimize contamination of stormwater runoff from fueling areas. Consider the following (or their equivalents): covering the fueling area, using spill and overflow protection, minimizing runoff of stormwater to the fueling areas, using dry cleanup methods, and treating and/or recycling stormwater runoff collected from the fueling area.

E.X.1.1.4 Above Ground Storage Tank Area. Minimize contamination of the stormwater runoff from above-ground storage tank areas, including the associated piping and valves. Consider the following (or their equivalents): regularly cleaning these areas, explicitly addressing tanks, piping and valves in the SPCC program, minimizing stormwater runoff from adjacent areas, restricting access to the area, inserting filters in adjacent catch basins, providing absorbent booms in unbermed fueling areas, using dry cleanup methods, and permanently sealing drains within critical areas that may discharge to a storm drain.

E.X.1.2 Employee Training. As part of your employee training program, address, at a minimum, the following activities (as applicable): spent solvent management, spill prevention and control, used oil management, fueling procedures, and general good housekeeping practices.

E.X.2 Additional SWPCP Requirements.

E.X.2.1 Description of Good Housekeeping Measures for Material Storage Areas. In connection with Schedule E.X.1.1.1, describe in the SWPCP the containment area or enclosure for materials stored outdoors.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart Y – Sector Y – Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries.

E.Y.1 Additional Technology-Based Effluent Limits.

E.Y.1.1 Controls for Rubber Manufacturers. Minimize the discharge of zinc in your stormwater discharges. Following are some general control measure options to consider: using chemicals purchased in pre-weighed, sealed polyethylene bags; storing in-use materials in sealable containers, ensuring an airspace between the container and the cover to minimize "puffing" losses when the container is opened, and using automatic dispensing and weighing equipment.

E.Y.1.1.1 Zinc Bags. Ensure proper handling and storage of zinc bags at your facility. Following are some control measure options: employee training on the handling and storage of zinc bags, indoor storage of zinc bags, cleanup of zinc spills without washing the zinc into the storm drain, and the use of 2,500-pound sacks of zinc rather than 50- to 100-pound sacks.

E.Y.1.1.2 Dumpsters. Minimize discharges of zinc from dumpsters. Following are some control measure options: covering the dumpster, moving the dumpster indoors, or providing a lining for the dumpster.

E.Y.1.1.3 Dust Collectors and Baghouses. Minimize contributions of zinc to stormwater from dust collectors and baghouses. Replace or repair, as appropriate, improperly operating dust collectors and baghouses.

E.Y.1.1.4 Grinding Operations. Minimize contamination of stormwater as a result of dust generation from rubber grinding operations. One control measure option is to install a dust collection system.

E.Y.1.1.5 Zinc Stearate Coating Operations. Minimize the potential for stormwater contamination from drips and spills of zinc stearate slurry that may be released to the storm drain. One control measure option is to use alternative compounds to zinc stearate.

E.Y.1.2 Controls for Plastic Products Manufacturers. Minimize the discharge of plastic resin pellets in your stormwater discharges. Control measures to be considered for implementation (or their equivalents) include minimizing spills, cleaning up of spills promptly and thoroughly, sweeping thoroughly, pellet capturing, employee education, and disposal precautions.

E.Y.2 Additional SWPCP Requirements.

E.Y.2.1 Potential Pollutant Sources for Rubber Manufacturers. Document in your SWPCP the use of zinc at your facility and the possible pathways through which zinc may be discharged in stormwater runoff.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart Z – Sector Z – Leather Tanning and Finishing.

E.Z.1 Additional Technology-Based Effluent Limits.

E.Z.1.1 Good Housekeeping Measures.

E.Z.1.1.1 Storage Areas for Raw, Semiprocessed, or Finished Tannery By-products. Minimize contamination of stormwater runoff from pallets and bales of raw, semiprocessed, or finished tannery by-products (e.g., splits, trimmings, shavings). Consider indoor storage or protection with polyethylene wrapping, tarpaulins, roofed storage, etc. Consider placing materials on an impermeable surface and enclosing or putting berms (or equivalent measures) around the area to prevent stormwater run-on and runoff.

E.Z.1.1.2 Material Storage Areas. Label storage containers of all materials (e.g., specific chemicals, hazardous materials, spent solvents, waste materials) minimize contact of such materials with stormwater.

E.Z.1.1.3 Buffing and Shaving Areas. Minimize contamination of stormwater runoff with leather dust from buffing and shaving areas. Consider dust collection enclosures, preventive inspection and maintenance programs, or other appropriate preventive measures.

E.Z.1.1.4 Receiving, Unloading, and Storage Areas. Minimize contamination of stormwater runoff from receiving, unloading, and storage areas. If these areas are exposed, consider the following (or their equivalents): covering all hides and chemical supplies, diverting drainage to the process sewer, or grade berming or curbing the area to prevent stormwater runoff.

E.Z.1.1.5 Outdoor Storage of Contaminated Equipment. Minimize contact of stormwater with contaminated equipment. Consider the following (or their equivalents): covering equipment, diverting drainage to the process sewer, and cleaning thoroughly prior to storage.

E.Z.1.1.6 Waste Management. Minimize contamination of stormwater runoff from waste storage areas. Consider the following (or their equivalents): covering dumpsters, moving waste management activities indoors, covering waste piles with temporary covering material such as tarpaulins or polyethylene, and minimizing stormwater runoff by enclosing the area or building berms around the area.

E.Z.2 Additional SWPCP Requirements.

E.Z.2.1 Drainage Area Site Map. Identify in your SWPCP where any of the following may be exposed to precipitation or surface runoff: processing and storage areas of the beamhouse, tanyard, and re-tan wet finishing and dry finishing operations.

E.Z.2.2 Potential Pollutant Sources. Document in your SWPCP the following sources and activities that have potential pollutants associated with them (as appropriate): temporary or permanent storage of fresh and brine-cured hides; extraneous hide substances and hair; leather dust, scraps, trimmings, and shavings.

Schedule E – Sector-Specific Requirements for Industrial Activity

Subpart AA – Sector AA – Fabricated Metal Products

E.AA.1 Additional Technology-Based Effluent Limits.

E.AA.1.1 Good Housekeeping Measures.

E.AA.1.1.1 Raw Steel Handling Storage. Minimize the generation of and/or recover and properly manage scrap metals, fines, and iron dust. Include measures for containing materials within storage handling areas.

E.AA.1.1.2 Paints and Painting Equipment. Minimize exposure of paint and painting equipment to stormwater.

E.AA.1.2 Spill Prevention and Response Procedures. Ensure that the necessary equipment to implement a cleanup is available to personnel. The following areas should be addressed

E.AA.1.2.1 Metal Fabricating Areas. Maintain clean, dry, orderly conditions in these areas. Consider using dry clean-up techniques.

E.AA.1.2.2 Storage Areas for Raw Metal. Keep these areas free of conditions that could cause, or impede appropriate and timely response to, spills or leakage of materials. Consider the following (or their equivalents): maintaining storage areas so that there is easy access in the event of a spill, and labeling stored materials to aid in identifying spill contents.

E.AA.2.2.3 Metal Working Fluid Storage Areas. Minimize the potential for stormwater contamination from storage areas for metal working fluids.

E.AA.1.2.4 Cleaners and Rinse Water. Control and clean up spills of solvents and other liquid cleaners, control sand buildup and disbursement from sand-blasting operations, and prevent exposure of recyclable wastes. Substitute environmentally benign cleaners when possible.

E.AA.1.2.5 Lubricating Oil and Hydraulic Fluid Operations. Minimize the potential for stormwater contamination from lubricating oil and hydraulic fluid operations. Consider using monitoring equipment or other devices to detect and control leaks and overflows. Consider installing perimeter controls such as dikes, curbs, grass filter strips, or equivalent measures.

E.AA.1.2.6 Chemical Storage Areas. Minimize stormwater contamination and accidental spillage in chemical storage areas. Include a program to inspect containers and identify proper disposal methods.

E.AA.1.3 Spills and Leaks. In your spill prevention and response procedures, pay attention to the following materials (at a minimum): chromium, toluene, pickle liquor, sulfuric acid, zinc and other water priority chemicals, and hazardous chemicals and wastes.

E.AA.2 Additional SWPCP Requirements.

E.AA.2.1 Drainage Area Site Map. Document in your SWPCP where any of the following may be exposed to precipitation or surface runoff: raw metal storage areas; finished metal storage areas;

scrap disposal collection sites; equipment storage areas; retention and detention basins; temporary and permanent diversion dikes or berms; right-of-way or perimeter diversion devices; sediment traps and barriers; processing areas, including outside painting areas; wood preparation; recycling; and raw material storage.

E.AA.2.2 Potential Pollutant Sources. Document in your SWPCP the following additional sources and activities that have potential pollutants associated with them: loading and unloading operations for paints, chemicals, and raw materials; outdoor storage activities for raw materials, paints, empty containers, corn cobs, chemicals, and scrap metals; outdoor manufacturing or processing activities such as grinding, cutting, degreasing, buffing, and brazing; onsite waste disposal practices for spent solvents, sludge, pickling baths, shavings, ingot pieces, and refuse and waste piles.

E.AA.3 Additional Inspection Requirements.

E.AA.3.1 Inspections. At a minimum, include the following areas in all inspections: raw metal storage areas, finished product storage areas, material and chemical storage areas, recycling areas, loading and unloading areas, equipment storage areas, paint areas, and vehicle fueling and maintenance areas. Also inspect areas associated with the storage of raw metals, spent solvents and chemicals storage areas, outdoor paint areas, and drainage from roof. Potential pollutants include chromium, zinc, lubricating oil, solvents, aluminum, oil and grease, methyl ethyl ketone, steel, and related materials.

E.AA.4 Sector-Specific Benchmarks.

Table E.AA-1 identifies benchmarks that apply to the specific subsectors of Sector AA. These benchmarks apply to both your primary industrial activity and any co-located industrial activities.

Table E.AA-1

Subsector (You may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Fabricated Metal Products, except Coating (SIC 3411-3499; 3911-3915)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
Fabricated Metal Coating and Engraving (SIC 3479)	Nitrate plus Nitrite Nitrogen	0.68 mg/L

SCHEDULE F
NPDES GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply
   The permit registrant must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468B.025, the Clean Water Act and 40 Code of Federal Regulations (CFR) §122.41(a), and is grounds for enforcement action; for permit termination, revocation and/or reissuance, or modification; or for denial of a permit renewal application.

2. Penalties for Water Pollution and Permit Condition Violations
   ORS 468.140 allows the Director to impose civil penalties up to $25,000 per day for violation of a term, condition, or requirement of a permit. ORS 468.943 creates the criminal offense of unlawful water pollution in the second degree, for the criminally negligent violation of ORS chapter 468B or any rule, standard, license, permit or order adopted or issued under ORS chapter 468B. Unlawful water pollution in the second degree is punishable by a fine of up to $25,000 or imprisonment for not more than one year, or both. In addition, OAR 468.946, creates the offense of unlawful water pollution of the first degree, which is a Class B felony.

3. Duty to Mitigate
   The permit registrant must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit. In addition, upon request of the department, the permit registrant must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

4. Duty to Reapply
   If the permit registrant wishes to continue an activity regulated by this permit after the expiration date of this permit, the permit registrant must apply for and have the permit registration renewed. The application must be submitted at least 180 days before the expiration date of this permit. The department may grant written permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions
   This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:
   a. Violation of any term, condition, or requirement of this permit, a rule, or a statute
   b. Failure to pay fees when they are due
   c. Obtaining this permit by misrepresentation or failure to disclose fully all material facts
   d. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge
   e. The permit registrant is identified as a Designated Management Agency or allocated a wasteload under a Total Maximum Daily Load (TMDL)
   f. New information or regulations
   g. Modification of compliance schedules
   h. Requirements of permit re-opener conditions
   i. Correction of technical mistakes made in determining permit conditions
   j. Determination that the permitted activity endangers human health or the environment
   k. Other causes as specified in 40 CFR §§122.62, 122.64, and 124.5

   DEQ will give permit registrant notice of the right to a contested case hearing in the event DEQ issues a Notice of Revocation, Suspension or Refusal to Renew the permit.

   The filing of a request by the permit registrant for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants

The permit registrant must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rules (OAR) 340-041-0033 for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

7. Property Rights
The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, nor does it authorize any injury to persons of property or invasion of any other private rights, nor any infringement of federal, tribal, state, or local laws or regulations.

8. Permit References
Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act and OAR 340-041-0033for toxic pollutants, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

9. Permit Fees
The permit registrant must pay the fees required by OAR 340-045-0070 to 0075.
The permit registrant must pay annual compliance fees by the last day of the month prior to when the permit was issued. For example, if the permit was issued or last renewed in April, the due date will be March 31st. If the payment of annual fees is 30 days or more past due, the permit registrant must pay 9% interest per annum on the unpaid balance. Interest will accrue until the fees are paid in full. If DEQ does not receive payment of annual fees when they are due, DEQ will refer the account to the Department of Revenue or to a private collection agency for collection.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance
The permit registrant must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permit registrant to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permit registrant only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Duty to Halt or Reduce Activity
For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permit registrant must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permit registrant in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities
   a. Definitions
      (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple units or processes of a treatment works when the nonuse is insignificant to the quality or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.
      (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

   b. Prohibition of bypass.
      (1) Bypass is prohibited unless:
         (a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;
         (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate

backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The permit registrant submitted notices and requests as required under General Condition B.3.c.

(2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Director determines that it will meet the three conditions listed above in General Condition B.3.b.(1).

c. Notice and request for bypass.

(1) Anticipated bypass. If the permit registrant knows in advance of the need for a bypass, it must submit prior written notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permit registrant must submit notice of an unanticipated bypass as required in General Condition D.5.

4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permit registrant. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of General Condition B.4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permit registrant who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permit registrant can identify the causes(s) of the upset;

(2) The permitted facility was at the time being properly operated;

(3) The permit registrant submitted notice of the upset as required in General Condition D.5, hereof (24-hour notice); and

(4) The permit registrant complied with any remedial measures required under General Condition A.3 hereof.

d. Burden of proof. In any enforcement proceeding the permit registrant seeking to establish the occurrence of an upset has the burden of proof.

5. Treatment of Single Operational Event

For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter must be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions

(1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.

(3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of overflows. Overflows are prohibited unless:

(1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and
(3) The overflows are the result of an upset as defined in General Condition B.4. and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permit registrant becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5.

7. Public Notification of Effluent Violation or Overflow
If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permit registrant must take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Removed Substances
Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling
Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit and must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of the Director.

2. Flow Measurements
Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures
Monitoring must be conducted according to test procedures approved under 40 CFR §136, unless other test procedures have been specified in this permit.

4. Penalties of Tampering
The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years or both.

5. Reporting of Monitoring Results
Monitoring results must be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permit registrant
If the permit registrant monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR §136 or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value must be recorded unless otherwise specified in this permit.

7. Averaging of Measurements
Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

8. Retention of Records
Except for records of monitoring information required by this permit related to the permit registrant's sewage sludge use and disposal activities, which must be retained for a period of at least five years (or longer as required by 40 CFR §503), the permit registrant must retain records of all monitoring information, including all calibration and maintenance records of all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

9. Records Contents
Records of monitoring information must include:
   a. The date, exact place, time and methods of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

10. Inspection and Entry
The permit registrant must allow the Director, or an authorized representative upon the presentation of credentials to:
   a. Enter upon the permit registrant's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and
   d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes
The permit registrant must comply with Oregon Administrative Rules (OAR) 340, Division 052, "Review of Plans and Specifications". Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers must be commenced until the plans and specifications are submitted to and approved by the Department. The permit registrant must give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

2. Anticipated Noncompliance
The permit registrant must give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers
This permit may be transferred to a new permit registrant provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit

must be transferred to a third party without prior written approval from the Director. The permit registrant must notify the Department when a transfer of property interest takes place.

4. Compliance Schedule
Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting
The permit registrant must report any noncompliance which may endanger health or the environment. Any information must be provided orally (by telephone) within 24 hours, unless otherwise specified in this permit, from the time the permit registrant becomes aware of the circumstances. During normal business hours, the Department's Regional office must be called. Outside of normal business hours, the Department must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

A written submission must also be provided within 5 days of the time the permit registrant becomes aware of the circumstances. If the permit registrant is establishing an affirmative defense of upset or bypass to any offense under ORS 468.922 to 468.946, and in which case if the original reporting notice was oral, delivered written notice must be made to the Department or other agency with regulatory jurisdiction within 4 (four) calendar days. The written submission must contain:
a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected;
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
e. Public notification steps taken, pursuant to General Condition B.7.

The following must be included as information which must be reported within 24 hours under this paragraph:
a. Any unanticipated bypass which exceeds any effluent limitation in this permit.
b. Any upset which exceeds any effluent limitation in this permit.
c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in this permit.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. Other Noncompliance
The permit registrant must report all instances of noncompliance not reported under General Condition D.4 or D.5, at the time monitoring reports are submitted. The reports must contain:
a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected; and
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information
The permit registrant must furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permit registrant must also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permit registrant becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it must promptly submit such facts or information.

8. Signatory Requirements
All applications, reports or information submitted to the Department must be signed and certified in accordance with 40 CFR §122.22.

9. Falsification of Reports

Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $100,000 per violation and up to 5 years in prison.

SECTION E. DEFINITIONS

1. BOD means five-day biochemical oxygen demand.
2. TSS means total suspended solids.
3. mg/l means milligrams per liter.
4. kg means kilograms.
5. m^3/d means cubic meters per day.
6. MGD means million gallons per day.
7. Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.
8. FC means fecal coliform bacteria.
9. Technology based permit effluent limitations means technology-based treatment requirements as defined in 40 CFR §125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.
10. CBOD means five day carbonaceous biochemical oxygen demand.
11. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.
12. Quarter means January through March, April through June, July through September, or October through December.
13. Month means calendar month.
14. Week means a calendar week of Sunday through Saturday.
15. Total residual chlorine means combined chlorine forms plus free residual chlorine.
16. The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and E. coli bacteria.
17. POTW means a publicly owned treatment works.

APPENDIX B

Stormwater Sample Collection Procedures

Stormwater Sample Collection Procedures

The purpose of sampling is to collect a representative sample of stormwater and analyze it before significant alteration of the sample occurs. This requires a sampling methodology that assures proper sampling, handling, and storage techniques, to eliminate, or minimize to the greatest extent possible, introduced fluids, dilutions, chemical reactions, and cross-contamination.

Proper cleaning and decontamination of sampling equipment and instruments will be observed in order to minimize the potential for cross-contamination and to assure the integrity of current and future samples (see Decontamination section).

The sampling should be documented on the *Stormwater Sample Field Log* provided in Appendix C, as to sampling procedure, sample numbers, sample locations, times, dates, weather, unusual or noticed conditions, and parameters such as pH that are measured in the field.

Field Measurement of pH

The measurement of pH is to take place in the field, either with pH paper capable of measuring pH in tenths of a standard unit (SU), or with a field pH instrument that has been properly calibrated prior to use.

Sample Containers

Sample containers should be obtained from the laboratory that analyzes the sample. The laboratory will provide the appropriate containers, with added preservatives if necessary. The laboratory will be instructed with regard to the media to be tested, the number of samples from each sampling site, and the parameters to be analyzed. Sample collection bottles and holding times are summarized in the table below.

Sample Container Summary

Parameter	Bottle Type	Minimum Sample Required	Holding Time	Preservation
TSS	250-ml poly	100 ml	48 Hours	Store at 4°C
Total Metals (Copper, Lead, Zinc, Cadmium, Chromium, Nickel)	250-ml poly	250 ml	6 months	Nitric Acid (HNO_3) to pH<2; Store at 4°C
Oil & Grease	1-L glass amber jar	750 ml	28 days; preserved within 24 hrs of collection	Sulfuric Acid (H_2SO_4) to pH<2; Store at 4°C

Notes: ml = milliliter; L = liter; poly = plastic bottle; Cadmium, Chromium, and Nickel only need to be sampled for the first 8 events

Sample Collection

When collecting a stormwater sample from an outfall, stormwater can be readily sampled as it falls from the pipe before it reaches the receiving water if the discharge pipe is safely accessible and not submerged. You may need to fasten the collection bottles to a pole to reach the pipe (specialized poles for this purpose can be purchased).

Samples are to be obtained using the following guidelines in order to collect the most accurate representation of stormwater conditions and to avoid analytical results containing false benchmark exceedances:

- Wear disposable powder-free gloves when sampling
- Grab samples with the stormwater entering directly into bottles supplied by the laboratory rather than by transferring the samples from a container that may not be clean. Metal contamination of ordinary containers is common. Furthermore, transferring the sample from another container is not an option for oil and grease samples under any circumstances.
- When holding the sample bottle, keep hands away from the opening in order to prevent contaminating the sample.
- Always hold the bottle with its opening facing upstream (into the flow of water) so that the water enters directly into the bottle and does not first flow over the bottle or your hands.

- Sample where the water has a moderate flow so that the stormwater discharge will be well-mixed and the sample will be representative. Sampling in still water should be avoided. Include in the field form a note about the sample location and how briskly the water appears to be moving.

- Sample from a central portion of the stormwater flow, avoiding touching the bottom of channels or pipes so as not to stir up solid particles.

- Do not rinse or overfill the bottles. Fill the bottle to about 1/2 inch of the top (not quite full) to ensure that no preservative, if any, is lost.

As much as possible, floating and suspended material in the stormwater should be avoided. Also, muddying the sample or stirring other bottom material up into the sample is to be avoided. The objective is to minimize agitation of suspended solids, sediments, and surface debris; and to the greatest extent possible, avoid aeration and agitation of the collected stormwater.

Sampling for Oil and Grease

When sampling for oil and grease, the following procedures should be used in order to obtain a representative stormwater sample.

- Oil and grease floats on water so sampling it requires special attention. Oil and grease samples must be collected directly into the sample bottles supplied by the laboratory because oil and grease tends to stick to the sides of containers. Do not rinse the sampling bottles beforehand or pour the sample from another container. Do not fill the bottle completely and do not pour out some of the sample if the bottle is overfilled by mistake. If you do overfill a bottle, use a new bottle instead to collect your sample. Because you only get one try at filling an oil and grease bottle, it is a good idea to have extra bottles on hand.

- Oil and grease samples should be collected as the stormwater falls from a pipe or from a running stream of flow when possible so the source will be well mixed. When the samples must be collected from a water surface, the person holding the bottle should plunge it below the surface in a sweeping arc and then bring it upwards through the water surface again, so the water surface is broken twice by the mouth of the bottle. Be sure to note on the field form how you collected your samples, as this is especially important for the oil and grease sample.

Handling, Storing, Shipping, and Testing

As soon as the sample is collected, label the sample container with the sample location, date, and collection time with permanent ink and place the container in a cooler chilled with blue ice. The sampler needs to complete a Chain-of-Custody (see

last page for example). As soon after collection as possible, the samples should be transported to the laboratory.

A Chain-of-Custody form which is supplied by the laboratory should be used. The chain-of-custody form must be filled out as to the sampler, date and time of sampling, sample number, sample location or station, analysis to be done, type of sample, to whom the sample was delivered, and when. The sample bottles must also be labeled to identify the sampler, the sample number, date and time of sampling.

Generally the sample should arrive at the lab the same day as taken and no more that 24 hours should elapse. If there is any question about time allowed between sampling and analysis, the laboratory should be contacted for the guidance required. Although shipping of samples should be avoided when possible, if shipping cannot be avoided, sealed and secured containers should be used.

Decontamination

Sampling equipment, instruments, tools or other objects that are placed into the sampling area of a stormwater site will be cleaned thoroughly between each site and/or sampling interval, using a detergent wash with potable water rinses.

Decontamination of equipment includes every surface, external and internal, which can come in contact with the stormwater sample. The wash water must be clean and complete rinsing is required if soaps or detergents are used. Soaps or detergents must be mild and compatible with the parameters to be tested.

Laboratories

The laboratory that is used for sample testing must be certified (EPA- and/or DEQ-approved) and must analyze the samples in a timely manner. The laboratory must have an internal quality assurance/quality control (QA/QC) program that will be presented with the sample results. The laboratory must also be capable of conducting testing according to 40 CFR, Part 136.

Quality Assurance

The sampling and analysis plan may include sample redundancy (duplicates), and field and laboratory blanks to evaluate sampling and decontamination procedures and reproducibility of laboratory analysis. It also requires careful and prompt analysis of samples and blanks by a qualified laboratory. Collectively, these procedures and protocols constitute a quality assurance/quality control (QA/QC) policy. The sampling method should be uniform from one sampling episode to the next.

For further information on stormwater sampling procedures and methods, refer to the State of Washington DOE Stormwater Sampling manual.

WDOE, 2002. *How to Do Stormwater Sampling – A guide for industrial facilities.* Washington State Department of Ecology. Publication #02-10-071. December 2002 http://www.ecy.wa.gov/pubs/0210071.pdf

CHAIN OF CUSTODY

Wilhelm Trucking Company
3250 NW St. Helens Road
Portland, OR 97226

Lab Project No.

Chain of Custody No.

NPDES 1200-Z Permit No: **100721**

Comments:

Project Manager _____

Collected by _____

Project No. _____

Sample Number Prefix:

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: TSS	Analyses to be Performed: Total Metals Cu, Pb, Zinc, Cad, Chromium, Nickel	Analyses to be Performed: Oil and Grease	RUSH

Relinquished by:	Company:	Date	Time	Remarks
Relinquished by:	Company:	Date	Time	
Received by:	Company:	Date	Time	
Received by:	Company:	Date	Time	

APPENDIX C

Stormwater Monitoring Forms and Logs

Wilhelm Trucking Company
STORMWATER SYSTEM INSPECTION

The purpose of this inspection is to ensure that Best Management Practices (BMPs) are adequate to prevent stormwater pollution, and that the SWPCP is accurate and up-to-date. Conduct the inspection in the **Fall, before the start of the rainy season.** Sample and inspect again during a rain event, at least 60 days after the initial monitoring. The best time to take samples is during the month in which runoff first occurs, and during a rain event.

Maintain copies of all inspection reports with this SWPCP.

I. GENERAL DATA:

Site Name:_____

Date:_____

Inspector(s):_____

Describe how heavy the rain is:_____

Number and name of out-falls:_____

II. GENERAL FACILITY INSPECTIONS: Include comments on any items with a negative or unsatisfactory response.

STORMWATER SAMPLE FIELD LOG

Site: Wilhelm Trucking Company
3250 NW St. Helens Road, Portland, Oregon
NPDES 1200-Z Permit No.: 100721

Storm Year: _____
Date: _____
Sampled by: _____

Storm Event Information	
Date and Time Rainfall Began:	Date and Time Discharge Began:
Duration of Storm Event (hrs):	Rainfall During Storm Event (in):
24-Hour Rainfall on Day of Sampling (in)	Number of Dry Days Prior to Storm Event[1]:
Source of Storm Event Information: (e.g., Wunderground, Weather Channel, etc.)	

Discharge Point Observations	
Sample Location:	Lat: Long:
Flow at Sample Point: Vigorous, Moderate, Slow, Still (circle one)	
Sheen Present?[2] Yes, No (circle one) Describe:	
Floating Solids Present?[2] Yes, No (circle one) Describe:	
Water Clarity:	
pH (field measurement):	pH Measurement Method:
Comments:	

Sample Collection
Sample Method:
Sample Time:
Sample Number:
1-L Amber Glass Bottle w Sulfuric Acid for Oil & Grease) Sample Containers: 250-ml Plastic Bottle, Unpreserved for TSS 250-ml Plastic Bottle, Preserved w Nitric Acid for Metals
Parameters: Oil & Grease, Total Suspended Solids (TSS), Total (Unfiltered) Metals (Copper, Lead, Zinc)
Comments:
NOTE: The following must all be taking place at the time of sampling: 1) rainfall; 2) surface runoff at the site; and 3) discharge at the outfall. Confirm: Yes, No (circle one)

1 =There should be at least one day of no measureable precipitation prior to the storm event being sampled
2 = Also fill out the Stormwater Visual Monitoring Log

STORMWATER VISUAL MONITORING LOG

SITE: Wilhelm Trucking Company
3250 NW St. Helens Road
Portland, Oregon

Storm Year: _____
NPDES Permit File Number: 100721
NPDES Permit Type: 1200-Z
Monitoring Point Location:
Lat: Long:

Month	Day of Month	Time (00:00)	Observer	Rain, Runoff & Discharge? (Y or N) [1]	Storm Event Rainfall (inches)	Prior 24-Hr Rainfall (inches)	Floating Solids Observed?	Oil or Sheen Observed? (Y or N) [2]	Corrective Action Taken? (Y or N) [3]	Comments
July										
August										
September										
October										
November										
December										
January										
February										
March										
April										
May										
June										

1 = Answer should always be Y for any month where discharge occurs; if no discharge for the month, then indicate N and do not fill out remainder of line
2 = If observed, describe in Comment column or on a separate sheet
3 = If corrective action was taken, please describe on a separate sheet

STORMWATER SYSTEM MONTHLY INSPECTION LOG: NPDES 1200-Z STORMWATER PERMIT REQUIREMENT

Site: Wilhelm Trucking Company NPDES 1200-Z Permit No.: 100721

3250 NW St. Helens Road, Portland, Oregon

STORM YEAR: _____

Inspector: _____ Date of Inspection: _____

Have potential pollution sources described in the SWPCP plan changed? YES / NO

Are catch basins and area drains clear of debris and sediment? YES / NO

Is the site generally free of loose debris and sediment? YES / NO

Are paved areas clean and free of debris and sediment? YES / NO

If the answer to any of the above questions is NO, describe the corrective actions taken and changes or variances from the plan: _____

_____

_____

_____

Is the site map generally accurate? YES / NO

If NO, describe changes or variances from the plan:_____

_____

_____

Have any spills or leaks of significant materials/potential pollutants that impacted stormwater runoff occurred since the last inspection? YES / NO

If YES, describe the spill or leak, the corrective actions taken, and measures implemented to prevent similar incidents in the future: _____

_____

_____

Are the Best Management Practices (BMPs) in this SWPCP being implemented, and are they adequate? YES / NO

If NO, describe changes or variances from the plan:_____

_____

_____

_____

Is it raining during the inspection? YES / NO

Is there discharge at the Outfall? YES / NO

What is the rainfall amount from the previous 24 hours? _____

(see: Wunderground)

Attach additional sheets as necessary to describe changes, variances, actions, or measures implemented.

EMPLOYEE TRAINING LOG: NPDES 1200-Z STORMWATER PERMIT REQUIREMENT

Site: Wilhelm Trucking Company NPDES 1200-Z Permit No.: 100721

3250 NW St Helens Road, Portland, Oregon

Date of Training: _____

Name of Trainer: _____

Topics Covered: _____

_____

_____

_____

_____

_____

_____

_____

_____

Employees Attending: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Wilhelm Trucking Company
General Spill Response Procedures
And Spill Reporting

DATE: _____ **TIME:** _____

LOCATION: _____

NOTIFICATIONS

___Compliance Administrator If so, please name: _____

___Outside Agencies If so, please name: _____

CHEMICAL(S) OF CONCERN _____

QUANTITY SPILLED _____

CONTROLLED ON SITE ___Yes ___No

If not, explain:_____

SPILL RESPONSE PROCEDURES

The facility maintains spill response equipment (spill kits) on site. Every effort will be made to contain the spill and prevent adverse impact to the stormwater control system.

Employees shall notify the Compliance Administrator or a member of the facility emergency response team as soon as a potential emergency is recognized.

The first emergency response person at the scene shall immediately assess the potential hazard. If the situation is considered an emergency that cannot be controlled by on-site personnel, a call for off-site spill response shall be made (9-1-1).

Small spills shall be managed on site with absorbent, which can contain and soak up liquid on pavement.

Larger spills shall be managed by placing a dike around the nearest stormwater catch basin down-gradient of the spill. The Compliance Administrator shall assess the contained material for the appropriate cleanup options.

If the spill is on grass or soil, absorbent shall be used to cover as much of the spill as possible, and cleanup activities shall begin immediately and quickly.

The Compliance Administrator shall direct on-scene management and emergency response.

Off-site spill response units shall be directed to the scene and provided with information about the facility.

Potential ignition sources shall be extinguished. Storm drains or ditches near spills shall be plugged or diked.

STORMWATER SYSTEM PREVENTATIVE MAINTENANCE AND REPAIR LOG

Site: Wilhelm Trucking Company NPDES 1200-Z Permit No.: 100721
1601 Railroad Ave, St. Helens, Oregon

CCTS staff who completed/oversaw maintenance:_____

Description of maintenance activities:

Was system repaired? If not, what are the next steps?

OBSERVATION	YES	NO	NEEDS WORK	COMMENTS N/A
1. Is spill response and emergency equipment in adequate supply, accessible, and clearly marked?				
2. Are materials which could contaminate surface water stored under cover and away from traffic routes?				
3. Are storage containers, drums, and bags labeled and in good condition (free of leaks and holes)?				
4. Are tanks, pipes, valves, and secondary containment structures in good condition (free of corrosion, rust, breaks, ...)? Does secondary containment have adequate capacity to contain a spill and accumulated stormwater if a spill occurs?				
5. Does the site show evidence of leaks and spills?				
6. Are catch basins and detention ponds free of debris and buildup?				
7. Are storm drains and discharge points protected from potential leaks or spills? (Observe each outfall and list results)				
8. Is the surface water discharge free of oil sheen, debris, or odors?				

OBSERVATION	YES	NO	NEEDS WORK	COMMENTS N/A
9. If sampling is required, have you taken samples of the discharge? Are the results in compliance with regulatory and permit requirements? (Attach results for each outfall sampled)				
10. Review the SWPCP. Are BMPs recommended in the plan fully implemented? Are the site maps accurate and up to date? Have there been any changes in the rules which should be reflected in the SWPCP? (Revise the SWPCP if necessary. Sign and date the SWPCP to indicate that it has been reviewed.)				
11. Have site employees received annual training in stormwater pollution prevention and spill response?				

III. CORRECTIVE ACTIONS

Any problems noted during the inspection must be corrected. Please note any corrective actions taken, including SWPCP revisions, and the date that they were completed.

_____

_____

_____

_____

_____

_____

_____

_____

Industrial Stormwater Discharge Monitoring Report - 1200-Z Permit

Permittee Legal Name:		*ODEQ File No./Facility ID:*	
Facility Common Name:		Reporting Period: July 1,	to June 30,
Facility Location:		Laboratory Name:	
County:		Laboratory ORELAP #:	

State of Oregon Department of Environmental Quality

Monitor for the following pollutants at sampling point(s) specified in your SWPCP. Add more sheets if necessary (e.g., if more than 4 samples are collected per pollutant or facility has more than 4 sampling points). <u>You MUST also attach a copy of laboratory results sheet(s) and associated QA/QC information to this form</u>.

Name or Number of Sampling Point(s) (group data per sampling point)	Sample Date	pH **	Suspended Solids, Total **	Oil and Grease, Total **	Copper, Total	Lead, Total	Zinc, Total	E. coli *
		s.u.	mg/L	mg/L	mg/L	mg/L	mg/L	counts/100 ml
Geometric Mean (Note 4)								
Geometric Mean (Note 4)								
Geometric Mean (Note 4)								
Geometric Mean (Note 4)								
Permit Benchmark		**5.5 - 9.0**	**130**	**10**	**0.1**	**0.4**	**0.6**	**406**

*** Only applies to landfills accepting septage/biosolids and sewage treatment plants.**

**** Effluent limits for these parameters apply to some industries - see permit, Schedule A.7.**

<u>Note 1</u>: Submit this report to the appropriate DEQ regional or agent offices (see below) annually by July 31st. The report must contain the results of all stormwater monitoring conducted during the year. If you have a monitoring waiver for one or more of the pollutant(s), please report "M" in the column(s)-see permit-Schedule B.3.

<u>Note 2</u>: Non-detects must be reported as "ND" along with the applicable method detection limit in parentheses - e.g. ND (0.001).

<u>Note 3</u>: If a stormwater sampling result exceeds any of the benchmark values, the permit registrant must, within 30 calendar days of receiving the sampling results, investigate the cause of the benchmark exceedance(s), review the SWPCP and submit an Action Plan for DEQ or agent approval.

<u>Note 4</u>: For the 4th year of coverage under the permit that became effective on July 1, 2007, report the geometric mean value of the last 4 samples collected for each pollutant parameter, from each sampling point. If any of the 4 samples were not collected during this monitoring year, attach the past DMR form(s) that include the sample results. For non-detect sampling results, use 1/2 the detection limit to calculate the geometric mean. You are not required to report the geometric mean for pollutant(s) that have a monitoring waiver. The geometric mean value is automatically calculated if using the Excel version of the DMR form.

<u>Note 5</u>: If a sampling event is missed or a sampling parameter is not analyzed or sampled, enter "NS" in each applicable column for that row.

Name/Title Principal Executive Officer or Authorized Delegate

(Please Print)

Telephone: *Email:*

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

Sign here: Date

See reverse side for additional visual monitoring requirements

Monthly Visual Observations

	Record Visual Observations for Oil and Grease Sheen and Floating Solids:	
	Oil and Grease Sheen - No visible sheen allowed. Monthly observation when discharging. For months when no discharges occur, please write in "No Discharge" for that month.	**Floating Solids** (associated with industrial activities) – No visible discharge allowed. Monthly observation when discharging. For months when no discharges occur, please write in "No Discharge" for that month.
	Date	**Observations (please note the sampling point(s) name or number)**
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		
May		
June		

For facilities located within the following local jurisdictions, please submit one (1) copy of this report and laboratory results sheet(s) and QA/QC documentation to the local jursisdiction annually by July 31st:

Clean Water Services
Industrial Stormwater
2550 SW Hillsboro Hwy.
Hillsboro, OR 97123

City of Portland
Industrial Stormwater Section
Water Pollution Control Lab
6543 N Burlington Ave.
Portland, OR 97203-5452

City of Eugene
Industrial Source Control
410 River Ave.
Eugene, OR 97404

For all other locations, please submit one (1) copy of this report and laboratory results sheet(s) and the QA/QC documentation to the appropriate DEQ regional office annually by July 31st:

DEQ Northwest Region Office
2020 SW 4th Ave., Suite 400
Portland, OR 97201
Phone: (503) 229-5263
Hours: 8 am - 5 pm

DEQ Western Region Office
165 East 7th Ave., Suite 100
Eugene, OR 97401
Phone: (541) 686-7838
Hours: 8 am - 5 pm

DEQ Eastern Region Office
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
Phone: (541) 388-6146
Hours: 8 am - 5 pm

APPENDIX D

Oregon DEQ Spill/Release Report

SPILL/RELEASE REPORT

State of Oregon Department of Environmental Quality

1 - GENERAL INFORMATION **OERS No. _____**

a. Company/Individual Name: _____

b. Address: _____

_____

c. Company Contact Person: _____

d. Phone Number(s): _____

e. Specific on-site location of the release (and address if different from above):

_____

_____

_____

Please provide a map of the site showing area(s) where the release occurred, any sample collection locations, location of roads/ditches/surface water bodies, etc.

2 - RELEASE INFORMATION

a. Date/Time Release started:_____ Date/Time stopped:_____

b. Release was reported to (specify Date/Time/Name of Person contacted where applicable):

ODEQ _____

OERS _____

NRC _____

Other (describe):_____

c. Person(s) reporting release:_____

d. Name, quantity and physical state (gas, liquid, solid or semi-solid) of material(s) released:

_____

_____

Please attach copies of material safety data sheets (MSDS) or constituent profiles for released material(s).

e. The release affected: ____Air ____Groundwater ____Surface Water ____Soil ____Sediment

f. Name and distance to nearest surface water body(s), even if unaffected (include locations of creeks, streams, rivers and ditches that discharge to surface water on maps):

_____

Has the release reached the surface water identified above?: ____Yes ____No

Could the release potentially reach the surface water identified above? ____Yes ____No

Explain:_____

_____

g. Depth to nearest aquifer/groundwater:_____

Is nearest aquifer/groundwater potable (drinkable)? ____Yes ____No

Has the release reached the nearest aquifer/groundwater? ____Yes ____No

Explain:_____

_____

h. Release or potential release to the air occurred? ____Yes ____No
Explain:_____
_____

i. Was there a threat to public safety? ____Yes ____No
j. Is there potential for future releases? ____Yes ____No
Explain:_____
_____

k. Describe other effects/impacts from release (emergency evacuation, fish kills, etc.):
_____
_____
_____

l. Describe how the release occurred. Include details such as the release source, cause, contributing weather factors, activities occurring prior to or during the release, dates and times of various activities, first responders involved in containment activities, etc.:
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

3 - SITE INFORMATION

a. Adjacent land uses include (check all that apply and depict on site maps):
____Residential ____Commercial ____Light Industrial ____Heavy Industrial
____Agricultural ____Other (describe):_____
b. What is the population density surrounding the site:_____
c. Is the site and/or release area secured by fencing or other means? ____Yes ____No
d. Soil types (check all that apply): ____alluvial ____ bedrock ____ clay ____sandy
____silt ____ silty loam ____artificial surface (cement/asphalt/etc.)
e. Describe site topography:_____
_____
_____

4 - CLEANUP INFORMATION

a. Was site cleanup performed? ____Yes ____No

If No, explain:_____

_____

b. Who performed the site cleanup?

Company Name:_____

Address: _____

_____

Cleanup Supervisor:_____

Phone Number(s): _____

c. Has all contamination been removed from the site? ____Yes ____No

If No, explain:_____

_____

d. Estimated volume of contaminated soil removed:_____

e. Estimated volume of contaminated soil left in place:_____

f. Was a hazardous waste determination made for cleanup materials? ____Yes ____No

g. Based on the determination, are the cleanup materials hazardous wastes?

____Yes ____No If Yes, list all waste codes:_____

h. Was contaminated soil or water disposed of at an off-site location? ____Yes ____No

If yes, attach copies of receipts/manifests/etc., and provide the following information:

Facility Name: _____

Address: _____

_____

Facility Contact: _____

Phone Number(s): _____

i. Is contaminated soil or water being stored and/or treated on-site? ____Yes ____No

If yes, please describe the material(s), storage and/or treatment area, and methods utilized (attach additional sheets if necessary):

_____

_____

_____

_____

j. Describe cleanup activities including what actions were taken, dates and times actions were initiated and completed, volumes of contaminated materials that were removed, etc. (attach additional sheets or contractor reports if necessary or more convenient):

_____

_____

_____

_____

_____

5 - SAMPLING INFORMATION

Attach copies of all sample data and indicate locations of sample collection on maps.

a. Were samples of contaminated soil collected? ____Yes ____No ____N/A
b. Were samples of contaminated water collected? ____Yes ____No ____N/A
c. Were samples collected to show that all contamination had been removed?
____Yes ____No ____N/A
d. Describe sampling activities, results and discuss rationale for sampling methods:

_____
_____
_____
_____
_____
_____
_____
_____

6 - ADDITIONAL INFORMATION

a. Provide a description or plan outlining the list of actions to be taken to prevent future releases from occurring.

_____
_____
_____
_____

7 - SPILL REPORT CHECKLIST

To ensure that you have gathered all the information requested by the Department in this Spill/Release Report, please complete the following checklist:

____ Map(s), pre and post cleanup photos of the site showing buildings, roads, surface water bodies, ditches, waterways, point of the release, extent of contamination, areas of excavation and sample collection locations attached.

____ Material Safety Data Sheet (MSDS), or constituent profiles for released material(s) attached. **Note: an MSDS is not required for motor fuels.**

____ Sampling data/analytical results attached.

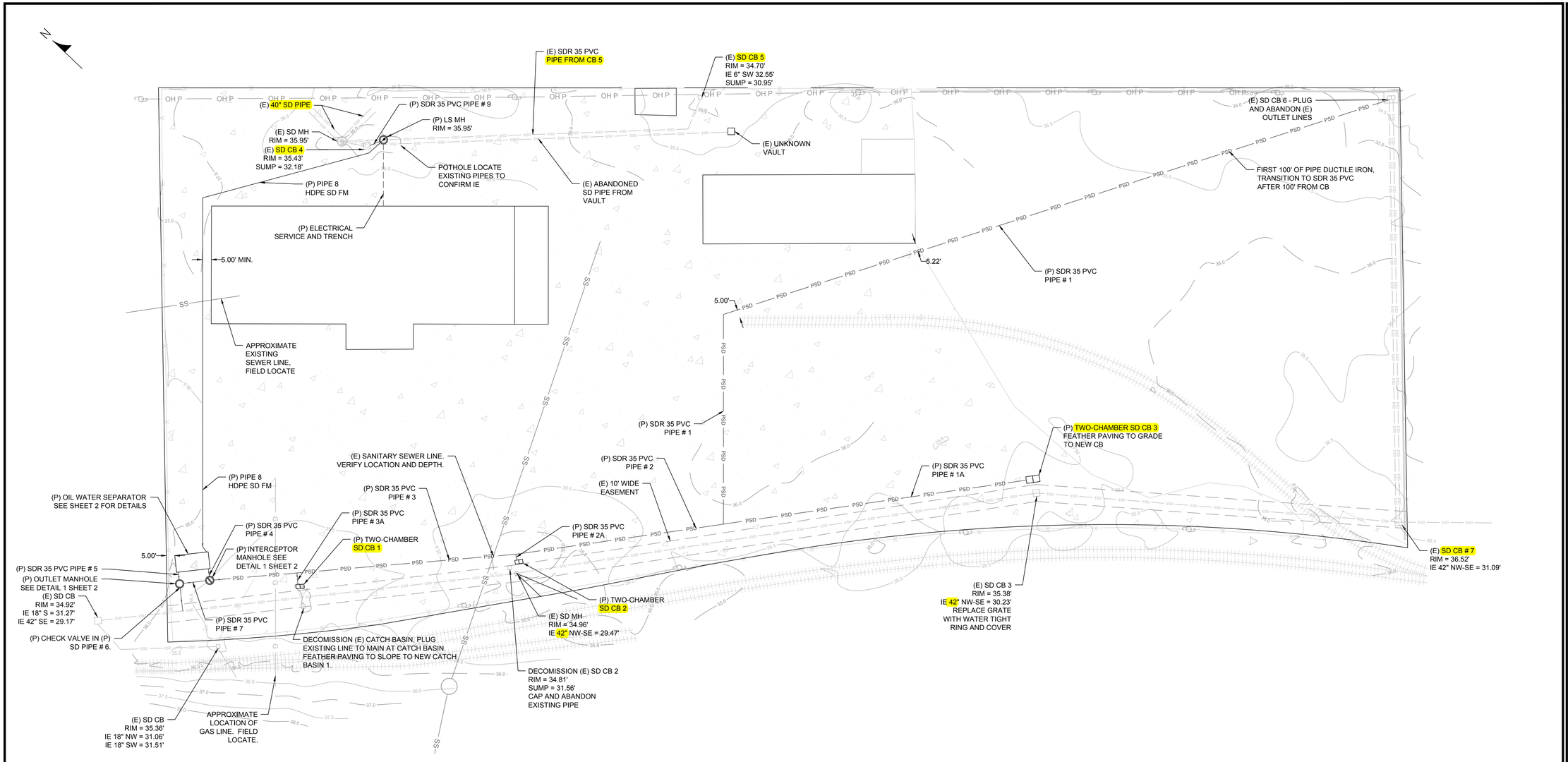
____ Receipts/manifests (if any) for disposal of cleanup materials attached.

____ Contractor reports (if any) attached.

If you would like to submit your report by e-mail it can be submitted electronically to: DOSPILLS@deq.state.or.us

APPENDIX E

Site Upgrade Plan Sheets



SITE PLAN 1/1

SCALE: 1" = 40'

NOTES:

1. INSTALL CLEANOUTS EVERY 100' OF PIPE.
2. FIELD LOCATE UTILITIES PRIOR TO START OF EXCAVATION.
3. CONTAMINATED SOILS POSSIBLE, TEST SOIL AS EXCAVATED. IF CONTAMINATED, CONTACT ENGINEER OF RECORD.
4. TOPOGRAPHIC SURVEY AND STRUCTURE ELEVATIONS FROM CRAWFORD LAND SURVEY CONDUCTED JUNE 6, 2013.
HORIZONTAL DATUM - ORGN NAD83(2011) EPOCH 2010.00
VERTICAL DATUM - CITY OF PORTLAND
BASIS OF BEARING - ORGN NAD83(2011) EPOCH 2010.00
5. MAINTENANCE NOTE- THE GRAVITY STORM LINE TAILWATER CONDITION IS LIKELY TO CAUSE SEDIMENTATION IN THE LINE. TO ASSURE EFFECTIVE OPERATION OF THE LINE IT SHOULD BE INSPECTED ANNUALLY AND CLEANED AS NEEDED.

LEGEND

- PROPERTY LINE
- ESD — EXISTING STORM DRAIN
- OH P — EXISTING OVERHEAD POWER
- X — EXISTING FENCE
- EXISTING RAILROAD
- BUILDING OUTLINE
- PROPOSED FORCE MAIN
- PSD — PROPOSED STRUCTURES
- PSD — PROPOSED GRAVITY PIPE
- PROPOSED ELECTRICAL
- EXISTING EASEMENT
- EXISTING ASPHALT

Pipe #	Description	IE in	IE out	L	Slope	Diameter
		ft	ft	ft	ft/ft	in
1	CB 6 to Pipe 2	33.23	30.53	540	0.005	12
1A	CB 3 to Pipes 1-2	33.35	30.53	181.76	0.016	6
2	CB 3 to CB 2	30.53	29.91	124.7	0.005	15
2A	CB 2 to Pipes 2-3	32.81	29.91	3.5	0.830	6
3	CB 2 to Int MH	29.91	29.00	180.49	0.005	15
3A	CB 1 to Pipe 3	32.80	29.26	7	0.505	6
4	Int MH to OWS	30.80	30.78	5	0.005	10
5	OWS to Outlet MH	30.50	30.47	5	0.005	12
6	Outlet MH to Main	30.47	30.25	14.27	0.015	15
7	(OF) Int MH to Outlet MH	30.65	30.47	17.88	0.010	15
8	SD Force Main	33.00	30.47	325	-	3
9	CB 4 to LS MH	33.18	32.00	5.88	0.201	8

Structure	Rim	Invert	Description
	ft	ft	
Ex CB 6	34.40	32.70	Ex 6 inch SW Out Plug
		32.65	Ex 6 inch SW Out Plug
		33.23	Pr 12 inch SDR 35 PVC SW SD Pipe 1 Out
Pr CB 3	35.35	33.35	Pr 6 inch SDR 35 PVC SW SD Pipe 1A Out
Pr CB 2	34.81	32.81	Pr 6 inch SDR 35 PVC SW SD Pipe 2 A Out
Pr CB 1	34.80	32.80	Pr 6 inch SDR 35 PVC NE SD Pipe 3A Out
Pr Int MH	35.50	29.00	Pr 15 inch SDR 35 PVC SE SD Pipe 3 In
		30.80	Pr 10 inch SDR 35 PVC NE SD Pipe 4 Out
		30.65	Pr 15 inch SDR 35 PVC NW SD Pipe 7 Out
		31.70	Pr Weir
Pr 816 1 CPS OWS	35.50	30.78	Pr 10 inch SDR 35 PVC SW SD Pipe 4 In
		30.47	Pr 3 inch SDR 35 PVC NE SD Force Main Pipe 1 In
		30.47	Pr 15 inch SDR 35 PVC SW SD Pipe 6 Out
Pr Outlet MH	35.75	30.47	Pr 12 inch SDR 35 PVC SE SD Pipe 5 In
		30.25	15 inch SDR 35 PVC SE SD Pipe 6 In
		30.65	15 inch SDR 35 PVC SE SD Pipe 7 Out
Pr LS MH	35.95	32.00	Pr 8 inch SDR 35 PVC NW SD Pipe from CB 4 In
		27.52	Ex 6 inch SDR 35 PVC SE SD Pipe From CB 5 In
		27.49	Ex 6 inch RCP NW SD Pipe to Ex MH Out Field Confirm
		33.00	Pr 3 inch Sch 80 PVC SW SD FM 1 Out Field Confirm

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

RENEWAL DATE: 6/30/2014

Issue for Permit

Aquarius Environmental
www.aquariusenv.com

Designed: DS
Drawn: JAW
Checked: DS
Date: 7/18/2013
Scale: 1" = 40'

SITE PLAN
WILHELM TRUCKING CO. SW IMPROVEMENTS
3250 NW ST HELENS RD, PORTLAND, OR

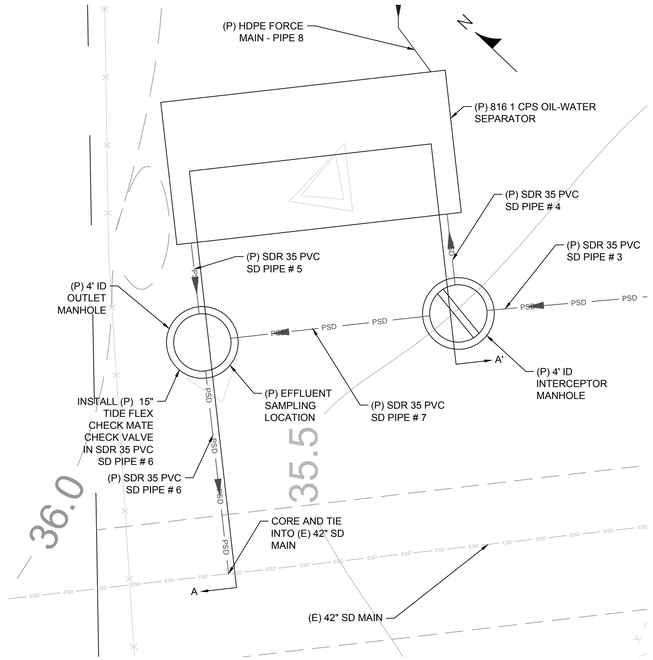
REVISIONS

Rev	Date	Description

SHEET 1

1 OF 3

File: WTC Plans.dwg

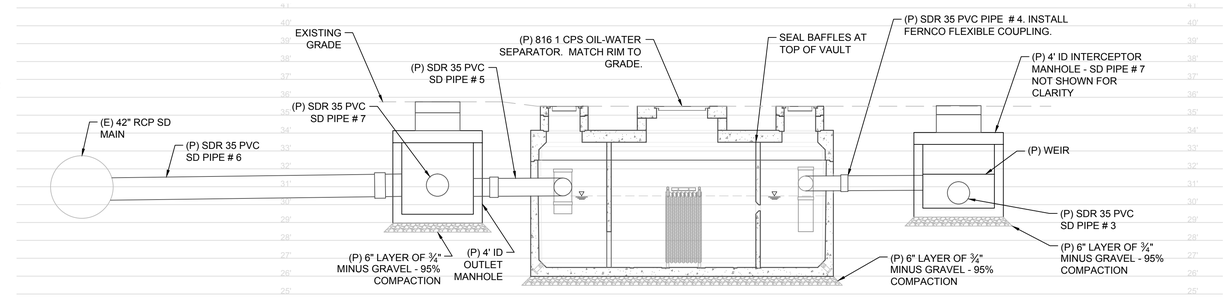


WEST TREATMENT PLAN (1/2)

SCALE: 1" = 5'

LEGEND

- PROPERTY LINE
- EXISTING STORM DRAIN
- EXISTING OVERHEAD POWER
- EXISTING FENCE
- EXISTING RAILROAD
- BUILDING OUTLINE
- PROPOSED FORCE MAIN
- PROPOSED STRUCTURES
- PROPOSED GRAVITY PIPE
- EXISTING ASPHALT



SECTION A-A' (2/2)

SCALE: 1" = 4'

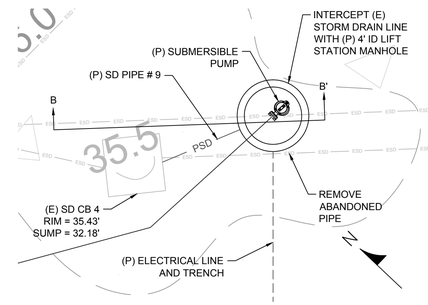
LIFT STATION SYSTEM

STRUCTURE ID	LS MH
OPERATING FLOW RATE (gpm)	95
TOTAL DYNAMIC HEAD (ft)	23.9'
PUMP MANUFACTURER	GOULDS
PUMP MODEL	WE1034H
POWER REQUIRED (volts/phase/amps)	460/3/3.5
MOTOR HORSEPOWER (hp)	1
PUMP SPEED (rpm)	3500
IMPELLER DIAMETER (in)	4.440
EFFICIENCY (percent)	30%
ACCESS OPENING DIAMETER (in)	30"

PIPE DATA:	I.E.	ORIENTATION	MATERIAL	DIAMETER
(E) INLET PIPE	27.52	315°	RCP	6"
(P) INLET PIPE	32.00'	135°	SDR 35	8"
(P) FM TO TMT	33.00'	180°	HDPE	3"
(E) OUTLET PIPE	27.49'	120°	RCP	6"
(P) OUT RISER	33.00'	120°	SDR 35	6"

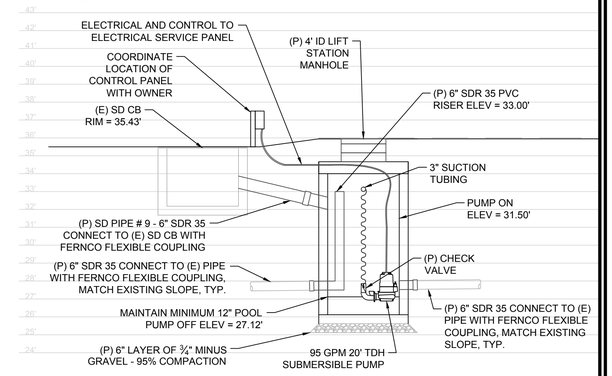
NOTES/SPECIAL REQUIREMENTS:

PIPE ORIENTATION KEY: 90° / 180° / 0° / 270° (N)



EAST MANHOLE PLAN (2/2)

SCALE: 1" = 4'

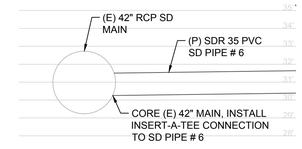


SECTION B-B' (2/2)

SCALE: 1" = 4'

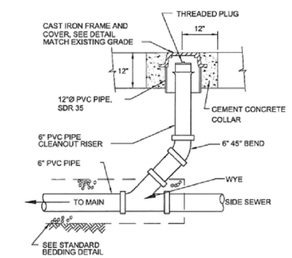
Pipe #	Description	IE in	IE out	L	Slope	Diameter
		ft	ft	ft	ft/ft	in
1	CB 6 to Pipe 2	33.23	30.53	540	0.005	12
1A	CB 3 to Pipes 1-2	33.35	30.53	181.76	0.016	6
2	CB 3 to CB 2	30.53	29.91	124.7	0.005	15
2A	CB 2 to Pipes 2-3	32.81	29.91	3.5	0.830	6
3	CB 2 to Int MH	29.91	29.00	180.49	0.005	15
3A	CB 1 to Pipe 3	32.80	29.26	7	0.505	6
4	Int MH to OWS	30.80	30.78	5	0.005	10
5	OWS to Outlet MH	30.50	30.47	5	0.005	12
6	Outlet MH to Main	30.47	30.25	14.27	0.015	15
7	(OF) Int MH to Outlet MH	30.65	30.47	17.88	0.010	15
8	SD Force Main	33.00	30.47	325	-	3
9	CB 4 to LS MH	33.18	32.00	5.88	0.201	8

Structure	Rim	Invert	Description
	ft	ft	
Ex CB 6	34.40	32.70	Ex 6 inch SW Out Plug
		32.65	Ex 6 inch SW Out Plug
		33.23	Pr 12 inch SDR 35 PVC SW SD Pipe 1 Out
Pr CB 3	35.35	33.35	Pr 6 inch SDR 35 PVC SW SD Pipe 1A Out
Pr CB 2	34.81	32.81	Pr 6 inch SDR 35 PVC SW SD Pipe 2 A Out
Pr CB 1	34.80	32.80	Pr 6 inch SDR 35 PVC NE SD Pipe 3A Out
Pr Int MH	35.50	29.00	Pr 15 inch SDR 35 PVC SE SD Pipe 3 In
		30.80	Pr 10 inch SDR 35 PVC NE SD Pipe 4 Out
		30.65	Pr 15 inch SDR 35 PVC NW SD Pipe 7 Out
		31.70	Pr Weir
Pr 816 1 CPS OWS	35.50	30.78	Pr 10 inch SDR 35 PVC SW SD Pipe 4 In
		30.47	Pr 3 inch SDR 35 PVC NE SD Force Main Pipe 1 In
		30.47	Pr 15 inch SDR 35 PVC SW SD Pipe 6 Out
Pr Outlet MH	35.75	30.47	Pr 12 inch SDR 35 PVC SE SD Pipe 5 In
		30.25	15 inch SDR 35 PVC SE SD Pipe 6 In
		30.65	15 inch SDR 35 PVC SE SD Pipe 7 Out
Pr LS MH	35.95	32.00	Pr 8 inch SDR 35 PVC NW SD Pipe from CB 4 In
		27.52	Ex 6 inch SDR 35 PVC SE SD Pipe From CB 5 In
		27.49	Ex 6 inch RCP NW SD Pipe to Ex MH Out Field Confirm
		33.00	Pr 3 inch Sch 80 PVC SW SD FM 1 Out Field Confirm



MAIN CONNECTION DETAIL (3/2)

SCALE: 1" = 4'



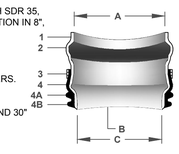
CLEANOUT DETAIL

NOT TO SCALE

A. EQUIVALENT O.BELL END ACCEPTS PIPE WITH SDR 35, ASTM D3034 OR EQUIVALENT O.D. SPECIFICATION IN 8", 10", 12", 15", 18", 21", 24", 27", AND 30" SIZES. (FOR 4" AND 6" SIZES REFER TO FATBOY SPECIFICATIONS).

B. CURVATURE VARIES WITH MAINLINE DIAMETERS.

C. SPIGOT END PVC SDR 35, ASTM D3034 DIAMETERS: 8", 10", 12", 15", 18", 21", 24", 27" AND 30"

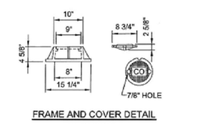


PART	PART NAME	MATERIALS
1	HUB ADAPTOR	PVC SDR 35 ASTM D3034
2	RUBBER GASKET	ASTM F477
3	SECURING CLAMP*	BAND SS #301 SCREW SS #305 HOUSING SS #301
4	RUBBER SLEEVE (AVAILABLE IN NITRILE AND EPDM BY SPECIAL ORDER)	ASTM F477
4A	UPPER SEGMENT**	
4B	LOWER SEGMENT***	

* OPTIONAL: #316 STAINLESS STEEL BAND, SCREW AND HOUSING
** DISTANCE BETWEEN 4A AND 4B WILL VARY BY PRODUCT TYPE
*** WILL NOT APPEAR ON RUBBER SLEEVES FOR CONCRETE OR CLAY PIPE

NOTE: RECOMMENDED METHOD OF CUTTING HOLE IS WITH HOLE SAW FOR PVC AND OTHER PLASTICS, AND DIAMOND BIT FOR CONCRETES, CLAY, FRP AND D.I. (SEE INSTALLATION INSTRUCTIONS. HOLE SAWS ARE AVAILABLE FOR PURCHASE OR RENT.)

INSERTA TEE SIZE	HOLE DIAMETER
8" (200 mm)	8 ¾" (222mm)
10" (250 mm)	10 7/8" (276mm)
12" (300 mm)	12 7/8" (327mm)
15" (375 mm)	15 13/16" (402mm)
18" (450 mm)	19 3/16" (503mm)
21" (525 mm)	22 5/16" (573mm)
24" (600 mm)	25 5/16" (643mm)
27" (675 mm)	28 1/2" (724mm)
30" (750 mm)	32 11/32" (826mm)



FRAME AND COVER DETAIL

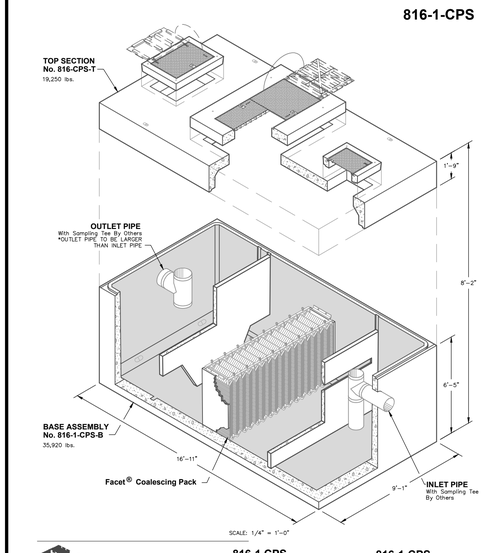
NOT TO SCALE

CLEAN OUT DETAIL (5/2)

SCALE: 1" = 4'

INSERT-A-TEE DETAIL (4/2)

NTS



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816-1 CPS
File Name: 010-8161CPS
Issue Date: 2010

816-1-CPS
OIL WATER SEPARTOR
COALESCING - 292 GPM

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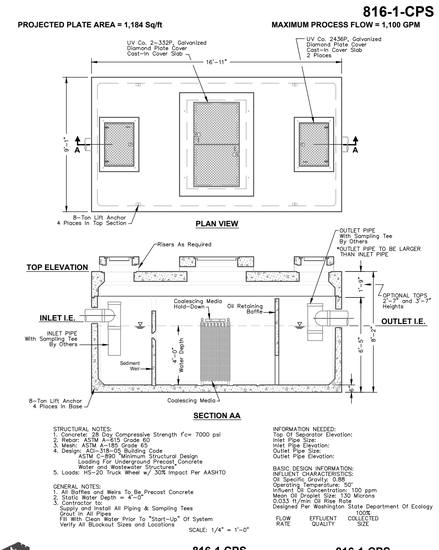
133



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COALESCING - 292 GPM

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133.1

Issue for Permit

REGISTERED PROFESSIONAL ENGINEER 65720PE OREGON JULY 13, 2004 DANIEL A SCARPINE
RENEWAL DATE: 6/30/2014

Aquarius Environmental
www.aquariusenv.com

Designed: DS
Drawn: JAW
Checked: DS
Date: 7/18/2013
Scale: VARIES

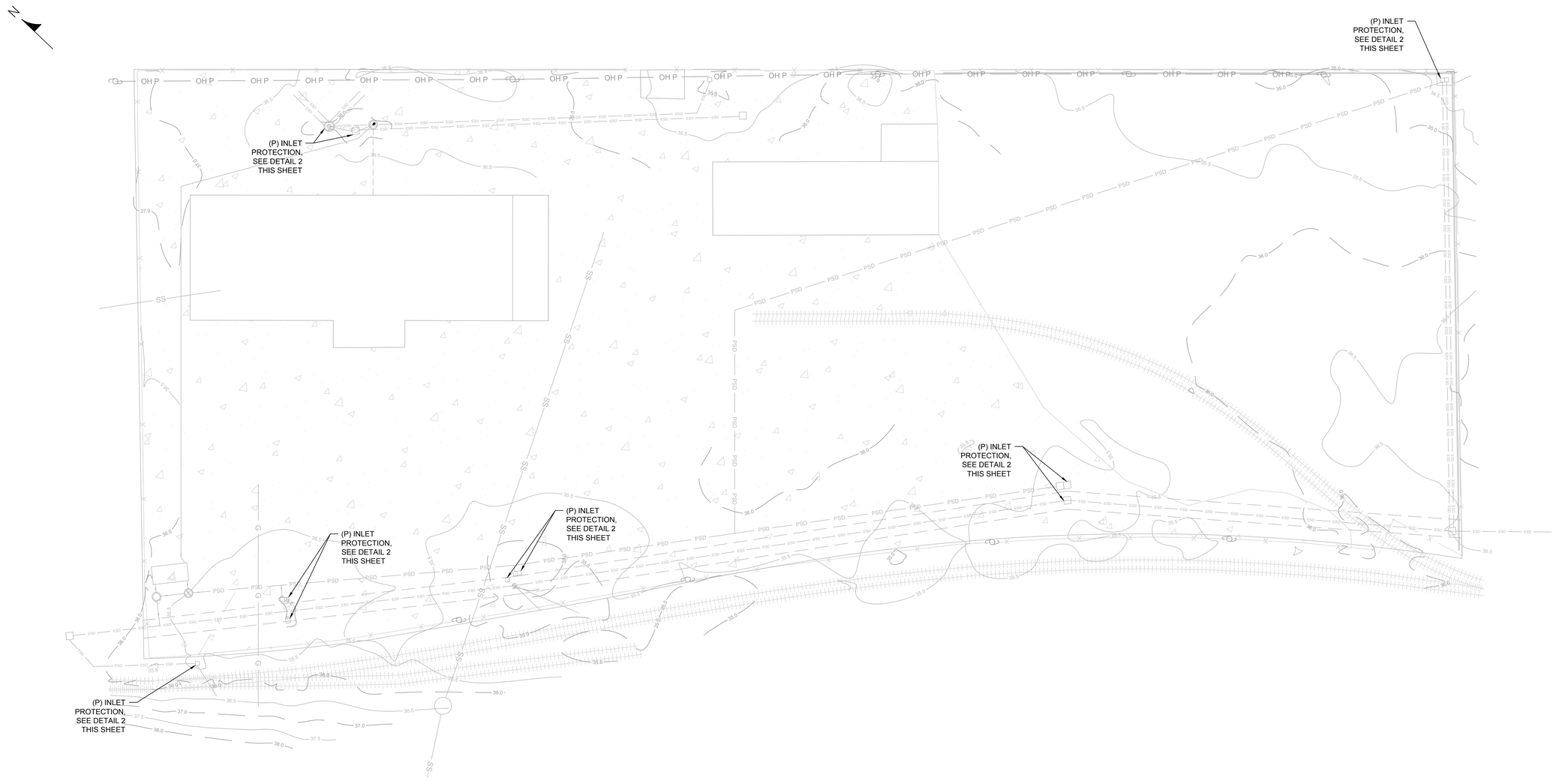
DETAILS
WILHELM TRUCKING CO. SW IMPROVEMENTS
3250 NW ST HELENS RD, PORTLAND, OR

REVISIONS

Rev	Date	Description

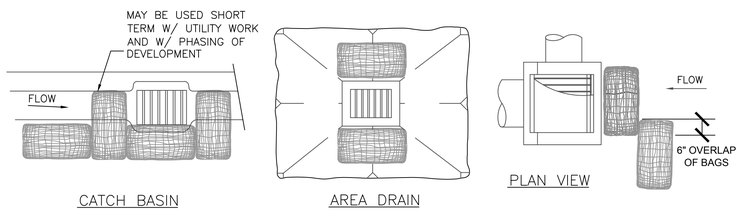
SHEET 2

File: WTC Plans.dwg



EROSION CONTROL PLAN 1/3

SCALE: 1" = 40'



MAINTENANCE NOTES:

1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP-SLOPE AREA IS PERMANENTLY STABILIZED.
2. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND SEDIMENT FENCES, STRAW BALES OR BIOFILTER BAGS.
3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

LEGEND

- PROPERTY LINE
- EXISTING STORM DRAIN
- EXISTING FENCE
- EXISTING RAILROAD
- EXISTING ASPHALT

REGISTERED PROFESSIONAL ENGINEER 65720PE OREGON JULY 13, 2004 DANIEL A. SCARRINE

RENEWAL DATE: 6/30/2014

Issue for Permit

Aquarius Environmental

www.aquariusenv.com

Designed: DS
Drawn: JAW
Checked: DS
Date: 7/18/2013
Scale: 1" = 40'

EROSION CONTROL PLAN
WILHELM TRUCKING CO. SW IMPROVEMENTS
3250 NW ST HELENS RD, PORTLAND, OR

REVISIONS

Rev	Date	Description

SHEET 3

3 OF 3

File: WTC Plans.dwg

APPENDIX F

Oregon DEQ Industrial Stormwater Best Management Practices Manual

Industrial Stormwater Best Management Practices Manual

By: Dennis Jurries, PE
Krista Ratliff

February 2013

State of Oregon
Department of Environmental Quality

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

Last Updated: 2/13/2013

This report prepared by:

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Alternative formats (Braille, large type) of this document can be made available.
Contact DEQ's Office of Communications & Outreach, Portland, at (503) 229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696.

Table of Contents

Executive Summary 1
Introduction 2
Best Management Practices 4
BMP 1 Coolant/Oil Recovery 4
BMP 2 Weld Fume Control 6
BMP 3 Drum & Container Containment 7
BMP 4 Tank Containment 9
BMP 5 Metal Roof & Siding Coating, Gutter and Downspout Treatment 10
BMP 6 Biological Based Parts Cleaners 11
BMP 7 Lined Grease Containers 12
BMP 8 Vehicle, Pavement, and Building Washing 13
BMP 9 Oil/Water Separators 15
BMP 10 Oil/Water Separators for Air Compressors 17
BMP 11 Oil & Sediment Trap Catch Basins 17
BMP 12 Containers for Dust Collectors 19
BMP 13 Ozone Generators for Cooling Towers 20
BMP 14 Cartridge Filtration 21
BMP 15 Sweeping 23
BMP 16 Battery Storage 24
BMP 17 Wrecked Vehicle Storage & Scrap Metal Recycling 25
BMP 18 Paint Stripping 27
BMP 19 Equipment Covers 28
BMP 20 Brake Shoe Replacement 29
BMP 21 Employee Environmental Training 30
BMP 22 Housekeeping 31
BMP 23 Lawn Care 33
BMP 24 Dumpster Covering 36
BMP 25 Semi-Trucks and Trailers 38
BMP 26 Fueling and Liquid Loading/Unloading Operations 39
BMP 27 Parking Lots and Yards 40
BMP 28 Stormwater Diversion - Speed Bumps and Speed Humps 41
BMP 29 Grassy Filter Strip and Planter 42

BMP 30 Catch Basin Insert Bag 44
BMP 31 Constructed Wetlands 45
BMP 32 Bioswales 47
BMP 33 Sand Filters 49
BMP 34 Porous Pavers 50
BMP 35 Flocculation 50
BMP 36 Electrocoagulation 54
References 57

Executive Summary

This document is designed to aid in the selection and implementation of best management practices for the protection of water quality affected by industrial stormwater discharges.

Best management practices, or source controls, are practices and/or procedures to prevent pollution in stormwater discharge, including methods to prevent toxic and hazardous substances from reaching receiving waters. They are designed to address the quality of a facility's practices and may ultimately affect the ability of the facility to meet effluent limits, impairment and sector-specific reference concentrations and/or benchmarks. Best management prcatices are most effective when organized into a comprehensive stormwater pollution control plan. Several different source controls can be used to achieve similar environmentally protective results. With facility-specific or activity-specific pollutant(s) of concern as the major consideration(s) in selecting appropriate best manaegement prcatices, facilities can tailor a stormwater pollution control plan to achieve permit compliance with available technologies.

The best management practices included in this document address activities and operations that take place outdoors and do not address pollutants from indoor industrial production. These practicess are to be considered a work in process and are by no means a complete list of appropriate pollution control measures. DEQ may periocically add other best management practices to this document.

Introduction

Background:
Under the Total Daily Maximum Load, or TMDL, program states must list waterbodies not meeting water quality standards and to determine, for each degraded waterbody, the "total maximum daily load" of the problematic pollutant that can be allowed without violating the applicable water quality standard. The regulating community or agency then determines what types of additional pollutant loading reductions are needed, considering not only point sources but also nonpoint sources. The regulator then establishes controls on these sources to ensure further reductions to achieve applicable water quality goals. National Pollutant Discharge Elimination permit conditions must respond to federal U.S. Environmental Protection Agency stormwater requirements, as well as TMDLs, which have been mandated by Congress to regulate stormwater discharges more rigorously. Locally in 2007 and 2008, two environmental advocacy groups, Northwest Environmental Defense Center and Columbia Riverkeeper, challenged the validity of the Oregon's current industrial permits under the federal Clean Water Act. DEQ revised the industrial NPDES permit as part of a settlement agreement and implemented significant changes.

Organization:
This is a 'living document' with new additions generally added at the document's end. Table 1, following the Reference section, is organized by type of activity and provides an index to the numbered best management practices for easy access to the body of information**.**

Best Usage:
The best way to use this guide is to assess your site's *activities* that affect your stormwater discharge(s), using Table 1. Determine the pollutants in the stormwater discharge(s) and the potential sources of those pollutants on site, then determine which potential sources have the most significant impact on the discharge(s). Select a best management practice or practices that will be most effective in controlling pollution in the stormwater discharges, while being practical about resources and costs that will be required to implement and maintain those practices. After you install selected best management practices, sample the stormwater discharges to verify reduced pollutants and determine if additional practices will be necessary to meet permit monitoring requirements for the various pollutants of concern. [Caution: The efficiencies provided in this document should be used as indicators of the potential pollutant reduction related to best management practice installation. The efficiencies can be variable depending on a number of factors including flow, maintenance of the best management practice, loading and other factors.]

Low Impact Development began in Prince George's County, Maryland in 1990 as an alternative approach to the no longer cost-effective detention ponds and basin on construction sites. The concept has become the preferred method of stormwater management because engineered small-scale hydrologic controls replicate pre-developed conditions through infiltration, filtration, storage, evaporating and detaining water close to its original source. Often space is a limiting factor for industrial facilities' use of low-impact development controls. Other limitations include: soil conditions, climate, groundwater levels, cost and maintenance. DEQ promotes the use of low-impact development practices to reduce stormwater flows and control the mass load of pollutants that enter the receiving stream. In addition, if an industrial facility can capture and treat and/or infiltrate all stormwater without discharging to waters of the state or a conveyance system that discharges to waters of the state, that facility may be eligible for termination of NPDES permit coverage. Low-impact development options include:

- Bioretention Areas
- Dispersion or Swales
- Vegetated Roofs
- Permeable Pavements or Pavers
- Roof Rainwater Collection Systems (for re-use)

Underground Injection Control places fluids below the ground through dry wells, drill holes, soaking

trenches and infiltration facilities with under drains. Any infiltration facility is a UIC if it is deeper than the facility is wide. Oregon Association of Clean Water Agencies hired Kennedy/Jenks Consultants to evaluate stormwater data before entering UIC devices. This report use data from five municipalities around Oregon, Clackamas County, Gresham, Redmond, Bend and Portland to provide DEQ with groundwater protectiveness models to demonstrate UICs do not pose a likely adverse risk to groundwater. This report and other factors reaffirm that injection systems to dispose of water that may come in contact with any raw material, product, byproduct or waste during manufacturing or processing may be a viable option while protecting groundwater under the Safe Drinking Water Act federally enacted in 1974. If all stormwater can be injected into the ground, permitting will be addressed through the underground injection control program and the facility may be exempt from NPDES permitting. All underground injection controls must be registered and approved for issuance through either a water pollution control facility (WPCF) permit or authorized by rule. Stormwater may be managed through underground injection systems provided conditions established in rule can be met. Some industrial activities which may inhibit use of groundwater injection include:

- Vehicle washing, maintenance, repair and recovery
- Airport de-icing
- Storage of treated lumber
- Facilities handling hazardous materials or improper storage and containment or chemicals
- Sites under Resource Conservation and Recovery Act (RCRA)

Best Management Practices

BMP 1 Coolant/Oil Recovery

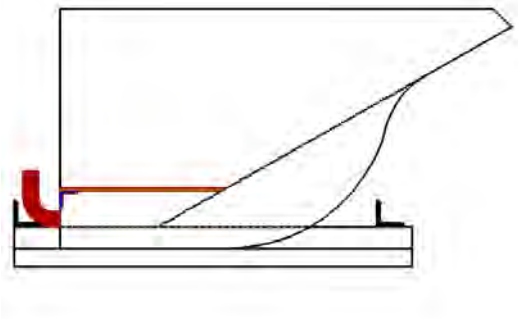
Activity: Mechanical metal removal through the use of high-speed equipment and the associated discharge of metal fines in the form of swarf, grindings, chips, etc.

Typical Pollutants: Heavy metals, i.e. chromium, copper, manganese, lead, zinc; Dissolved Oxygen consuming organisms, i.e. bacteria, fungi; Chemicals in the coolant, i.e. corrosion inhibitors, emulsifiers, biocides, and etc.; Tramp oil; and Decreased pH.

Typical Problem: Swarf and turnings are discharged into a hopper along with varying amounts of coolant and tramp oil. The hopper is transported outside and dumped into a dumpster or special portable scrap bin supplied by a scrap dealer. Typically the outside bin or dumpster is not liquid proof nor is it covered. The coolants, metal fines, and tramp oil leak out of the outside bin or are spilled in the process of loading onto a transport vehicle. Quite often the discharge continues as the truck carries the scrap down the highway.

BMP: Locating the outside scrap bin on a concrete pad that drains into a dead-end containment sump and is bermed to prevent storm water run-on may resolve the potential source providing that the sump is emptied periodically. The sump should either be double contained or be coated on the inside with a flexible epoxy to minimize any seepage from any small cracks that may develop in the concrete sump. The trapped oil in the sump can be removed with a Belt Skipper similar to that shown on the right.

Another approach that works is to modify the scrap hopper located at the metal removing machinery for coolant/oil separation from the swarf while the coolant/oil is warm and less viscous. This approach would minimize or eliminate leakage outdoors by removing most of the potential contaminants at the source.



A removable plate, either solid or with small perforations, either screened or unscreened, can be added to the bottom of the swarf/chip hopper. This creates a sump for the coolant and oils to drain into while the liquid is very hot and thus less viscous. A piping connection should be made into the lower chamber sized to fit the hose end on your sump sucker. If holes are made in the bottom plate, the number of holes will be determined with experimentation. They should be sufficient to provide the air draw of the sump sucker and should be located to encourage the best flow out of the lower chamber when the liquid is sucked out.

The same thing can be done with large scrap dumpsters.
A Vacuum Truck would be needed to suck out all of the fluids from the large sump pipe.

Coolant should be of the synthetic type and should be recycled on site. Small package recycling units are available from several manufacturers.

A few manufacturers will modify existing hoppers or sell new hoppers that have a filtering

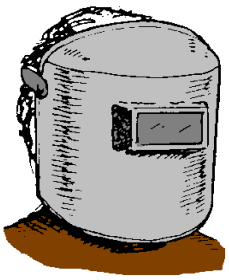
screen and filter material separating the scrap from the liquid chamber.

Two commercially available bins with built in screening.

As the scrap bins are moved outside, pause at the outside door where someone should use a sump sucker to draw the liquid/fines out of the lower chamber for either proper disposal or recycling of the coolant.

Efficiency/Impact: Virtually all liquid and metal fines from this activity are prevented from entering the storm water drainage by implementation of this BMP provided the outside scrap dumpster/bin is covered when scrap from inside bins are not being discharged in to it. This point source should no longer be a significant contributor of pollutants to the storm water discharge.

BMP 2 Weld Fume Control



Activity: Metal cutting with gas burners, oxygen/acetylene torches, and welding of metal with stick, wire, or gas welders.

Typical Pollutants: Oily air emissions, metal particles; gaseous metal; and vaporized flux.

Typical Problem: The fume from the metal cutting/welding operation is exhausted to the outside where it comes in contact with rain and precipitates out into the storm water. Indoor air quality is also of concern.

BMP: Welding creates an oily soot type smoke. The amount of smoke produced from the welding process can be estimated using the table below.

Fume Ratio:

MIG (Wire Feed)	**0.005-0.01**	**lb. of smoke/lb. of rod**
TIG	**0.004**	**lb. of smoke/lb. of rod**
Oxy-acetylene torch	**0.004**	**lb. of smoke/lb. of rod**
Stick	**0.015**	**lb. of smoke/lb. of rod**
Flux core	**0.02**	**lb. of smoke/lb. of rod**

This fume has products that can be very small, submicron in size.

There are several methods to control this fume. Centralized cartridge filtration systems like that shown on the left and portable HEPA filtration systems similar to that shown on the right are a couple of control methods in use today which appear to be phasing out electrostatic precipitator systems. Air extraction units with mist or charcoal filters can also be used.

Efficiency/Impact: Implementation of one of these BMPs will mostly eliminate this source of pollutants, not only to storm water but also to air, and significantly improve indoor air quality. As an added benefit, if the air inside of a building is heated, it may be possible to recycle the air and provide a significant energy cost savings in the winter months. This point source should no longer be a significant contributor to the storm water discharge concerns.

BMP 3 Drum & Container Containment

Activity: Oil (& other fluids) dispensing and outside storage

Typical Pollutants: Oil, hydraulic fluid, antifreeze, paint, solvent, cleaners, petroleum hydrocarbons, toluene, ethylene glycol, etc.

Typical Problem: Drums, pails, and small containers of liquids are stored outside in non-bermed, uncontained areas, which through expansion and contraction of the container, can damage the container, or the container bungs casing leaks, or filling/dispensing op-

erations can discharge pollutants to the ground in the vicinity. Rain and snow contact this material and transport it off site or into the ground water.

Dispensing oil, antifreeze, and other potentially hazardous liquids may result in spills and leaks around the dispensing area. This leaked liquid can be tracked to other locations, or can seep through cracks and floor joints into the soil and groundwater beneath the floor. Rain and snow melt may transport these pollutants off site.

BMP: Portable metal storage buildings with built-in containment reduces this risk and better protects the liquid containers from damage and possible contamination. Environmental controls, i.e. heating and air conditioning, and fire protection are usually available in these pre-constructed units if needed.

If drums must be kept outside consider using cone shaped drum covers to keep water off the top of the drums

Containment pallets made from steel or plastic will contain the liquid

When dispensing into secondary containers, the containment should drain into a drum or other container. Hoses on dispensing stations should not be able to extend beyond the containment area. For dispensing area containment, the volume of the containment area should be equal to the tank being dispensed from. If possible dispensing areas should be under roof or some other protection from stormwater. If a roof is not provided to keep out rain and snow, then the volume of the enclosure should be 110% of the volume of the largest bulk tank inside of the enclosure

Efficiency/Impact: Implementation of these BMPs will reduce the risk of exposure to stormwater of the contaminants associated with the delivery, dispensing, and storage of the materials in bulk tanks. Some risk of contamination will still exist from the material handling activities associated with moving containers of these liquids to and from the pallets or storage buildings or dispensing.

BMP 4 Tank Containment

Activity: Storage of liquids in bulk containers or tanks.

Typical Pollutants: Oils, diesel, gasoline (petroleum hydrocarbons); antifreeze (ethylene glycol); and solvents (toluene, mineral oil)

Typical Problem: Leakage or spillage occurs around tanks from filling, dispensing, deterioration of pipe connections or failure of secondary containment

BMP: Bulk storage tanks should have secondary containment in the form of a curbed enclosure with a liner to prevent migration of the liquids through the enclosure walls and floor. The liner can be in the form of a compatible flexible epoxy or a liner membrane compatible with the fluids being contained. If a roof is not provided to keep out rain and snow, then the volume of the enclosure should be 110% of the volume of the largest bulk tank inside of the enclosure. Fill locations should have drip trays that drain into a drum or other container. Dispensing areas should have their own containment. When dispensing into secondary containers, the containment should drain into a drum or other container. Hoses on dispensing stations should not be able to extend beyond the containment area. For dispensing area containment, the volume of the containment area should be equal to the tank being dispensed from. Dispensing areas should be under roof or some other protection from storm water. Caution should be used to ensure that incompatible materials are not contained within the same enclosure.

Double-walled, aboveground storage tanks maybe used instead of single walled storage tanks with containment structures. Filling and dispensing areas associated with double-walled tanks should have containment and protection from storm water.

Efficiency/Impact: Implementation of this BMP will reduce the risk of exposure to storm water of the contaminants associated with the delivery, dispensing, and storage of the materials in bulk tanks.

BMP 5 Metal Roof & Siding Coating, Gutter and Downspout Treatment

Activity: Runoff from buildings with corrugated galvanized sheet metal roofs and/or siding and gutter and downspouts

Typical Pollutants: Zinc & Iron

Typical Problem: As the sheet metal ages zinc from the galvanized coating is released to storm water runoff. If the loose of zinc continues for too long then, iron will also show up in the storm water discharge and eventually the roof or siding will have to be replaced rather than be repaired.

BMP: Avoid using galvanized sheeting on new construction. Clean and paint the exposed galvanized sheet with a good enamel paint. Be sure to contain and collect any liquids used in cleaning for proper disposal. Instigate a regular inspection and maintenance program concerning the building painting.

Painted Siding and Roof **Downspout Treatment**

Efficiency/Impact: With proper maintenance of the painted surface the zinc and iron in runoff can be decreased from this source to the non-detect level. Periodic recharging of or replacement of the filter media will significantly reduce the zinc and iron levels in the downspout runoff (see page 23 for some of the possible pollutant reductions obtainable).

BMP 6 Biological Based Parts Cleaners

Activity: Cleaning of parts and equipment in parts cleaners containing mineral spirits/oil or petroleum products.

Typical Pollutants: Petroleum hydrocarbons

Typical Problem: The use of petroleum based cleaners leads to the requirement for either storage of the spent cleaner or recycling companies periodically removing old cleaner solution/sludge and adding new solution. This results in spent cleaner storage on site and/or frequent handling of both the clean and contaminated cleaner. This increases the risk of spills and leakage getting into storm water. The spent cleaning solution/sludge must be treated as a hazardous waste and be properly handled and disposed.

BMP: Large parts and frames are generally cleaned in a shot blast machine. Smaller parts should be cleaned in an aqueous based solution (caustic or other) or in a biological solution. These units typically are heated and may involve agitation. Parts cleaners other than these typically have a sludge residue or the solution has to be replaced periodically. The sludge or removed solution is usually considered a hazardous waste somewhere in its cycle. The sludge from an aqueous based or biological parts washer is not typically hazardous and solutions are only added, never removed.

There are now many manufacturers and suppliers of Biological Parts Washers.

Efficiency/Impact: Use of water based or biological parts cleaning solutions could potentially result in no hazardous waste generation, improved health for employees, and overall cost savings in material, labor, and waste disposal. Generally, cleaning with these solutions takes employee involvement in the acceptance of the use of the material and usually takes a little bit longer to perform the cleaning operation.

BMP 7 Lined Grease Containers

Activity: Vehicle maintenance, equipment maintenance, and construction involving the addition of grease to joints, couplings, bearings, etc.

Typical Pollutants: Grease (Petroleum Hydrocarbons with heavy metal additives)

Typical Problem: Grease containers when emptied still contain fair amounts of grease residue in them. Should water mix with this grease, potential adverse impact to the environment in the form of oil/water spillage may occur.

BMP: Some suppliers provide returnable containers (bulk) that, when sealed after use, minimize the potential adverse impact. Another environment friendly option is a container that is lined. After emptying, the liners can be removed and more of the grease squeezed out. The liners can then be placed in a drum for accumulation and properly disposed.

Efficiency/Impact: An increase in the amount of grease available at very little increase in labor cost will result from implementation of this BMP. If the lined containers are used, properly accumulated and disposed of after use or bulk returnable containers are used, very little risk of environmental contamination through storm water dis-

charges will be present from this source.

BMP 8 Vehicle, Pavement and Building Washing

Activity: Pressure washing or steam cleaning of equipment, outdoor surfaces and/or vehicles. Under the 1200-Z Industrial Stormwater Permit authorized non-stormwater discharges include: Pavement washing where no detergents or hot water are used, no spills or leaks of toxic or hazardous materials have occurred (unless all spill material has been removed), and surfaces are swept prior to washing. In addition, vehicle washing without use of detergent or hot water is authorized depending upon the volume of weekly washing and discharge point. Additional controls and/or DEQ permits will be needed if using heated water, acids, bases, metal brighteners or conduct engine washing.

Typical Pollutants: Degreasers, organics, heavy metals, oil and grease and pollutants from soap, such as, phosphate and nitrogen

Typical Problem: When equipment and/or vehicles are washed outside, contaminants in the washwater and the overspray mix with the stormwater runoff.

BMP: Ideally wash areas should be located on well-constructed and maintained, impervious surfaces with drains piped to the sanitary sewer. The wash area should extend at least 4 feet in every direction from the perimeter of the vehicle or equipment being washed. When sanitary sewer is not available there are several different approaches that can be taken depending on the size of the site and the resources available, (although permits may be required) such as:

- discharging the storm water to a properly sized grassy swale or constructed wetland,
- discharging the washwater and storm water to a collection sump for later disposal,

- discharging the storm water through an oil/water separator,
- provide a package recirculation/treatment system for washing
- relocating the washing operations to a commercial washing facility,
- contract with a mobile washer to wash the vehicles and ensure that they capture and remove the liquid and solids and properly dispose of them, and/or
- perform the washing activities off site at a commercial vehicle wash facility.

- The use of organic solvents or non-biodegradable chemicals, soaps and detergents is prohibited.

Selection of the cleaning detergent is critical if oil/water separation unit is used. Ensure that the detergents used do not emulsify oils as this would allow the oils and grease to flow though the oil/water separator instead of being separated from the effluent. The detergent must be a low sudsing, phosphate-free, biodegradable type. Design the cleaning area with walls to keep the dirty overspray from leaving the wash area.

Commercial Alternatives:

- Hire a commercial mobile washer. These units are capable and must collect all water and solvents, therefore, are less restricted on use of acids or brighteners, engine cleaning or high pressure washing.
- Relocating the washing operations to a commercial washing facility.

Additional Source Controls:

1. All wash water runoff should be drained away from a shop area or chemical storage facility.

2. Cleaning operations should be modified to minimize paint residues (chips), heavy metals, or any other potentially hazardous materials that detach from surfaces. Modifications such as, change of cleaning agent or reduction in water pressure. Detached particles should not enter storm sewers or surface waters but rather collected for proper disposal.

3. The use of acids and/or solvents as cleaning agents for building exteriors and pavement areas is not allowed. Dry or semi-dry methods may be used to clean these surfaces (i.e., sand or other particle blasting, grind-off and vacuum technology, and ice blast technology). If blasting is used as an alternative, all solids should be swept or vacuumed and disposed of properly.

4. Facilities that conduct engine washing, acid/caustic/metal brightener washing, or steam/heated water washing shall conduct all operations on an impermeable surface. This wash water must be collected and treated prior to discharge and a Wash Water Permit is required.

Sanitary Sewer Discharge

1. Prior to disposal of wash water to sanitary sewer, minimum effluent limits must be met as required by the local Sewer Authority. It is the facility's responsibility to meet all discharge conditions before using the sanitary sewer. There are no DEQ permitting requirements if all wash water is authorized and routed into the sanitary sewer.
2. If pretreatment units are necessary they should be operated and maintained in accordance with manufacturer specifications and as required by the local Sewer Authority.

Disposal alternatives to ensure contaminated water does not enter surface waters are as follow:

1. Wash water may be collected in a sump, grit trap, or containment structure to be pumped or si-

phoned to a vegetated area so that complete percolation into the ground occurs. An impermeable fabric liner may be needed for the lagoons or constructed wetlands to protect groundwater. All criteria set forth in OAR 340-40 must be met for groundwater quality protection. Treatment options include, but are not limited to:

- grit trap for suspended solids removal
- oil/water separator removes floating oil
- ph adjust unit will neutralize acids and caustics
- advance treatment alternatives

➢ The treatment system must be, at all times, properly operated and maintained. Records of maintenance activities should be maintained on-site for DEQ inspection.

2. Disposal of wash water should occur on ground surfaces with vegetated cover and may not cause any erosion. Depending on the amount of vehicles washed in a week, a permit may be required.

3. If facility is close to surface waters the wash water may be disposed to a dry grassy swale, a minimum of 250 feet in length before the waterbody. Complete percolation in the swale should occur with no direct discharge to the surface water. Discharge into a grassy swale for treatment should not occur within 24 hours after a rainfall event or if water remains ponded in the swale. A distance of 250 feet was based on a hydraulic conductivity of 0.2 gal/ft/day, volume per day of 150 gallons, and a swale with a width of 3 feet.

Efficiency/Impact: The use of a recycling system will not only reduce or eliminate the contaminant discharge to stormwater or sanitary sewer but it will greatly reduce the amount of water used in the process. The use of a bioswale with an oil/water separator will likewise virtually eliminate the total suspended solids, oil and grease, and heavy metals discharged provided both are properly sized. A portable collection system will provide the collection of the contaminants provided the collection system is large enough to capture significant amounts of the overspray.

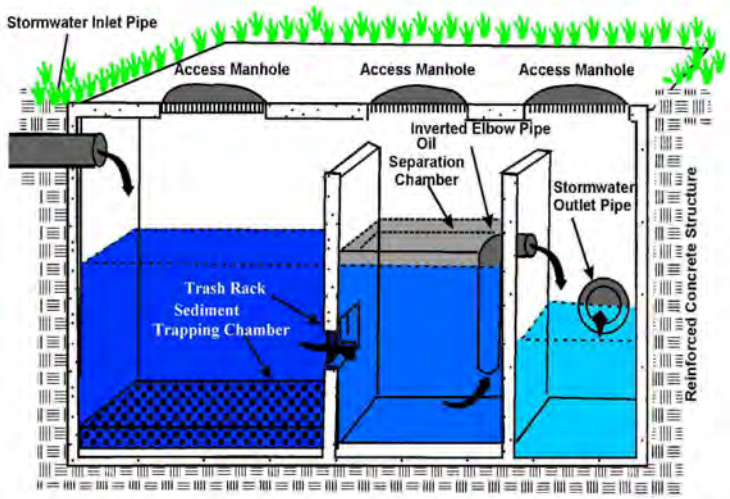
BMP 9 Oil/Water Separators

Activity: Any site that has steel, equipment or vehicles stored outside and has a potential for oily storm water discharges.

Typical Pollutants: Oil and grease, PAH, and suspended solids

Typical Problem: Structural steel and plate arrives on the site from the supplier coated with oil to inhibit corrosion. As storm water comes in contact with the steel the oil disperses and runs off. Equipment stored outside has grease and oil on it that washes off when contacted by storm water. Vehicles not only have the normal oil and grease associated with them but they also have road film which contains oil.

BMP: Installation of a properly sized oil/water separator can reduce the amount of both Total Suspended Solids and Oil and Grease in the storm water run-off. Several types of oil/water separators are available (Gravity, Coalescing, Centrifugal, Carbon Absorption, Ultrafiltration, etc.). Gravity Oil/Water Separators are generally the most economical provided emulsifying chemicals have not been used upstream of the separator, dirt is not a major contaminant, and high shear centrifugal pumps are not used to pump the water to the separator.



There are three basic types of oil/water separators, spill control (SC), API (longer retaining time), and coalescing plate (CPS) recommended for use in all pipe drainage systems conveying runoff from paved areas, subject to vehicular use or storage of chemicals, prior to discharge from the project site or into an open drainage feature. All three types have the following basic application/selection criteria:

- Urban residential runoff usually low flows
- Suitable for smaller sites, draining 5 or less acres
- Land uses associated with include: industrial, transportation, log storage, airports, fleet yard, railroad, gas station, vehicle/equipment dealers and repair, construction and petroleum storage.
- SC can be effective at retaining small spills but does not remove dispersed oil droplets because they have a short residence time. SC type should be required when the site stores petroleum based products and spills are likely.

API used where there is a relatively high likelihood of dispersed oil contamination. API/CPS should be used in areas with high traffic volumes (2,500 vehicles per day), at sites that are used for petroleum storage/transfer, scrap and wrecking yards, or at sites where heavy equipment is stored and/or maintained. Oil/water separators cannot deal well with heavy sediment loads and should be used in conjunction with detention, biofiltration, or water quality treatment system to protect groundwater. CPS consist of a bundle of plates made of fiberglass or polypropylene installed in a concrete vault. The plates improve the removal of oil and fine suspended sediments and assist in concentrating the pollutants for removal. CPS requires frequent inspection and maintenance to operate as designed. A mechanism should exist for the system to be bypassed, so the system can be taken off line for maintenance. Oil and sediment removed from devices may qualify as hazardous waste and should be tested prior to disposal. Oil separators should be sized for a local six-month reoccurring 24-hour design storm. Larger storms should be diverted from the separators.

Efficiency/Impact: The use of gravity oil/water separators in the storm water outflow can greatly reduce the free oil droplets larger than 0.015cm (150 microns). Ultrafiltration can virtually eliminate oil in the storm water outflow. Fouling of membranes may be-

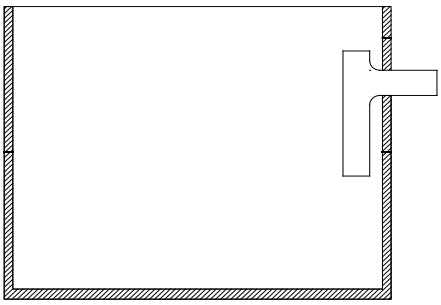
come a concern with Ultrafiltration although some newer vibrating membranes show great promise for keeping the membranes clear during backflushing.

BMP 10 Oil/Water Separators for Air Compressors

Activity: The use of compressed air.

Typical Pollutants: Oil

Typical Problem: Compressed air systems typically absorb or condense moisture from the ambient air. Fine oil is released to the compressed air in the compression cycle. The condensed water is either manually drained out of the compressor, filters, and/or the air receiver tank or is automatically drained by a timed valve system. This condensate may be discharged to the ground or to a location that can leak or be spilled into the outside environment. Storm water then flushes this oil to the storm water outfall.



BMP: Install an oil/water separator especially made for compressors and receiver tanks or manufacture a simple separator similar to the one shown on the following page and siphon off the oil. Discharge the remaining water to the sanitary sewer if it is available on-site.

Efficiency/Impact: Oil from this source can be greatly reduced or eliminated and loading to the storm water conveyances will be reduced.

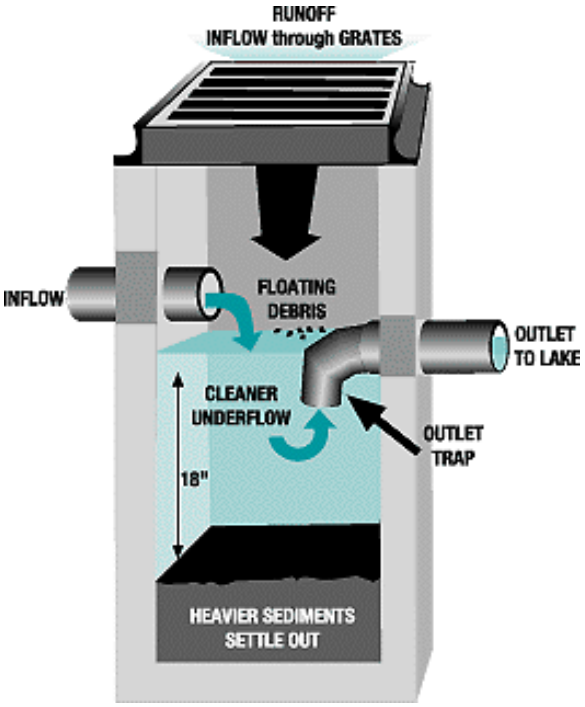
BMP 11 Oil and Sediment Trap Catch Basins

Activity: Storm water runoff from commercial or industrial sites to standard catch basins or drains.

Typical Pollutants: Oil, PAH, and sediment

Typical Problem: On sites that use standard catch basins or drains there is no retention of any oils or sediments. This could result in excessive discharges to storm water of these pollutants.

BMP: Retrofitting drains to standard sediment and oil trap (Lynch style) catch basins properly designed for the flow-through rate and when properly maintained can reduce oil and grease levels in the storm water discharge significantly.



Efficiency/Impact: Proper sizing and maintenance can reduce the discharge concentrations of oil and grease to below 10mg/l and suspended solids including heavy metals by from 10% to 42% depending on the influent flow rate and the accumulated sediment level already in the lower sump with the lower efficiency corresponding to the higher flow rates. It is extremely important to remove the accumulated sediments and oil in the catch basin when the sediment retention capacity (depth below the bottom of the outfall pipe) is reduced by 50 % but to a depth of not less than 18 inches to the outfall pipe.

Note: An additional issue on some industrial sites is the lack of a single or common sampling point which may require that sampling be accomplished from the catch basin(s). The catch basin is typically the worst place to sample in that it is where the pollutants are concentrated and retained and it is not really representative of the pollutant concentrations leaving the site. Sometimes an insert bag may be used in the catch basin as a BMP to remove sediments. Moving this bag to the side typically re-suspends TSS that was clinging to the bag thus increasing the TSS in the samples collected. Consider using a pipe Tee instead of an inverted elbow or flat steel invert/cleanout in the catch basin outfall. If the pipe and tee are four inches or more in diameter, it is possible to dip the sample bottle in the clean side of the catch basin and if the tee where extended up through the grate and a removable cap was place upon it, the insert bag would not have to be disturbed nor would the grate have to be removed in order to sample. Another option for sampling is to excavate to the outfall piping on the discharge side of the catch basin and replace the a section of the 45 degree angled drain pipe with a sampling sump with access to a sealed cover at ground level. The depth to the angled outfall pipe would probably be around 18 inches or less in most cased.

BMP 12 Containers for Dust Collectors

Activity: Arc furnace or mechanical removal operations (grinding, sanding, shot blasting, etc.) that create dust which is collected in baghouses.

Typical Pollutants: Metal fines, suspended solids in storm water

Typical Problem: Mechanical removal operations involving the removal of metal, paint, wood, and other materials generate dust that is collected in bag filter houses. Arc furnaces will generate a metallic fume that condenses out as a dust on the way to the baghouse. The baghouses must discharge the dust collected to a dumpster, drum, or bin. If the connection between the baghouse and the collection container is not airtight then, dust leaks out into the environment. Storm water will contact this dust and convey it off-site, typically causing a TSS discharge problem.

BMP: If a drum is being used for collection of the dust, manufacture from a removable drum top a flange or sleeve that a flexible boot can be clamped to and attach the sleeve to both the discharge point on the baghouse and to the drum sleeve. Use quick release clamps to attach the removable drum top to the drum. If a dumpster or other large container is used to collect the dust, manufacture a solid reinforced cover for the container using rubber sealing strips and

clamps or bolts to hold the cover in place. The cover should have a sleeve or flange that attaches to a flexible boot which is attached to the discharge point on the baghouse. It may be necessary to also include a vent line from the dust receiving container back into the dust collector in order to relieve the air pressure resulting from the dust dropping down in to the collection container.

Spillage that occurs from connecting and disconnecting to the flexible boot should be immediately cleaned up using a vacuum. A fixed vacuum duct may be plumbed into the inlet of the dust collector with a valve so that the spillage can be reintroduced into the dust collector. Also, frequent vacuum sweeping of the area around the dust collector should be performed.

Efficiency/Impact: Through the use and proper maintenance of the container covers most of the dust can be contained significantly reducing the amount of dust that could leak out to the environment. This would, in turn, greatly reduce the impact from this source of suspended solids and metals to the storm water discharge.

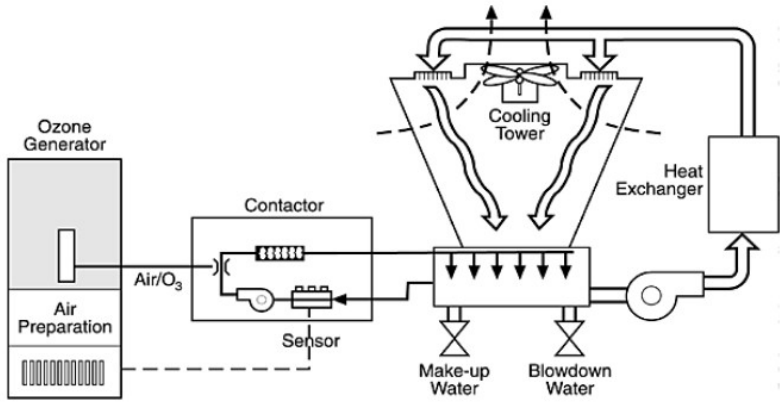
BMP 13 Ozone Generators for Cooling Towers

Activity: The use of cooling towers with the associated water treatment chemicals and blowdown discharges.

Typical Pollutants: Biocides, algaecides, fungicides, and corrosion inhibitors (BOD, COD); suspended solids; zinc; and copper

Typical Problem: Chemicals such as Biocides, Algaecides, and Corrosion Inhibitors are added to cooling towers to prevent biological growth, and to reduce scaling and corrosion. Periodically cooling tower water must be blown down in order to remove sediment and particulate buildup in the cooling tower sump. This water should be discharged to sanitary sewer but may not be in areas where a sanitary sewer is not available. Even when the water is discharged to a sanitary sewer an upset can occur in which the cooling tower sump water is discharged to outside areas and comes in contact with storm water. This water can contain elevated levels of copper, zinc, and chemicals with high BOD_5 and COD.

BMP: Use ozone instead of chemicals to control biological growth and scaling. Ozone is a powerful oxidizing agent. It has one and one-half times the oxidizing potential of chlorine. A properly operated and controlled ozone treatment system will not allow microorganisms that secrete the glue-like substance called mucilage to survive and will break down existing mucilage. Microbiological induced corrosion (MIC) can be controlled through the use of ozone. The pH of the water when using ozone is around 8 in comparison to levels typically below 7 when using chemical treatment. Cooling tower sumps can be vacuumed out using a swimming pool type vacuum. With little or no biological growth, the absence of chemical additives, and the absence of scaling sediment, particulate accumulation can be restricted to airborne particulates for the most part which should reduce the frequency for the need to remove sediments and particulates by blowing down the sump. Use of a swimming pool vacuum cleaner could eliminate almost all blowdown.

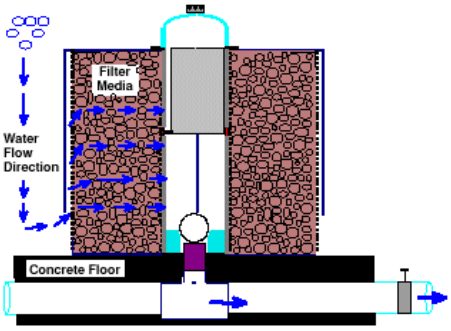


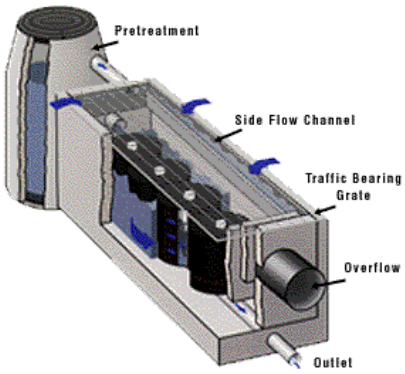
An alternative to introducing ozone is the use of ultraviolet light disinfection to control microbial growth in cooling tower water. In this case the cooling tower is recirculated through the UV unit which kills organisms attempting to grow in the water. Blowdown will still have to occur but will probably be required at a reduced frequency over that necessary when chemicals are used. The computer chip industry has used this method for their ultrapure water processes for years and the machinery coolant recycling equipment industry has also been using UV treatment units to eliminated biological growth in their coolant recycling equipment.

Efficiency/Impact: By replacing chemical additives with ozone or UV treatment and using a swimming pool vacuum cleaner for sediment removal, potential pollutants from this source to the storm water conveyances can be reduced or eliminated.

BMP 14 Cartridge Filtration

Activity: Operations with exposed copper and/or galvanized piping, galvanized siding and/or roofing materials, cathodic protection coatings of copper such as may be found on boats, or other exposed copper, brass, and/or zinc coated materials that are exposed to storm water may have significant levels of these metals present in their storm water discharge. Operations involving heavy vehicle traffic may also have metals in their storm water discharge such as copper from brake shoes and clutches or zinc from tire wear.





Vault type filters

Typical Pollutants: Copper, zinc, PAH, and Total Suspended Solids

Typical Problem: Dust from tires (1% Zinc wear rate = 90mg/km/tire) and clutch/brake mechanisms, deterioration from galvanized building materials or corrosion and/or oxidation of copper piping and fixtures cause discharges of particulate and dissolved chemical forms of copper and zinc to the environment when contacted by storm water. Copper based cathodic protection on boats and other equipment generates chemical and particulate forms of copper that becomes combined with storm water.

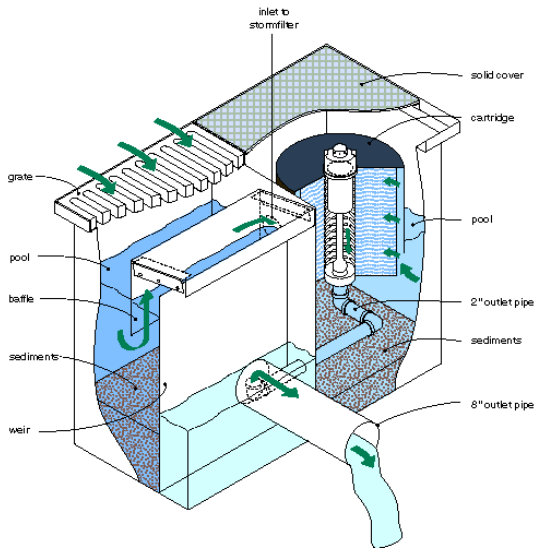
BMP: The installation of properly sized compost filtration units can remove significant amounts of both chemical and particulate forms of some heavy metals, including copper and zinc, and reduce TSS levels in the storm water discharge. Colloidal particulate levels from clay soils should also be reduced effectively.

Effectiveness/Impact: Evaluation of existing sites over a three-year period show that the mean reductions of pollutants in storm water for the following were achieved:

For Compost Media

TDS	**22.4%**	**Turbidity**	**91.8%**
COD	**70.4%**	**Total Phosphorus**	**44.9%**
Lead	**44.9%**	**Zinc**	**83.2%**
Copper	**65.3%**	**Oil & Grease**	**80.9%**

In general, reductions for Heavy Metals can be expected to be in the range of 65 to 95% and for Oil & Grease up to 85% for a properly designed and sized system.



Catch Basin type filter

Roof Downspout type filter

BMP 15 Sweeping

Activity: Operations that have exposed copper and/or galvanized piping, galvanized siding and/or roofing materials, or other exposed copper, brass, and/or zinc coated materials exposed to storm water can have significant levels of these metals present in the storm water discharge. Operations involving heavy vehicle traffic also produce elevated metal levels in storm water from vehicle brake shoes or clutches (copper) and tire particles (1% zinc wear rate = 90mg/km/tire).

Typical Pollutants: Total Suspended Solids, PAH, Copper, Zinc.

Typical Problem: Dust from tires and clutch or brake mechanisms, deterioration from galvanized building materials, or corrosion and/or oxidation of copper piping and fixtures cause discharges of particulate and dissolved chemical forms of copper and zinc to the environment when contacted by storm water. Copper based cathodic protection on boats and other equipment also generate dissolved chemical and particulate forms of copper that can become combined with storm water.

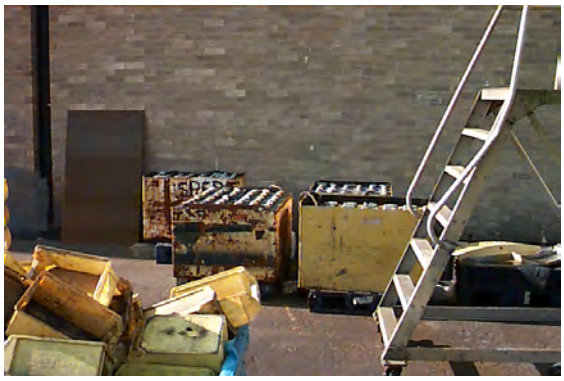
BMP: Sweeping of paved roads, parking lots, and storage areas with a type of vacuum sweeper that incorporates HEPA filtration or other high efficiency method of filtration of the exhaust air from the sweeper to trap the very fine metallic particles found in road or parking lot dust can reduce these discharges to storm water.

Ensure that good control measures are implemented when dumping the contents of the sweeper and practice proper disposal methods for the emptied contents to ensure that there is no adverse environmental impact after spending so much effort in the initial clean-up.

Efficiency/Impact: This type of Sweeper is capable of collecting and containing up to 99.6% of particles as small as 2.5 microns in size. The elimination of particulates in storm water is related to the frequency of sweeping as is shown comparisons of various types of sweepers in the following graph.

There are sweeper certifications, PM-10 and AQMD, which both are high effeciency sweepers that can contain small particle sizes. Some models, as shown below, contain hoppers which can be emptied directly into a dumpster or dump and debris as it is picked up from the floor and passed through a polyester filter. When the hopper is full, it can be emptied directly into a dumpster or dump truck, minimizing the chance of particulate matter being re-released into the air. Information from the manufacturer, reports that the sweepers will retain particles 10 microns, or 0.001 mm, or larger. The smaller size of the model and four-wheel steering makes it easy to maneuver in small spaces that traditional sweepers would not fit.

BMP 16 Battery Storage



Activity: The outdoor replacement or storage of lead/acid or nickel/cadmium batteries and the long time storage of vehicles or battery powered equipment outside.

Typical Pollutants: Soluble metals such as lead, nickel, or cadmium, Sulfuric acid

Typical Problem: When batteries are replaced, the used batteries are generally stored around a site until enough have been collected to make it feasible to either have them picked up or shipped out to a battery recycler. These batteries are usually stored on the shop floor or outside without containment and with no thought of exposure to storm water. Sometimes electric lift trucks, pallet jacks, welders, portable powered pumps, etc. are stored outside with the batteries used for starting or for operation left in place and poorly protected from storm water contact. Lead sulfate usually present on lead/acid batteries or in the spillage of the lead/acid or nickel-cadmium/acid solution can create soil contamination and a storm water run-off problem.

BMP: Batteries should be stored in a contained area protected from the weather. Containment pallets can be used to collect any acid spillage. The pallets should be placed inside of buildings to keep storm water from coming into contact with the batteries.

Efficiency/Impact: Containment, protection from the weather, and frequent shipment to the recycler can minimize or eliminate the adverse storm water impact from this potential source of contamination.

BMP 17 Wrecked Vehicle Storage & Scrap Metal Recycling

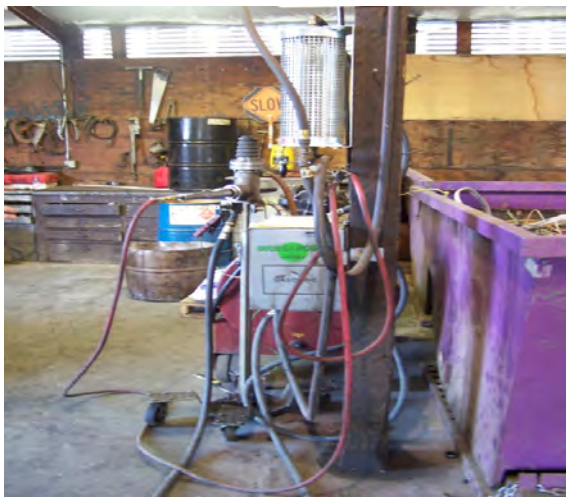
Activity: Wrecked or Damaged Vehicle Storage or Scrap Metal Recycling

Typical Pollutants: Antifreeze (ethylene glycol), gasoline, oil, grease, brake fluid, diesel

Typical Problem: Depending on the damage to the vehicle, fluids may leak due to the damage incurred and/or the damage may expose oily components of the vehicle that would normally be protected from the weather. Storm water will contact these contaminants and infiltrate the ground, contaminating the soil and groundwater at the site and combining with storm water runoff, depending on the rainfall and soil conditions, to waters of the State.

BMP: Provide containment of wrecked vehicles on impervious surfaces. If wrecked vehicles are stored on impervious surfaces, the drainage from those surfaces should pass through an oil/water separator prior to discharging to a storm water drainage system or to a storm water sewer. Insure that all fluids are completely drained from wrecked vehicles. If possible, provide a roofed storage area to prevent storm water contact with wrecked or damaged vehicles.

Fluid Vacuum Extraction System



Fluid Vacuum Drill System

Remove engine oil, transmission fluid, rear-end oil, antifreeze, Freon, and any other fluids before storing the vehicles on the site.

Fluid Gravity Drain System

Efficiency/Impact: Storage of all vehicles under a roof with a storm water divergence berm should, by eliminating storm water contact and allowing collection of potential contaminants, eliminate storm water concerns. Providing an impervious surface for the vehicles should eliminate the concern for groundwater contamination. Draining of the vehicle fluids would minimize but not eliminate the contaminant(s) concern.

BMP 18 Paint Stripping

Activity: Stripping coatings (paint, plastic, etc.) from metal and wood surfaces outdoors.

Typical Pollutants: Hazardous stripping chemicals, lead from old lead based paints, zinc chromate from old paint preparations, metal particulate, low pH, and increased suspended solids

Typical Problem: Stripping of wood and metal parts is usually accomplished with the use of chemicals that have health and environmental hazards. High pressure water blasting can cause increased runoff and can, in the case of blasting wood, damage the surface. Sand blasting creates a large amount of solids to dispose, i.e. the sand plus the paint removed which may be considered hazardous waste.

BMP: Consider using dry ice or baking soda abrasion type removal of old surface coatings instead of chemical or sand blasting. The dry ice system removes the surface

coating and leaves only the material removed on the ground, which can be vacuumed or swept up. Using baking soda as the blasting agent leaves the material removed plus baking soda which is not typically harmful and can be fairly easily separated from the paint removed with it by using reclamation equipment or through dissolving the baking soda in water and separating the paint by sedimentation and then evaporating the water. Use a removable ground cover before blasting to ease the cleanup efforts at job completion.

Another consideration is the use of a temporary or portable structure to contain and isolate the work and debris from the stripping from contact with storm water runoff such as the temporary structure on the left used to protect a boat during hull stripping.

Efficiency/Impact: By placing a removable ground cover such as a plastic tarp down prior to conducting the work and using one of the blasting methods mentioned or building a temporary structure, virtually all of the removed material can easily be cleaned up with minimal volumes of material involved. Disposal will be less costly when less volume of combined materials are involved over the conventional sand blasting methods. The overall impact to the environment and especially to storm water discharges will be minimized or eliminated.

BMP 19 Equipment Covers

Activity: Storage of used or new equipment outside exposed to rain and snow fall.

Typical Pollutants: Metals, TSS, Oil & Grease

Typical Problem: During the removal and installation of production or facilities equipment, the equipment is typically stored outside exposed to the elements for short durations in the case of new equipment being installed or for longer duration for equipment removed from service. This may allow rainwater or snow melt to wash oil and grease along with metal solids into the stormwater runoff.

BMP: Obtain tarps or plastic sheeting and wood bracing or pallets in the case of used equipment to keep the equipment above the surface water runoff and to eliminate the exposure of the equipment to rainfall and snowfall. The tarps or sheeting must be securely anchored to minimize the maintenance activities that may be needed to keep the protection in place.

Efficiency/Impact: Except for the times that the equipment is being place in the buildings or unloaded/loaded on trucks for shipping this sours of contaminants should be able to be eliminated.

BMP 20 Brake Shoe Replacement

Activity: Vehicle repair/brake shoe replacement including materials handling vehicles.

Typical Pollutants: Asbestos, copper, total suspended solids

Typical Problem: Dust in the brake shoe/wheel housing is typically disturbed and can be released into the environment when brake shoes are replaced. This dust will migrate from inside buildings to outside areas creating an asbestos and/or increased copper discharge when contacted by storm water.

BMP: Use the Low Pressure/Wet Cleaning Method described below for dust removal in brake shoe housings. Some older brake shoes may still be present which contain asbestos. Some new brake shoes on mobile equipment still contain asbestos. Brake shoes contain copper compounds in addition to other materials. The dust in the brake shoe housing can, because of its micron and submicron size, escape the shop area and contaminate the site to a level that, when contacted by storm water, may exceed the copper discharge benchmark. If a vacuum is used, ensure that it is of a type that has a HEPA filtration system that can retain the micron sized particles.

Low Pressure/Wet Cleaning Method

- A drip pan shall be placed under the brake assembly, positioned to avoid splashes and spills.
- The reservoir shall contain water containing an organic solvent or wetting agent. The flow of liquid shall be controlled such that the brake assembly is gently flooded to prevent the asbestos-containing brake dust from becoming airborne.
- The aqueous solution shall be allowed to flow between the brake drum and brake support before the drum is removed.
- After removing the brake drum, the wheel hub and back of the brake assembly shall be thoroughly wetted to suppress dust.
- The brake support plate, brake shoes and brake components used to attach the brake shoes shall be thoroughly washed before removing the old shoes.

- In systems using filters, the filters, when full, shall be first wetted with a fine mist of water, then removed and placed immediately in an impermeable container, properly labeled and disposed.

- Any spills of asbestos-containing aqueous solution or any asbestos-containing waste material shall be cleaned up immediately and properly disposed.

- The use of dry brushing during low pressure/wet cleaning operations is prohibited.

Efficiency/Impact: Use of the wet method for removing the dust in the wheel/brake housing or the use of a HEPA vacuum will significantly reduce or eliminate this practice as a source for copper or asbestos in storm water. It will also significantly reduce the potential health hazard associated with asbestos exposure to employees.

BMP 21 Employee Environmental Training

Activity: Employee environmental education and training.

Typical Pollutants: All

Typical Problem: Many employees are not aware of the potential adverse impact the company's business may have on the environment or how they personally can affect those impacts. They may not have even thought about environmental impacts and cannot recognize bad practices. Some may not know whom to inform of upsets or potential problems.

BMP: Provide periodic training that describes the potential adverse environmental impacts of the business and methods for preventing those impacts. The training should:

- Describe how the company is being environmentally responsible.
- Encourage employees to bring forth suggestions for improving the environmental performance of the business.
- Describe how and to whom the employee should report potential environmentally relate concerns.
- Inform the employee of what to do.
- Provide incentives to employees to offer ideas for improvement.

Record attendance of the training. Show graphics in the presentation such as pictures of the various parts of the site under discussion during the presentation. Schedule regular inspections of the site looking for possible conditions or operations that could produce potential adverse environmental impacts. Use a team approach to this inspection, as it is too easy, even for professionals, to acquire tunnel vision during the inspection. During the site inspections, write up every questionable item or practice for later thought or resolution. To resolve or dismiss a suggestion or

question during the inspection may distract from the process of the inspection or discourage employees from providing their input. Do not associate biodegradable with environmentally safe. Verify that the company is not moving wastes from one media to another, i.e. water to air, storm water to groundwater, etc.

Before the training takes place, analyze the potential problem areas of the site and the potential for how the site's manufacturing process can adversely impact the environment. Develop the training program presentation around these areas. Ask the question "what message am I trying to present?" and thoroughly provide the information necessary to answer the question. How and to whom should it be reported? Involve employees in the presentation through discussion items. Don't over look providing this training to temporary employees.

Efficiency/Impact: By making employees aware of the potential adverse impacts of the business and encouraging employees to offer ideas and suggestions, employers will see, not only a decrease in pollutants in their storm water discharge but, potentially in air, hazardous waste, and other media.

BMP 22 Housekeeping

Activity: Any site that stores material outside.

Typical Pollutants: Total suspended solids from erosion, oil and grease, BOD_5, heavy metals.

Typical Problem: Poor housekeeping inside and outside on a site provide a possible indicator of the degree of the site's compliance with environmental, health and safety regulations. In addition, poor outside housekeeping tends to discharge paper, cardboard, wood, pallet and box strapping, and other wastes to the storm water conveyance system. These wastes can plug the storm water conveyances, and divert storm water flows causing increased erosion and localized flooding.

BMP: Good housekeeping includes:

- Orderly storage of bags, drums, and piles of materials and chemicals; prompt cleanup of spilled liquids;
- Frequent sweeping, vacuuming, or other cleanup methods for accumulated dry chemicals and materials can cut down on possible storm water contamination;
- Proper disposal of toxic and hazardous wastes, and
- Removal of accumulated scrap and spare parts.

Good housekeeping doesn't just happen. It occurs when it is well planned, scheduled, and when upper management demonstrates its importance by participating in regular inspections. Set aside time in the work schedule for cleanup activities.

- Schedule personnel to be responsible for the cleanup and rotate every employee through the schedule.
- Periodic inspections and regular site cleanup can prevent problems from occurring. The frequency of outside inspections should be increased during the October through May rainy period.
- Encourage employees to pick up trash when it is seen and to report when more intensive clean up is needed.

Every site that is environmentally responsible has good housekeeping activities. Most sites with environmental problems do not have good housekeeping activities.

Efficiency/Impact: The implementation of a formal housekeeping program with education and encouragement of employees can reduce or eliminate pollution by bringing the importance of how materials are stored and how trash can affect the storm water discharges to their attention along with the importance that management places on the issue. A regular maintenance schedule for storm water conveyances minimizes erosion and visually verifies the condition of the storm water discharges. Several typical pollutants in storm water can readily be identified by visual observance.

BMP 23 Lawn Care

Activity: Facilities having lawns or vegetated areas.

Typical Pollutants: Fertilizers, pesticides, herbicides, fungicides, phosphorus, nitrogen, zinc, copper, and pH.

Typical Problem: Lawn care entails the application of fertilizers, herbicides, pesticides, and water in order to achieve a rich vibrant lawn. Weeds are quite often controlled through the application of chemicals. Over fertilizing and the over-application of pesticides and herbicides can contaminate storm water. Too much irrigation can wash these chemicals off the site into storm water conveyances, streams, rivers, and lakes. The nutrients, phosphorus, nitrogen, and pH can be detrimental to slow moving water bodies by encouraging algae growth. Herbicides and pesticides can adversely impact human health, fish and other wildlife. All of these pollutants can significantly affect the beneficial uses of water bodies.

BMP: If a landscape contractor is hired to take care of the lawn and other vegetated areas of the site, ensure that they do their part to protect the environment by applying the appropriate amount of chemicals. Encourage them to investigate more environmentally friendly alternatives to the use of chemicals such as a thin layer of compost on top of the lawn in the fall.

A few simple precautions can minimize adverse environmental impacts from lawn care. No matter what chemicals are used, over-watering can move the chemicals in to the storm water conveyance system. Use rain measuring equipment to automatically prevent automatic lawn sprinklers from turning on. In the Northwest, watering to a depth of six inches a couple of times a week is sufficient for a lush green growth. Always water in the morning, between 6 a.m. and noon, or in the evening around sundown so that the water has time to infiltrate before it evaporates

Fertilization:

For lawn fertilization, 1,000 square feet of lawn requires 0.5 pound of nitrogen per month of active growth(~8 months in Portland area ~ 4 pounds). A good ratio for fertilizer is 3 parts nitrogen

to 1 part phosphorus to 2 parts potassium to 1 part sulfur (3:1:2:1). Use a slow release fertilizer such as one containing water insoluble nitrogen (WIN). After determining the amount of fertilizer to use per year based upon the growing season, apply the fertilizer in four equal applications of approximately one pound per 1,000 square feet each application, i.e. 1/4 in early spring, 1/4 in late spring, 1/4 in late summer, and 1/4 in the fall.

Have your site's soil tested to determine if other materials such as iron (for low pH soil < 6.8), boron, chlorine, copper, manganese, molybdenum, nickel, and zinc should be added for a healthy lawn. If soil testing indicates that one or more of the additives above is needed, contact your county Extension Agent, a lawn and garden center, or a master gardener for advice on how much of the additives to apply for optimum growing conditions.

Fertilizer over-use, over watering, and watering at the wrong time of the day set up a good environment for many grass diseases and for invasion by weeds that are very competitive with the grasses in the lawn.

Pest Management:

Pest management can be conducted in an environmentally friendly manner through:

- **Knowledge**
  1. knowing the variety of grass in your lawn;
  2. knowing its growth characteristics; and

- **Identification**
  1. identifying the weeds present;
  2. identifying the grass disease present; and/or
  3. identifying the insect pests present
     a). Note where the pest is located on the lawn
     b). Draw a picture of the pest or collect a sample
        i. Research in books for a match of the pest found to a photograph;
        ii. Contact local County Extension office for assistance and advice; or
        iii. Take sample to local home and garden center for identification.

Weed removal is best accomplished by hand-pulling.

Maintain a buffer strip next to waterways. Do not apply fertilizer or pesticides to this strip. It is used to absorb excess fertilizer from the care of the rest of the lawn. It will also retain excess nutrients and sediments.

Healthy Lawn

Step 1: Lawn conversion — Convert lawn areas into groundcover, trees, shrubs, or meadow plantings. For a low input approach, replace the grass underneath mature trees with groundcover. For an even lower input approach, examine your lawn for potential conversion areas and plant groundcovers, trees, shrubs, or perennials in all areas where grass is hard to grow. For the lowest input approach, use turf only where

it is the best plant to fulfill a particular function, such as providing children's sports area.

Step 2: Soil building	Provide a strong foundation for the lawn. For a low input lawn, get a soil test to determine the soil's pH and fertility. You may not need to add any lime or fertilizer to your lawn. For a lower input lawn, test for soil compaction. Can you sink a screwdriver into the ground without pounding or is the soil compacted? If the soil is compacted, aerate with a hand corer or mechanical aerator. For the lowest input lawn, examine the soil's texture- neither extremely sandy soils nor extremely heavy clay soils make for good lawns. Next count earthworms - if none can be found in a square foot of soil, there's a problem. A healthy soil community has over 10 per square foot. With this basic understanding of soil acidity, fertility, compaction, texture, and earth-worms, one can build soil that supports dense, healthy turf.
Step 3: Grass selection	Choose the type of grass that will be easiest to grow. For a low input lawn, select hardy grass species adapted to your region's climate. For a lower input lawn, select named grass varieties to meet your specific needs. For the lowest input lawn, try the new low input slow growing or dwarf grass mixes.
Step 4: Mowing and thatch management	Mow to the right height at the right time and recycle clippings. For a low input lawn, leave clippings on the lawn to provide nutrients and moisture. For a lower input lawn, set mowing height as high as possible. For the lowest input lawn, adjust mowing height and frequency during the growing season and monitor thatch levels.
Step 5: Minimal fertilization	Give the lawn what it needs but don't overfeed. For a low input lawn, recycle clippings and (in the right season) apply commercial fertilizer at half the recommended rate; avoid weed and feed formulations and don't fertilize if rain is imminent. For a lower input lawn, fertilize as above but use encapsulated nitrogen or an organic product instead and fertilize only if soil tests show it's needed. For the lowest input lawn, substitute home generated compost for commercial organic or encapsulated products.
Step 6: Weed control and tolerance	Establish a realistic tolerance level for weeds and use less toxic control methods to maintain it. For a low input lawn use least toxic weed control methods such as: cultivation, solarization, flaming, mowing, or herbicidal soap. For a lower input lawn, grow strong healthy grass and it will crowd out weeds. For the lowest input lawn, broaden your definition of "lawn" to include weeds that perform desirable functions.
Step 7: Integrated pest	Establish a realistic tolerance level for pests and use least toxic con-

management — trol methods to maintain it. For a low input lawn, use least toxic control methods such as removing or trapping pests, introducing biological control agents, or apply least toxic chemical controls such as insecticidal soaps. For a lower input lawn, grow strong, healthy grass that can resist attack. For the lowest input lawn, use cultural controls to prevent infestation, protect natural predators, and add beneficial soil microbes.

Step 8: Sensible irrigation — Practice water conserving landscaping techniques.
For a low input lawn, water infrequently, in the early morning, but soak the lawn well. For a lower input lawn, water only when the lawn definitely needs it, and calibrate sprinklers. For the lowest input lawn, accept that the grass may not be green year round.

Efficiency/Impact: Proper maintenance of lawns and vegetative strips can be pleasing to the eye and provide environmental benefits such as reduced pollution to streams, rivers, and lakes, cooler runoff, reduce sediments in the runoff, and in some cases reduce other pollutants from the site. The degree that this BMP will be effective is directly proportional to the degree of involvement in the care of the lawn or the degree of caution exercised in selecting a lawn care contractor and the degree that the watering system is in tune with the lawn and the weather.

BMP 24 Dumpster Covering

Activity: Storage of general rubbish or food rubbish outside in dumpsters.

Typical Pollutants: Suspended solids, nutrients, bacteria, dioxin, chemicals

Typical Problem: Waste materials are typically removed from inside the site buildings to a collection container (dumpster) outside of the buildings. If these dumpsters have an open top or the top is left open at times when materials are not being dumped into them, storm water makes contact and will mix with the wastes and leak out to the storm water discharge conveyances for the site.

BMP: There are two effective methods for addressing this concern. At the end of a building, extend the roof over the area where the dumpsters will be placed to keep storm water out. Slope the floor that the dumpsters are sitting on to a drain where the contaminated storm water/dumpster drainage can be collected and discharged to a sanitary sewer, if necessary.

The other method is to ensure that covers are on all of the dumpsters and that the covers are lowered when wastes are not being discharged into them. The second method has the most risk in that this method relies on employees always performing the proper procedure and many different situations can arise that may interrupt the procedure and prevent it from occurring. No matter which method is used, ensure that no storm water catch basin is located close by.

Efficiency/Impact: Either method for protecting wastes from storm water exposure will minimize or eliminate storm water pollution from this source. The method that relies on the least effort from employees is usually the most reliable.

BMP 25 Semi-Trucks and Trailers

Activity: Trucking firms or other operations in which semi trailers are parked on site and dollies are used to attach to the trailers to move the trailers around the site or operations in which semi tractors are used on site.

Typical Pollutants: Oil and grease

Typical Problem: Fifth wheel hitching mechanisms used to attach semi-tractors or Yard Goats to semi-trailers have a thick coating of grease on them to minimize the friction encountered and to ease the attachment process during connection of tractors or Yard Goats to the trailers. When the Yard Goats or semi-tractors are parked and not attached to trailers the grease on the fifth wheel is exposed to storm water. This allows the storm water run-off to pick up the oil and grease.

BMP: Manufacture or purchase a quick install cover to slip over the hitch. A simple lightweight inexpensive cylindrical slip-on cover could be made out of fiberglass. Ensure that all operators of the equipment are instructed to place the cover over the hitches when they are not being used. Changing from the lubricated type fifth wheel hitch to a Teflon non-lubricated type is a better approach but, if rental or transit trailers are in use frequently this may not be a viable option due to the requirement that both the trailer and the tractor fifth wheel slider plates need to be coated with the Teflon.

Efficiency/Impact: While there will always be some exposure especially at the times the covers are removed for making the connections and the moving of the trailers, this method should minimize the adverse impact that the practice has on the storm water run-

off.

BMP 26 Fueling and Liquid Loading/Unloading Operations

Activity: Fueling operations performed by employees on-site or through restricted access systems such as Cardlock sites in various locals across the State.

Typical Pollutants: Gasoline and diesel fuels (Petroleum Hydrocarbon)

Typical Problem: Fueling nozzles can stick in the open or on position when fueling vehicles. Loading/unloading hoses can leak or become disconnected. Employees some times are not instructed in the correct methods for spill clean-up. Frequently, spill clean-up materials are not available at the dispensing pumps 0r the loading areas. Fueling stations may not have roofed areas or properly sloped or contained areas for collecting spilled fuel. All of these situations and conditions can result in fuel or other liquids contacting storm water and entering the site runoff.

Cover

Berm

BMP: The fueling area should be designed and operated to minimize contact between spilled fuel, leaked fluids, and storm water. This can be accomplished through roofing the dispensing/loading/unloading area and providing an impervious berm to keep the surface runoff outside the liquid dispensing/loading/unloading areas.

- Use a damp cloth on the pumps and a damp mop on the pavement for area clean up.
- Clean up spills immediately:
  - Spread absorbent material and sweep it up with a broom.

  - Perform a hazardous waste determination on the absorbed material.
  - Dispose of the absorbed material properly.
- Ensure that the overfill nozzle protection is in working order.
- Do not try to top off tanks. Stop filling when the dispensing nozzle shuts off the first time.
- Remove any nozzle locking mechanism which allows the fuel to stay on with the operator absent. The operator should be present at all times to ensure that overfilling and spillage does not occur.
- Cover fueling areas and berm/slope the pavement under the roof to a drain system that is connected to a holding tank or contains the spillage at the surface for easy clean up.
- Provide an easily accessible and well-marked emergency shutoff for pumps with plainly written instructions on how to operate the shutoff**.**
- Never hose down the fueling area.
- Don't drain spills to the sanitary or the storm water sewers.
- Ensure that the fueling area has an undamaged continuous paved or otherwise impervious surface.
- Ensure that spill cleanup materials are readily available.
- For areas where multiple customers or operators from multiple companies have access, provide highly visible, simple instructions on how to clean up spills and report the incidence.
- Provide well placed, understandable instructions on the proper procedures to follow in the event of an emergency, including reporting information.

Efficiency/Impact: Implementation of this BMP can virtually eliminate this potential source of storm water contamination provided site inspection is frequently performed.

BMP 27 Parking Lots and Yards

Activity: Using gravel areas that do not have a geotextile underlay for vehicle storage, parking or other industrial usage.

Typical Pollutants: Total Suspended Solids, (TSS) turbidity, metals, oil, and other pollutants which attach to soil particles.

Typical Problem: Vehicle wheels push the gravel into the underlying soil and pumps the fine soils up through the gravel.

BMP: Remove some of the gravel, place geotextile fabric, and reapply clean gravel on top. This will allow water to migrate through but provide a barrier to gravel soil movement.

Efficiency/Impact: Use of geotextiles to separate soil and rock in roadbeds and in parking lots greatly reduces the amount of soil available to migrate off site in the stormwater runoff. There is a much less expensive method than either asphalt or concrete paving to reduce the sediment and turbidity in the stormwater runoff. The use of these fabrics will normally reduce the level of soil in the runoff to below permitted levels

BMP 28 Stormwater Diversion - Speed Bumps and Speed Humps

Activity: Diverting runoff from sensitive areas or diverting it to an area where it can be treated or controlled

Typical Pollutants: Fertilizers, fuel, alcohol, granular products, just about any type of chemical, TSS, and etc.

Typical Problem: Either stormwater runs into an area that you do not want it to go and becomes contaminated or a product migrates into the stormwater runoff.

BMP: Install an asphalt or a concrete or a temporary removable berm to either retain the product or divert the stormwater. In areas where the berm (width and height are approximately the same) would cause problems due to its height and short width, extend the width and make it into a hump (width is typically six or more times the height). The hump would work well where tractor trailer or lift truck operations occur. Humps are presently used in some cities to cause vehicle to slow down without the ability to cause major damage to the vehicles when crossed at reasonable speeds.

Efficiency/Impact: Implementing this control will greatly reduce or illuminate the mixing of pollutants from the mixing and can greatly facilitate the treatment of the runoff by keeping the volume of the runoff that needs to be treated to a minimum.

BMP 29 Grassy Filter Strip and Planter

Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant discharges in their storm water runoff to levels below the benchmarks. Unused excess land may be necessary to implement these BMPs.

Typical Pollutants: Sediment (TSS), PAH, metals, BOD, phosphorus, and hydrocarbons (Oil & Grease)

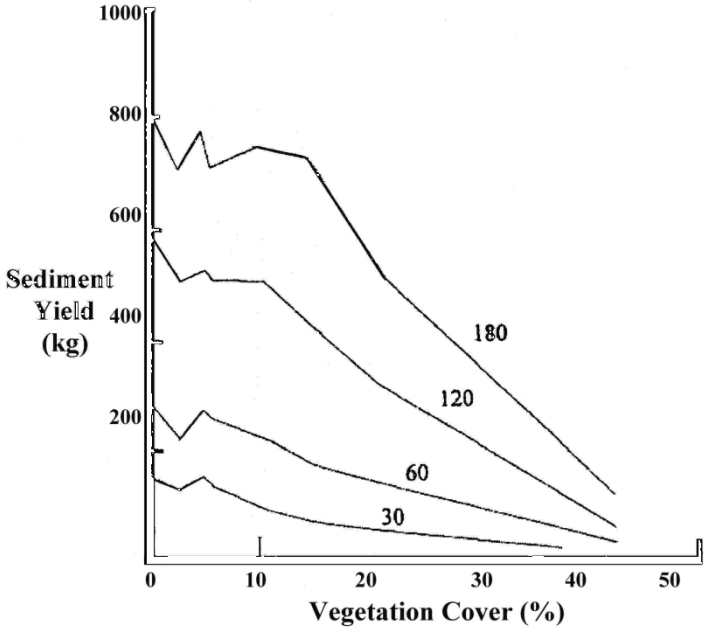
Typical Problem: When the implementation of specific point source BMPs has not eliminated or reduced the contaminants in the storm water to the specific benchmarks, end of the pipe or final discharge BMPs may be necessary.

BMP: Install a grassy filter strip and ensure that the storm water passes through the strip in sheet flow**.** Vegetated filter (buffer) strips are best used on sites with sheet runoff, such as parking lots.

- Effective filter strip widths range from a minimum of 50 feet to a maximum of 200 feet.
- Best for smaller drainage basins, five acres or less.
- Not suitable on slopes or sites with shallow depth to bedrock .
- Best for sheet flow. Do not use on slopes over 10%.
- Good for conventional pollutants.
- Cannot be used to convey larger storms, or concentrated flow discharges as their effectiveness will be destroyed plus they could become sources of pollution through erosion.
- Best grasses are tall fescue, followed by western wheatgrass, annual or Italian Ryegrass, Kentucky Bluegrass.
- Rectangular and V shaped cross sections are the least desirable.
- Design to create a low velocity flow, bent grass is not as good a filter.
- Curbing for impervious areas draining to the filter strips should have a one-foot gap every five feet.

Efficiency/Impact: Properly sized and maintained vegetated filter strips can have a removal efficiency of up to 80 percent for suspended solids.

The graph on the right shows for different simulated rainfall events of a specific intensity and various durations of 30 to 180 minutes, the effect vegetation cover has on the retention and removal of sediment from a site with a 10 % slope.



BMP 30 Catch Basin Insert Bag

Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant discharges in their storm water runoff to levels below the benchmarks. Unused excess land may be necessary to implement these BMPs.

Typical Pollutants: Sediment (TSS), PAH, metals, BOD, phosphorus, and hydrocarbons (Oil & Grease)

Typical Problem: When the implementation of specific point source BMPs has not eliminated or reduced the contaminants in the storm water to the specific benchmarks, end of the pipe or final discharge BMPs may be necessary.

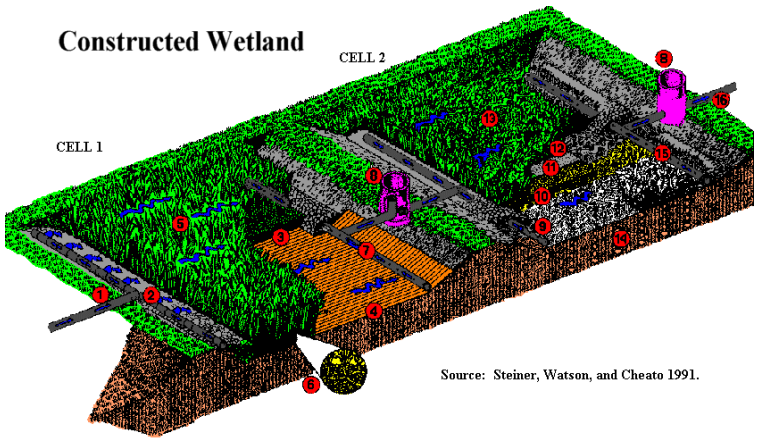
BMP: Install a catch basin filter system (**normal flow**) without overflow slots in the filter media: a catch basin coupled with a sump and sediment traps (i.e. trapped or Lynch style catch basins). May also be used with an inlet device, prefiltering insert and screens (see other facilities and retrofit). The inserts consist of several filtering trays suspended from the inlet grate. Common filters are charcoal, wood fibers or fiberglass.

- Retains small particles, partially effective with high levels of particulate heavy metals, oil/grease, and TSS. Moderate reduction in TSS and turbidity. However, few pollutants are associated with these coarser solids.
- Disadvantage: When 60% full, the suspended solid deposition is in equilibrium with scour, and the capture efficiency is reduced to zero.
- Best in small basins and with treatment of highly turbid runoff prior to discharge to catch basin.
- Do not use on unstable or steep slopes.
- Usually used with vaults, tanks, sumps or inverted (hood) inlet. Inlet can be coupled with a filtration system (see retrofit).
- Maintenance is critical and must be at least semiannual. Require a maintenance schedule and plan for disposal of material removed by the catch basin.
- Insert maintenance is required quarterly and should be inspected more frequently during wet periods.
- Catch basins with a restrictor device (multiple orifice and weir/riser section) for controlling outflow provide minimal control for floatables and petroleum based products.
- Design the size of catch basin sump to handle the site runoff rate, TSS concentration in runoff and how often it will be cleaned out.
- To minimize groundwater pollution problems, be careful where infiltrating catch basins are used (residential areas) and pre-treat the infiltration water.
- **Using a Catch Basin Insert Filter Bag with a bypass or overflow is not recommended as they tend to bypass the inflow almost all of the time. Even during a relatively small rainfall event the types of catch basin insert bags with an overflow or bypass will tend to bypass on trapped (Lynch) type catch basins a significant amount of the runoff**

thereby eliminating the benefits of using this BMP. Using an insert bag without an overflow or bypass may result in flow back up and cause temporary local flooding unless the bag has the largest surface area (filtering area) inside of the bag possible for the size of the catch basin in which it is used.

Efficiency/Impact: Catch Basin Filter System Efficiency: TSS up to 22%, and Turbidity up to 38%

BMP 31 Constructed Wetlands



See the Biofilters document at http://www.deq.state.or.us/wq/stormwater/docs/nwr/biofilters.pdf **for further information on Constructed Wetlands.**

Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant discharges in their storm water runoff to levels below the benchmarks. Unused excess land may be necessary to implement these BMPs.

Typical Pollutants: Sediment (TSS), PAH, metals, BOD, phosphorus, and hydrocarbons (Oil & Grease)

Typical Problem: When the implementation of specific point source BMPs has not eliminated or reduced the contaminants in the storm water to the specific benchmarks, end of the pipe or final discharge BMPs may be necessary.

BMP: Install a constructed wetland. Constructed wetlands are constructed by a combination of excavation and/or berming. The basic types of constructed wetlands are: shallow marsh, a 2 or 3 celled pond/marsh, extended-detention wetland and pocket wetland.

Storm water treatment facilities are not considered waters of the State, however, their discharge is regulated in the same way as any treatment system. Created wetlands built as mitigation for loss of wetlands under the Clean Water Act Section 404, are considered waters of the State. Created wetlands are protected as natural wetlands and cannot be used for conveyance or treatment of wastewater, unlike constructed wetlands.

- Extended-detention wetland and pocket wetlands are less effective in removal of some types

of pollution than other types of wetlands.

- The constructed wetland should be lined when located over permeable soils for permanent pool maintenance. This is to prevent potential groundwater and soil contamination. Use a Bentonite clay (12" thick) or commercial heavy plastic pond liner (minimum 40 ml). Place a minimum of 18" thick compacted soil over the liner prior to seeding.
- The permanent pool depth should be between three to six feet in depth, plus one foot of dead storage for sediment. Six feet is the maximum depth or the pond will stratify in summer and create low oxygen conditions which result in the re-release of phosphorus and other pollutants. In addition, if the pond is deeper than six feet, it will likely pollute the groundwater.
- Suitable for larger sites up to 100 acres.
- Soils should be tested to determine suitability. Best when located in clay loams, silty clay loams, sandy clays, silty clays and clays.
- Cannot be used in areas with shallow depth to bedrock or unstable slopes.
- Good for removal of nutrients and conventional pollutants such as oil and grease and some heavy metals.
- Needs to have a shallow marsh system in association to deal with nutrients.
- Should be multi-celled, preferably three of equal sizes. The first cell should be three feet deep to trap coarse sediments and slow turbulence. They need to be designed as a flow through facility, and the pond bottom should be flat to facilitate sedimentation.
- Need to be designed with periodic maintenance in mind by using an overhead scooping device.
- Side slopes should be 2:1, not steeper than 3:1, and 10 to 20 feet in width. A length to width ratio of 5:1 is preferred, with a minimum ratio of 2:1 to enhance water quality benefits. The longer length allows more travel time and opportunity for infiltration, biofiltration and sedimentation.
- Pond berm embankments over six feet should be designed by a registered engineer. Berm tops should be 15 feet wide for maintenance access and should be fenced for public safety.
- Shape should be long, narrow, and irregular since these are less prone to short circuiting, are more effective, and maximize the treatment area.
- Baffles can be used to increase the flow path and water residence time.
- Should have an overflow system/emergency spillway to accommodate a 100 year, 24 hour flood and a gravity drain.
- Maintenance is of primary importance. The site must be responsibly selected. A maintenance plan needs to address removal of dead vegetation (that release nutrients) prior to the winter wet season, debris removal from trash racks, sediment monitoring in forbays and in basin are likely to contain significant amounts of heavy metals and organics (regular testing is advised).
- Access to the wet pond is to be restricted with a gate and posted signs.
- For mosquito control, either stock the pond with fish or allow it to be drained for short periods of time (do not kill the marsh vegetation).
- Constructed wetland is more complex, with more vegetation, and shallower with greater surface area, hydrologic factors (flow) play a larger part in siting.
- Selection of vegetation should be done by a wetland specialist.
- Oil/water separators can be used prior to the constructed wetland, depending upon the surrounding land uses.
- Relatively low maintenance costs.
- Fence off for safety (children), to protect plants/wildlife.

- Disadvantages/constructed wetlands:
  a.) Constructed wetlands have a larger land requirement for equivalent service compared to a wet pond.
  b.) Relatively high construction costs.
  c.) Delayed efficiency until plants are well established (1–2 seasons).
- Buffer width 25 to 50 feet.
- Limit water level fluctuations, as they kill plants.

Efficiency/Impact: Wet pond/wetland removal efficiencies:*
a) Heavy metals = 40 to 80%;
b) Total Phosphorus = 40 to 80%
c) Total Nitrogen = 40 to 60%
d) TSS = 70%
e) Soluble reactive phosphorus 75%
f) Nitrate = 65%
g) Ammonia = -43
h) COD = 2
i) Total copper, lead and zinc = 80 to 95%

* Higher efficiencies are associated with use of O/G trap, larger pond/marsh area and volume. These efficiencies assume that the intensity of the storm water inflow does not exceed the capacity of the wetlands and that the pollutants are not in a concentrated form from a large spill or discharge.

BMP 32 Bioswales

See the Biofilters document at
http://www.deq.state.or.us/wq/stormwater/docs/nwr/biofilters.pdf **for further information on Bioswales.**

Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant discharges in their storm water runoff to levels below the benchmarks. Unused excess land may be necessary to implement these BMPs.

Typical Pollutants: Sediment (TSS), PAH, metals, BOD, phosphorus, and hydrocarbons (Oil & Grease)

Typical Problem: When the implementation of specific point source BMPs has not eliminated or reduced the contaminants in the storm water to the specific benchmarks, end of the pipe or final discharge BMPs may be necessary.

BMP: Install a grassy bioswale. Swales basically act as filters for runoff from frequent storms. The principle form of treatment is the settling out of pollutants and the use of vegetation to take up the dissolved fraction. For best results a swale should be designed to deal with the peak runoff for a two year, 24 hour storm event.

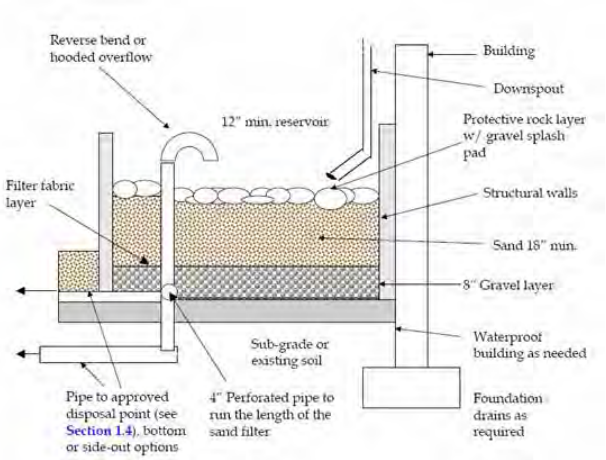
- Does well with first flush runoff, economically feasible, improves aesthetics and has minimal environmental impacts. Best in median strips and parking lot islands.
- The organic topsoil layer is good for degrading petroleum solvents, heavy metals, nutrients and hydrocarbons.
- Critical design elements: size of drainage area to be treated, location of bioretention areas, sizing guidelines, calculate water budget.
- Biofiltration is suitable for smaller sites 10 or less acres.
- Needs a minimum width of 20 feet.
- Must be graded to create sheet flow, not a concentrated stream. Sheet flow decreases the chance of producing gully erosion and distributes contaminants over a wider area. Level spreaders (i.e. slotted curbs) can be used to facilitate sheet flow.
- Can be placed anywhere with careful site design.
- Do not use on steep, unstable slopes or landslides.
- Can reduce peak flow rates.
- Best when used for treatment and conveyance of storm water after a settling pond.
- Good for nutrient removal and conventional pollutants such as suspended solids and some heavy metals.
- Best at 200 feet in length, in tight spaces obtain more length by using a curved path. Should have a maximum bottom width of 50 feet. One foot high check dams should be installed every 50 feet starting 20 feet downstream from the inflow point.
- Good when used at a storm water outfall, commercial development or roadside.

Efficiency/Impact: Bioswales can, when sized correctly and when incorporated with an upstream settling pond, provide similar pollutant removal efficiencies to those achieved by a biopond or constructed wetland.

Removal efficiencies:

a) TSS = 83 to 92%
b) Lead = 67%
c) Copper = 46%
d) Total phosphorus = 29 to 80%
e) Total zinc and aluminum = 63%
g) Oil/grease/TPH = 75%
h) Nitrate-N = 39 to 89%

BMP 33 Sand Filters



Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant discharges in their storm water runoff to levels below the benchmarks.

Typical Pollutants: Total Phosphorus, Heavy Metals, Bacteria, Total Nitrogen

Typical Problem: When the implementation of specific point source BMPs has not eliminated or reduced the contaminants in the storm water to the specific benchmarks, end of the pipe or final discharge BMPs may be necessary.

BMP: Installation of a sand filter has shown to reduce some heavy metals.

Efficiency/Impact: Research has shown zinc to be reduced to as little as 8% of the original concentration. More research is needed to determine the effect a sand filter will have on other metals. The mechanism for the removal of the metals is not completely understood at this time. Due to the particle size, this method should have negligible effect on the dissolved metals.

Typical Pollutant Removal Efficiency

Pollutant	Percent Removal	Pollutant	Percent Removal
Biochemical Oxygen Demand (BOD)	70	Total Kjeldahl Nitrogen (TKN)	46
Total Suspended Solids (TSS)	70	Total Phosphorus (TP)	33 - 85
Total Organic Carbon (TOC)	48	Iron (Fe)	45
Total Nitrogen (TN)	21-47	Lead (Pb)	45
Zinc (Zn)	45	Bacteria	55

BMP 34 Porous Pavers

Activity: Areas of a site in which uncontaminated runoff is occurring, the likelihood of chemical or fine particle spill is minimal, and the underlying soils have a capacity to infiltrate. This should also generally be an area of no or low weight vehicle traffic, i.e. sidewalks, passenger automobile parking or traffic areas.

Typical Pollutants: Oil & Grease, small quantities of biodegradable chemicals

Typical Problem: Fairly clean runoff is mixing with contaminated runoff such that the combined volume of runoff is expensive to treat or there is a desire to recharge the shallow subsurface aquifer rather than constructing additional drainage structures or systems.

BMP: Use pavers, porous concrete, and in some cases porous asphalt to provide drainage, surcharge of the shallow aquifer, and a reduction in the stormwater runoff.

Efficiency/Impact: Small amounts of petroleum contamination will be treated by the biota in the shallow soils beneath the porous material. If sediment is present refreshing the porosity can be challenging unless removable pavers are used. In the case of the use of porous asphalt it is unknown as to whether or not the asphalt can be renewed as it is doubtful that a sealcoat can be applied to extend the life of the material as can be done for standard parking lots or roads. If the porous material is properly designed and installed there is the ability to drain fairly large areas in western Oregon during the rainy season and thus reduce or eliminating storm water runoff. This BMP should not be used in areas that have a likelihood of spills or sediment loading.

BMP 35 Flocculation

Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant discharges in their storm water runoff to levels below the benchmarks. Unused excess land may be necessary to implement these BMPs.

Typical Pollutants: Sediment (TSS), PAH, metals, BOD, phosphorus, and hydrocarbons (Oil & Grease)

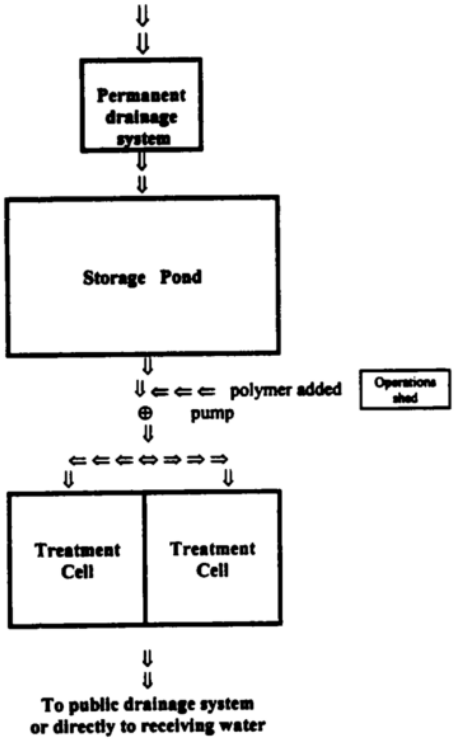
Typical Problem: When implementation of specific point source BMPs have not managed or eliminated the contaminants in the storm water to the benchmarks or below or where potential point sources for the contaminants cannot be identified, end of the pipe or final discharge BMPs may be necessary.

BMP: Install a flocculation system using a flocculent such as Chitosan, Calgon Cat Floc 2953, or a Polyaluminum Chloride such as Sumalchlor-50 or other.

Fine particles suspended in water give it a milky appearance, usually measured as turbidity. Their small size, often much less than 0.001 mm in diameter, give them a very large surface area relative to their volume compared to Total Suspended Solids particles that are in the range of 0.0015 mm in size and larger. These fine particles typically carry a negative surface charge. Largely because of these two factors, small size and negative charge, these particles tend to stay in suspension for extended periods of time. Because of this, removal is not practical by settling alone. Polymers and inorganic chemicals speed the process of clarification. The added chemical destabilizes the suspension and causes the smaller particles to agglomerate. The process consists of three steps: coagulation, flocculation, and settling or clarification.

The conditions under which clarification is achieved can affect performance.

Currents can reduce settling efficiency. Currents can be produced by wind, by differences between the temperature of the incoming water and the water in the clarifier, and by flow conditions near the inlets and outlets. Calm water such as that which occurs during batch clarification provides a good environment for effective performance, as many of these factors become less important in comparison to flow-through clarification basins. One source of currents that is likely important in batch systems is movement of the water leaving the clarifier unit. Given that flocs are relatively small and light the exit velocity of the water must be as low as possible. Sediment on the bottom of the basin can be resuspended and removed by fairly modest velocities.



Coagulants and flocculant-aids:

Polymers are large organic molecules that are made up of subunits linked together in a chain-like structure. Polymers that carry groups with positive charges are called cationic. Cationic polymers can be used as primary coagulants to destabilize negatively-charged turbidity particles present in storm water. Inorganic chemicals such as aluminum or ferric sulfate and aluminum or ferric chloride can also be used, as these chemi-

cals become positively charged when dispersed in water.

In practice, the only way to determine whether a polymer is effective for a specific application is to perform preliminary or on-site testing. Polymer effectiveness can degrade with time and also from other influences. Thus, manufacturers' recommendations for storage should be followed.

Application of coagulants and flocculent-aids at the appropriate concentration or dosage rate for optimum turbidity removal is important for management of chemical cost, as well as for effective performance. The optimum dose in a given application depends on several site-specific features. The turbidity of untreated water is a primary determinant. The surface charge of particles to be removed is also important, as previously noted. Environmental factors that can influence dosage rate are water temperature, pH, and the presence of constituents that consume or otherwise affect polymer effectiveness (for example, color, oils). Preparation of working solutions and thorough dispersal of polymers in water to be treated is also important to establish the appropriate dosage rate.

Design engineers wishing to review more detailed presentations on this subject are referred to the following textbooks:

- Fair, G., J. Geyer and D. Okun, *Water and Wastewater Engineering*, Wiley and Sons, NY, 1968.
- American Water Works Association, *Water Quality and Treatment*, McGraw-Hill, NY, 1990.
- Weber, W.J, *Physiochemical Processes for Water Quality Control*, Wiley and Sons, NY, 1972.

Comparisons

The above discussion indicates that the design and operation of a polymer system should take into consideration the factors that determine optimum, cost-effective performance. It may not be possible to fully incorporate all of the classic concepts into the design because of practical limitations at construction sites. Nonetheless it is important to recognize the following:

- The right polymer must be used at the right dosage. A dosage that is either too low or too high will not produce the lowest turbidity. There is an optimum dosage rate. This is a situation where the adage “more is always better” does not apply.
- The coagulant must be mixed rapidly into the water to ensure proper dispersion.
- A flocculation step is important to increase the rate of settling, to produce the lowest turbidity and to keep the dosage rate as low as possible.
- Too little energy input into the water during the flocculation stage results in flocs that are too small and/or insufficiently dense. Too much energy can rapidly destroy floc as it is formed.
- Since the volume of the basin is a determinant in the amount of energy per unit volume, a basin can be too big relative to the size of the energy input system.
- Care must be taken in the design of the withdrawal system to minimize outflow velocities.

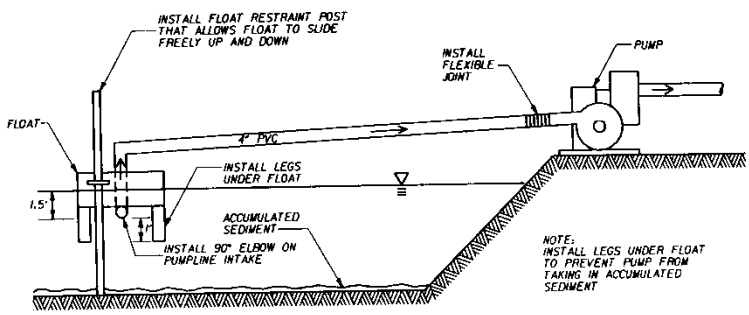
Number and volume of treatment cells

There are three reasons for having two rather than one treatment cell. First, if something goes wrong with the treatment of a particular batch, the contractor can continue treatment in the se-

cond cell while dealing with the problem in the first cell. The second reason is the uncertainty over the time required to achieve satisfactory clarification. If one had confidence that satisfactory settling could be achieved consistently within 30 to 60 minutes, it might be reasonable to conclude that only one cell is needed since turnover could occur rapidly. The third reason is the time to empty the cell after treatment. It therefore seems appropriate to use two cells.

The second consideration is the volume of the individual treatment cell. There are two opposing considerations in sizing the treatment cells. There is a desire to have a large cell- so as to be able to treat a large volume of water each time a batch is processed. However, the larger the cell the longer the time required to empty the cell. It is also possible that the larger the cell the less effective the flocculation process, and therefore the settling. The simplest approach to sizing the treatment cell is to multiply the allowable discharge rate by the desired draw-down time. The desired draw-down time is about four hours.

A four-hour draw-down time allows one batch per cell per eight hour work period. A batch can be prepared in the morning including an hour or so of flocculation followed by about two hours of settling followed by discharge, although discharge could occur after hours. Or a batch can be prepared in the afternoon, followed by settling overnight, with discharge the following morning. The main point is that it appears to be most logical to size the cell to fit the desired drawdown time, constrained by the allowable release rate.



FLOATING PUMPLINE INTAKE (TYP.)

Configuration of the outlet device

The withdrawal device used for removing the liquid from the settling pond should be designed so that pulling settled sediments from the bottom of the treatment cell in the vicinity of the device does not occur. Whether this is a problem is not known but it should be evaluated. One approach is to place the discharge outlet near the area where treated water enters the cell. At this location there will be relatively little accumulation of solid because of the turbulence created by the incoming water.
A second approach is to use the float configuration as in the diagram shown above. The use of four rather than one inlet pipe reduces the inlet velocity. Reduced inlet velocity reduces the possibility that sediments will be picked up and discharged from the settling pond.

A third approach is to modify the float to include a square circular weir that the water enters before reaching the outlet pipe. A circular weir with, say, 10 feet of circumference would significantly reduce the overflow rates (velocity) over the weir. As an example, examine how exit ve-

locities are kept as low as possible in water and wastewater clarifiers. These clarifiers include what is known as effluent launders. They are long troughs, placed at the outlet end the clarifier or around the outside circumference in the case of circular clarifiers, into which the water flows. Actually weirs, they reduce the exit velocity of the water leaving the clarification area of the clarifier.

The weir may provide at least one and possibly two benefits with the treatment of storm water. First, it may reduce the carry-out of floc that is still settling while the cell is being drawn down, could result in lower final effluent turbidities and/or allow a reduction in the settling time to achieve the same effluent turbidity. Secondly, the weir could reduce if not eliminate the tendency for the withdrawal pipe to suck-up previously settled sediment.

FLOCCULATION SYSTEMS SHOULD BE DESIGNED BY NOWLEDGEABLE PERSONNEL. A CONSULTANT SHOULD BE CONTRACTED WITH TO DEVELOP AND IMPLEMENT A SYSTEM. OPERATING PERSONNEL NEED TO BE SPECIFICALLY TRAINED TO OPERATE THESE SYSTEMS.

Chitosan

A product made from shrimp and crab shells called Chitosan has started to be used in Oregon. This material comes in two forms, the semi liquid and a semisolid. Chitosan in the solid form is available in a sock that can be mounted inside of a pipe. This sock form would be released based upon the flow of water around it and does not require the injection and monitoring equipment that other flocculation systems require.

The picture on the left shows a Chitosan sock.

In the picture on the right a sample of turbid water is shown after the Chitosan solid has been lightly dipped and stirred in the sample and left for approximately 10 minutes. The flocculated sediment can be seen forming in the bottom of the jar.

Efficiency/Impact: Mean turbidity reductions can be achieved in the 95.5% to 99.4% range. Metals and other pollutants may be treated with removal efficiencies of 35 to 99 %.

BMP 36 Electrocoagulation

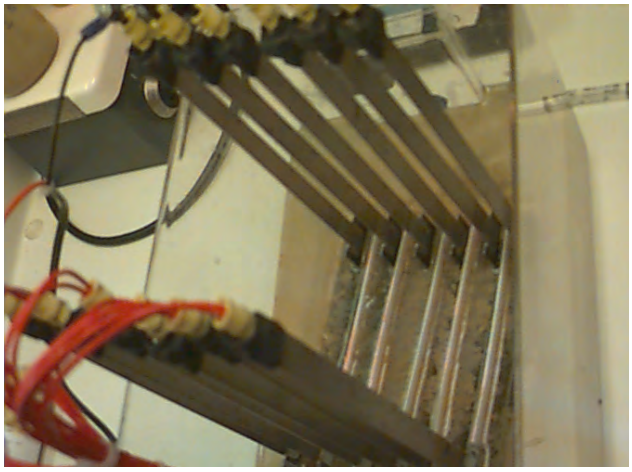
Activity: Sites with surface water runoff contamination that have implemented specific non-point source BMPs for pollution prevention but have been unable to reduce the pollutant dis-

charges in their storm water runoff to levels below the benchmarks.

Typical Pollutants: Sediment (TSS), PAH, metals, BOD, phosphorus, and turbidity

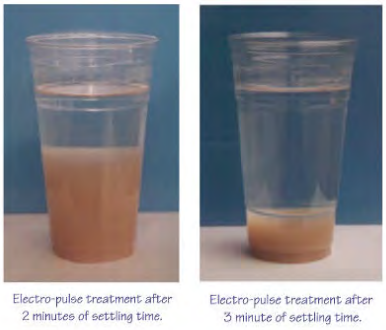
Typical Problem: When implementation of specific point source BMPs have not managed or eliminated the contaminants in the storm water to the benchmarks or below or where potential point sources for the contaminants cannot be identified, end of the pipe or final discharge treatment BMPs may be necessary.

BMP: Experiments with a process tentatively called ElectroFloc or Electrocoagulation indicates that it may be possible to use electricity to floc dissolved metals, TSS, turbidity, and other pollutants from storm water runoff. By charging aluminum plates with about 40 volts DC in a batch process, it has been shown to create an approximately equal number of charged particles in suspension. These dissimilar charged particles attract each other and due to aluminum ions present remain in contact with each other in as little as five minutes per liter. This works for TSS and turbidity in the lab and should work for dissolved metals as the metals usually are not really dissolved but submicron in size particles. Dissolved oxygen is increased in the water due to the splitting of the water molecule into hydrogen and oxygen in which the hydrogen leaves the water and the oxygen saturates the water volume. Some commercial package units are available.

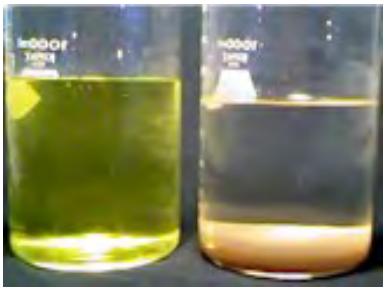


Lab Test Unit showing some floc forming on the surface

Industrial Package Unit



Turbidity from Clay Soils



Chromium

Efficiency/Impact:

Lab tests have repeatedly show that TSS and turbidity can be reduced by 98% and the dissolved oxygen content can be increased to around 16 mg/l. The following are various manufacturer's test removal results for the units that they provide:

Arsenic	37 %	Aluminum	75-99.7 %
Barium	94 %	BOD	53-89 %
Calcium	69-98 %	Cadmium	98-99.9 %
COD	65.4-86.2 %	Chromium, Hexavalent	99.9 %
Chromium, Total	97-99.9%	Copper	97-99.9 %
Cyanide	96.1 %	Fluoride	56 %
Iron	95-99 %	Lead	76-98 %
Magnesium	31-74 %	Nickel	90-99.7%
Nitrogen, Total	41.5 %	Oil & Grease	99.5 %
Phosphate	75-97 %	Phosphorus, Total	90.2 %
Radium (pCiL)	98 %	Selenium	44 %
Silicon	84-99 %	Strontium	49 %
Sulfate	33 %	TOC	96-98.6 %
TSS	45.5-99 %	Turbidity	77.8 %
Uranium	96 %	Vanadium	70 %
Zinc	96-99.9%		

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(Individual manufacturers or suppliers are shown as examples of equipment discussed in this docment only and are not specifically recommended by DEQ.)

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APPENDIX B

Performance Stromwater Sampling, Interim Letter Report
1st Sampling Event (March 2014)

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

May 12, 2014

Mr. Jim Orr
Department of Environmental Quality – Northwest Region
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201

HAI Project No. 7436

**SUBJECT: Post-Source Control Measure Implementation,
Performance Stormwater Sampling, Interim Letter Report,
1st Sampling Event (March 2014),
Wilhelm Trucking Company,
3250 NW St. Helens Road, Portland, Oregon**

Dear Mr. Orr:

Introduction

The Oregon Department of Environmental Quality (DEQ) and the City of Portland Bureau of Environmental Services (BES) have requested that source control measure implementation and performance stormwater sampling activities be performed at the above-referenced Wilhelm Trucking Company property (Figures 1 and 2) based on their connection to the public stormwater conveyance system within the City of Portland's Outfall Basin No. 18, which discharges to the Willamette River.

The post-source control performance stormwater sampling activities described in this Interim Letter Report are being performed as outlined in the Work Plan for Source Control Measure Implementation and Stormwater Sampling Activities (Work Plan)[1], which was prepared by Hahn and Associates, Inc. (HAI) in December 2013. DEQ approved the stormwater sampling portion of the Work Plan via email correspondence on February 26, 2014.

As detailed in the Work Plan, significant source control measures were implemented at the property in the summer of 2013, including installation of a new stormwater conveyance and treatment system, and installation of a new asphalt pavement cap on the high-traffic portions of the site (Figure 3).

The objective of the post-source control performance stormwater sampling activities is two-fold:

1. To confirm the effectiveness of the source control measures implemented at the property in reducing contaminant concentrations and/or load in stormwater, and
2. To provide current site discharge data to determine if contaminant concentrations fall within the "typical" range for industrial sites, and to evaluate the need for additional source control measures.

In order to meet these objectives, a total of four stormwater sampling events have been proposed at the Wilhelm property during the 2013-2014 rain year. This Interim Letter Report presents the sampling activities and analytical results for the 1st Stormwater Sampling Event, which was conducted at the property on March 28, 2014.

[1] Hahn and Associates, Inc. (2013). *Work Plan for Source Control Measure Implementation and Stormwater Sampling Activities, Wilhelm Trucking Company, 3250 NW St. Helens Road, Portland, Oregon* (HAI Project No. 7436). December 6, 2013.

Storm Event and Sampling Criteria

As part of the new stormwater system modifications, a new permanent compliance stormwater sampling point was established. The monitoring point (SP-01) is located within the new stormwater system outlet manhole, which is downgradient of the stormwater treatment facility, and immediately prior to the outfall into the BES 42-inch storm sewer line (Figure 3).

The 1st stormwater sampling event was conducted during a period of moderate to heavy rainfall, which produced approximately 1.86-inches of rain during the entire storm event, which was calculated as being from 03:00 Daylight Savings Time (DST) to 18:00 DST on March 28, 2014. The event was not considered a "first flush" event, as there was 0.26-inches of recorded rainfall within the preceding 24-hours of the sampling event. Although this volume exceeded the 0.1-inch rainfall threshold typically used to define antecedent dry periods, DEQ approved this sampling (via email correspondence on March 26, 2014) due to the large rain volume predicted for the event, and the opportunity to observe the new treatment system during peak stormwater flow conditions.

The stormwater treatment system contains an overflow bypass to prevent backup and flooding, and is designed to treat the 6-month rain event, which volume-wise is 91% net annual (i.e., 91% of all rainfall is treated and about 9% will bypass). DEQ has requested that at least one sampling event be conducted during peak stormwater flow conditions to attempt sample collection during a bypass overflow. Despite two visits to the site during the March 28, 2014 rain event (one at 07:00 DST and one at 16:00 DST), the overflow bypass was not observed to be flowing (both times the water level was measured to be about 10 inches below the top of the overflow bypass weir). Most notably, the second site visit was conducted immediately following a large deluge (0.78 inches of rain) that was recorded between 15:00 DST and 16:00 DST. The sampling observations and details were recorded on a storm water sample field log, which is included as Attachment A.

Rainfall data for the 1st storm water sampling event was obtained from the City of Portland's HYDRA Network (http://or.water.usgs.gov/non-usgs/bes/yeon.rain) for Rain Gage No. 121 located at 3395 NW Yeon Street (the gage located closest to the Wilhelm property), and is included as Attachment B, along with a hydrograph showing the rainfall during the event, along with the site observation and sampling times.

Sampling Results

The storm water sample testing results are presented in Table 1, the template for which is provided in DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (January 2009, updated October 2010). The data are presented in micrograms per liter (μg/l) / parts per billion (ppb), and are compared to the established Screening Level Values (SLVs) for Portland Harbor sites. Additionally, the data are compared to the previous stormwater sampling results that were collected prior to the implementation of the source control measures at the Wilhelm site (during the 2011-2012 rain year as part of the original stormwater assessment activities).

Three additional storm water sampling events are scheduled to be conducted at the Wilhelm property this rain season. The results will be presented to DEQ in separate interim reports, following each sampling event. Upon completion of all four storm water sampling events, a comprehensive report will be prepared as specified in the Work Plan, which will include an in-depth discussion of all storm water analytical data collected during these events.

If there are any comments or questions regarding this Interim Letter Report, please feel free to contact Gary Walvatne or myself at 503-796-0717.

Sincerely,

Reviewed by:

Mike Krzeminski
Sr. Project Manager
mikek@hahnenv.com

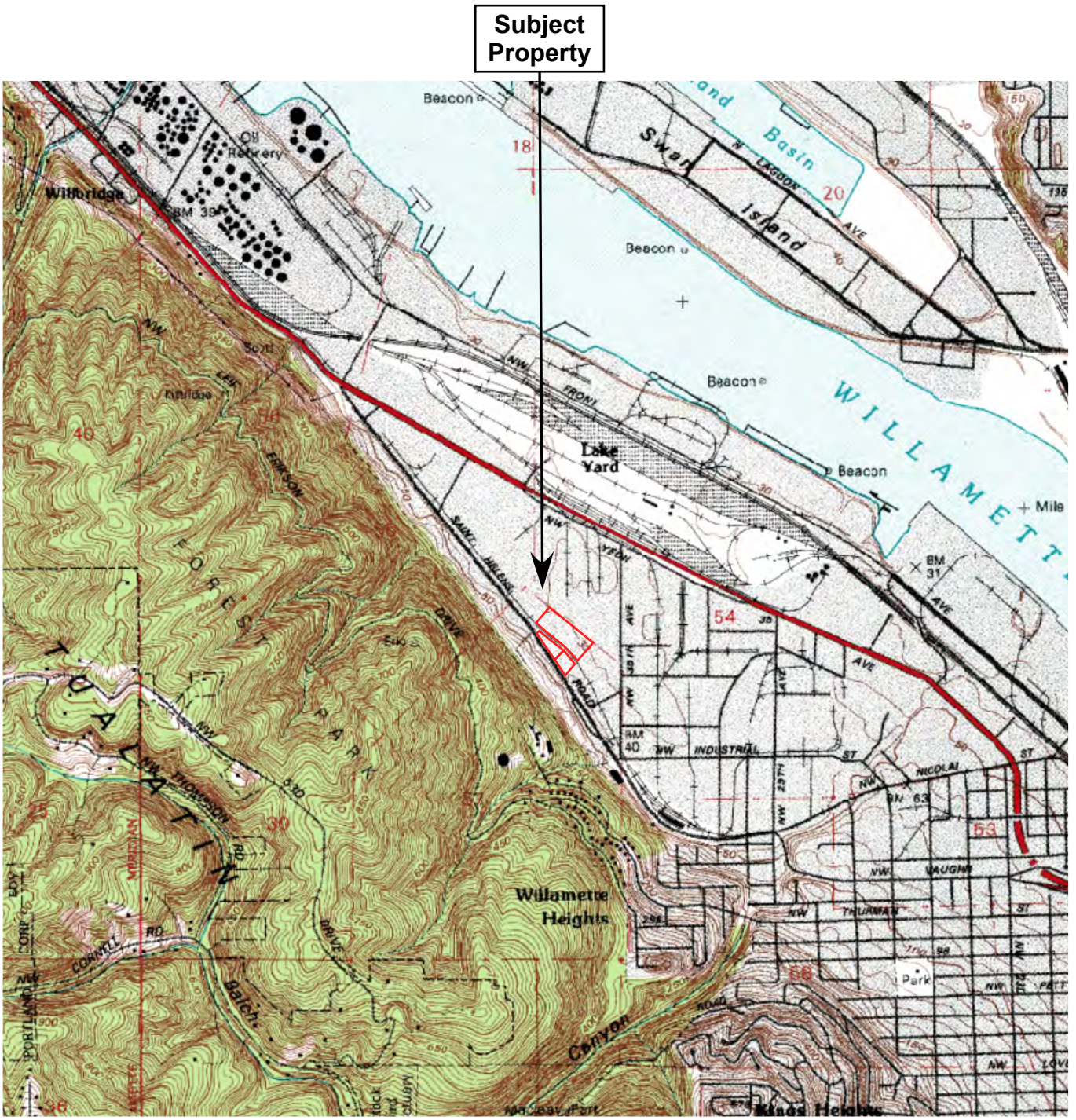
Gary Walvatne, R.G.
Sr. Associate
garyw@hahnenv.com

Attachments: 6

Figure 1 – Location Map
Figure 2 – Site Location Map
Figure 3 – Site Map Including Storm Water Sample Location

Table 1 – Storm Water Analytical Data for the 1st Sampling Event (March 2014)

Attachment A – Storm Water Sample Field Log
Attachment B – Rainfall Data and Hydrograph



Note: Base Map from the Portland (1990), Oregon USGS 7.5-Minute Quadrangle

Contour Interval: 10 Feet

NORTH

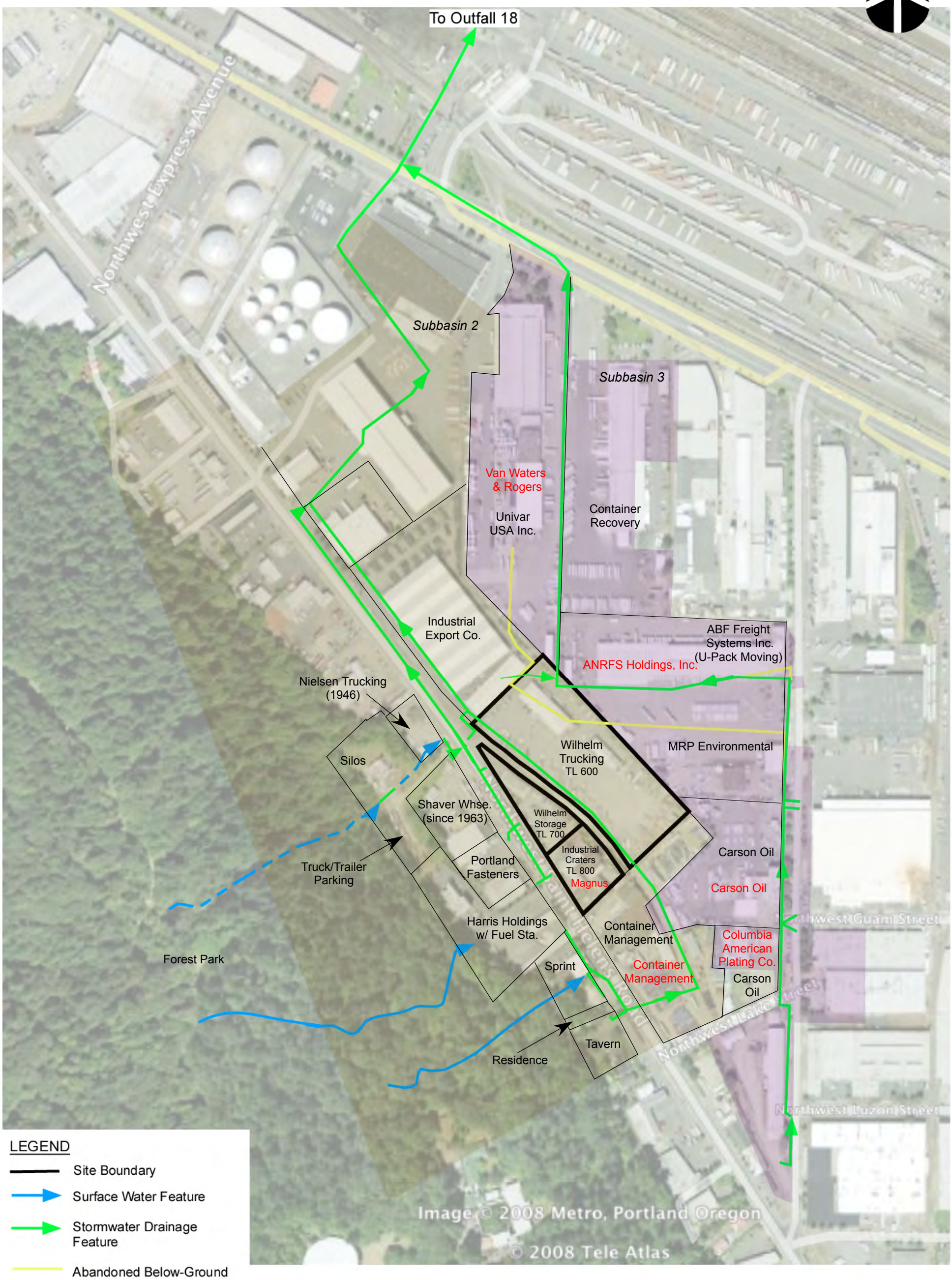
0 1000 2000 4000

1"=2000' Scale in Feet

FIGURE 1 – Location Map

Post-Source Control Stormwater Sampling
Wilhelm Trucking Company
3250 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436 May 2014



LEGEND

- Site Boundary
- Surface Water Feature
- Stormwater Drainage Feature
- Abandoned Below-Ground Pipe
- Outfall 18 Subbasin 2
- Outfall 18 Subbasin 3

NOTES:
- Current Property Occupant or Owner is in black type.
- DEQ Environmental Cleanup Site Information (ECSI) File is in red type.
- Only properties and ECSI sites that are located adjacent or "up-gradient" within the stormwater drainage lines shared by Wilhelm are indicated herein.

1"=150'

0 75 150 300
Scale in Feet

FIGURE 2
Site Vicinity Map
Post-Source Control Stormwater Sampling
Wilhelm Trucking Company
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436 May 2014

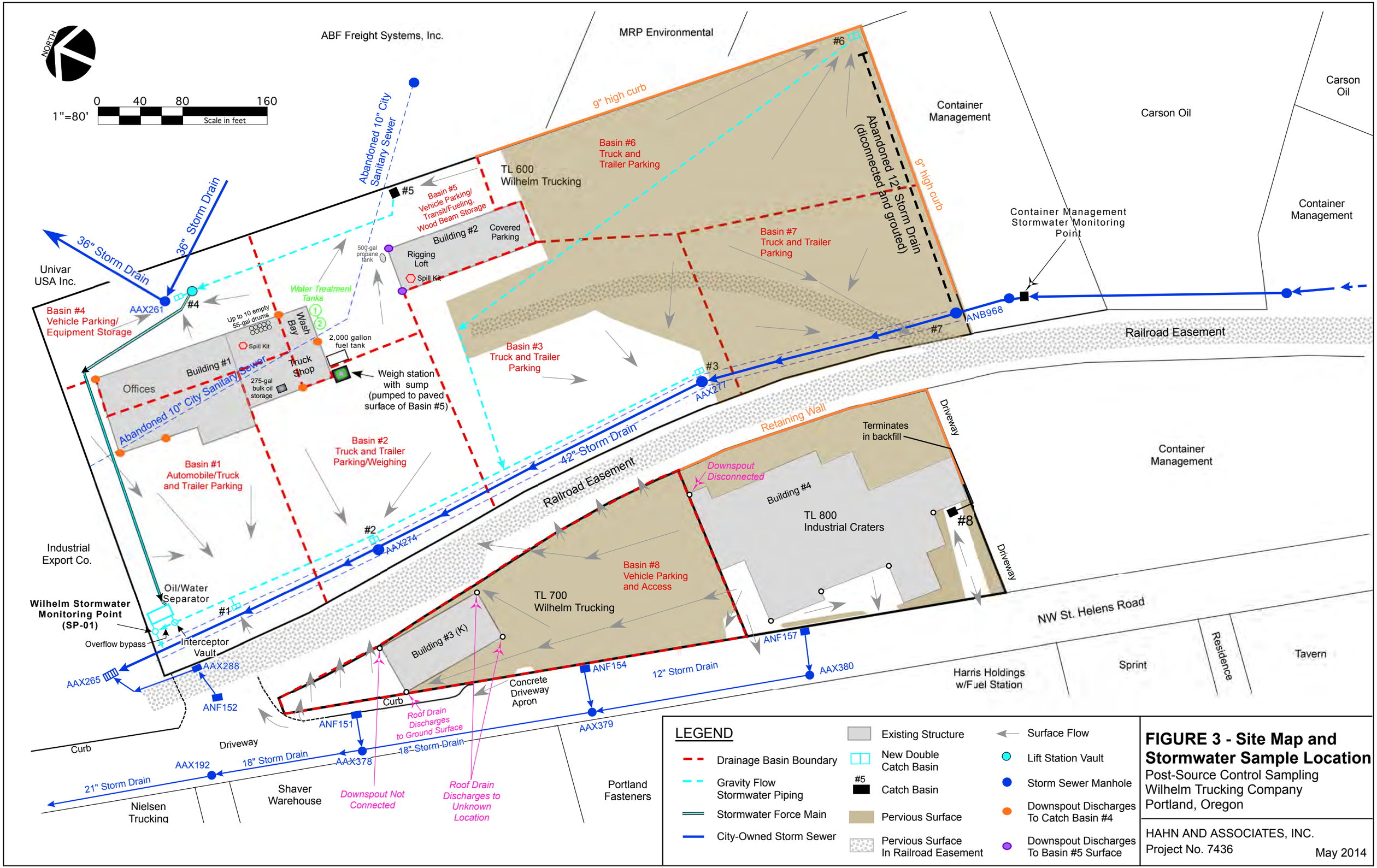


FIGURE 3 - Site Map and Stormwater Sample Location

Post-Source Control Sampling
Wilhelm Trucking Company
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 7436
May 2014

APPENDIX D: STORMWATER DATA REPORTING AND SCREENING TABLE FOR PORTLAND HARBOR SITES[1]

INSTRUCTIONS FOR USING THIS TEMPLATE:

This worksheet is protected so you cannot add or delete rows; you may only add data. If you did not analyze for a chemical within a group, fill in "NA" for Not Analyzed. If you did not analyze a whole group, leave it blank.

TO ADD DATA, fill in the columns to the right of the screening table. Label each column with the sample location (e.g., CB #1) and date of the sample. Detected compounds should be in bold text and compounds exceeding SLVs should be shaded. Include qualifiers. For undetected compounds, report them as being less than the method detection level (e.g., <0.5).

	SLV for Portland Harbor[2]	101 (CB#1-CB#2) 2/22/2012	101 (CB#1-CB#2) 3/05/2012	101 (CB#1-CB#2) 4/3/2012	101 (CB#1-CB#2) 6/07/2012	102 (CB#3) 2/22/2012	102 (CB#3) 3/05/2012	102 (CB#3) 4/3/2012	102 (CB#3) 06/07/2012	103 (CB#4-CB#5) 2/22/2012	103 (CB#4-CB#5) 3/05/2012	103 (CB#4-CB#5) 4/3/2012	103 (CB#4-CB#5) 06/07/2012	104 (CB#6) 2/22/2012	104 (CB#6) 3/05/2012	104 (CB#6) 4/03/2012	104 (CB#6) 06/07/2012	Fall 2013 - New Stormwater Treatment System Installed	101 (SP-01) 03/28/2014
Units	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l		µg/l
Metals/Inorganics																			
Aluminum (pH 6.5 - 9.0)	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Antimony	6	**0.67**	**0.55**	**0.53**	**0.57**	**1.2**	**1.1**	**0.73**	**0.75**	<0.25	**0.32 J**	**0.27 J**	<0.25	**0.88**	**0.68**	**0.61**	**0.9**		<1.0
Arsenic	0.045	**1.3**	**1.2**	**1.1**	**1.5**	**6.8**	**4.5**	**1.9**	**1.4**	<0.14	**0.58**	**0.57**	**0.30 J**	**3.2**	**1.5**	**1.7**	**2.0**		**0.667 J**
Arsenic III	190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Cadmium	0.094	**0.34**	**0.41**	**0.44**	**0.47**	**1.8**	**1.2**	**0.44**	**0.29**	**0.12**	**0.27**	**0.26**	**0.14**	**0.21**	**0.39**	**0.44**	**0.61**		**0.233**
Chromium, total	100	**8.7**	**8.7**	**6**	**10.4**	**40**	**23**	**9.1**	**5.0**	**0.44 J**	**3.1**	**2.3**	**0.85**	**3.7**	**2.8**	**3.4**	**5.6**		**2.38**
Chromium, hexavalent	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Copper	2.7	**32.7**	**36.1**	**27.9**	**39.3**	**179**	**116**	**39.7**	**28.7**	**4.8**	**18.8**	**15.3**	**6.6**	**16.8**	**18.5**	**23.1**	**37.6**		**11.7**
Lead	0.54	**23.6**	**24.5**	**18.2**	**30.2**	**159**	**105**	**27.4**	**21.2**	**1.4**	**10.1**	**9.1**	**3.2**	**15.1**	**16.9**	**19.8**	**30.2**		**7.22**
Manganese	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Mercury	0.77	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037		<0.04
Methyl Mercury	0.0028	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Nickel	16	**7.4**	**8.5**	**6.4**	**8.5**	**31.7**	**20.7**	**8.3**	**4.3**	**0.51**	**3.1**	**2.5**	**0.83**	**2.5**	**3.1**	**4.1**	**7.3**		**2.86**
Selenium	5	**0.34 J**	**0.27 J**	**0.37 J**	**0.25J**	**1.4**	**0.58**	**0.42 J**	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22		<0.5
Silver	0.12	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25		<0.1
Zinc	36	**130**	**133**	**117**	**153**	**510**	**327**	**110**	**72**	**96.3**	**142**	**137**	**91.6**	**53.9**	**63.8**	**76.8**	**107**		**44.9**
Perchlorate	<24.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Cyanide	5.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Butyltins																			
Monobutyltin	--																		
Dibutyltin	--																		
Tributyltin	0.072																		
Tetrabutyltin	--																		

	SLV for Portland Harbor[2]	101 (CB#1-CB#2) 2/22/2012	101 (CB#1-CB#2) 3/05/2012	101 (CB#1-CB#2) 4/3/2012	101 (CB#1-CB#2) 6/07/2012	102 (CB#3) 2/22/2012	102 (CB#3) 3/05/2012	102 (CB#3) 4/3/2012	102 (CB#3) 06/07/2012	103 (CB#4-CB#5) 2/22/2012	103 (CB#4-CB#5) 3/05/2012	103 (CB#4-CB#5) 4/3/2012	103 (CB#4-CB#5) 06/07/2012	104 (CB#6) 2/22/2012	104 (CB#6) 3/05/2012	104 (CB#6) 4/03/2012	104 (CB#6) 06/07/2012	Fall 2013 - New Stormwater Treatment System Installed	101 (SP-01) 03/28/2014
Units	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l		µg/l
PCBs Aroclors																			
Aroclor 1016	0.96	<0.0187	<0.0189	<0.0467	<0.0187	<0.0187	<0.0190	<0.0467	<0.00943	<0.00943	<0.0187	<0.0187	<0.00935	<0.00935	<0.00962	<0.00935	<0.0100		<0.0189
Aroclor 1221	0.034	<0.0187	<0.0189	<0.0467	<0.0187	<0.0187	<0.0190	<0.0467	<0.00943	<0.00943	<0.0187	<0.0187	<0.00935	<0.00935	<0.00962	<0.00935	<0.0100		<0.0189
Aroclor 1232	0.034	<0.0187	<0.0189	<0.0467	<0.0187	<0.0187	<0.0190	<0.0467	<0.00943	<0.00943	<0.0187	<0.0187	<0.00935	<0.00935	<0.00962	<0.00935	<0.0100		<0.0189
Aroclor 1242	0.034	<0.0187	<0.0189	<0.0467	<0.0187	<0.0187	<0.0190	<0.0467	<0.00943	<0.00943	<0.0187	<0.0187	<0.00935	<0.00935	<0.00962	<0.00935	<0.0100		<0.0189
Aroclor 1248	0.034	<0.0187	<0.0189	<0.0467	<0.0187	<0.0187	<0.0190	<0.0467	<0.00943	<0.00943	<0.0187	<0.0187	<0.00935	<0.00935	<0.00962	<0.00935	<0.0100		<0.0189
Aroclor 1254	0.033	<0.0187	<0.0189	<0.0467	<0.0187	**0.0524**	<0.0190	<0.0467	<0.00943	<0.00943	<0.0187	<0.0187	<0.00935	<0.00935	<0.00962	<0.00935	<0.0100		<0.0189
Aroclor 1260	0.034	**0.0337 J**	**0.049**	<0.0467	**0.0455**	**0.18**	**0.215**	**0.0531 J**	**0.0211**	<0.00943	**0.0213 J**	**0.0202 J**	<0.00935	**0.0243**	**0.0252**	**0.0266**	**0.0188**		<0.0189
Aroclor 1262	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA			NA
Aroclor 1268	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA			NA
Total PCBs	0.000064	**0.0377 J**	**0.049**	<0.0467	**0.0455**	**0.2324**	**0.215**	**0.0531 J**	**0.0211**	<0.00943	**0.0213 J**	**0.0202 J**	<0.00935	**0.0243**	**0.0252**	**0.0266**	**0.0188**		<0.0189
PCB Congeners	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
All 209 PCB congener target analytes	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
3,3',4,4'-TCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
3,4,4',5-TCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3,3',4,4'-PeCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3,4,4',5-PeCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3',4,4',5-PeCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2',3,4,4',5-PeCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
3,3',4,4',5-PeCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3,3',4,4',5'-HxCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3,3',4,4',5-HxCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3',4,4',5,5'-HxCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
3,3',4,4',5,5'-HxCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2,3,3',4,4',5,5'-HpCB	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Chlorinated Herbicides																			
Dalapon	200																		
Dicamba	1,100																		
MCPA	18																		
Dichlorprop	370																		
2,4-D	70																		
2,4,5-TP (Silvex)	50																		
2,4,5-T	370																		
2,4-DB	290																		
Dinoseb	7																		
MCPP	37																		
Organochlorine Pesticides																			
α - BHC	0.0049	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
β - BHC	0.017	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
γ - BHC (Lindane)	0.052	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
δ - BHC	0.037	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		NA
Heptachlor	0.000079	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
Heptachlor epoxide	0.000039	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
Aldrin	0.00005	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
Chlordane	0.00081	NA	<0.25	<0.25	<0.05	NA	<0.25	<0.25	<0.05	NA	<0.25	<0.25	<0.05	NA	<0.25	<0.25	<0.05		NA
Endosulfan alpha-	0.056	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.05		NA
Endosulfan beta-	0.056	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
Endosulfan sulfate	89	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
DDE	0.00022	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
DDD	0.00031	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
DDT	0.00022	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
DDT - total (sum DDE+DDE+DDT)	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Dieldrin	0.000054	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
Endrin	0.036	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
Endrin aldehyde	0.3	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.10		NA
Endrin ketone	--	NA	<0.10	<0.10	<0.10	NA	<0.10	<0.10	<0.10	NA	<0.10	<0.10	<0.10	NA	<0.10	<0.10	<0.10		NA
Methoxychlor	0.03	<0.25	<0.25	<0.25	<0.50	<0.25	<0.25	<0.25	<0.50	<0.25	<0.25	<0.25	<0.50	<0.25	<0.25	<0.25	<0.50		NA
Toxaphene	0.0002	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0		NA
oxy chlordane	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
cis - nonachlor	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
trans - nonachlor	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA

	SLV for Portland Harbor[2]	101 (CB#1-CB#2) 2/22/2012	101 (CB#1-CB#2) 3/05/2012	101 (CB#1-CB#2) 4/3/2012	101 (CB#1-CB#2) 6/07/2012	102 (CB#3) 2/22/2012	102 (CB#3) 3/05/2012	102 (CB#3) 4/3/2012	102 (CB#3) 06/07/2012	103 (CB#4-CB#5) 2/22/2012	103 (CB#4-CB#5) 3/05/2012	103 (CB#4-CB#5) 4/3/2012	103 (CB#4-CB#5) 06/07/2012	104 (CB#6) 2/22/2012	104 (CB#6) 3/05/2012	104 (CB#6) 4/03/2012	104 (CB#6) 06/07/2012	Fall 2013 - New Stormwater Treatment System Installed	101 (SP-01) 03/28/2014
Units	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l		µg/l
Volatile Organic Compounds																			
1,1,1,2- Tetrachloroethane	2.5	<0.10	<0.35	<0.10	<0.10	<0.10	<0.35	<0.10	<0.10	<0.10	<0.35	<0.10	<0.10	<0.10	<0.35	<0.10	<0.10		NA
1,1,1- Trichloroethane (TCA)	11	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10		NA
1,1,2,2- Tetrachloroethane	0.33	<0.10	<0.17	<0.10	<0.10	<0.10	<0.17	<0.10	<0.10	<0.10	<0.17	<0.10	<0.10	<0.10	<0.17	<0.10	<0.10		NA
1,1,2- Trichloroethane	1.2	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10		NA
1,1- Dichloroethane	47	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10		NA
1,2,3- Trichloropropane	0.0095	<0.20	<0.25	<0.20	<0.20	<0.20	<0.25	<0.20	<0.20	<0.20	<0.25	<0.20	<0.20	<0.20	<0.25	<0.20	<0.20		NA
1,2- Dichloroethane (EDC)	0.73	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10		NA
cis-1,2-Dichloroethlyene	61	<0.10	<0.37	<0.10	<0.10	<0.10	<0.37	<0.10	<0.10	<0.10	<0.37	<0.10	<0.10	<0.10	<0.37	<0.10	<0.10		NA
1,2- Dichloropropane	0.97	<0.10	<0.41	<0.10	<0.10	<0.10	<0.41	<0.10	<0.10	<0.10	<0.41	<0.10	<0.10	<0.10	<0.41	<0.10	<0.10		NA
1,2- Dibromoethane (EDB)	0.033	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10		NA
2- Butanone (MEK)	7,100	<1.0	<2.0	**5.9**	<1.0	**1.8 J**	<2.0	**8.1**	<1.0	<1.0	<2.0	**13**	<0.10	<1.0	<2.0	<1.0	<1.0		NA
2- Chloroethyl Vinyl Ether	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2- Hexanone	99	<1.0	<0.54	<1.0	<1.0	<1.0	<0.54	<1.0	<1.0	<1.0	<0.54	<1.0	<0.10	<1.0	<0.54	<1.0	<1.0		NA
4- Methyl-2-Pentanone (MIBK)	170	**1.4 J**	<2.0	**3.8 J**	<1.0	**1.4 J**	**2.2 J**	**1.2 J**	<1.0	<1.0	<2.0	<1.0	<0.10	<1.0	<2.0	<1.0	<1.0		NA
Acetone	1500	<1.0	<12.5	**18.2**	**50.2**	**3.3 J**	<12.5	**50.6**	**82.1**	**4.8 J**	<12.5	**42.2**	**16.5**	<1.0	<12.5	<1.0	**8.9**		NA
Acrolein	0.042	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Acrylonitrile	0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Bromochloromethane	--	<0.10	<0.22	<0.10	<0.10	<1.0	<0.22	<0.10	<0.10	<0.10	<0.22	<0.10	<0.10	<0.10	<0.22	<0.10	<0.10		NA
Bromodichloromethane	1.1	<0.10	<0.23	<0.10	<0.10	<1.0	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10		NA
Bromoform	8.5	<0.10	<2.0	<0.10	<0.10	<1.0	<2.0	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10		NA
Bromomethane	8.7	<0.10	<0.36	<0.10	<0.10	<1.0	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10		NA
Carbon Disulfide	0.92	<0.10	<0.21	**0.29 J**	<0.10	**0.1 J**	<0.21	**0.26 J**	<0.10	<0.10	<0.21	**0.27 J**	<0.10	<0.10	<0.21	**0.27 J**	<0.10		NA
Carbon Tetrachloride	0.51	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10		NA
Chlorobenzene	50	<0.10	<0.33	<0.10	<0.10	<0.10	<0.33	<0.10	<0.10	<0.10	<0.33	<0.10	<0.10	<0.10	<0.33	<0.10	<0.10		NA
Chlorodibromomethane	0.79	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10		NA
Chloroethane	23	<0.10	<0.32	<0.10	<0.10	<0.10	<0.32	<0.10	<0.10	<0.10	<0.32	<0.10	<0.10	<0.10	<0.32	<0.10	<0.10		NA
Chloroform	0.17	<0.10	<0.34	<0.10	<0.10	<0.10	<0.34	<0.10	<0.10	<0.10	<0.34	<0.10	<0.10	<0.10	<0.34	<0.10	<0.10		NA
Chloromethane	2.1	**0.24 J**	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10		NA
cis-1,2-dichloroethylene	590	<0.10	<0.37	<0.10	<0.10	<0.10	<0.37	<0.10	<0.10	<0.10	<0.37	<0.10	<0.10	<0.10	<0.37	<0.10	<0.10		NA
cis-1,3-Dichloropropene	0.055	<0.10	<0.27	<0.10	<0.10	<0.10	<0.27	<0.10	<0.10	<0.10	<0.27	<0.10	<0.10	<0.10	<0.27	<0.10	<0.10		NA
Dibromomethane	61	<0.10	<0.48	<0.10	<0.10	<0.10	<0.48	<0.10	<0.10	<0.10	<0.48	<0.10	<0.10	<0.10	<0.48	<0.10	<0.10		NA
Dichlorodifluoromethane	390	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10	<0.10	<0.23	<0.10	<0.10		NA
Iodomethane (Methyl Iodide)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Isopropylbenzene	660	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10		NA
Methylene chloride	8.9	<0.50	<2.0	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50		NA
Styrene	100	<0.10	<0.35	<0.10	<0.10	<0.10	<0.35	<0.10	<0.10	<0.10	<0.35	<0.10	<0.10	<0.10	<0.35	<0.10	<0.10		NA
trans-1,4-Dichloro-2-butene	7100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Trichlorofluoromethane	1,300	<0.10	<0.30	<0.10	<0.10	<0.10	<0.30	<0.10	<0.10	<0.10	<0.30	<0.10	<0.10	<0.10	<0.30	<0.10	<0.10		NA
Vinyl Acetate	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Benzene	1.2	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10	<0.10	<0.36	<0.10	<0.10		NA
EthylBenzene	7.3	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10	<0.10	<0.38	<0.10	<0.10		NA
m,p-Xylene	1.8	<0.20	<0.66	<0.20	<0.20	<0.20	<0.66	<0.20	<0.20	<0.20	<0.66	<0.20	<0.20	<0.20	<0.66	<0.20	<0.20		NA
o-Xylene	13	<0.10	<0.46	<0.10	<0.10	<0.10	<0.46	<0.10	<0.10	<0.10	<0.46	<0.10	<0.10	<0.10	<0.46	<0.10	<0.10		NA
Xylenes (total)	200	<0.30	<1.1	<0.30	<0.30	<0.30	<1.1	<0.30	<0.30	<0.30	<1.1	<0.30	<0.30	<0.30	<1.1	<0.30	<0.30		NA
Methyltert-butyl ether	37	<0.10	<0.24	<0.10	<0.10	<0.10	<0.24	<0.10	<0.10	<0.10	<0.24	<0.10	<0.10	<0.10	<0.24	<0.10	<0.10		NA
Tetrachloroethene (PCE)	0.12	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10	<0.10	<0.26	<0.10	<0.10		NA
Toluene	9.8	**0.10 J**	<0.39	<0.10	<0.10	<0.10	<0.39	<0.10	<0.10	<0.10	<0.39	<0.10	<0.10	<0.10	<0.39	<0.10	**0.11J**		NA
trans-1,2-Dichloroethene	100	<0.10	<0.21	<0.10	<0.10	<0.10	<0.21	<0.10	<0.10	<0.10	<0.21	<0.10	<0.10	<0.10	<0.21	<0.10	<0.10		NA
trans-1,3-Dichloropropene	0.055	<0.10	<0.18	<0.10	<0.10	<0.10	<0.18	<0.10	<0.10	<0.10	<0.18	<0.10	<0.10	<0.10	<0.18	<0.10	<0.10		NA
Trichloroethene (TCE)	0.17	<0.10	<0.20	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10		NA
Vinyl Chloride	0.015	<0.10	<0.17	<0.10	<0.10	<0.10	<0.17	<0.10	<0.10	<0.10	<0.17	<0.10	<0.10	<0.10	<0.17	<0.10	<0.10		NA

	SLV for Portland Harbor[2]	101 (CB#1-CB#2) 2/22/2012	101 (CB#1-CB#2) 3/05/2012	101 (CB#1-CB#2) 4/3/2012	101 (CB#1-CB#2) 6/07/2012	102 (CB#3) 2/22/2012	102 (CB#3) 3/05/2012	102 (CB#3) 4/3/2012	102 (CB#3) 06/07/2012	103 (CB#4-CB#5) 2/22/2012	103 (CB#4-CB#5) 3/05/2012	103 (CB#4-CB#5) 4/3/2012	103 (CB#4-CB#5) 06/07/2012	104 (CB#6) 2/22/2012	104 (CB#6) 3/05/2012	104 (CB#6) 4/03/2012	104 (CB#6) 06/07/2012	Fall 2013 - New Stormwater Treatment System Installed	101 (SP-01) 03/28/2014
Units	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l		µg/l
Semivolatile Organic Compounds																			
Halogenated Compounds																			
1,2-Dichlorobenzene	49	<0.37	<0.37	<0.37	<4.7	<0.37	<0.37	<0.37	<4.7	<0.37	<0.37	<0.37	<4.7	<0.37	<0.38	<0.37	<4.7		NA
1,3-Dichlorobenzene	14	<0.32	<0.32	<0.32	<4.7	<0.32	<0.32	<0.32	<4.7	<0.32	<0.32	<0.32	<4.7	<0.32	<0.33	<0.32	<4.7		NA
1,4-Dichlorobenzene	2.8	<0.32	<0.32	<0.32	<4.7	<0.32	<0.32	<0.32	<4.7	<0.32	<0.32	<0.32	<4.7	<0.32	<0.33	<0.32	<4.7		NA
1,2,4-Trichlorobenzene	8.2	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7		NA
Hexachlorobenzene	0.00029	<0.39	<0.39	<0.39	<4.7	<0.39	<0.39	<0.39	<4.7	<0.39	<0.39	<0.39	<4.7	<0.39	<0.39	<0.39	<4.7		NA
2-Chloronaphthalene	490	<0.21	<0.21	<0.21	<4.7	<0.21	<0.21	<0.21	<4.7	<0.21	<0.21	<0.21	<4.7	<0.21	<0.21	<0.21	<4.7		NA
Hexachloroethane	3.3	<0.31	<0.31	<0.31	<4.7	<0.31	<0.31	<0.31	<4.7	<0.31	<0.31	<0.31	<4.7	<0.31	<0.32	<0.31	<4.7		NA
Hexachlorobutadiene	0.86	<0.30	<0.30	<0.30	<4.7	<0.30	<0.30	<0.30	<4.7	<0.30	<0.30	<0.30	<4.7	<0.30	<0.31	<0.30	<4.7		NA
Hexachlorocyclopentadiene	5.2	<0.12	<0.12	<0.12	<4.7	<0.12	<0.12	<0.12	<4.7	<0.12	<0.12	<0.12	<4.7	<0.12	<0.12	<0.12	<4.7		NA
2,2'-oxybis(1-chloropropane)	0.95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Bis-(2-chloroethoxy) methane	--	<0.46	<0.46	<0.46	<4.7	<0.47	<0.47	<0.46	<4.7	<0.46	<0.46	<0.46	<4.7	<0.47	<0.47	<0.46	<4.7		NA
Bis-(2-chloroethyl) ether	0.06	<0.37	<0.37	<0.37	<4.7	<0.37	<0.37	<0.37	<4.7	<0.37	<0.37	<0.37	<4.7	<0.37	<0.38	<0.37	<4.7		NA
4-Chlorophenyl-phenyl ether	0.06	<0.44	<0.45	<0.44	<4.7	<0.45	<0.45	<0.44	<4.7	<0.44	<0.45	<0.44	<4.7	<0.45	<0.45	<0.44	<4.7		NA
4-bromophenyl-phenyl ether	--	<0.33	<0.33	<0.33	<4.7	<0.33	<0.33	<0.33	<4.7	<0.33	<0.33	<0.33	<4.7	<0.33	<0.34	<0.33	<4.7		NA
3,3'-Dichlorobenzidine	0.028	<0.77	<0.78	<0.77	<4.7	<0.78	<0.78	<0.77	<4.7	<0.77	<0.78	<0.77	<4.7	<0.78	<0.79	<0.77	<4.7		NA
4-Chloroaniline	150	<0.65	<0.65	<0.65	<4.7	<0.66	<0.66	<0.65	<4.7	<0.65	<0.65	<0.65	<4.7	<0.66	<0.66	<0.65	<4.7		NA
Organonitrogen Compounds																			
Nitrobenzene	3.4	<0.36	<0.36	<0.36	<4.7	<0.36	<0.36	<0.36	<4.7	<0.36	<0.36	<0.36	<4.7	<0.36	<0.37	<0.36	<4.7		NA
Aniline	12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
2-Nitroaniline	110.0	<0.40	<0.40	<0.40	<4.7	<0.40	<0.40	<0.40	<4.7	<0.40	<0.40	<0.40	<4.7	<0.40	<0.40	<0.40	<4.7		NA
3-Nitroaniline	3.2	<0.40	<0.40	<0.40	<4.7	<0.40	<0.40	<0.40	<4.7	<0.40	<0.40	<0.40	<4.7	<0.40	<0.40	<0.40	<4.7		NA
4-Nitroaniline	3.2	<0.42	<0.42	<0.42	<4.7	<0.42	<0.42	<0.42	<4.7	<0.42	<0.42	<0.42	<4.7	<0.42	<0.42	<0.42	<4.7		NA
N-Nitrosodimethylamine	0.00042	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
N-Nitroso-di-n-propylamine	0.0096	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
N-Nitrosodiphenylamine	6	<0.39	<0.39	<0.39	<4.7	<0.39	<0.39	<0.39	<4.7	<0.39	<0.39	<0.39	<4.7	<0.39	<0.39	<0.39	<4.7		NA
2,4-Dinitrotoluene	3.4	<0.54	<0.54	<0.54	<4.7	<0.54	<0.54	<0.54	<4.7	<0.54	<0.54	<0.54	<4.7	<0.54	<0.55	<0.54	<4.7		NA
2,6-Dinitrotoluene	37	<0.34	<0.34	<0.34	<4.7	<0.34	<0.34	<0.34	<4.7	<0.34	<0.34	<0.34	<4.7	<0.34	<0.35	<0.34	<4.7		NA
Carbazole	3.4	<0.37	<0.37	<0.37	<4.7	<0.37	<0.37	<0.37	<4.7	<0.37	<0.37	<0.37	<4.7	<0.37	<0.38	<0.37	<4.7		NA
Oxygen-Containing Compounds																			
Benzoic Acid	42	<0.10	<0.10	**4.3 J**	<23.7	<0.10	<0.10	<0.10	<23.7	<0.10	<0.10	<0.10	<23.7	<0.10	<0.11	<0.10	<23.7		NA
Benzyl Alcohol	8.6	<1.4	<1.4	<1.4	<4.7	<1.4	<1.4	<1.4	<4.7	<1.4	<1.4	<1.4	<4.7	<1.4	<1.4	<1.4	<4.7		NA
Dibenzofuran	3.7	<0.35	<0.35	<0.35	<4.7	<0.35	<0.35	<0.35	<4.7	<0.35	<0.35	<0.35	<4.7	<0.35	<0.36	<0.35	<4.7		NA
Isophorone	71	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7		NA
Phenols and Substituted Phenols																			
Phenol	2560	<0.12	<0.12	<0.12	<4.7	<0.12	<0.12	<0.12	**4.9**	<0.12	<0.12	<0.12	<4.7	<0.12	<0.12	<0.12	<4.7		NA
2-Methylphenol (o-Cresol)	13	<0.16	<0.16	<0.16	<4.7	<0.16	<0.16	<0.16	<4.7	<0.16	<0.16	<0.16	<4.7	<0.16	<0.16	<0.16	<4.7		NA
4-Methylphenol (p-Cresol)	180	<0.26	<0.27	<0.26	<4.7	<0.27	<0.27	<0.26	<4.7	<0.26	**0.62 J**	**0.32 J**	<4.7	<0.27	<0.27	<0.26	<4.7		NA
2,4-Dimethylphenol	730	<0.094	<0.095	<0.094	<4.7	<0.095	<0.095	<0.094	<4.7	<0.094	<0.095	<0.094	<4.7	<0.095	<0.096	<0.094	<4.7		NA
2-Chlorophenol	30	<0.36	<0.36	<0.36	<4.7	<0.36	<0.36	<0.36	<4.7	<0.36	<0.36	<0.36	<4.7	<0.36	<0.37	<0.36	<4.7		NA
2,4-Dichlorophenol	110	<0.38	<0.38	<0.38	<4.7	<0.38	<0.38	<0.38	<4.7	<0.38	<0.38	<0.38	<4.7	<0.38	<0.38	<0.38	<4.7		NA
2,4,5-Trichlorophenol	3600	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7		NA
2,4,6-trichlorophenol	2.4	<0.19	<0.19	<0.19	<4.7	<0.19	<0.19	<0.19	<4.7	<0.19	<0.19	<0.19	<4.7	<0.19	<0.19	<0.19	<4.7		NA
2,3,4,6-Tetrachlorophenol	1,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Pentachlorophenol	0.56	<0.43	<0.44	<0.43	<4.7	<0.44	<0.44	<0.43	<4.7	<0.43	<0.44	<0.43	<4.7	<0.44	**0.46 J**	<0.43	<4.7		NA
4-Chloro-3-methylphenol		<0.36	<0.36	<0.36	<4.7	<0.36	<0.36	<0.36	<4.7	<0.36	<0.36	<0.36	<4.7	<0.36	<0.37	<0.36	<4.7		NA
2-Nitrophenol	150	<0.67	<0.67	<0.67	<4.7	<0.68	<0.68	<0.67	<4.7	<0.67	<0.67	<0.67	<4.7	<0.68	<0.68	<0.67	<4.7		NA
4-Nitrophenol	150	<0.38	<0.38	<0.38	<4.7	<0.38	<0.38	<0.38	<4.7	<0.38	<0.38	<0.38	<4.7	<0.38	<0.38	<0.38	<4.7		NA
2,4-Dinitrophenol	73	<0.92	<0.93	<0.92	<9.5	<0.93	<0.93	<0.92	<9.5	<0.92	<0.93	<0.92	<9.5	<0.93	<0.94	<0.92	<9.5		NA
Methyl-4,6-Dinitrophenol 2-	150	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
Phthalate Esters																			
Dimethylphthalate	3	<0.26	<0.27	<0.26	<4.7	<0.27	<0.27	<0.26	<4.7	<0.26	<0.27	<0.26	<4.7	<0.27	<0.27	<0.26	<4.7		<0.236
Diethylphthalate	3	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7	<0.41	<0.41	<0.41	<4.7		<0.236
Di-n-butylphthalate	3	<0.44	<0.45	<0.44	<4.7	<0.45	<0.45	<0.44	<4.7	<0.44	<0.45	<0.44	<4.7	<0.45	<0.45	<0.44	<4.7		**0.538**
Butylbenzylphthalate	3	<0.43	<0.44	<0.43	<4.7	<0.44	<0.44	<0.43	<4.7	<0.43	<0.44	<0.43	<4.7	<0.44	<0.44	<0.43	<4.7		**0.291 J**
Di-n-octylphthalate	3	<0.47	<0.47	<0.47	<4.7	<0.48	<0.48	<0.47	<4.7	<0.47	<0.47	<0.47	<4.7	<0.48	<0.48	<0.47	<4.7		<0.236
bis(2-Ethylhexyl)phthalate	2.2	<0.94	**2.4 J**	**3.0 J**	<4.7	**0.99 J**	**2.3 J**	**1.8 J**	<4.7	<0.94	**1.5 J**	**1.1 J**	<4.7	**1.3 J**	**3.0 J**	<0.94	<4.7		**1.5**

	SLV for Portland Harbor[2]	101 (CB#1-CB#2) 2/22/2012	101 (CB#1-CB#2) 3/05/2012	101 (CB#1-CB#2) 4/3/2012	101 (CB#1-CB#2) 6/07/2012	102 (CB#3) 2/22/2012	102 (CB#3) 3/05/2012	102 (CB#3) 4/3/2012	102 (CB#3) 06/07/2012	103 (CB#4-CB#5) 2/22/2012	103 (CB#4-CB#5) 3/05/2012	103 (CB#4-CB#5) 4/3/2012	103 (CB#4-CB#5) 06/07/2012	104 (CB#6) 2/22/2012	104 (CB#6) 3/05/2012	104 (CB#6) 4/03/2012	104 (CB#6) 06/07/2012	Fall 2013 - New Stormwater Treatment System Installed	101 (SP-01) 03/28/2014
Units	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l		µg/l
Polycyclic Aromatic Hydrocarbons																			
Naphthalene	0.2	<0.022	<0.047	<0.047	0.029J	0.042 J	<0.048	<0.047	0.041 J	0.028 J	<0.047	<0.047	0.020 J	0.035 J	<0.050	<0.047	0.021 J		<0.0189
2-Methylnaphthalene	0.2	<0.029	<0.047	<0.047	0.018J	<0.029	<0.048	<0.047	0.021 J	<0.029	<0.047	<0.047	0.015 J	<0.029	<0.050	<0.047	0.027 J		<0.0189
Acenaphthylene	0.2	0.056 J	0.16	0.1	0.11	0.74	0.48	0.24	0.2	<0.014	0.9	0.11	0.014 J	0.098	0.56	0.33	<0.0062		0.0598
Acenaphthene	0.2	0.016 J	<0.047	<0.047	<0.0050	0.049 J	<0.048	<0.047	0.018J	<0.015	0.060 J	<0.047	0.0082 J	<0.015	<0.050	<0.047	0.010 J		<0.00943
Fluorene	0.2	<0.013	<0.047	<0.047	0.013J	0.044 J	<0.048	0.064 J	0.010J	<0.013	0.051 J	<0.047	0.011 J	<0.013	<0.050	<0.047	0.0096 J		<0.00943
Phenanthrene	0.2	0.098	0.28	0.17	0.15	0.62	0.56	0.27	0.12	0.018 J	0.24	0.12	0.051 J	0.093 J	0.33	0.12	0.071 J		0.0469
Anthracene	0.2	0.040 J	0.15	0.050 J	0.073J	0.48	0.39	0.15	0.13	<0.0091	0.66	0.061 J	0.017 J	0.057 J	0.42	0.2	0.011 J		0.0355
Fluoranthene	0.2	0.3	0.88	0.48	0.54	2.2	2	0.78	0.57	0.044 J	1.5	0.41	0.076 J	0.19	1.4	0.6	0.092 J		0.216
Pyrene	0.2	0.39	1.2	0.75	0.84	3.4	2.9	1.3	0.98	0.056 J	2.8	0.55	0.098	0.31	2.1	0.96	0.1		0.353
Benzo(a)anthracene	0.018	0.11	0.34	0.22	0.18	1.2	0.98	0.4	0.29	0.026 J	1.1	0.19	0.025 J	0.12	0.81	0.45	0.040 J		0.0826
Chrysene	0.018	0.21	0.61	0.34	0.38	1.7	1.3	0.6	0.52	0.027 J	1.5	0.27	0.047 J	0.19	1.1	0.57	0.078 J		0.205
Benzo(b)fluoranthene	0.018	0.26	0.85	0.61	0.58	2.7	2.2	1.1	0.94	0.042 J	3.5	0.53	0.069 J	0.33	2	1.3	0.071 J		0.396
Benzo(k)fluoranthene	0.018	0.084 J	0.28	0.19	0.19	0.95	0.74	0.34	0.29	0.014 J	1	0.15	0.018 J	0.12	0.66	0.34	0.020 J		0.107
Benzo(a)pyrene	0.018	0.21	0.71	0.45	0.47	2.9	2.3	0.94	0.86	0.035 J	3.9	0.46	0.051 J	0.31	2	1.2	0.042 J		0.318
Indeno(1,2,3-cd)pyrene	0.018	0.24	0.76	0.5	0.56	3	2.2	1	0.96	0.041 J	3.7	0.49	0.064 J	0.37	2.2	1.4	0.041 J		0.286
Dibenz(a,h)anthracene	0.018	0.023 J	0.084 J	0.056 J	0.057J	0.28	0.22	0.12	0.11	<0.014	0.39	0.052 J	0.0094 J	0.027 J	0.21	0.15	0.0095 J		0.0345
Benzo(g,h,i)perylene	0.2	0.31	0.94	0.64	0.68	3.4	2.6	1.2	1.1	0.048 J	4.4	0.58	0.071 J	0.44	2.6	1.6	0.053 J		0.363
Chlorinated Dioxins and Furans																			
2,3,7,8,-TCDD (Toxicity Equivalence Quotient)	5.1E-09																		
2,3,7,8,-TCDD	5.1E-09																		
2,3,7,8,-TCDF	--																		
1,2,3,7,8,-PeCDD	--																		
1,2,3,7,8,-PeCDF	--																		
2,3,4,7,8,-PeCDF	--																		
2,3,4,7,8,-PeCDF	--																		
1,2,3,6,7,8,-HxCDD	--																		
1,2,3,7,8,9,-HxCDD	--																		
1,2,3,4,7,8,-HxCDF	--																		
1,2,3,6,7,8,-HxCDF	--																		
1,2,3,7,8,9,-HxCDF	--																		
2,3,4,6,7,8,-HxCDF	--																		
1,2,3,4,6,7,8,-HpCDD	--																		
1,2,3,4,6,7,8,-HpCDF	--																		
1,2,3,4,7,8,9,-HpCDF	--																		
OCDD	--																		
OCDF	--																		
Total tetrachlorinated dioxins	--																		
Total pentachlorinated dioxins	--																		
Total hexachlorinated dioxins	--																		
Total heptachlorinated dioxins	--																		
Total tetrachlorinated furans	--																		
Total pentachlorinated furans	--																		
Total hexachlorinated furans	--																		
Total heptachlorinated furans	--																		
Other Analytes																			
TPH Diesel	--	260	330	240	220	820	290	500	55 J	80	150	110	63 J	83	140	100	48 J		<94.3
TPH Heavy Oil	--	1,900	2,600	1,600	1,700	1,600	1,700	1,100	390	270 J	980	660	200 J	340 J	650	350 J	210 J		868
TPH-Gx	--	<25	<19	<25	<25	<25	<19	<25	<25	<25	<19	<25	<25	<25	<19	<25	<25		NA
Total Organic Carbon	--	2,100	6,200	6,100	4,700	4,000	57,400	5,700	5,700	2,600	5,600	4,300	2,700	6,500	5,400	6,600	6,600		2,580
Total Suspended Solids	--	131,000	232,000	175,000	304,000	528,000	344,000	121,000	542,000	9,000	102,000	44,000	13,000	31,000	30,000	27,000	47,000		27,000

[1]This table differs from the Non-Portland Harbor stormwater table in that Portland Harbor screening levels for stormwater include consideration of drinking water MCLs and PRGs, per the JSCS. MCLs and PRGs are lower than other screening values for a subset of analytes.

[2]The source of each SLV is documented in Table 3.1 of the Portland Harbor Joint Source Control Strategy, which can be viewed at http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/docs/JSCSFinalTable03_1.pdf

Storm Water Sample Field Log

Site: Wilhelm Trucking Property — Project No.: 7436
3250 NW St Helens Road — Date: 3/28/14
Portland, Oregon — Sampled by: Mike Krzeminski

All Times Listed are in Daylight Savings Time (DST)

Weather Conditions	Moderate to Heavy Rains
Time Rain Event Commenced	03:00 3/28/14
Duration of Rain Event	15 hours
Rainfall Previous 24 Hours	0.26 Inches http://or.water.usgs.gov/non-usgs/bes/yeon.rain 03:00 3/27 to 03:00 3/28
Total Rainfall During Storm Event (Yeon Raingage)	1.86 Inches http://or.water.usgs.gov/non-usgs/bes/yeon.rain 03:00 to 18:00 3/28
Was sample representative of "first flush" conditions (collected within the first 30 minutes of flow)	No
Comments	Onsite @ 0705 - Solid Steady Rain. Water level in ~~outlet~~ Interceptor manhole (where overflow bypass weir located) was about 10" below bypass weir top. Wait w 1 hour to see if overflow would occur, But No change in water level.

Sample Location ID	**Wilhelm Compliance Stormwater Sample Point (SP-01)**
Sample Location Type	Stormwater Treatment Facility Outlet Manhole
Estimated Flow (description)	Moderate - As visible through treatment system
Overflow Bypass Flowing?	No - See Comment Above
Sheen Present?	No
Floating Solids Present?	NO
Water Clarity	Slightly Turbid
Stormwater System Observations and Comments	Treatment system Appears to be functioning well with heavy rains + large water volumes.
Sample Method	Extendable pole w/ stainless steel cup. (Decontaminated in office)
Sample Time	0815
Sample Number	7436-140328-101
Sample Containers	4-1L Ambers (1 upreserved, 1- w/ HCL), 3-500ml polys (1 unpreserved, 1- w/ HNO3, 1- w/ H2SO4)
Parameters	Diesel and Oil TPH, Total Metals, PCBs, PAHs, TOC, TSS
Comments	

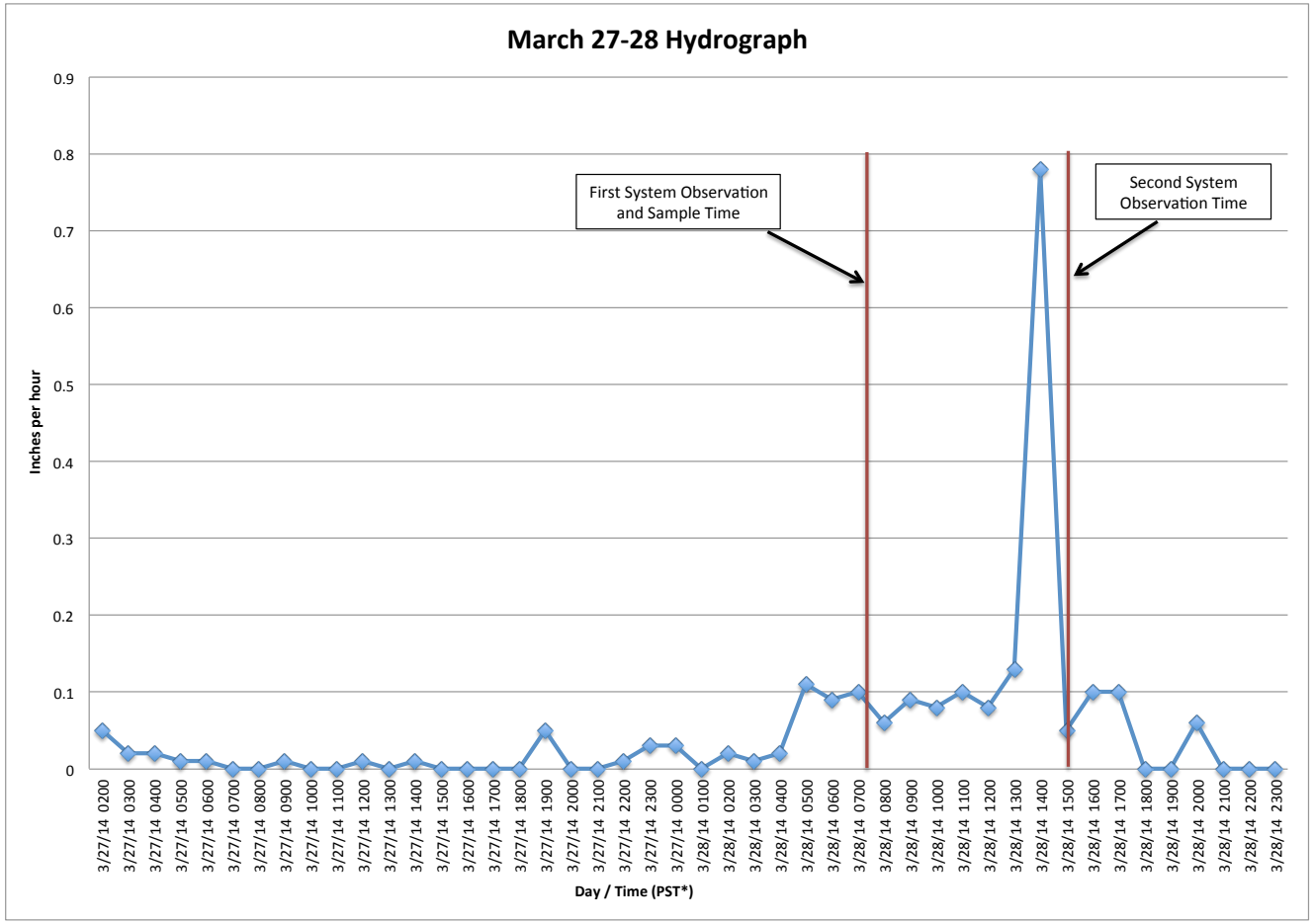
1600 - Gary Walvatne w/ HAI returned to site to observe the system for potential overflow and possibly collect another sample if the overflow bypass was flowing. Rains were moderate (Heavy on the way to the site), However the flow in the system was still measured at ~10" below the top of the overflow bypass weir, so additional sample Not collected.

Yeon Rain Gage - 3395 NW. Yeon Ave.

PROVISIONAL, UNCORRECTED RAW DATA FROM THE CITY OF PORTLAND HYDRA NETWORK.
Data are the number of tips of the rain gage bucket.
Each tip is 0.01 inches of rainfall.
[-, missing data]
Dates and times are PACIFIC STANDARD TIME.

Date	Daily Total	Hourly data --> 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10-APR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
09-APR-2014	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-APR-2014	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	22	7	12
07-APR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-APR-2014	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
05-APR-2014	14	0	2	1	0	0	2	3	0	0	1	0	0	0	2	0	1	0	1	0	0	0	0	1	0
04-APR-2014	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
03-APR-2014	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	1	3	2	9	3	0
02-APR-2014	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
01-APR-2014	7	0	1	1	0	1	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0
31-MAR-2014	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	1	10	5	0	1
30-MAR-2014	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
29-MAR-2014	71	0	0	5	0	1	0	0	5	13	1	2	18	7	0	0	0	0	7	7	4	0	0	1	0
28-MAR-2014	201	3	0	2	1	2	11	9	10	6	9	8	10	8	13	78	5	10	10	0	0	6	0	0	0
27-MAR-2014	28	4	1	5	2	2	1	1	0	0	1	0	0	1	0	1	0	0	0	0	5	0	0	1	3
26-MAR-2014	52	0	0	0	4	0	4	8	0	0	0	1	3	0	11	0	1	1	1	0	0	6	0	8	4
25-MAR-2014	25	0	0	0	0	5	9	1	0	0	0	2	0	0	1	0	4	3	0	0	0	0	0	0	0
24-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-MAR-2014	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
19-MAR-2014	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
18-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-MAR-2014	4	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
16-MAR-2014	73	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	12	23	12	12	10	1	0
15-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-MAR-2014	26	5	7	5	5	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13-MAR-2014	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12-MAR-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Date/Time*	# of Tips	Inches
3/27/14 0200	5	0.05
3/27/14 0300	2	0.02
3/27/14 0400	2	0.02
3/27/14 0500	1	0.01
3/27/14 0600	1	0.01
3/27/14 0700	0	0
3/27/14 0800	0	0
3/27/14 0900	1	0.01
3/27/14 1000	0	0
3/27/14 1100	0	0
3/27/14 1200	1	0.01
3/27/14 1300	0	0
3/27/14 1400	1	0.01
3/27/14 1500	0	0
3/27/14 1600	0	0
3/27/14 1700	0	0
3/27/14 1800	0	0
3/27/14 1900	5	0.05
3/27/14 2000	0	0
3/27/14 2100	0	0
3/27/14 2200	1	0.01
3/27/14 2300	3	0.03
3/27/14 0000	3	0.03
3/28/14 0100	0	0
3/28/14 0200	2	0.02
3/28/14 0300	1	0.01
3/28/14 0400	2	0.02
3/28/14 0500	11	0.11
3/28/14 0600	9	0.09
3/28/14 0700	10	0.1
3/28/14 0800	6	0.06
3/28/14 0900	9	0.09
3/28/14 1000	8	0.08
3/28/14 1100	10	0.1
3/28/14 1200	8	0.08
3/28/14 1300	13	0.13
3/28/14 1400	78	0.78
3/28/14 1500	5	0.05
3/28/14 1600	10	0.1
3/28/14 1700	10	0.1
3/28/14 1800	0	0
3/28/14 1900	0	0
3/28/14 2000	6	0.06
3/28/14 2100	0	0
3/28/14 2200	0	0
3/28/14 2300	0	0



*All times are listed in Pacific Standard Time (PST). The sample and system observation times were recorded on the field notes in Daylight Savings Time (DST), but were converted to PST to plot on this Hydrograph
Each Tip equals 0.01 inches of rainfall
Data obtained from City of Portland's HYDRA Network for Rain Gage No. 121, located at 3395 NW Yeon Street

APPENDIX C

Overflow Bypass Field Observation Sheets

Storm Water Sample Field Log

Site: Wilhelm Trucking Property — Project No.: 7436
3250 NW St Helens Road — Date: 3/28/14
Portland, Oregon — Sampled by: Mike Krzeminski

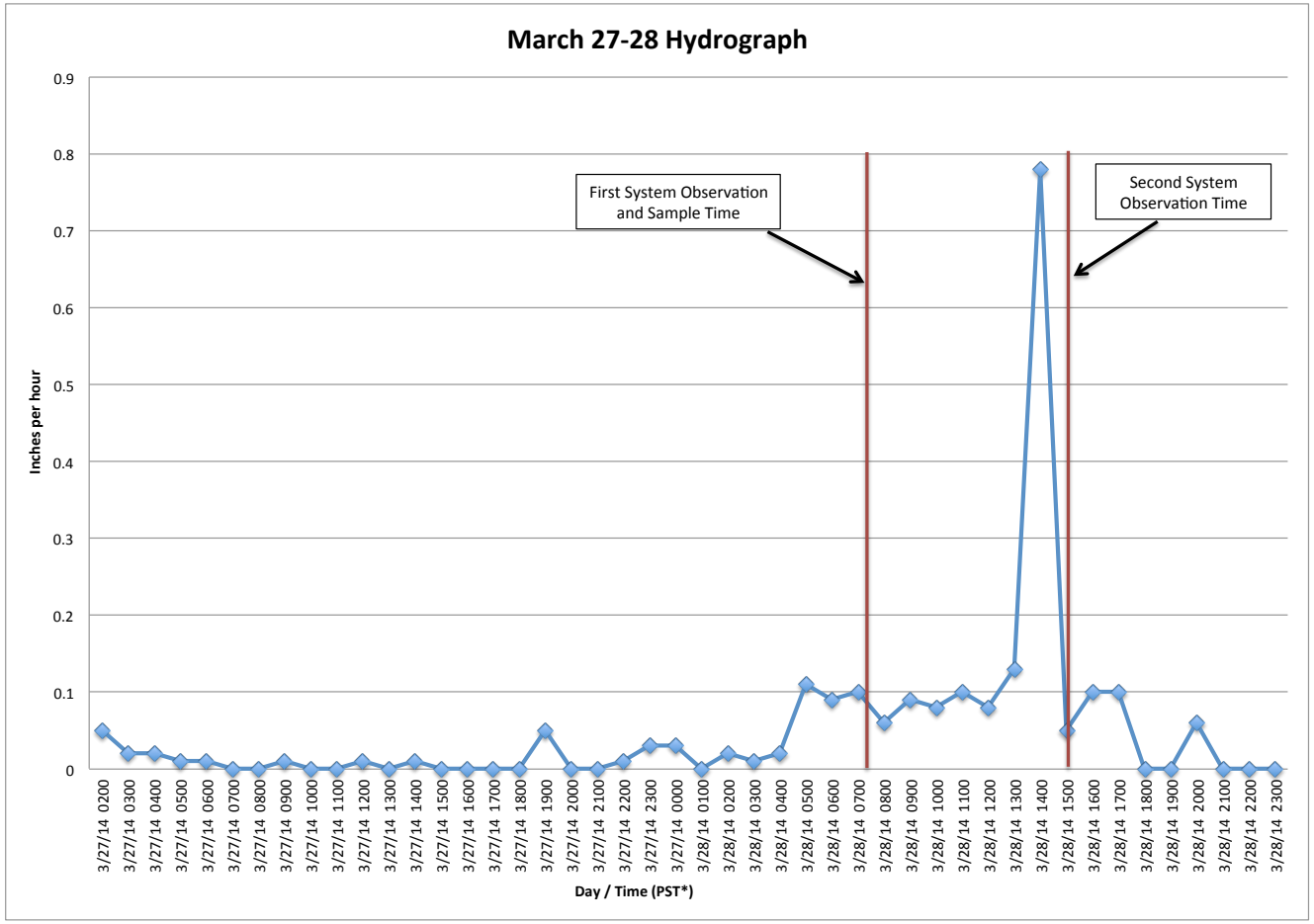
All Times Listed are in Daylight Savings Time (DST)

Weather Conditions	Moderate to Heavy Rains
Time Rain Event Commenced	03:00 3/28/14
Duration of Rain Event	15 hours
Rainfall Previous 24 Hours	0.26 Inches http://or.water.usgs.gov/non-usgs/bes/yeon.rain 03:00 3/27 to 03:00 3/28
Total Rainfall During Storm Event (Yeon Raingage)	1.86 Inches http://or.water.usgs.gov/non-usgs/bes/yeon.rain 03:00 to 18:00 3/28
Was sample representative of "first flush" conditions (collected within the first 30 minutes of flow)	No
Comments	Onsite @ 0705 - Solid Steady Rain. Water level in ~~outlet~~ Interceptor manhole (where overflow bypass weir located) was about 10" below bypass weir top. Wait w 1 hour to see if overflow would occur, But No change in water level.

Sample Location ID	**Wilhelm Compliance Stormwater Sample Point (SP-01)**
Sample Location Type	Stormwater Treatment Facility Outlet Manhole
Estimated Flow (description)	Moderate - As visible through treatment system
Overflow Bypass Flowing?	No - See Comment Above
Sheen Present?	No
Floating Solids Present?	NO
Water Clarity	Slightly Turbid
Stormwater System Observations and Comments	Treatment system Appears to be functioning well with heavy rains + large water volumes.
Sample Method	Extendable pole w/ stainless steel cup. (Decontaminated in office)
Sample Time	0815
Sample Number	7436-140328-101
Sample Containers	4-1L Ambers (1 upreserved, 1- w/ HCL), 3-500ml polys (1 unpreserved, 1- w/ HNO3, 1- w/ H2SO4)
Parameters	Diesel and Oil TPH, Total Metals, PCBs, PAHs, TOC, TSS
Comments	

1600 - Gary Walvatne w/ HAI returned to site to observe the system for potential overflow and possibly collect another sample if the overflow bypass was flowing. Rains were moderate (Heavy on the way to the site), However the flow in the system was still measured at ~10" below the top of the overflow bypass weir, so additional sample Not collected.

Date/Time*	# of Tips	Inches
3/27/14 0200	5	0.05
3/27/14 0300	2	0.02
3/27/14 0400	2	0.02
3/27/14 0500	1	0.01
3/27/14 0600	1	0.01
3/27/14 0700	0	0
3/27/14 0800	0	0
3/27/14 0900	1	0.01
3/27/14 1000	0	0
3/27/14 1100	0	0
3/27/14 1200	1	0.01
3/27/14 1300	0	0
3/27/14 1400	1	0.01
3/27/14 1500	0	0
3/27/14 1600	0	0
3/27/14 1700	0	0
3/27/14 1800	0	0
3/27/14 1900	5	0.05
3/27/14 2000	0	0
3/27/14 2100	0	0
3/27/14 2200	1	0.01
3/27/14 2300	3	0.03
3/27/14 0000	3	0.03
3/28/14 0100	0	0
3/28/14 0200	2	0.02
3/28/14 0300	1	0.01
3/28/14 0400	2	0.02
3/28/14 0500	11	0.11
3/28/14 0600	9	0.09
3/28/14 0700	10	0.1
3/28/14 0800	6	0.06
3/28/14 0900	9	0.09
3/28/14 1000	8	0.08
3/28/14 1100	10	0.1
3/28/14 1200	8	0.08
3/28/14 1300	13	0.13
3/28/14 1400	78	0.78
3/28/14 1500	5	0.05
3/28/14 1600	10	0.1
3/28/14 1700	10	0.1
3/28/14 1800	0	0
3/28/14 1900	0	0
3/28/14 2000	6	0.06
3/28/14 2100	0	0
3/28/14 2200	0	0
3/28/14 2300	0	0



*All times are listed in Pacific Standard Time (PST). The sample and system observation times were recorded on the field notes in Daylight Savings Time (DST), but were converted to PST to plot on this Hydrograph
Each Tip equals 0.01 inches of rainfall
Data obtained from City of Portland's HYDRA Network for Rain Gage No. 121, located at 3395 NW Yeon Street

Storm Water Sample Field Log

Site: Wilhelm Trucking Property — Project No.: 7436
3250 NW St Helens Road — Date: 10/22/14
Portland, Oregon — Sampled by: Mike Krzeminski

All Times listed in Daylights Savings Time (DST)

Weather Conditions	Heavy Rains
Time Rain Event Commenced	~ 0500 10/22/14
Duration of Rain Event	~ 12 hrs
Rainfall Previous 24 Hours	0.07 Inches http://or.water.usgs.gov/non-usgs/bes/yeon.rain
Total Rainfall During Storm Event (Yeon Raingage)	1.85 Inches http://or.water.usgs.gov/non-usgs/bes/yeon.rain
Was sample representative of "first flush" conditions (collected within the first 30 minutes of flow)	NA
Comments	Onsite @ 1350 - overflow bypass not flowing, water is ~2" from top of wier. Heavy rains expected to continue, so will return to site later for another observation. Return @ 1645 - water level ~3" below top of wier. No overflow observed.
Sample Location ID	**Wilhelm Compliance Stormwater Sample Point (SP-01)**
Sample Location Type	Stormwater Treatment Facility Outlet Manhole
Estimated Flow (description)	moderate to Heavy as visible through system
Overflow Bypass Flowing?	No
Sheen Present?	No
Floating Solids Present?	No
Water Clarity	Turbid
Stormwater System Observations and Comments	System functioning well - handeling the large volume of water with No Issues or observed backups or overflows.
Sample Method	No Sample Collected since outside 3hr Sample window
Sample Time	—
Sample Number	—
Sample Containers	4-1L Ambers (1 upreserved, 1- w/ HCL), 3-500ml polys (1 unpreserved, 1- w/ HNO3, 1- w/ H2SO4)
Parameters	Diesel and Oil TPH, Total Metals, PCBs, PAHs, TOC, TSS
Comments	

Yeon Rain Gage - 3395 NW. Yeon Ave.

PROVISIONAL, UNCORRECTED RAW DATA FROM THE CITY OF PORTLAND HYDRA NETWORK.
Data are the number of tips of the rain gage bucket.
Each tip is 0.01 inches of rainfall.
[-, missing data]
Dates and times are PACIFIC STANDARD TIME.

First observation* Second observation*

Date	Daily Total	Hourly data --> 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
23-OCT-2014	26	0	0	7	10	6	0	3*	0																
22-OCT-2014	201	1	1	0	0	0	2	0	4	3	5	8	25	44	32	31	20	7	6	0	0	9	2	1	0
21-OCT-2014	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
20-OCT-2014	18	0	0	0	0	1	0	0	1	0	0	0	0	0	0	6	5	5	0	0	0	0	0	0	0
19-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-OCT-2014	3	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17-OCT-2014	33	0	0	1	4	5	4	0	0	0	0	0	0	0	2	5	0	2	6	1	2	0	0	0	1
16-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-OCT-2014	30	0	12	1	0	0	2	1	0	4	0	1	1	5	2	0	0	0	0	0	0	0	0	0	1
14-OCT-2014	31	2	4	7	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	7	0
13-OCT-2014	15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	8	2
12-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-OCT-2014	27	0	0	0	4	20	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
10-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02-OCT-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-OCT-2014	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
30-SEP-2014	12	0	0	0	0	0	0	2	0	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
29-SEP-2014	8	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	2	0	0	0	0	0	0	0
28-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-SEP-2014	6	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	0	0	0	0	0	0	0	0
24-SEP-2014	26	5	4	4	1	4	1	2	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
23-SEP-2014	41	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	3	2	0	3	1	0	3	6	18
22-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-SEP-2014	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-SEP-2014	9	0	0	0	0	0	1	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-SEP-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-AUG-2014	11	0	0	0	0	0	0	0	0	0	1	0	0	0	10	0	0	0	0	0	0	0	0	0	0
29-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-AUG-2014	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-AUG-2014	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4	0
11-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-AUG-2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* - Times adjusted from Daylights Savings Time to PST