Completion Summary for City of Portland Outfall Basin 17

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 in Outfall Basin 17.

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.

Outfall 17 is located on the west side of the Willamette River in the Guilds Lake Industrial Area at approximately River Mile (RM) 9.6. Before 2011, the basin consisted of 1,895 acres with approximately 85 percent of the land use as open space and 11 percent of the land use as heavy industrial. In 2011, as part of the City's Combined Sewer Overflow (CSO) Abatement Program, stormwater from most of the industrial area was diverted to the City's wastewater treatment plant (see Figure 1). As a result, the current basin now includes an upper subbasin, which comprises approximately 1,400 acres of primarily open space, with a small component of residential land, in the West Hills, and a lower subbasin consisting of industrial and major transportation land use.

The City collected inriver sediment data in the vicinity of Outfall 17 in 2003 as part of a maintenance dredging project at Fire Bureau Station 6. Evaluation of these data and subsequent data collected by the Lower Willamette Group (LWG) indicated the presence of sediment contamination in the vicinity of the outfall so the City identified Basin 17 for source investigation. Given the low elevation of some parts of the Basin 17 conveyance system, the downgradient portion of the basin also represents a potential preferential groundwater pathway to the river.

By the time the Portland Harbor Study Area expanded upstream and included Basin 17, design was underway for the CSO Abatement Program and the City had determined that the majority of the Basin 17 industrial area would be diverted. Therefore, the City modified the source investigation objective in the portion of Basin 17 slated for diversion. The investigation in the diverted area focused on identifying major sources that could be discharging contaminants at concentrations that violate current City wastewater discharge limitations and prohibitions.

Data collected by the City in the diverted portion of the basin identified the General Electric (GE) Decommissioning Facility as a major source of polychlorinated biphenyls (PCB) and the Galvanizers Co. facility as a major source of zinc. Based on these findings, both sites entered the DEQ Cleanup Program to conduct source control evaluations (SCE) and implement source control measures (SCM). As of 2011, stormwater from these sites discharges to the City's

combined sewer system. SCMs implemented at these sites reduced contaminant discharges to the river (pre-diversion) and now (post-diversion) help to meet City discharge limits and prohibitions for the combined sewer system.

About half of the industrial land use area in the current (undiverted) basin is the Burlington Northern Railroad Lake Yard. Under DEQ Cleanup Program authority, this site has been conducting an SCE and plans to abandon all connections to Basin 17. Most of the remaining areas within the basin lack industrial exposures to stormwater, have been evaluated by DEQ as not needing source control, or are conducting an investigation under a DEQ Cleanup Program agreement. Source evaluation in the remaining portion of the basin did not indicate the presence of other major potential contaminant sources.

Because the City has identified all major sources of contaminants to the basin and necessary controls are being implemented under DEQ and/or City authority, future discharges from the basin are not likely to represent a significant source to the Willamette River and the City has met the remedial investigation (RI)/SCM objectives for Basin 17.

2 Introduction

This Completion Summary presents a weight-of-evidence evaluation of whether further source investigation is needed in Basin 17, 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 17, 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 major sources of contaminants 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 17 discharges to Balch Creek Cove on the west side of the Willamette River at approximately RM 9.6. Basin 17 currently consists of an upper subbasin in the West Hills and a lower subbasin in the Guilds Lake Industrial Area. Before the 2011 CSO diversion, the drainage area consisted of 1,895 acres. The delineated drainage area for this outfall is approximately 1,486 acres, most of which is Forest Park. This acreage includes about 39 acres of industrial land that has been disconnected temporarily from the City system (see below). Figures 1 and 2 show the location of the outfall and drainage basin boundary and provide an overview of the associated stormwater conveyance system.

The upper subbasin consists mostly of Forest Park, along with some residential properties and adjacent roadways. The lower subbasin (about 80 acres) includes an industrial area and a small section of the Oregon Department of Transportation's (ODOT) Highway 30. This lower

subbasin delineation includes about 39 acres of the Burlington Northern (BNSF) rail yard that was disconnected from Basin 17 in 2009 through placement of temporary plugs in its connections to the municipal system. After these disconnections are permanent, the lower subbasin will be redelineated. For the purposes of this Completion Summary, the actual drainage of the current lower subbasin is approximately 41 acres, even though the delineated basin shown in the attached figures is approximately 80 acres. The overall basin will be reduced to approximately 1,447 acres after the rail yard connection to the City system is permanently abandoned.

3.2 Land Use and Potential Upland Sources

Land use in the majority of the current basin (92 percent) is open space (see Figure 2). A small amount of residential and commercial land use is present in the upper subbasin. In the lower subbasin, land use is predominantly heavy industrial with some major transportation (i.e., state highway). Industrial operations in the former basin were diverse, including activities such as metal forging and finishing, transformer reconditioning, manufacturing, chemical processing, brewing, and transportation-related activities (e.g., warehousing and trucking). In the current delineated basin industrial area, operations mainly include railroad (e.g., railcar maintenance, washing, fueling, and freight loading) and warehousing.

Sites that were identified as potential sources to the City's sanitary conveyance system (i.e., sites in the industrial area slated for diversion) include six DEQ Cleanup Program sites listed in DEQ's Environmental Cleanup Site Information (ECSI) database. Sites identified as potential upland sources to the current delineated basin include three sites listed in the ECSI database. Table 1 lists these sites and indicates the associated contaminants of interest (COI) and the status of stormwater and preferential groundwater pathway evaluations. All three of the DEQ Cleanup Program sites currently are conducting stormwater pathway evaluations under DEQ oversight or have been identified by DEQ as not needing an SCE.

		Site Pathway Evaluations		
DEQ Cleanup Site	Site COIs ⁽¹⁾	Stormwater Pathway ⁽²⁾	Preferential Groundwater Pathway ⁽³⁾	
Sites Only in Former Basin (pre	-2011 CSO diversion)			
Galvanizers Co. (ECSI #1196)	<i>Stormwater COI</i> : PAHs, TPH, metals, phthalates <i>Groundwater COI</i> : metals, TPH	Source Control Evaluation In Progress	Source Control Evaluation in Progress	
General Electric	Stormwater COIs: PAHs, TPH,	Source Control Decision	Source Control	
Decommissioning Facility	PCBs, metals	/No Further Action	Decision	
(ECSI #4003)	Groundwater : PCBs	Bs Issued		
Hill Investment Co. (ECSI #1076)	<i>Stormwater COIs</i> : PAHs, PCBs, metals, phthalates ⁽⁴⁾	Need for Source ControlEvaluation to beDetermined/LowPriority		
Mogul Corp. (ECSI #1307)	Not listed ⁽⁶⁾	Need for Source Control Evaluation to be Determined/Low Priority	Source Control Decision Completed ⁽⁷⁾	

Table 1	DEO Cleanun	Program	Sites in	Rasin	17
Lable 1.	DEQ Cleanup	i i ugi am	Sites III	Dasm	1/

		Site Pathway Evaluations	
DEQ Cleanup Site	Site COIs ⁽¹⁾	Stormwater Pathway ⁽²⁾	Preferential Groundwater Pathway ⁽³⁾
Paco Pumps (ESCI #146)	PCBs, lubricating oil ⁽⁸⁾	Source Control Decision /No Further Action Issued	Source Control Decision Completed
Wirfs Property (aka Schnitzer Investment – NW 35 th) (ECSI #2424)	<i>Stormwater</i> : VOC, SVOCs, metals <i>Groundwater</i> : VOCs	Source Control Evaluation Needed	Source Control Evaluation in Progress
Sites in Current Basin			
Burlington Northern Railroad Lake Yard (ECSI #100) ⁽⁹⁾ (aka Guilds Lake RR Yard and Portland Terminal Railroad)	<i>Stormwater COIs</i> : VOCs, SVOCs, PAHs, TPH, PCBs, metals, phthalates <i>Groundwater COIs</i> : Not listed	Source Control Evaluation In Progress	Source Control Evaluation in Progress
Hercules Inc. (ECSI #988)	Not listed ⁽⁶⁾	Source Control Evaluation Not Needed	Not shown
ODOT - Portland Harbor Source Control Evaluation (ECSI #5437)	Not listed ⁽⁶⁾	Source Control Evaluation In Progress	Not shown

Notes:

PAHs = polycyclic aromatic hydrocarbons; PCBs = polychlorinated biphenyls; SVOCs = semivolatile organic compounds; TPH = total petroleum hydrocarbons; VOCs = volatile organic compounds; COIs = contaminants of interest; DEQ = Oregon Department of Environmental Quality; ECSI = Environmental Cleanup Site Information

- (1) Unless otherwise noted, site contaminants of interest 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: DEQ Milestone Report, Figure 1b, "Status of Stormwater Source Control Evaluations, January 2013" (DEQ, 2013).
- (3) Source: DEQ Milestone Report, Figure 3, "Groundwater Source Control Evaluation Status, January 2013" (DEQ, 2013), unless otherwise noted.
- (4) Site is listed in Appendix Q of the draft FS as Ashland Chemical (Anchor et al., 2012).
- (5) Figure 3 of the DEQ Milestone Report (DEQ, 2013) categorizes this site as "1999 DEQ Source Control Screening Low/Medium Priority for Source Control Evaluation." The Milestone Report defines this category as 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.
- (6) 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, 2002; DEQ, 2012a; DEQ, 2012b).
- (7) It is not known whether the Groundwater Source Control Evaluation for this site considered the preferential pathway to the City stormwater conveyance system.
- (8) 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). ECSI database (DEQ, 2007) lists PCBs and lubricating oil in soil as site contaminants.
- (9) This site is included in the basin delineation, but temporarily plugged all connections to Basin 17 in 2009. Permanent abandonment is pending.

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 17 stormwater conveyance system are listed in Table 2. Sites with current 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 (e.g., rights-of-way).

Address	Company	Permit Type	Time Period	
Sites Only in Former B	asin (pre-2011 CSO diversion)			
2601 NUM Voon	Mt. Hood Beverage Co.	Stormwater (1200-Z)	2000 - 2007	
	COHO Distributing LLC	Stormwater (1200-Z)	2007 - 2009	
2126 NIM 25th	Wayanhaanaan Paavaling	Stormwater (1200-P)	1993 - 1996	
3136 NW 35 th	weyernaeuser Recycling	Stormwater (1200-Z)	1997 - 1998	
3232 NW Industrial	US Food Service	Stormwater (1200-Z)	1998 - 2000	
2551 NW 30th	Paco Pumping Co	Stormwater (1200-Z)	1998 - 2002	
2406 NIW 25th	Calvanizora	Stormwater (1200-L)	1992 -1996	
2400 INVV 35 ^{ar}	Galvallizers	Stormwater (1200-Z)	1997 - 2012	
Sites in Current Basin				
3366 NW Yeon	Ashland Hercules Water Technologies	Cooling water (100-J)	1994 - 2001	
3500 NW Yeon	Portland Terminal RR Co	Stormwater (1200-Z)	1998 - Present ⁽²⁾	

Table 2. Current⁽¹⁾ and Historical NPDES Permit Coverage in Basin 17

Notes:

(1) Current permits are indicated in bold.

(2) Plans for permanently abandoning the portion of the site that discharges to Basin 17 are underway.

3.3 Outfall Setting

Outfall 17 discharges to an area of potential concern (AOPC 20) identified by the U.S. Environmental Protection Agency (EPA) based on elevated concentrations of PCBs, metals, and other contaminants (EPA, 2010). Outfall 17 is located in the west bank of Balch Creek Cove, which also receives discharges from City Outfall 16, outfall WR-258 associated with City Fire Station 6, and outfall WR-235 associated with the Port of Portland Terminal 2. Overwater activities (e.g., dock operations, material loading and unloading) occur within the AOPC in the vicinity of Outfall 17.

4 Basin Screening and Source Investigations

The City collected inriver sediment data in the vicinity of Outfall 17 in 2003 as part of a maintenance dredging project at Fire Bureau Station 6 (CH2M HILL, 2004). Evaluation of these data and subsequent data collected by the LWG indicated the presence of sediment contamination in the vicinity of the outfall (GSI, 2008), so the City identified this basin for source investigation.

City source investigation activities in the industrial area slated for diversion resulted in the identification of two new DEQ Cleanup Program sites. In 2002, the City detected PCBs and metals in inline solids samples collected for a line cleaning project and identified the GE and Galvanizers sites as likely potential sources of one or more of these contaminants (BES, 2003). As a result of this investigation, DEQ initiated SCEs at GE and Galvanizers. Subsequent data collected at these sites and in the City conveyance system confirmed that GE was a major source of PCBs and Galvanizers was a major source of zinc to the City's conveyance system.

Both sites also investigated the preferential groundwater pathway to Outfall 17. GE detected PCBs at low concentrations in groundwater. Groundwater characterization at and downgradient of the Galvanizers site indicated that zinc had migrated offsite at concentrations that may exceed City discharge limits if groundwater was infiltrating the City system. Because of the elevation of the conveyance system in this area, Galvanizers continues to investigate this pathway (BES, 2009).

GE collected inline solids data from a variety of Basin 17 locations (AMEC, 2008). City evaluation of these data from the basin area slated for diversion indicated a low potential for other sources to be discharging to the system at concentrations that would violate City discharge limits and prohibitions.

GE also collected inline solids from three locations in the current basin that represent the majority of the non-rail yard basin drainage area (i.e., drainage from NW Yeon, NW Front, and associated properties) (AMEC, 2008). Contaminant concentrations were low and did not indicate a need for further source tracing. BNSF is conducting an SCE under DEQ oversight. Stormwater pathway data were not collected for this investigation from the portion of the BNSF site that discharges to Basin 17 because work is underway to permanently abandon all connections to Basin 17. The evaluation of the preferential groundwater pathway from this site is in progress.

Investigations and evaluations completed by the City and others in the Basin 17 conveyance system are listed in Table 3.

Data Collection Period	Party	Purpose	Documentation
2002	City	Characterize inline solids planned for removal and disposal during cleaning of a portion of the City conveyance system.	City of Portland/Outfall 17/Contaminated Sediment Source Identification (BES, 2003)
2004	GE	Evaluate offsite inline solids data collected from the vicinity of the site to identify other potential sources of stormwater contaminants.	Source Control Evaluation and Implementation Report. GE Energy – Energy Services Portland Inspection & Repair Service (I&RS) Center, 2727 NW 29th Avenue. (AMEC, 2006)
2007	City and DEQ	Evaluate inline solids from a catch basin adjacent to the Paco Pumps site (also known as Sulzer Pumps).	Letter to DEQ re: Inline Solids Data Adjacent to Sulzer Pumps Facility at 2551 NW 29th Avenue (BES, 2007)
2007	GE	Evaluate inline solids data to identify contaminant sources in the vicinity of the GE site.	Public Sewer Sediment Assessment Summary Report (AMEC, 2008)
2002-2008	City	Evaluate Balch Creek water quality	Westside Streams Water Quality and Trend Analyses Status Report. (BES, 2010)

Table 3	Investigations	in the l	Racin 17	Stormwater	Conveyance	System
Table J.	Investigations	in the i	Dasin 17	Stormwater	Conveyance	System

Note:

DEQ = Oregon Department of Environmental Quality

5 Completion of Source Identification

Most of the industrial area formerly within Basin 17 was diverted to the City's wastewater treatment plant in 2011. The lines of evidence evaluated to verify that source tracing is complete and major sources are not present include: (1) investigation results from the basin (and upland site information), (2) planned drainage area reduction, and (3) land use at remaining upland areas not undergoing DEQ Cleanup Program investigation or redevelopment. Findings from this evaluation are summarized below:

- *Source Tracing Results:* Evaluation of inline solids data collected by GE from the current industrialized portion of the basin (AMEC, 2008) did not indicate that major sources were present in the drainage areas represented by these sampling locations. These locations represent drainage from NW Front Avenue and industrial properties along NW Yeon. BNSF did not characterize stormwater discharges to Basin 17 because of temporary abandonment of all connections to the basin and plans for permanent disconnection (see below).
- *Planned Reduction in Basin Drainage Area*: BNSF Railroad Lake Yard (ECSI #100) the largest industrial site in the basin has temporarily abandoned all connections to Basin 17 and is in the process of constructing onsite stormwater infiltration facilities under DEQ Cleanup Program oversight. BNSF plans to infiltrate all stormwater from areas previously draining to Outfall 17 and will be required to permanently abandon all connections to the basin as part of this project. This will reduce the basin drainage area by approximately 39 acres and eliminate this site as a potential future source of contaminants to the basin.
- *Upland Investigation Coverage and Land Use*: Approximately 92 percent of the land use in the Basin 17 is open space. For the industrialized portion of the basin, Figure 3 displays the spatial extent of DEQ Cleanup Program site investigations and other programmatic controls (see key to figures provided at beginning of this Appendix). As shown in Figure 3, the majority of this area is being investigated, or likely does not need investigation because of existing controls. With the exception of a few small parcels, sites in the industrial area are:
 - Investigating the stormwater pathway and implementing SCMs under DEQ Cleanup authority;
 - Designated by DEQ as not needing an SCE or as a low priority for completing an SCE;
 - o Covered under NPDES stormwater regulations; and/or
 - Monitored for stormwater exposures through periodic inspections under the City's Industrial Stormwater Program.

Land use in remaining industrial areas is primarily warehouse operations, and in the upper subbasin is open space with some residential and commercial areas. Many of the industrial properties in the lower basin have No Exposure Certifications (NEC; see Section 6) and non-industrial activities are not a major known or suspected source of contaminants to the City stormwater conveyance system.

Based on these lines of evidence, the City concludes that Basin 17 source evaluation is complete and no major sources are present in the basin.

6 Basin Source Controls

Source control in Basin 17 includes SCMs completed (or planned) under DEQ Cleanup Program agreements with upland sites and ongoing City and DEQ programs that are described in Municipal Report. Source controls implemented in Basin 17 are displayed in Figure 3 and summarized in this section.

One type of programmatic source control is the elimination of stormwater exposures to industrial activities. Sites that currently hold NPDES NECs are listed in Table 4.

Address	Company	NEC Time Period
3436 NW Yeon	Rose City Bindery	2000 – Present
3448 NW Yeon	Gans Ink & Supply Company	2009 – Present
3456 NW Yeon	Sterling Business Forms	2013 – Present
3838 NW Front	Georgia-Pacific NW SERF CTR	2009 – Present
3310 NW Yeon	Documart Copies	2003 - Present
3366 NW Yeon	Ashland Hercules Water Technologies	2006 - Present

Table 4. Sites with No Exposure Certification (NEC) in Basin 17

Note

NEC = No Exposure Certification

Additional site-specific, programmatic, and conveyance system source controls for Basin 17 are summarized in Table 5. As shown in Figure 3, several properties within the upper subbasin have implemented stormwater source controls to meet stormwater quantity and quality objectives under the City's Stormwater Management Manual during property redevelopment. Types of treatment facilities in the upper subbasin include stormwater filters, infiltration and flow-through planter boxes, ecoroofs, and sedimentation manholes.

Site / Area	Source Controls	Implementation Timeframe		
Source Control Measures (SCI	M) at DEQ Cleanup Program Sites ⁽¹⁾			
Burlington Northern Railroad Lake Yard (ECSI #100) (aka Guilds Lake RR Yard and Portland Terminal Railroad)	The eastside stormwater system (discharging to Outfall 17) has been disconnected temporarily to infiltrate site stormwater and is being evaluated for permanent disconnection under a plan approved by DEQ. ⁽¹⁾	Temporary disconnect in 2009. Permanent abandonment timeframe to be determined		
Hercules, Inc. (ECSI #988)	Not applicable ⁽²⁾	Not applicable ⁽²⁾		
ODOT - Portland Harbor Source Control Evaluation (ECSI #5437)	To be determined	To be determined		
Other (Programmatic SCM)				
Burlington Northern Railroad Lake Yard; residential properties in the upper subbasin	Stormwater Management Manual Requirements.	Ongoing		
Georgia-Pacific NW Service Center	City Discharge Authorization. ⁽³⁾	Ongoing		
See listing in Table 2	NPDES 1200-Z Stormwater Permit Requirements.	Ongoing		
See listing in Table 4	NPDES No Exposure Certifications	Ongoing		

Table 5. Basin 17 Source Controls

Notes:

ECSI = Environmental Cleanup Site Information; RR = Railroad; NPDES = National Pollutant Discharge Elimination System

(1) Description of upland site SCMs is based on information in reports on file with DEQ.

(2) DEQ has no evidence of a confirmed hazardous substance release (DEQ, 2012a).

(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 a source evaluation in Basin 17. Major contaminant sources are not present in the basin. Therefore, future discharges from Outfall 17 are unlikely to represent a significant source of contaminants 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 17.

8 References

- AMEC. 2006. Source Control Evaluation and Implementation Report. GE Energy Energy Services, Portland Inspection & Repair Service (&RS) Center, 2727 NW 29th Avenue, Portland, Oregon. AMEC Earth & Environmental. February 2006.
- AMEC. 2008. Public Sewer Sediment Assessment Summary Report, GE Energy Energy Services, Portland Inspection & Repair Service (&RS) Center. AMEC Earth & Environmental. April 2008.
- Anchor et al. 2012. Portland Harbor RI/FS Draft Feasibility Study. Prepared for The Lower Willamette Group by Anchor QEA, LLC, Windward Environmental, LLC, Kennedy/Jenks Consultants, and Integral Consulting, Inc. February 2012.
- BES. 2003. City of Portland / Outfall 17 / Contaminated Sediment Source Identification Investigative Memorandum. City of Portland, Bureau of Environmental Services. June 30, 2003.
- BES. 2007. Letter to DEQ re: Inline Solids Data Adjacent to Sulzer Pumps Facility at 2551 NW 39th Avenue. City of Portland, Bureau of Environmental Services. July 9, 2007.
- BES. 2009. Letter to DEQ Subject: Review of Work Plan for Groundwater Pathway Source Control Evaluation, Galvanizers Company, dated January 19, 2009. City of Portland, Bureau of Environmental Services. February 5, 2009.
- BES. 2010. Westside Streams Water Quality and Trend Analyses Status Report. City of Portland, Bureau of Environmental Services. March 2010.
- CH2M HILL. 2004. Data Characterization Report. Characterization of Sediment and Proposed Dredge Depth. City of Portland Fire Bureau Station 6 Maintenance Dredging Project. Prepared for the Portland Fire Bureau. August, 2004.
- DEQ. 2002. DEQ Site Summary Full Report Details for ECSI Site ID 1307, Mogul Corp. DEQ Environmental Cleanup Site Information Database (ECSI), updated January 2002; accessed February 14, 2013. http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=1307
- DEQ. 2007. DEQ Site Summary Full Report Details for ECSI Site ID 146, Paco Pumps. DEQ Environmental Cleanup Site Information Database (ECSI), updated October 2007; accessed February 14, 2013. http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=146
- DEQ. 2012a. DEQ Site Summary Full Report Details for ECSI Site ID 988, Hercules Inc. DEQ Environmental Cleanup Site Information Database (ECSI), updated February 1994; accessed January 29, 2013. http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=988#actions

- DEQ. 2012b. DEQ Site Summary Full Report Details for ECSI Site ID 5437, ODOT Portland Harbor Source Control Evaluation. DEQ Environmental Cleanup Site Information Database (ECSI), updated November 2010; accessed January 29, 2013. <u>http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=5437</u>
- DEQ. 2013. Milestone Report, Upland Source Control at the Portland Harbor Superfund Site. Prepared by the Oregon Department of Environmental Quality. January 2013.
- EPA. 2010. Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Portland Harbor Feasibility Study Source Tables. Letter from EPA to Mr. Bob Wyatt, Chairman, Lower Willamette Group. November 23, 2010.
- GSI. 2008. Phase I Report and Inline Sampling Results for the City of Portland Basin 16. Prepared by GSI Water Solutions, Inc. for the City of Portland Bureau of Environmental Services Portland Harbor Program. June, 2008.
- Integral et al. 2011. Portland Harbor RI/FS, Draft Final Remedial Investigation Report. Prepared for the LWG. Prepared by Integral Consulting Inc., Windward Environmental LLC, Kennedy/Jenks Consultants, and Anchor QEA, LLC. August 29, 2011.

List of Figures

- Figure 1: Basin 17 Pre- and Post-Diversion Overview
- Figure 2: Basin 17 Current Overview
- Figure 3: Basin 17 Upland Site Source Controls





