

Completion Summary for City of Portland Outfall Basin 18

1 Summary

The City of Portland (City) has been addressing source control concerns related to the City conveyance systems for more than four decades, and several City programs have evolved to meet changing regulatory requirements and watershed health objectives. Following the 2000 listing of Portland Harbor on the National Priorities List, the City initiated a new partnership with the Oregon Department of Environmental Quality (DEQ) Cleanup Program to identify specific sources of contaminants to City stormwater conveyance systems in the harbor that were not being adequately controlled. This report summarizes the results of this collaborative effort and concludes that it has. This Completion Summary includes a weight-of-evidence evaluation to

This Completion Summary includes a weight-of-evidence evaluation to demonstrate that source identification is complete and a summary of source controls (implemented or planned) that will control future contaminant discharges to the Willamette River.

Basin 18 is located on the west side of the river in the Guilds Lake Industrial Area at approximately River Mile (RM) 8.8. Development in the industrialized portion of the Basin 18 includes a mix of small and large facilities as well as some unpaved operational areas where legacy contamination from historical activities may be present. Forest Park comprises nearly 60 percent of the basin; most of the remainder of the basin is developed for industrial use.

The extensive investigations completed in this basin represent a significant joint effort between the City and DEQ. The City and DEQ selected Basin 18 as an early focus area for the Portland Harbor Outfalls Project and used the basin to pilot different approaches to a conveyance system source investigation. Basin 18 contains many DEQ Cleanup Program sites, as well as a U.S. Environmental Protection Agency (EPA) site, and is one of the more complex basins within the study area. The City focused its source investigation activities on industrial areas in the basin identified as most likely to be major sources to the conveyance system. Based on findings from City investigations, two additional sites joined the Cleanup Program at DEQ's request. Other potential sources were identified and investigated through a coordinated site discovery effort with DEQ.

To facilitate the investigations, the City divided the industrial drainage area into four subbasins and the downstream branch, which primarily comprises the Burlington Northern Santa Fe (BNSF) Railroad Lake Yard (see Figure 1). Source investigation activities included comprehensive facility inspections, sampling (inline solids, stormwater, and dry-weather flow) in specific branches of the system, and coordination with DEQ and EPA on investigation of contaminated sites in the basin. Data collection within the basin confirmed that sources of polychlorinated biphenyls (PCB), pesticides, semivolatile organics (SVOC), and metals are present and that major sources of these contaminants have been identified. Upgradient of the BNSF rail yard, source investigation results indicate that the major sources of contaminants via the stormwater pathway are located in the west-central and east-central subbasins; although sources also are present in the western and eastern subbasins, investigation results did not indicate that major current sources were present in these areas. In the downstream branch, the

whole drainage area is being investigated by three DEQ Cleanup Program sites: the BNSF rail yard, Gunderson, and the Oregon Department of Transportation (ODOT).

In addition to the stormwater pathway, transport of erodible soils (e.g., via overland runoff or vehicle drag-out) appears to be a current pathway for migration of contaminants to the basin and between subbasins. Site investigations also confirmed potential preferential contaminated groundwater pathways to the river via infiltration to Basin 18 conveyances.

Most of the industrial sites within the basin are conducting or have completed investigations under DEQ Cleanup Program or EPA authority, have been remediated, are covered by the DEQ Stormwater Quality Program, and/or have been redeveloped under the City's Stormwater Management Manual. Ongoing source control measure (SCM) implementation at the identified sources, together with the current and future source control programs in the basin, are expected to provide necessary source control for Outfall 18 discharges. Therefore, the City has met the remedial investigation (RI)/SCM objectives for Basin 18.

2 Introduction

This Completion Summary presents a weight-of-evidence evaluation of whether further source investigation is needed in Basin 18, and the rationale for concluding that future discharges from the basin are not likely to be significant sources of contaminants to river sediment. The purpose of this report is to demonstrate that, for Basin 18, the City has met the joint RI/SCM objectives of the August 13, 2003, intergovernmental agreement (IGA) between the City and DEQ. Together, the City and DEQ identified all major sources of contamination to the basin and are using respective authorities to ensure that source controls are implemented where needed.

This report is included in Appendix A of the *Municipal Stormwater Source Control Report for Portland Harbor* (Municipal Report), which provides additional background and detail regarding the City's harborwide source control efforts, including regulatory and non-regulatory programs to address current and future sources and to minimize recontamination potential.

3 Outfall and Basin Setting

3.1 Basin Location and Configuration

Outfall 18 is located in the Guilds Lake Industrial Area and discharges to the west side of the Willamette River at approximately RM 8.8. The drainage area for this system (Basin 18) is approximately 470 acres. Forest Park comprises the majority of the basin area. Remaining drainage is from developed properties (almost entirely heavy industrial), a section of the ODOT facility (Highway 30), and small residential areas. Figure 1 shows the location of the outfall and the entire drainage basin boundary. Figure 2 focuses on the industrial portion of the drainage basin and provides an overview of the associated stormwater conveyance system.

The Basin 18 conveyance system has five main branches; four of the five convey runoff from properties on the south side of NW Yeon Avenue as shown in Figure 1. These four branches are identified as the western, west-central, east-central, and eastern subbasins. The fifth branch

(downstream subbasin) conveys drainage from ODOT, portions of the rail yard and the Gunderson site, and a section of NW Front Avenue.

In 2009, the City Bureau of Environmental Services and Bureau of Transportation partnered with the Owens Corning site at 3750 NW Yeon Avenue to construct stormwater treatment of roof and parking lot drainage. At the same time, the City constructed green street facilities (vegetated swales) along NW 35th Avenue to reduce suspended solids loading to Basin 18. City programs that result in these types of stormwater improvements are described in the Municipal Report.

Additional detail on the Outfall 18 stormwater conveyance system and associated drainage basin is included in the *Phase 1 Data Evaluation Report and Phase 2 Work Planning for City of Portland Outfall 18* (CH2M HILL, 2004a) and the *Outfall Basin 18 Inline Solids Investigation* technical memorandum (BES, 2010a).

3.2 Land Use and Potential Upland Sources

More than half of the basin land use is open space (see Figure 2). Land use in almost the entire remainder of the basin is heavy industrial and major transportation (i.e., state highway). A wide variety of industrial operations take place in the basin, such as railroad servicing (e.g., railcar maintenance, washing, fueling, and freight loading), bulk oil transferring, container reconditioning, manufacturing, metal fabricating, and transportation-related activities (e.g., warehousing and trucking).

Sites that were identified as potential upland sources to the basin include 16 that are in the DEQ Cleanup Program, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database, and one site being investigated under EPA oversight. Table 1 lists these sites and indicates the associated contaminants of interest (COI) and the status of stormwater pathway evaluations. Of these 17 sites, 14 have stormwater source control evaluations (SCE) that are in progress or pending under DEQ or EPA oversight. DEQ determined that SCEs at the remaining sites either are not needed or are a low priority.

Table 1. DEQ Cleanup Program Sites in Basin 18

DEQ Cleanup Site	Site COIs ⁽¹⁾	Site Pathway Evaluations	
		Stormwater Pathway ⁽²⁾	Preferential Groundwater Pathway ⁽³⁾
Western Subbasin			
Christenson Oil – Plant Number 1 (ECSI #2426)	Stormwater: VOCs, PAHs, TPH, metals Groundwater: Not listed	Source Control Evaluation In Progress	Source Control Evaluation in Progress
McWhorter Inc. (ECSI #135)	Stormwater: VOCs, SVOCs, PAHs, TPH, phthalates Groundwater: Not listed	Need for Source Control Evaluation to be Determined/ Low Priority	Source Control Evaluation in Progress
Texaco Portland Terminal (ECSI #169)	Stormwater and groundwater: VOCs, PAHs, TPH, metals	Source Control Evaluation Completed – Source Control Determination Pending	Source Control Evaluation Completed – Source Control Determination Pending

DEQ Cleanup Site	Site COIs ⁽¹⁾	Site Pathway Evaluations	
		Stormwater Pathway ⁽²⁾	Preferential Groundwater Pathway ⁽³⁾
West-Central Subbasin			
Container Management Services (ECSI #4784)	Stormwater: PAHs, TPH, PCBs, metals, phthalates, pesticides	Source Control Evaluation In Progress	Source Control Evaluation in Progress
Van Waters & Rogers – Portland (currently Univar) (ECSI #330)	Stormwater and groundwater: VOCs, TPH, pesticide/herbicides, metals	Source Control Evaluation In Progress (EPA lead)	EPA Source Control Lead
Wilhelm Trucking (ECSI #69)	Stormwater: PCBs, metals	Source Control Evaluation In Progress	Source Control Evaluation Completed – Source Control Determination Pending
East-Central Subbasin			
ANRFS Holdings Inc. (ECSI #1820)	Stormwater: PAHs, PCBs, metals, phthalates	Source Control Evaluation Not Needed	Not shown
Carson Oil - NW 35TH Ave. (ECSI #1405)	Stormwater: VOCs, PAHs, TPH, PCBs, metals, phthalates	Source Control Evaluation In Progress	Source Control Evaluation in Progress ⁽⁴⁾
Columbia American Plating Co. (ECSI #29)	Stormwater: VOCs, SVOCs, PCBs, metals, Other (e.g., cyanide), PAHs, phthalates	Source Control Evaluation Completed – Source Control Determination Pending ⁽⁵⁾	Source Control Evaluation Completed – Source Control Determination Pending
Container Recovery (ECSI #4015)	Stormwater: PAHs, PCBs, metals, phthalates	Source Control Evaluation In Progress ⁽⁶⁾	Source Control Decision Completed
Van Waters & Rogers – Portland (currently Univar) (ECSI #330)	Stormwater and groundwater: VOCs, TPH, pesticide/herbicides, metals	Source Control Evaluation In Progress (EPA lead)	EPA Source Control Lead
Wilhelm Trucking (ECSI #69)	Stormwater: PCBs, metals	Source Control Evaluation In Progress	Source Control Evaluation Completed – Source Control Determination Pending
Eastern Subbasin			
Hill Investment Co. (ECSI #1076)	Stormwater: PAHs, PCBs, metals, phthalates ⁽⁷⁾	Need for Source Control Evaluation to be Determined / Low Priority	Not needed ⁽⁸⁾
Trumbull Asphalt Plant (ECSI #1160)	Stormwater: PAHs, PCBs, metals, phthalates	Source Control Evaluation Needed	Not needed ⁽⁸⁾
Wirfs Property (ECSI #2424)	Stormwater: VOC, SVOCs, metals Groundwater: VOCs	Source Control Evaluation Needed	Source Control Evaluation in Progress

DEQ Cleanup Site	Site COIs ⁽¹⁾	Site Pathway Evaluations	
		Stormwater Pathway ⁽²⁾	Preferential Groundwater Pathway ⁽³⁾
Downstream Branch			
Gunderson Inc. (ECSI #1155)	Stormwater: Metals, PAHs, phthalates, PCBs Groundwater: Not listed	Source Control Evaluation In Progress	Source Control Evaluation in Progress
Burlington Northern Railroad Lake Yard (ECSI #100) (aka Guilds Lake RR Yard and Portland Terminal Railroad)	Stormwater: VOCs, SVOCs, PAHs, TPH, PCBs, metals, phthalates, Other (e.g., sodium cyanide, ethylene glycol, creosote constituents) Groundwater: Not listed	Source Control Evaluation In Progress	Source Control Evaluation in Progress
Texaco Product Pipeline (ECSI #2117)	VOCs, PAHs, TPH	Not Applicable	Source Control Evaluation in Progress ⁽⁹⁾
ODOT - Portland Harbor Source Control Evaluation (ECSI #5437)	Not listed ⁽¹⁰⁾	Source Control Evaluation In Progress	Not Shown

Notes:

PAHs = polycyclic aromatic hydrocarbons; TPH = total petroleum hydrocarbons; VOCs = volatile organic compounds; SVOC = semivolatile organic compounds; COIs = contaminants of interest; EPA = U.S. Environmental Protection Agency; ECSI = Environmental Cleanup Site Information; PCB = polychlorinated biphenyls; ODOT = Oregon Department of Transportation

- (1) Unless otherwise noted, site COIs are those identified in Appendix Q (Source Control Inventory Tables) of the Portland Harbor RI/FS Draft Feasibility Study (FS) (Anchor et al., 2012).
- (2) Source (unless noted otherwise): DEQ Milestone Report, Figure 1b, "Status of Stormwater Source Control Evaluations, January 2013" (DEQ, 2013a).
- (3) Source: DEQ Milestone Report, Figure 3, "Groundwater Source Control Evaluation Status, January 2013" (DEQ, 2013a), unless otherwise noted.
- (4) Stormwater Assessment Workplan, Carson Oil, Inc. (Golder Associates, 2012).
- (5) Based on communication with DEQ (DEQ, 2013b).
- (6) DEQ approved a Stormwater Assessment Workplan for this site (Wohlers, 2013) in June 2013 (DEQ, 2013c).
- (7) Site is listed in Appendix Q of the draft FS as Ashland Chemical (Anchor et al., 2012).
- (8) Figure 3 of the DEQ Milestone Report (DEQ, 2013a), categorizes this site as "1999 DEQ Source Control Screening - Low/Medium Priority for Source Control Evaluation". The Milestone Report defines this category as referring to sites that DEQ examined during its pre-Superfund-listing, site-discovery efforts. At that time, DEQ determined groundwater at these sites did not pose a significant threat to the river and did not recommend a groundwater SCE be completed.
- (9) Site is not shown in Figure 1b of DEQ Milestone Report. Table 1 of Milestone Report indicates SCE for this site is ongoing, and that groundwater is the only applicable pathway (DEQ, 2013a).
- (10) Site is not listed in Appendix Q of the draft FS or Table 4.2-2 of the Portland Harbor RI/FS Draft Final Remedial Investigation Report (Integral et al., 2011), and site COIs are not listed in ECSI database (DEQ, 2012).

Industrial sites covered or historically covered by National Pollutant Discharge Elimination System (NPDES) stormwater regulations also were considered as potential sources of pollutants to the City conveyance system. Sites within the basin that currently hold, or historically held, NPDES permits to discharge to the Basin 18 stormwater conveyance system are listed in Table 2. Sites with current stormwater NPDES permits are shown in Figure 2. Note that the City and ODOT both have NPDES Municipal Separate Storm Sewer System (MS4) stormwater permits that also cover basin drainage areas.

Table 2. Current⁽¹⁾ and Historical NPDES Permit Coverage in Basin 18

Address	Company	Permit Type	Time Period
3003 NW 35 th	Columbia American Plating	Stormwater (1200-Z)	1999 – 2005
	Carson Oil Warehouse	Stormwater (1200-Z)	2011 – Present
3125 NW 35 th	Carson Oil Truck Shop	Stormwater (1200-T)	1993 – 1996
		Stormwater (1200-Z)	1997 – Present
3000 NW St Helens	Container Management Services	Stormwater (1200-Z)	2000 – Present
3250 NW St Helens	Wilhelm Trucking Co.	Stormwater (1200-T)	1996 – 1997
		Stormwater (1200-Z)	1997 – Present
3333 NW 35 th	Bay News Inc./FTL, Inc.	Stormwater (1200-T)	1993 – 1996
		Stormwater (1200-Z)	1997 – 2001
	ABF Freight Systems, Inc. ⁽²⁾	Stormwater (1200-Z)	2001 – 2012
	MRP Services, Inc.	Stormwater (1200-Z)	2003 – 2011
3537 NW St Helens	Special Asphalt Products, Inc.	Stormwater (NPDES Individual Permit 3703-J)	1983 – 1987
		Oily Stormwater (1300-J)	1987 – 1996
		Stormwater (1200-H)	1992 – 1993
3750 NW Yeon	Owens Corning Fiberglass/ Owens Corning Corporation ⁽³⁾	Cooling Water (100J)	1992 – 2003
		Boiler Blowdown (500J)	1991 – 2003
		Groundwater (1500-A)	1995 – 2000
		Oily Stormwater (1300-J)	1988 – 2004
		Stormwater (1200-H)	1992 – 1996
		Stormwater (1200-Z)	1997 – 2007
	Owens Corning Roofing & Asphalt LLC	Stormwater (1200-Z)	2007 – Present
3900 NW Yeon	Container Recovery	Stormwater (1200-Z)	1999 – 2009
	Oregon Beverage Recycling Cooperative	Stormwater (1200-Z)	2009 – Present
3950 NW Yeon	Van Waters and Rogers, Inc./ Vopak USA, Inc./Univar USA ⁽⁴⁾	Groundwater (Individual NPDES) <i>Note: Permit included 1200-Z stormwater requirements.</i>	1998 – 2009
	Univar USA	Groundwater (Individual NPDES)	2009 – Present
3821 NW St Helens	Christenson Oil	Stormwater (1200-H)	1996
		Stormwater (1200-Z)	1997 – Present
3800 NW St Helens	Texaco/Equilon Enterprises, LLC ⁽⁵⁾	Groundwater (1500-A)	1998 – 2005
		Stormwater (1200-T)	1992 – 1995
		Oily Stormwater (1300-J)	1995 – 2007
	Equilon Enterprises, LLC	Stormwater (1200-Z)	2007 – Present

Address	Company	Permit Type	Time Period
4155 NW Yeon	McWhorter Inc./McWhorter Technologies Inc./Eastman Chemical Company ⁽⁶⁾	Cooling Water (100J)	1990 – 2001
		Groundwater (1500-A)	1995 – 2001
		Stormwater (1200-H)	1992 – 1996
		Stormwater (1200-Z)	1997 – 2001
3930 NW Yeon	Burlington Northern Railroad	Stormwater (1200-T)	1996
		Stormwater (1200-Z)	1998 – 2003
	Pacific Rail Services	Stormwater (1200-Z)	2003 – Present
4350 NW Front	Gunderson LLC	Stormwater (1200-L)	1992 – 1996
		Stormwater (1200-Z)	1997 – Present

Notes:

NPDES = National Pollutant Discharge Elimination System

- (1) Current permits are indicated in bold.
- (2) S&T Trucking covered as a tenant under ABF's Stormwater Pollution Control Plan.
- (3) Name changed from Owens Corning Fiberglass to Owens Corning Corporation on 3/3/1998.
- (4) Name changed from Van Waters & Rogers to Vopak USA on 4/2/2001 and to Univar USA on 11/20/2002.
- (5) Name changed from Texaco to Equilon Enterprises on 5/10/2000.
- (6) Name changed from McWhorter, Inc. to McWhorter Technologies, Inc., in 7/1994 and then to Eastman Chemical Company on 1/29/2001.

3.3 Outfall Setting

Outfall 18 discharges to an area of potential concern (AOPC 19) identified by the EPA based on elevated concentrations of PCBs, pesticides, metals, polycyclic aromatic hydrocarbons (PAHs), bis(2-ethylhexyl)phthalate (BEHP), and other contaminants in river sediment (EPA, 2010). In addition to Outfall 18, approximately 36 non-City outfalls discharge to AOPC 19. Overwater activities associated with industrial operations also take place within the AOPC in the vicinity of Outfall 18.

4 Basin Screening and Source Investigations

Source investigations in Basin 18 represent a significant amount of coordination between the City and DEQ. The City's investigations in Basin 18 started shortly after the 2000 listing of Portland Harbor and helped shape DEQ's and the City's joint approach to future source investigation and control activities in other City basins. In 2001, DEQ and the City initiated a pilot project in Basin 18 to develop an effective streamlined process for investigating and evaluating potential sources within the City basins (CH2M HILL, 2002); results of this pilot project (CH2M HILL, 2004a and 2005) served as the basis for development of the 2003 IGA between DEQ and the City. The City conducted research on individual sites under DEQ and EPA cleanup oversight in Basin 18, provided information to the agencies to better address site-specific stormwater pathway evaluations, and assisted DEQ with further site discovery actions in the basin. In addition, as data from the City conveyance system have been collected and evaluated over the years, the City and DEQ have coordinated to identify priorities for further source investigation. Basin 18 source investigations and findings are summarized below.

Phase 1 of the pilot project included sediment sampling adjacent to Outfall 18 in 2002 and compiling information on facilities in the basin to assess the potential for sites to discharge contaminated stormwater to Basin 18. Phase 1 results indicated that several contaminants were present at elevated concentrations in the vicinity of the outfall, and additional investigation of potential sources to the conveyance system was recommended for Phase 2 of the pilot project (CH2M HILL, 2004a). Subsequently, the City identified Basin 18 as a Priority 1 for source tracing based on elevated concentrations of PCBs, metals, pesticides, and phthalates detected in the inriver sediment samples collected by the City in 2002 in the vicinity of Outfall 18 (CH2M HILL, 2004b). Priority 1 designations were assigned to basins where significantly elevated contaminant concentrations had been detected in sediment near the outfall and further investigation efforts were needed to determine if these contaminants were being discharged to the City system.

Phase 2 of the pilot study was conducted in 2003, and it included inspecting more than a dozen facilities within the basin and collecting inline solids samples from the Basin 18 conveyance system to evaluate the feasibility of inline solids sampling as a source investigation tool (CH2M Hill, 2005). The investigation results indicated the presence of contaminant sources within the basin. The City conducted further inline solids sampling in 2004 in the vicinity of Container Management Services and Wilhelm Trucking, as part of emergency stormwater line cleaning activities in the west-central subbasin. Results of this investigation indicated elevated concentrations of PCBs, metals, phthalates, and PAHs in solids in the City and private stormwater lines in the vicinity of these two facilities (BES, 2006).

In 2006, the City evaluated the potential for its conveyance systems (including Basin 18) to act as preferential pathways for contaminated groundwater in identified shallow plumes, using an available groundwater plume dataset developed by the Lower Willamette Group (LWG) (Integral and GSI, 2004). Results indicated the presence of two shallow plumes potentially intersecting portions of the Basin 18 conveyance system: a petroleum plume in the vicinity of the Texaco and McWhorter sites, and a volatile organic compounds (VOC) plume in the vicinity of the Univar (formerly Van Waters & Rogers) site (GSI, 2006). This information helped to identify sites where investigations were needed to evaluate this pathway to the river.

Because the upland sites on the east side of NW Yeon Ave. (i.e., the rail yard and Gunderson) were conducting SCEs under DEQ oversight, the City focused its later investigations on the industrial area between NW Yeon Avenue and Forest Park. In early 2007, the City assisted DEQ with a site discovery effort in this portion of Basin 18, which resulted in DEQ requesting three sites to conduct SCEs.

As part of its Portland Harbor stormwater screening effort, the City evaluated 2007-2008 stormwater and sediment trap sample data collected by the LWG in Basin 18 at a point representing discharge from this area. Based on this analysis, concentrations of total PCBs, pesticides, and copper in Basin 18 stormwater were identified as potentially warranting further source tracing (BES, 2010b). In addition, the City installed sediment traps in the four subbasins upstream of the LWG sampling location to collect data concurrent with the LWG sediment trap investigation to prioritize areas for source identification. Analytical results indicated the presence of sources of PCBs, pesticides, and metals to the east-central subbasin, and sources of PCBs and pesticides to the west-central subbasin (BES, 2010a). Based on these results, the City focused subsequent source tracing on PCBs, pesticides, and metals.

Because the City already had identified Container Management and Wilhelm as likely contaminant sources in the west-central subbasin and these sites were initiating SCEs under DEQ oversight, the City focused the next phase of the investigation on the east-central subbasin (BES, 2012). The City conducted investigations in the east-central subbasin before and after comprehensive cleaning of all main lines in this branch of the system in 2010. Post-cleaning data collected by the City and by Univar as part of its SCE indicate that discharges of PCBs, pesticides, and metals have been reduced, although there are current sources to the subbasin. Results also confirmed an erodible soils pathway from the Container Management site to the east-central subbasin (BES, 2012).

Available information from upland sites confirms the presence of these contaminants at sites within and adjacent to the east-central and west-central subbasins. Likely major current sources to these subbasins include Container Management and Wilhelm Trucking; other sites under investigation by DEQ and EPA also may be discharging these and other contaminants to the basin (see Table 1). The former Columbia American Plating site was a likely source of metals and PCBs to the east-central subbasin before site redevelopment in 2009-2011.

All known and suspected major sources of contaminants to Basin 18, via the stormwater and/or preferential groundwater pathway, are being investigated under DEQ or EPA oversight. Stormwater pathway investigations (and/or preferential groundwater pathway evaluations, where applicable) are currently underway or recently completed at the BNSF, Carson Oil, Christenson Oil, Columbia American Plating, Container Management, Container Recovery, Gunderson, McWhorter, ODOT, Texaco, Univar, and Wilhelm Trucking facilities. In addition, DEQ anticipates completion of SCEs at the Trumbull Asphalt and Wirfs sites.

For additional information, investigations and evaluations completed by the City and others in the Basin 18 conveyance system are listed in Table 3.

Table 3. Investigations in the Basin 18 Stormwater Conveyance System

Data Collection Period	Party	Purpose	Documentation
2000	City	Compile basin background information to identify potential sources.	Preliminary Evaluation of City Outfalls (Westshore) (BES, 2000)
2002	City	Investigate inriver sediment quality in the vicinity of Outfall 18 and develop recommendations for Phase 2 pilot work to be conducted within the basin.	Phase 1 Data Evaluation Report and Phase 2 Work Planning for City of Portland Outfall 18, (CH2M HILL, 2004a)
2003	City	Pilot study to investigate inline solids within the City's conveyance system and evaluate potential contaminant sources.	Data Evaluation Report, Inline Solids in Basin M-1 and 18 (CH2M HILL, 2005)
2004	City	Conduct additional source tracing work through inline solids sampling during line cleaning adjacent to Container Management and Wilhelm Trucking.	Inline Solids Sampling in the Vicinity of Container Management Services and Wilhelm Trucking Co. (BES, 2006)
2005	City	Evaluate existing data on groundwater plumes and identify the potential for City conveyance systems (including Basin 18) to act as preferential pathways.	Relationships Between Upland Shallow Groundwater Plumes and the City Stormwater and Combined Conveyance System with the Portland Harbor (GSI, 2006)

Data Collection Period	Party	Purpose	Documentation
2007	LWG	Collect harborwide stormwater and sediment trap data to develop land use stormwater loading estimates for input to the inriver fate and transport model.	Portland Harbor RI/FS Round 3A and 3B Stormwater Data Report (Anchor and Integral, 2008)
2007 - 2008	City	Evaluate stormwater data from City outfalls to identify additional source tracing needs.	Stormwater Evaluation Report, City of Portland Outfall Project (BES, 2010b)
2007 - 2009	City	Collect inline solids and sediment trap samples at subbasin locations upstream of LWG location, concurrent with the LWG deployment, to assist with data evaluation and source tracing.	Outfall Basin 18 Inline Solids Investigation, TM No. 18-2 (BES, 2010a)
2008 - 2009	Shell Oil/ Texaco	Collect stormwater samples from the City conveyance system as part of the site's stormwater SCE.	Groundwater and Stormwater Source Control Evaluation Report, Shell Portland Bulk Terminal (URS, 2013)
2009	3003 NW 35 th LLC	Sample stormwater solids from City line adjacent to former Columbia American Plating site to evaluate the site's discharges to the conveyance system.	On-Site Stormwater Sewer Cleanout, Former Columbia American Plating Site (O'Gara, 2009)
2009 - 2011	City	Evaluate contaminant sources in the east-central subbasin through inline solids, sediment trap, and erodible soils sampling.	Outfall Basin 18 East-Central Subbasin Source Investigation Report (BES, 2012)
2010 - 2011	Univar	Collect stormwater, sediment trap, and dry-weather flow samples from the City stormwater line upstream and downstream of site connections to evaluate site contributions to the Basin 18 conveyance system via the stormwater and preferential groundwater pathways.	Draft Stormwater Pathway Investigation Report, Univar USA, Inc. (PES, 2012)
2011	Wilhelm	Collect stormwater solids samples from the City stormwater line immediately upstream and downstream from site connections to evaluate the site discharges to the Basin 18 conveyance system.	Storm Water Assessment, Erodible Soil And Storm Water Sediment Sampling Report, Wilhelm Trucking Company (Hahn and Associates, 2012)
2011 - 2012	BNSF	Collect stormwater solids and stormwater samples from the City stormwater line upstream and downstream of site connections as part of the site's stormwater SCE.	Source Control Evaluation Report, Guilds Lake Yard Site, (Farallon, 2013).
2012	Shell Oil/ Texaco	Collect dry-weather flow samples from the City conveyance system in NW Yeon Avenue as part of the site's evaluation of the preferential groundwater pathway.	Groundwater and Stormwater Source Control Evaluation Report, Shell Portland Bulk Terminal (URS, 2013)

The City's source investigation work was used by DEQ to focus upland site investigations and to identify sites for DEQ Cleanup Program consideration. Joint investigation by the City and DEQ resulted in the identification of sources of all contaminants selected for source tracing in Basin 18.

5 Completion of Source Identification

The lines of evidence evaluated to verify that source tracing is complete and all major sources have been identified include (1) results of source tracing activities conducted in the basin (and upland site information) and (2) land use at remaining upland areas not undergoing DEQ Cleanup Program investigation or redevelopment. Findings from this evaluation are summarized below.

- *Source Tracing Results:* Upland sources of all contaminants selected for source tracing have been identified. Following a basin-wide assessment, subsequent City source tracing focused on the east-central and west-central subbasins, because all sites discharging to the downstream branch were being investigated by DEQ and data from the western and eastern subbasins did not indicate that major current sources were present. The City selected PCBs, pesticides, and metals for source tracing in these areas. Source investigations and review of upland site data confirmed that four sites in these subbasins (Container Management, Wilhelm Trucking, Univar, and Columbia American Plating) detected one or more of the Basin 18 source tracing contaminants in site soils at concentrations comparable to or higher than those detected in solids from the Basin 18 conveyance system. Sources of other contaminants identified for source tracing, such as PAHs and phthalates, also have been identified (see Table 1). Based on data collected from the City conveyance system and data collected at identified sources, potential major sources to Basin 18 via stormwater, preferential groundwater, and vehicle/equipment drag-out have been identified.
- *Upland Investigation Coverage and Land Use:* Approximately 60 percent of the land use in Basin 18 is open space. For the developed portion of the basin, Figure 3 displays the spatial extent of DEQ Cleanup Program site investigation and other programmatic controls (see key to figures provided at beginning of this Appendix). As shown in Figure 3, the majority of developed area has been or is being investigated, or likely does not need investigation because of land use and existing controls. Most of the sites in the developed area:
 - Are or will be investigating the stormwater and/or preferential groundwater pathway and implementing SCMs under DEQ Cleanup Program or EPA authority;
 - Have completed investigation and remediation activities under DEQ or EPA oversight;
 - Have been designated by DEQ as not needing an SCE or as a low priority for completing an SCE;
 - Are covered under NPDES stormwater regulations; and/or
 - Have been inspected by the City for industrial stormwater exposures and have been provided technical assistance as needed to implement BMPs.

Land use at sites not covered by DEQ/EPA Cleanup or Water Quality Programs consists mostly of a few large warehouse operations with minimal industrial exposures to stormwater and some smaller sites on the west side of NW St. Helens Road. Current and future industrial activities exposed to stormwater will be addressed by the DEQ

Water Quality NPDES Program, and non-industrial activities are not a known or suspected major source of contaminants to the City stormwater conveyance system.

Based on these lines of evidence, the City concludes that the Basin 18 source tracing is complete and all major sources have been identified.

6 Basin Source Controls

The City and DEQ collaborated under their respective authorities to identify control mechanisms for all major sources identified in the basin. Source control for major and minor sources in Basin 18 includes SCMs completed (or planned) at contaminated sites under DEQ Cleanup Program or EPA agreements and ongoing City and DEQ programs that are described in the Municipal Report. Source controls implemented in Basin 18 are displayed in Figures 2 and 3 and summarized in this section.

One type of programmatic source control is the elimination of stormwater exposures to industrial activities. Sites that hold (or historically held) an NPDES No Exposure Certification (NEC) are listed in Table 4.

Table 4. Sites with No Exposure Certification (NEC) in Basin 18 ⁽¹⁾

Address	Company	Time Period
2840 NW 35 th	Journal Graphics	1999 – Present
3441 NW Guam	Portland Bolt & Manufacturing	2003 – Present
3074 NW St Helens	Industrial Craters & Packers	2003 – Present
3133 NW St Helens	Trad Trucking, Inc.	2004 – 2009
	CBL Trucking Company Inc.	2009 – Present
3136 NW 35 th	Weyerhaeuser Recycling	2000 – 2005
3322 NW 35 th	Ashland Chemical Inc.	2000 – 2010
3333 NW 35 th	S&H Trucking	2002 – 2007
	ABF Freight Systems, Inc.	2012 – Present
3509 NW St Helens	Industrial Craters & Packers	2008 – Present
3537 NW St Helens	Special Asphalt Products Inc.	2013 – Present
3641 NW St Helens	Tualatin Valley Transportation Inc.	2013 – Present
3717 NW St Helens	Baxter & Flaming Industries, Inc.	2000 – Present ⁽²⁾
4033 NW Yeon	Alliance Trading LLC	2013 – Present
4155 NW Yeon	Kenan Advantage Group Inc (Reinhard Transp)	2012 - Present

Notes:

(1) Current NECs are indicated in bold.

(2) Records indicate NEC was inactive between November 2005 and June 2006.

Additional site-specific, programmatic, and conveyance system source controls for Basin 18 are summarized in Table 5.

Table 5. Basin 18 Source Controls

Site / Area	Source Controls	Implementation Timeframe
Source Control Measures (SCM) at DEQ Cleanup Sites ⁽¹⁾		
ANRFS Holdings Inc. (ECSI #1820)	Not needed	Not applicable
Burlington Northern Railroad Lake Yard (ECSI #100) (aka Guilds Lake RR Yard and Portland Terminal Railroad)	To be determined.	To be determined
Carson Oil - NW 35TH Ave. (ECSI #1405)	The site cleaned out all onsite catch basins, trench drains, stormwater lines, and the oil/water separator, and pressure washed all paved surfaces.	2012
	Oil-water separator.	Ongoing
Christenson Oil - Plant Number 1 (ECSI #2426)	Product recovery from groundwater - dual phase extraction	Ongoing
	To be determined for stormwater.	To be determined
Columbia American Plating Co. (ECSI #29)	EPA conducted a removal action at the site in 2003-2004 to address the imminent threat site contamination posed to human health and the environment.	2003 - 2004
	The onsite stormwater conveyance system was cleaned and then the site was redeveloped. Improvements made as part of the site redevelopment include demolition of previous buildings, stormwater system replacement, installation of a stormwater treatment system, and site paving.	2009 - 2011
Container Management Services (ECSI #4784)	To be determined.	To be determined
Container Recovery (ECSI #4015)	The site cleaned out all onsite catch basins and accessible stormwater lines.	2008
	Additional SCMs to be determined.	To be determined
Gunderson Inc. (ECSI #1155)	Oil-water separator already in operation. Additional SCMs to be determined.	To be determined.
Hill Investment Co. (ECSI #1076)	Not needed.	Not applicable
McWhorter Inc. (ECSI #135)	Previous site redevelopment included removal of all buildings, tanks, and drainage systems. Additional SCMs to be determined.	To be determined
ODOT - Portland Harbor Source Control Evaluation (ECSI #5437)	To be determined.	To be determined

Site / Area	Source Controls	Implementation Timeframe
Texaco Portland Terminal (ECSI #169)	Replaced wooden flume ("Green Creek") that historically crossed the central portion of property with a buried pipe.	1993
	Removed 36 tons of sandblast grit and lead-based paint chips from surface soil in the East Tank Farm.	1995
	Cleaned out catch basins and storm lines in the East Tank Farm.	2008
	Removed additional soil from East Tank Farm based on surface soil sampling results.	2011
	Operation of an oil/water separator, which treats most of the stormwater discharging from the site.	Ongoing
	Operation of product recovery system to remediate gasoline pipeline release.	1983 - 1990
Texaco Product Pipeline (ECSI #2117)	Operation of air sparging/soil vapor extraction system to remediate pipeline corridor leak near Gunderson.	1993 - 2003
Trumbull Asphalt Plant (ECSI #1160)	Stormwater treatment of front parking lot and some roof drainage. Remainder of site to be determined.	To be determined.
Van Waters & Rogers - Portland (currently Univar) (ECSI #330)	To be determined.	To be determined
Wilhelm Trucking (ECSI #69)	Abandonment of portions of storm system, construction of new storm lines and catch basins, and installation of oil/water separator.	2013
	Additional SCMs to be determined.	To be determined
Wirfs Property (ECSI #2424)	To be determined.	To be determined
City Conveyance System		
West-Central Subbasin	The City cleaned the stormwater line adjacent to Container Management and Wilhelm Trucking.	2001, 2004
Eastern Subbasin (NW 35 th)	The City constructed two water quality swales to reduce total suspended solids loading to Basin 18. The swales treat stormwater discharged from a portion of NW 35 th Avenue.	2009
East-Central Subbasin (upper subbasin, including NW 35 th Avenue)	In response to detections of elevated concentrations of contaminants in the fall 2009 inline solids samples from this subbasin, and in anticipation of additional source investigations, the City cleaned the main lines in the upper subbasin (upstream of Univar).	2010
East-Central Subbasin (lower subbasin)	As part of Univar's stormwater source control evaluation, Univar cleaned the City stormwater line in the lower portion of the east-central subbasin (downstream of the section cleaned by the City).	2010
Other (Programmatic Source Controls)⁽²⁾		
Gunderson, Burlington Northern Railroad Lake Yard, Columbia American Plating/Carson Oil Warehouse	Stormwater Management Manual Requirements	Ongoing

Site / Area	Source Controls	Implementation Timeframe
Univar, Tualatin Valley Transportation Inc.	City Discharge Authorization ⁽³⁾	Ongoing
See site listing in Table 2	NPDES 1200-Z Stormwater Permit Requirements	Ongoing
See site listing in Table 4	NPDES No Exposure Certifications	Ongoing

Notes:

ECSI = Environmental Cleanup Site Information; NPDES = National Pollutant Discharge Elimination System; DEQ = Oregon Department of Environmental Quality; ODOT = Oregon Department of Transportation

- (1) For upland sites, descriptions of SCMs are based on information in DEQ Milestone Report (DEQ, 2013a), DEQ source control decisions, and/or reports on file with DEQ.
- (2) Programmatic source controls are described in the Municipal Report.
- (3) Additional site-specific stormwater pollution controls required and implemented under City Code.

Other municipal programs (e.g., periodic inspection of and technical assistance to non-NPDES sites, illicit discharge monitoring, street sweeping, etc.) likely provide additional source control benefits in the basin and will help to address minor sources for which specific control measures have not been required. City programs that control current and future contaminant discharges to the conveyance system are described in the Municipal Report.

7 Conclusion

The City completed source tracing in Basin 18 and identified the major and potential sources of contaminants to the City conveyance system. Because necessary SCMs at identified sources have been implemented or are being determined under appropriate DEQ, EPA and City regulatory authorities, future discharges from Outfall 18 are unlikely to represent a significant source of contaminants to the river. However, the City will continue to look for opportunities with existing and future City stormwater programs to reduce suspended solids loading from the basin to the river. The City concludes that it has met the RI/SCM objectives of the IGA and requests a source control decision from DEQ for Basin 18.

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List of Figures

Figure 1: Basin 18 Drainage Basin Overview

Figure 2: Basin 18 Industrial Area Overview and Conveyance System Source Controls

Figure 3: Basin 18 Upland Site Source Controls

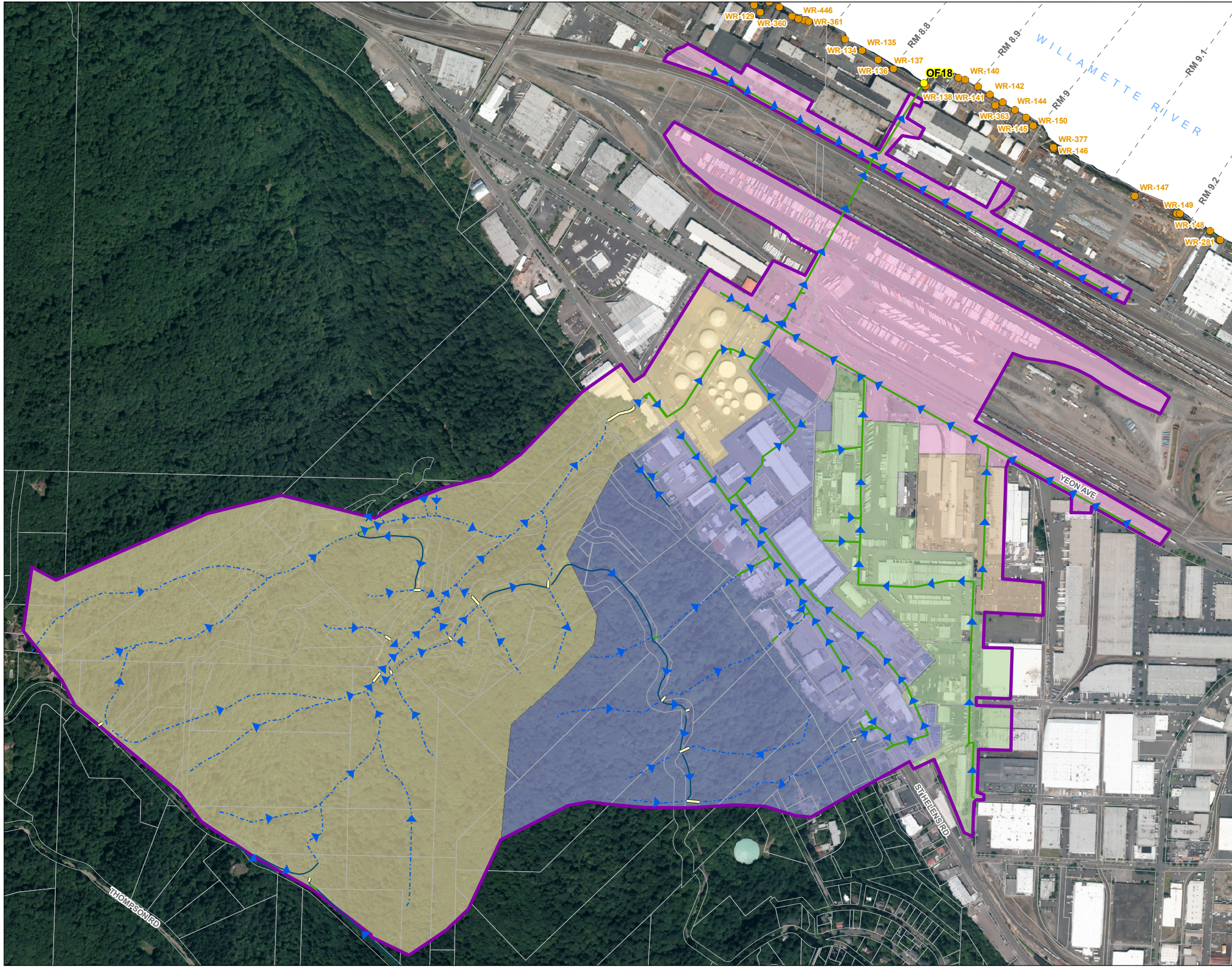
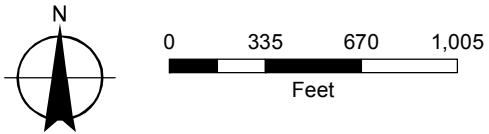


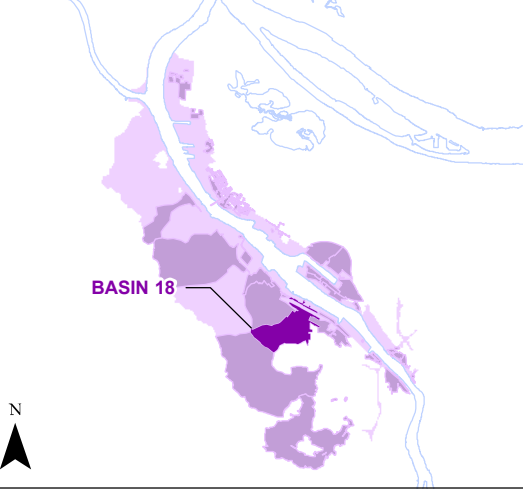
FIGURE 1
Basin 18
Drainage Basin Overview

- Basin 18
- Basin 18 Subbasins**
 - Western Subbasin
 - West-Central Subbasin
 - East-Central Subbasin
 - Eastern Subbasin
 - Downstream Subbasin
- Conveyance System**
 - Storm Line
 - Culvert
 - Ditch
 - Channel
 - City Outfall
 - Non-City Outfall
- All Other Data**
 - River Mile (RM)
 - Tax Lot
 - Discharges to City Outfall
 - Portland Harbor Hydroboundary



MAP NOTES:
Date: December 31, 2013
Data Sources: BES, METRO, Aerial Photo Taken 2012

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
1120 SW Fifth Avenue, Room 1000
Portland Oregon, 97204-1912



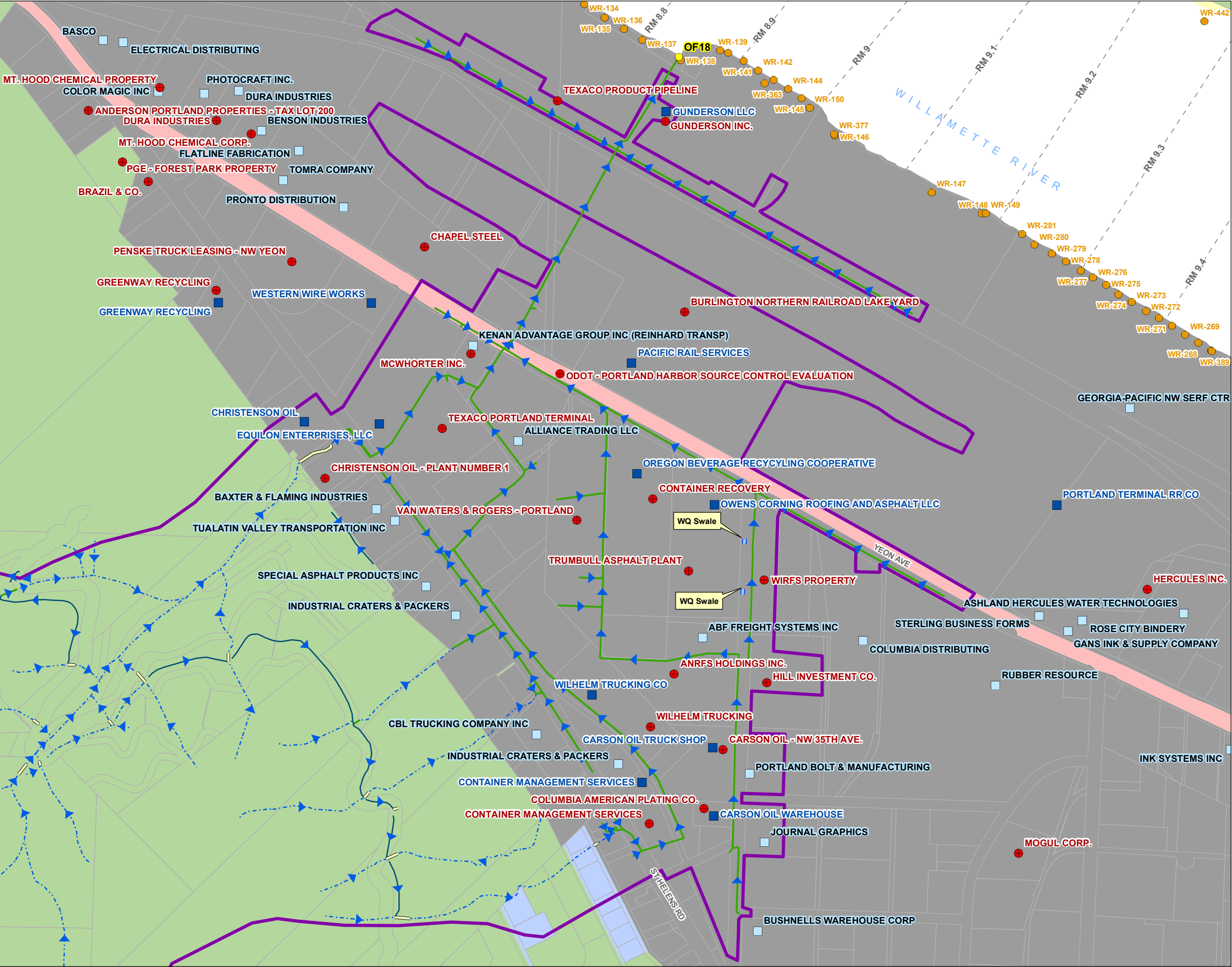
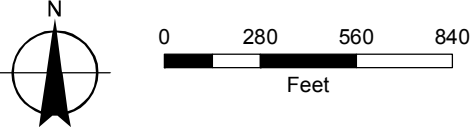


FIGURE 2
Basin 18
Industrial Area Overview and Conveyance
System Source Controls

- Basin 18
- DEQ ECSI Site
- NPDES Stormwater Permit
- NPDES No Exposure Certification
- Conveyance System**
 - Storm Line
 - Culvert
 - Ditch
 - Channel
 - Water Quality (WQ) Swale
 - City Outfall
 - Non-City Outfall
- Land Use/Zoning**
 - Heavy Industrial
 - Residential
 - Parks and Open Space
 - Major Transportation
- All Other Data**
 - River Mile (RM)
 - Tax Lot
 - Discharges to City Outfall
 - Portland Harbor Hydroboundary

NOTE:
Land use in undisplayed portion of basin is all Parks and Open Space.



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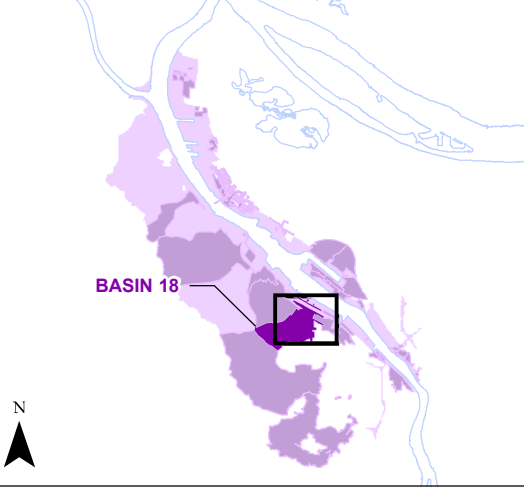
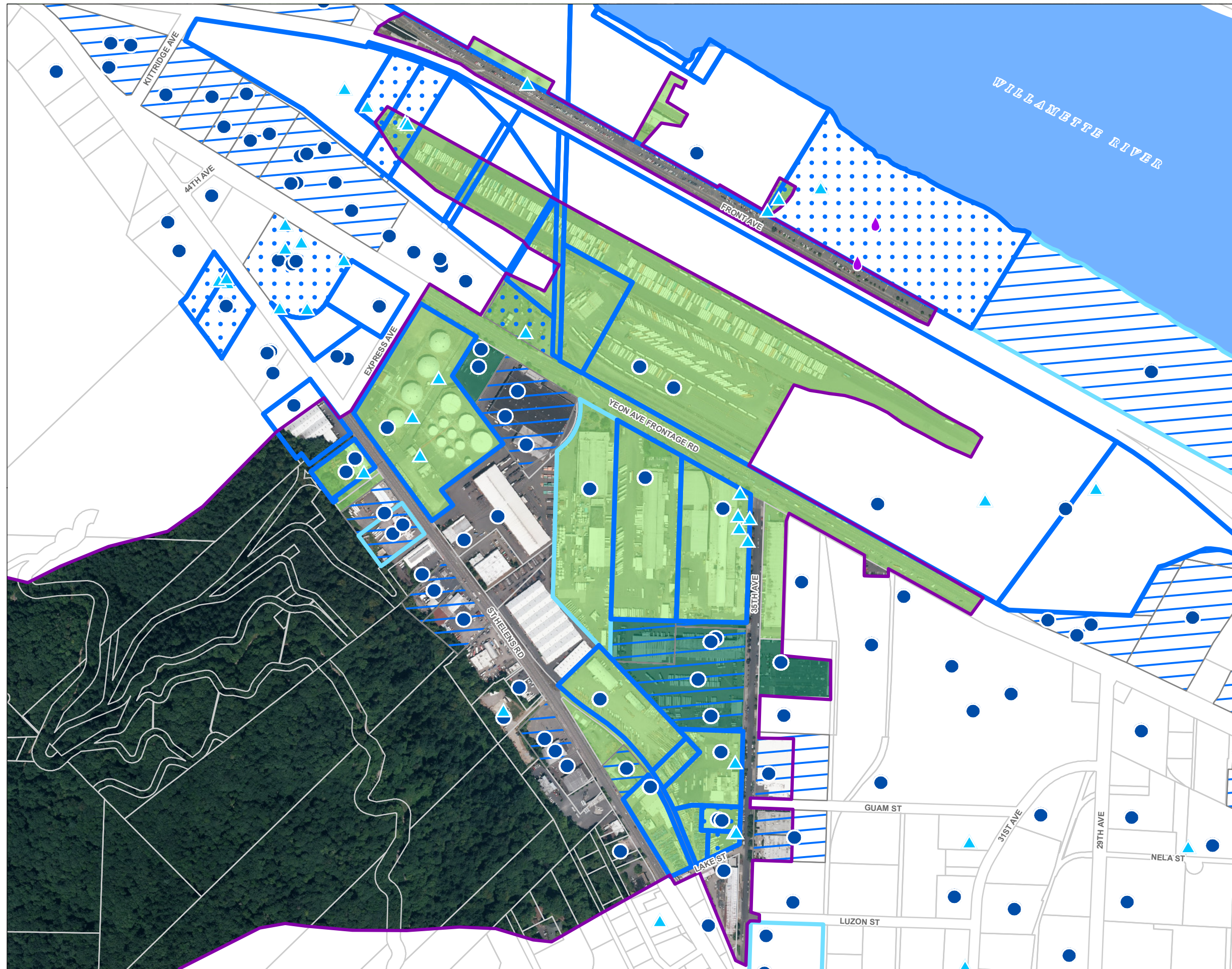
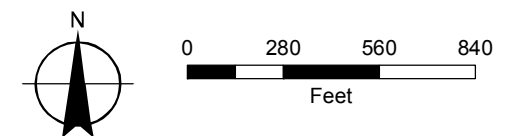


FIGURE 3
Basin 18
Upland Site Source Controls



- Basin 18
- Tax Lot
- DEQ Stormwater SCEs**
 - SCE implemented or pending
 - SCE not needed or low priority
- All Other Features**
 - NPDES Stormwater Discharge Permit
 - City Discharge Authorization
 - NPDES No Exposure Certification
 - >50% of Site Area Redeveloped Under City SWMM
 - Stormwater Treatment Facility
 - Ecoroof
 - Site Inspection - BES Industrial Stormwater Program
 - Discharges to City Outfall
 - Portland Harbor Hydroboundary



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Aerial Photo Taken 2012

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