Table 5-1

Listing of Areas of Potential Concern Identified by Dames & Moore in 1989

Area	Area Description
1	Aboveground waste oil tank and ten 55-gallon drums of petroleum (stained soil)
2	Pipe lining and coating building (northwest corner--dark-stained soil)
3	Pipe lining and coating building (southeast corner-dark-stained soil and concrete)
4	2,000-gallon diesel AST and pumps (dark-stained soil)
5	Transformer storage
6	Sixteen 55-gallon drums of solvent (no containment)
7	Industrial well
8a	1,000-gallon gasoline UST
8b	Bay 9 asphalt dipper tank
9	Railroad spur (stained soil)
10	Dust suppressant use and storage
11	Transformer area (stained soil)
12	Flammable material storage building
13	Lay down area south of main building
14	Onsite catch basins associated with a wash pad and storm water system

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Sample ID						GP1W		GP2W		GP3W		GP4W		GP5W		GP6W		GP7W		GW01-15-		GW02-15-		GW03-15-	
Sample Date						09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		08/29/02		08/29/02		08/29/02	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Excavation [2]**	**DEQ RBCs Volatilization[3]**	**DEQ RBCs Vapor Intrusion[4]**																				
CONV																									
Alkalinity, Total as CaCO3	ug/L	--																							
Chloride	ug/L	--																							
Nitrate ion	ug/L	--																							
Nitrate-N	ug/L	--																							
Sulfate	ug/L	--																							
Total Organic Carbon	ug/L	--																							
Metals Total																									
Iron	ug/L	--																							
Manganese	ug/L	50	3000000																						
VOCs																									
1,1,1-Trichloroethane	ug/L	11	1100000			**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000	1.0	U	1.0	U	1.0	U	**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.7**	
1,1-Dichloroethene	ug/L	--	43000		340000	**3.3**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**6.6**	
1,2-Dichloroethene	ug/L	--	--	1800000	350000																				
Acetone	ug/L	1,500	--																						
Benzene	ug/L	1.2	1700	14000	2800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.5**	J
Carbon Dioxide	ug/L	--	--																						
Chloroform	ug/L	0.17	720	5500	1200	**1.8**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**	
Chloromethane	ug/L	2.1	22000	2100000	320000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cis-1,2-Dichloroethene	ug/L	--	24000			**960**	D	**230**	D	**4.1**		**56.0**		**1.3**		1.0	U	1.0	U	1.0	U	**8.4**		**1,800**	D
Methane	ug/L	--	--																						
Methylene Chloride	ug/L	8.9				1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethene	ug/L	0.12	5400		32000	**9,800**	D	**4,300**	D	**2.1**		**4.6**		**2.8**		**3.3**		**3.1**		**3.5**		**700**	D	**4,900**	D
Toluene	ug/L	9.8	210000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000	**8.4**		**3.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.9**	
Trichloroethene	ug/L	0.17	430	19000	3300	**1,200**	D	**260**	D	**1.1**		**11.0**		1.0	U	1.0	U	1.0	U	1.0	U	**53.0**		**850**	D
Vinyl Chloride	ug/L	0.015	1200	6800	910	1.0	U	1.0	U	1.0	U	**7.4**		1.0	U	**1.5**		1.0	U	1.0	U	1.0	U	**2.8**	

Notes:

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[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

[2] Screening value taken from DEQ Risk-Based Concentrations for the groundwater in excavation for the Construction and Excavation worker (6/7/12 revision)

[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Sample ID						GW04-15-		GW05-16-		GW06-16-		GW07-16-		GW08-16-		GW09-16-		GW09-16-		GW10-16-		GW11-16-		GW12-16-	
Sample Date						08/29/02		08/30/02		08/29/02		08/29/02		08/29/02		08/29/02		08/29/02		08/29/02		08/30/02		08/30/02	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Excavation [2]**	**DEQ RBCs Volatilization[3]**	**DEQ RBCs Vapor Intrusion[4]**																				
CONV																									
Alkalinity, Total as CaCO3	ug/L	--																							
Chloride	ug/L	--																							
Nitrate ion	ug/L	--																							
Nitrate-N	ug/L	--																							
Sulfate	ug/L	--																							
Total Organic Carbon	ug/L	--																							
Metals Total																									
Iron	ug/L	--																							
Manganese	ug/L	50	3000000																						
VOCs																									
1,1,1-Trichloroethane	ug/L	11	1100000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800	1.0	U	**0.5**	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethene	ug/L	--	43000		340000	1.0	U	**22.0**		1.0	U	1.0	U	1.0	U	**0.6**	J	**0.5**	J	1.0	U	1.0	U	1.0	U
1,2-Dichloroethene	ug/L	--	--	1800000	350000																				
Acetone	ug/L	1,500	--																						
Benzene	ug/L	1.2	1700	14000	2800	1.0	U	**0.8**	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Carbon Dioxide	ug/L	--	--																						
Chloroform	ug/L	0.17	720	5500	1200	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.6**	
Chloromethane	ug/L	2.1	22000	2100000	320000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cis-1,2-Dichloroethene	ug/L	--	24000			**0.7**	J	**4,200**	D	**39.0**		**34.0**		**11.0**		**61.0**		**57.0**		**50.0**		1.0	U	**16.0**	
Methane	ug/L	--	--																						
Methylene Chloride	ug/L	8.9				1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethene	ug/L	0.12	5400		32000	**260**	D	**1,200**	D	**310**	D	**210**	D	**110**	D	**120**	D	**120**	D	**260**	D	**27.0**		**3,300**	D
Toluene	ug/L	9.8	210000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000	1.0	U	**13.0**		1.0	U	1.0	U	1.0	U	**0.6**	J	**0.5**	J	**1.0**	J	1.0	U	1.0	U
Trichloroethene	ug/L	0.17	430	19000	3300	**13.0**		**860**	D	**59.0**		**12.0**		**20.0**		**100**	D	**98.0**	D	**110**	D	**1.3**		**65.0**	
Vinyl Chloride	ug/L	0.015	1200	6800	910	1.0	U	**48.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.7**		1.0	U	1.0	U

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[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

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[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Sample ID						MW01-		MW02-		MW03-		GP-101-		GP-102-		GP-103-		GP-104-		GP-106-		GP-107-		GP-108-	
Sample Date						08/29/03		08/29/03		08/29/03		07/21/04		07/21/04		07/21/04		07/21/04		07/21/04		07/21/04		07/21/04	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Excavation [2]**	**DEQ RBCs Volatilization[3]**	**DEQ RBCs Vapor Intrusion[4]**																				
CONV																									
Alkalinity, Total as CaCO3	ug/L	--																							
Chloride	ug/L	--																							
Nitrate ion	ug/L	--																							
Nitrate-N	ug/L	--																							
Sulfate	ug/L	--																							
Total Organic Carbon	ug/L	--																							
Metals Total																									
Iron	ug/L	--																							
Manganese	ug/L	50	3000000																						
VOCs																									
1,1,1-Trichloroethane	ug/L	11	1100000			1.0	U	1.0	U	1.0	U	1.0	U	**0.34**	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000	1.0	U	1.0	U	1.0	U	**0.19**	J	**0.24**	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethene	ug/L	--	43000		340000	**2.7**		1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		**0.92**	J	1.0	U	**0.54**	J	1.0	U
1,2-Dichloroethene	ug/L	--	--	1800000	350000																				
Acetone	ug/L	1,500	--																						
Benzene	ug/L	1.2	1700	14000	2800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.18**	J	1.0	U	1.0	U	1.0	U
Carbon Dioxide	ug/L	--	--																						
Chloroform	ug/L	0.17	720	5500	1200	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloromethane	ug/L	2.1	22000	2100000	320000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cis-1,2-Dichloroethene	ug/L	--	24000			**800**	D	1.0	U	1.0	U	1.0	U	**0.4**	J	**200**	D	**120**	D	**15.0**		**170**	D	**7.6**	
Methane	ug/L	--	--																						
Methylene Chloride	ug/L	8.9				1.0	U	1.0	U	1.0	U	2.0	U	2.0	U	2.0	U	2.0	U	**0.11**	J	2.0	U	2.0	U
Tetrachloroethene	ug/L	0.12	5400		32000	**240**	D	1.0	U	**19.0**		1.0	U	**59.0**	D	**66.0**	D	**260**	D	**1.3**		**66.0**	D	**21.0**	
Toluene	ug/L	9.8	210000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000	**5.8**		1.0	U	1.0	U	1.0	U	1.0	U	**1.5**		**2.8**		1.0	U	**0.87**	J	1.0	U
Trichloroethene	ug/L	0.17	430	19000	3300	**34.0**		1.0	U	**1.0**		1.0	U	**10.0**		**38.0**	D	**170**	D	**3.8**		**40.0**		**5.6**	
Vinyl Chloride	ug/L	0.015	1200	6800	910	**10.0**		1.0	U	1.0	U	**0.27**	J	1.0	U	**0.88**	J	**0.78**	J	**4.0**		**5.0**		**0.18**	J

Notes:

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[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

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[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Sample ID						GP-109-		GP-110-		GP-111-		GP-112-		GP-112-		MW01-		MW02-		MW03-		MW03-		MW04-	
Sample Date						07/21/04		07/21/04		07/21/04		07/22/04		07/22/04		08/16/04		08/16/04		08/16/04		08/16/04		08/16/04	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Excavation [2]**	**DEQ RBCs Volatilization[3]**	**DEQ RBCs Vapor Intrusion[4]**																				
CONV																									
Alkalinity, Total as CaCO3	ug/L	--																							
Chloride	ug/L	--																							
Nitrate ion	ug/L	--																							
Nitrate-N	ug/L	--																							
Sulfate	ug/L	--																							
Total Organic Carbon	ug/L	--																							
Metals Total																									
Iron	ug/L	--																							
Manganese	ug/L	50	3000000																						
VOCs																									
1,1,1-Trichloroethane	ug/L	11	1100000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000	**0.25**	J	1.0	U	1.0	U	1.0	U	1.0	U	**0.48**	J	**0.39**	J	**0.21**	J	**0.23**	J	**0.26**	J
1,1-Dichloroethene	ug/L	--	43000		340000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.8**		1.0	U	1.0	U	1.0	U	**0.91**	J
1,2-Dichloroethene	ug/L	--	--	1800000	350000																				
Acetone	ug/L	1,500	--																						
Benzene	ug/L	1.2	1700	14000	2800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.23**	J	1.0	U	1.0	U	1.0	U	**0.13**	J
Carbon Dioxide	ug/L	--	--																						
Chloroform	ug/L	0.17	720	5500	1200	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloromethane	ug/L	2.1	22000	2100000	320000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.36**	J
Cis-1,2-Dichloroethene	ug/L	--	24000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1,200**	D	**0.17**	D	1.0	U	1.0	U	**500**	D
Methane	ug/L	--	--																						
Methylene Chloride	ug/L	8.9				2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Tetrachloroethene	ug/L	0.12	5400		32000	**0.75**	J	**3.3**		**0.66**	J	1.0	U	1.0	U	**1,000**	D	**0.47**	J	**21.0**		**11.0**		**150**	D
Toluene	ug/L	9.8	210000			1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.12**	J	1.0	U	1.0	U	**0.18**	J
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**16.0**		1.0	U	1.0	U	1.0	U	**4.5**	
Trichloroethene	ug/L	0.17	430	19000	3300	**0.22**	J	1.0	U	**0.6**	J	1.0	U	1.0	U	**80.0**	D	1.0	U	**2.0**		**1.9**		**31.0**	
Vinyl Chloride	ug/L	0.015	1200	6800	910	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**8.5**		1.0	U	1.0	U	1.0	U	**180**	D

Notes:

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[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

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[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Sample ID						MW04-		MW05-		MW01-		MW02-		MW03-		MW04-		MW05-		MW06-		MW06-		MW01-	
Sample Date						08/16/04		08/16/04		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		06/21/05	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Excavation [2]**	**DEQ RBCs Volatilization[3]**	**DEQ RBCs Vapor Intrusion[4]**																				
CONV																									
Alkalinity, Total as CaCO3	ug/L	--																						**160,000**	
Chloride	ug/L	--																						**2,400**	
Nitrate ion	ug/L	--																							
Nitrate-N	ug/L	--																						100	U
Sulfate	ug/L	--																						**2,000**	
Total Organic Carbon	ug/L	--																						**1,400**	
Metals Total																									
Iron	ug/L	--																						**16,000**	
Manganese	ug/L	50	3000000																					**2,600**	
VOCs																									
1,1,1-Trichloroethane	ug/L	11	1100000			1.0	U	1.0	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.1	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800	1.0	U	1.0	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.1	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000	**0.21**	J	**0.22**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.1	U
1,1-Dichloroethene	ug/L	--	43000		340000	**0.75**	J	**0.58**	J	**4.0**		0.5	U	0.5	U	**0.56**		0.5	U	**2.5**		**2.7**		**2.4**	
1,2-Dichloroethene	ug/L	--	--	1800000	350000					**1,100**		0.5	U	**0.68**		**200**		**27.0**		**690**		**710**		**630**	
Acetone	ug/L	1,500	--							1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.8**		**1.6**		2.2	U
Benzene	ug/L	1.2	1700	14000	2800	1.0	U	1.0	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.1	U
Carbon Dioxide	ug/L	--	--																					**72,000**	
Chloroform	ug/L	0.17	720	5500	1200	1.0	U	1.0	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**1.7**		**1.6**		1.1	U
Chloromethane	ug/L	2.1	22000	2100000	320000	1.0	U	1.0	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.1	U
Cis-1,2-Dichloroethene	ug/L	--	24000			**310**	D	**160**	D	**1,200**	D	0.5	U	**0.68**		**210**	D	**27.0**		**740**	D	**720**	D	**840**	D
Methane	ug/L	--	--																					**5,200**	
Methylene Chloride	ug/L	8.9				2.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U
Tetrachloroethene	ug/L	0.12	5400		32000	**74.0**	D	**52.0**	D	**790**	D	0.5	U	**20.0**		**190**	D	**110**	D	**2,000**	D	**1,900**	D	**470**	D
Toluene	ug/L	9.8	210000			**0.14**	J	1.0	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.1	U
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000	**3.7**		**1.5**		**6.7**		0.5	U	0.5	U	**1.9**		0.5	U	**4.3**		**4.4**		**5.2**	
Trichloroethene	ug/L	0.17	430	19000	3300	**25.0**		**5.6**		**49.0**		0.5	U	**1.9**		**38.0**		**8.5**		**1,000**	D	**960**	D	**45.0**	
Vinyl Chloride	ug/L	0.015	1200	6800	910	**120**	D	**0.54**	J	**5.8**		0.5	U	0.5	U	**72.0**		0.5	U	**0.93**		**0.95**		**4.3**	

Notes:

D = Dilution

J = Estimated value.

U = analyzed for but not detected.

-- = Not Established

Bolded = detect

Shaded = detected result exceeded JSCS SLVs

[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

[2] Screening value taken from DEQ Risk-Based Concentrations for the groundwater in excavation for the Construction and Excavation worker (6/7/12 revision)

[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Analyte	Units	JSCS SLVs [1]	DEQ RBCs Excavation [2]	DEQ RBCs Volatilization [3]	DEQ RBCs Vapor Intrusion [4]	Sample ID	MW02-		MW03-		MW03-		MW04-		MW05-		MW06-		MW1-		MW2-		MW3-		MW3-	
						Sample Date	06/21/05		06/21/05		06/21/05		06/21/05		06/21/05		06/21/05		09/21/05		09/21/05		09/21/05		09/21/05	
CONV																										
Alkalinity, Total as CaCO3	ug/L	--					**170,000**		**140,000**		**150,000**		**190,000**		**120,000**		**150,000**		**160,000**		**160,000**		**150,000**		**130,000**	
Chloride	ug/L	--					**1,700**		**4,400**		**4,300**		**3,400**		**1,600**		**5,800**		**2,900**		**2,000**		**4,300**		**4,200**	
Nitrate ion	ug/L	--																	100	U	100	U	**230**		**280**	
Nitrate-N	ug/L	--					100	U	**170**		**140**		**120**		100	U	100	U								
Sulfate	ug/L	--					**150**		**15,000**		**13,000**		**9,500**		**6,600**		**22,000**		**4,400**		**110**		**15,000**		**17,000**	
Total Organic Carbon	ug/L	--					**2,300**		**1,600**		**1,600**		**1,900**		**1,900**		**2,700**		**1,200**		**2,100**		**1,500**		**1,500**	
Metals Total																										
Iron	ug/L	--					**15,000**		**6,500**		**4,200**		**11,000**		**7,700**		**13,000**		**16,000**		**15,000**		**3,000**		**12,000**	
Manganese	ug/L	50	3000000				**2,700**		**1,200**		**980**		**1,800**		**1,600**		**2,600**		**2,500**		**2,500**		**930**		**1,700**	
VOCs																										
1,1,1-Trichloroethane	ug/L	11	1100000				0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	ug/L	--	43000		340000		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	**2.5**		0.5	U	0.5	U	0.5	U
1,2-Dichloroethene	ug/L	--	--	1800000	350000		0.5	U	**1.0**		0.5	U	**150**		**53.0**		**1,300**		**690**		0.5	U	**0.79**		**0.79**	
Acetone	ug/L	1,500	--				1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	10.0	U	2.2	U	**8.6**		**11.0**		**4.8**	
Benzene	ug/L	1.2	1700	14000	2800		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
Carbon Dioxide	ug/L	--	--				**42,000**		**49,000**		**49,000**		**110,000**		**42,000**		**110,000**		**57,000**		**43,000**		**63,000**		**31,000**	
Chloroform	ug/L	0.17	720	5500	1200		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
Chloromethane	ug/L	2.1	22000	2100000	320000		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
Cis-1,2-Dichloroethene	ug/L	--	24000				0.5	U	**1.0**		0.5	U	**150**	D	**53.0**		**1,300**	D	**730**	D	0.5	U	**0.79**		**0.79**	
Methane	ug/L	--	--				**9,800**		**1,200**		**940**		**8,600**		**3,000**		**1,800**		**3,900**		**13,000**		**7,700**		**720**	
Methylene Chloride	ug/L	8.9					0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	ug/L	0.12	5400		32000		0.5	U	**5.0**		**12.0**		**130**	D	**110**	D	**2,100**	D	**460**	D	0.5	U	**9.0**		**9.7**	
Toluene	ug/L	9.8	210000				0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.0	U	1.1	U	0.5	U	0.5	U	0.5	U
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000		0.5	U	0.5	U	0.5	U	**1.9**		0.5	U	**9.9**		**5.0**		0.5	U	0.5	U	0.5	U
Trichloroethene	ug/L	0.17	430	19000	3300		0.5	U	**1.8**		**2.1**		**28.0**		**18.0**		**1,500**	D	**38.0**		0.5	U	**1.7**		**1.8**	
Vinyl Chloride	ug/L	0.015	1200	6800	910		0.5	U	0.5	U	0.5	U	**59.0**		0.5	U	**5.7**		**2.9**		0.5	U	0.5	U	0.5	U

Notes:

D = Dilution

J = Estimated value.

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-- = Not Established

Bolded = detect

Shaded = detected result exceeded JSCS SLVs

[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

[2] Screening value taken from DEQ Risk-Based Concentrations for the groundwater in excavation for the Construction and Excavation worker (6/7/12 revision)

[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-2

Historical Groundwater Sampling Results

Northwest Pipe Company

Sample ID						MW4-		MW5-		MW6-		PW1W	
Sample Date						09/21/05		09/21/05		09/21/05		09/07/01	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Excavation [2]**	**DEQ RBCs Volatilization[3]**	**DEQ RBCs Vapor Intrusion[4]**								
CONV													
Alkalinity, Total as CaCO3	ug/L	--				**180,000**		**120,000**		**150,000**			
Chloride	ug/L	--				**3,500**		**2,900**		**6,500**			
Nitrate ion	ug/L	--				**240**		**1,000**		100	U		
Nitrate-N	ug/L	--											
Sulfate	ug/L	--				**13,000**		**17,000**		**25,000**			
Total Organic Carbon	ug/L	--				**1,500**		**2,400**		**1,800**			
Metals Total													
Iron	ug/L	--				**7,600**		**4,300**		**12,000**			
Manganese	ug/L	50	3000000			**1,500**		**1,700**		**2,100**			
VOCs													
1,1,1-Trichloroethane	ug/L	11	1100000			0.5	U	0.5	U	5.0	U	1.0	U
1,1,2-Trichloroethane	ug/L	1.2	49	19000	8800	0.5	U	0.5	U	5.0	U	1.0	U
1,1-Dichloroethane	ug/L	47	10000	73000	16000	0.5	U	0.5	U	5.0	U	**1.7**	
1,1-Dichloroethene	ug/L	--	43000		340000	0.5	U	0.5	U	**6.2**		1.0	U
1,2-Dichloroethene	ug/L	--	--	1800000	350000	**140**		**150**		**1,600**			
Acetone	ug/L	1,500	--			1.0	U	**3.7**		10.0	U		
Benzene	ug/L	1.2	1700	14000	2800	0.5	U	0.5	U	5.0	U	1.0	U
Carbon Dioxide	ug/L	--	--			**110,000**		**40,000**		**98,000**			
Chloroform	ug/L	0.17	720	5500	1200	0.5	U	0.5	U	5.0	U	1.0	U
Chloromethane	ug/L	2.1	22000	2100000	320000	0.5	U	0.5	U	5.0	U	1.0	U
Cis-1,2-Dichloroethene	ug/L	--	24000			**160**		**160**		**1,700**		**11.0**	
Methane	ug/L	--	--			**6,100**		**2,600**		**3,000**			
Methylene Chloride	ug/L	8.9				0.5	U	0.5	U	5.0	U	1.0	U
Tetrachloroethene	ug/L	0.12	5400		32000	**140**	D	**1,200**	D	**2,800**	D	**3.8**	
Toluene	ug/L	9.8	210000			0.5	U	0.5	U	5.0	U	1.0	U
Trans-1,2-Dichloroethene	ug/L	110	14000	1800000	350000	**1.9**		**0.93**		**12.0**		1.0	U
Trichloroethene	ug/L	0.17	430	19000	3300	**24.0**	D	**72.0**	D	**1,900**	D	1.0	U
Vinyl Chloride	ug/L	0.015	1200	6800	910	**55.0**		0.5	U	**6.7**		1.0	U

Notes:

D = Dilution

J = Estimated value.

U = analyzed for but not detected.

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Bolded = detect

Shaded = detected result exceeded JSCS SLVs

[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)

[2] Screening value taken from DEQ Risk-Based Concentrations for the groundwater in excavation for the Construction and Excavation worker (6/7/12 revision)

[3] Screening value taken from DEQ Risk-Based Concentrations for the groundwater volatilization to outdoor air Occupational (6/7/12 revision)

[4] Screening value taken from DEQ Risk-Based Concentrations for the groundwater vapor intrusion into buildings occupational (6/7/12 revision)

Table 5-3

Construction Summary of Groundwater Monitoring Wells

Northwest Pipe Company - Portland, Oregon

Well ID	Installation Date	Total Depth [a]	Casing Diameter (inches) [b]	Borehole Diameter (inches)	Screen Length (feet)	Screened Interval [a]	Top of Filter Pack [a]	MPE [c]	GSE [d]	Screened Material	Comments
MW-1	07/23/03	25	2-inch	6	10	14 to 24	12.5	32.02	32.39	Medium to fine sand	Backfilled from 27 ft bgs.
MW-2	07/23/03	22	2-inch	6	10	10.5 to 20.5	9	29.05	29.35	Medium to fine sand	Backfilled from 23 ft bgs.
MW-3	07/24/03	26	2-inch	6	10	14.5 to 24.5	13	30.54	30.78	Medium to fine sand	Backfilled from 27 ft bgs.
MW-4	08/06/04	27	2-inch	6	10	16.5 to 26.5	14	31.51	32.08	Sand w/ silt. Medium to fine sand	Backfilled from 29 ft bgs.
MW-5	08/06/04	28	2-inch	6	10	17.5 to 27.5	16	31.76	32.17	Sand w/ silt.	Backfilled from 30 ft bgs.
MW-6	12/20/04	29	2-inch	6	10	18.5 to 28.5	16.5			Medium to fine sand	No Survey
MW-7	05/31/12	18	2-inch	4	10	17 to 7	6	26.37	26.79	Medium to fine sand	Installed with direct push
MW-8	05/31/12	17	2-inch	4	10	17 to 7	6	26.36	26.88	Medium to fine sand	Installed with direct push
MW-9	05/31/12	17	2-inch	4	10	17 to 7	6	25.75	26.17	Medium to fine sand	Installed with direct push

Notes:

[a] Feet below ground surface (ft bgs).

[b] Casing and screen constructed with flush-threaded Schedule 40 polyvinyl chloride with 0.010-inch machine-slotted screen.

[c] MPE = Measuring point elevation, feet City of Portland Vertical Datum (COP).

Monitoring wells MW-1 through MW-3 were resurveyed on August 20, 2004. Elevations confirmed from original survey effort conducted during 2003.

[d] GSE = Ground surface elevation, feet COP.

Table 5-4

Field Parameter Data Summary for August 2004 & June 2012 Groundwater Sampling Event

Northwest Pipe Company - Portland, Oregon

Well ID	Date Sampled	Sample Time	Purge Volume (gallons)	pH [-log (H+)]	Temperature (^{o}C)	DO [a] (mg/L)	Specific Conductance [b] (uS/cm at 25^{o}C)	Turbidity (NTUs)	ORP [c] (millivolts)
MW-1	8/16/2004	10:15	6.0	6.8	15.1	0.15	366	4.6	-130
MW-2	8/16/2004	12:35	6.5	7.0	16.5	0.16	343	3.2	-151
MW-3	8/16/2004	13:35	7.0	6.8	16.3	0.26	304	3.7	-93
MW-4	8/16/2004	14:50	8.0	6.5	15.3	0.14	429	1.0	-103
MW-5	8/16/2004	11:30	8.0	6.8	15.1	0.13	284	0.8	-130
MW-6	6/21/2005	15:14	8.0	6.1	14.7	0.17	377	4.0	-33.7
MW-7	6/15/2012	15:18	1.5	6.7	14.4	-	353	11.4	-100
MW-8	6/15/2012	14:22	1.4	7.0	15.3	-	312	10.3	-134
MW-9	6/15/2012	13:17	2.3	6.8	15.9	-	360	2.8	-128

Notes:

[a] DO = dissolved oxygen in milligrams per liter.

[b] Specific conductance is electrical conductivity normalized to 25^{o}C.

[c] ORP = Oxidation reduction potential.

^{o}C = degrees Celsius.

uS/cm = microsiemens per centimeter.

NTUs = nephelometric turbidity units.

Table 5-5

Natural Attenuation Parameters in Monitoring Well Samples

Northwest Pipe Company - Portland, Oregon

Station Location	Date Sampled	Alkalinity, Total as $CaCO_3$	Nitrate-N	Fe^{2+} (Ferrous Iron)	Manganese	Sulfate	Carbon Dioxide	Methane	Chloride	Total Organic Carbon
MW-01	6/21/2005	155	0.10 U	16	2.6	2.0	72	5.2	2.4	1.4
	9/21/2005	158		16	2.5	4.4	57	3.9	2.9	1.2
MW-02	6/21/2005	172	0.10 U	15	2.7	0.15	42	9.8	1.7	2.3
	9/21/2005	164		15	2.5	0.11	43	13	2.0	2.1
MW-03	6/21/2005	135	0.17	6.5	1.2	15	49	1.2	4.4	1.6
	(duplicate)	146	0.14	4.2	0.98	13	49	0.94	4.3	1.6
	9/21/2005	148		3.0	0.93	15	63	7.7	4.3	1.5
	(duplicate)	132		12	1.7	17	31	0.72	4.2	1.5
MW-04	6/21/2005	192	0.12	11	1.8	9.5	108	8.6	3.4	1.9
	9/21/2005	182		7.6	1.5	13	114	6.1	3.5	1.5
MW-05	6/21/2005	120	.10 U	7.7	1.6	6.6	42	3.0	1.6	1.9
	9/21/2005	120		4.3	1.7	17	40	2.6	2.9	2.4
MW-06	6/21/2005	149	.10 U	13	2.6	22	111	1.8	5.8	2.7
	9/21/2005	150		12	2.1	25	98	3.0	6.5	1.8

Note:

Concentrations in milligrams per liter (mg/L)

U = analyzed for but not detected above the indicated reporting limit

Table 5-6
Groundwater Elevation Summary
Northwest Pipe Company - Portland, Oregon

Well ID	Date	Time	MPE [a]	Depth to Water [b]	Elevation [c]
MW-1					
	7/31/2003	12:05	32.02	12.72	19.30
	8/29/2003	8:45	32.02	12.96	19.06
	12/3/2003	10:23	32.02	13.45	18.57
	7/19/2004	15:32	32.02	12.91	19.11
	8/16/2004	9:25	32.02	13.33	18.69
	6/21/2005	10:10	32.02	13.25	18.77
	9/21/2005	11:00	32.02	13.95	18.07
	9/24/2007	10:20	32.02	13.57	18.45
MW-2					
	7/31/2003	12:23	29.05	9.79	19.26
	8/29/2003	8:50	29.05	10.01	19.04
	12/3/2003	10:37	29.05	10.49	18.56
	7/19/2004	15:44	29.05	9.98	19.07
	8/16/2004	9:30	29.05	10.41	18.64
	6/21/2005	12:00	29.05	10.33	18.72
	9/21/2005	12:45	29.05	11.03	18.02
	9/24/2007	10:27	29.05	10.68	18.37
MW-3					
	7/31/2003	12:40	29.16	11.53	17.63
	8/29/2003	8:53	29.16	11.75	17.41
	12/3/2003	10:54	29.16	12.16	17.00
	7/19/2004	15:53	29.16	11.78	17.38
	8/16/2004	9:33	29.16	12.12	17.04
	6/21/2005	12:55	29.16	11.97	17.19
	9/21/2005	13:35	29.16	12.71	16.45
	9/24/2007	10:30	29.16	12.39	16.77
MW-4					
	8/16/2004	9:35	30.13	13.00	17.13
	6/21/2005	14:00	30.13	12.86	17.27
	9/21/2005	15:15	30.13	13.59	16.54
	9/24/2007	10:31	30.13	13.24	16.89
MW-5					
	8/16/2004	9:27	30.38	13.03	17.35
	6/21/2005	11:10	30.38	12.97	17.41
	9/21/2005	11:50	30.38	13.66	16.72
	9/24/2007	10:21	30.38	13.27	17.11

Table 5-6
Groundwater Elevation Summary
Northwest Pipe Company - Portland, Oregon

Well ID	Date	Time	MPE [a]	Depth to Water [b]	Elevation [c]
MW-6					
	6/21/2005	14:50	Not surveyed	12.45	
	9/21/2005	14:25		13.16	
	9/24/2007	10:24		12.79	
MW-7					
	6/15/2012	15:18	26.37	5.98	20.39
MW-8					
	6/15/2012	14:22	26.36	6.00	20.36
MW-9					
	6/15/2012	13:17	25.75	5.35	20.40
Willamette River [d]					
	7/31/2003	--	0.175	3.72	3.90
	8/29/2003	--	0.175	3.46	3.64
	12/3/2003	--	0.175	3.92	4.10
	7/19/2004	--	0.175	3.20	3.38
	8/16/2004	--	0.175	3.05	3.23
	6/15/2012	14:30	0.175	9.44	9.27

Notes:

[a] MPE = Measuring point elevation in feet City of Portland Vertical datum.
MPE at north edge top of PVC well casing.

[b] Depth to water in feet below MPE.

[c] Elevation in feet (MPE - depth to water)

[d] Willamette River mean gauge height (Morrison Street Bridge) converted from Willamette River datum to COP by subtracting 0.175 foot from the measured value.

Old monitoring wells (MW1-MW6) in NGVD29. Conversion from NGVD29 to COP datum is by adding 1.375 feet to elevation

TABLE 5-7

Anatytical Parameters and Weighting for Preliminary Screening for Anaerobic Biodegradation Processes

Northwest Pipe Company Portland Oregon

Analysis	Concentration In Most Contaminated Zone	Interpretation	Value	Northwest Pipe Score[a]
Oxygen	< 0.5 mg/L	Tolerated; suppresses the reductive pathway at higher concentrations	3	3
Nitrate	< 1 mg/L	At higher concentrations. may compete with reductive pathway	2	2
Iron II	> 1 mg/L	Reductive pathway possible	3	3
Sulfate	< 20 mg/L	At higher concentrations, may compete with reductive pathway	2	2
Sulfide	> 1 mg/L	Reductive pathway possible	3	ND[b]
Methane	> 0.5 mg/l	Ultimate reductive daughter product	3	3
Oxidation reduction potential	< 50 millivolts	Reductive pathway likely	2	2
pH	5<pH<9	Optimal range for reductive pathway	0	0
TOC	> 20 mg/L	Carbon and energy source; drives dechlorination: can be natural or anthropogenic	2	0
Temperature	> 20°C	At T > 20°C, biochemical process is accelerated	1	0
Carbon dioxide	> 2x background	Ultimate oxidative daughter product	1	1
Alkalinity	> 2x background	Results from inleraction between Co, and aquifer minerals	1	0
Chloride	> 2x background	Daughter product of organic chlorine	2	2
Hydrogen	> 1 nM	Reductive pathway possible	3	ND
TCE		Daughter product of PCE	2	2
DCE		Daughter product of TCE	2	2
VC		Daughter product of DCE	2	2
		Total Score for Northwest Pipe Site		**24**

[a] Using data from MW·2 as indicative of background conditions and MW-1, MW-4, and MW-6 as representative of the most contaminated zone.

[b] ND = Not determined. Assigned a value of zero although the actual value, if data were available, may be higher

[c] Points awarded only if it can be shown that the compound is a daughter product (i.e, not a constituent of the source material). The presence of TCE and further breakdown products, combined with the limited migration distance away from the area of highest concentration, indicate that TCE, DCE. and VC are breakdown products.

Table 5-8

Storm Water Analytical Results

Northwest Pipe Company

Station:				CB-101		CB-101		CB-103		CB-105		CB-106		CB-106		CB-107		CB-107		CB-201		CB-202		CB-202		CB-202		SP-002	
Sample ID:				SB22-11072006		SW108-120307-0		SW105-120307-0		CB2-9903		SB16-11072006		SW112-120307-0		SB14-11072006		SW113-120307-0		CB1-9903		CB5-9903		CB5-7805		SW118-120307-0		SB02-11072006	
Date Sampled:				11/07/06		12/03/07		12/03/07		09/09/03		11/07/06		12/03/07		11/07/06		12/03/07		09/09/03		09/09/03		07/08/05		12/03/07		11/07/06	
Chemical Group	Constituents	Units	JSCS Screening Criteria [1,2]																										
CONV	Oil & Grease	mg/L	--							5.0	U									**11**		5.0	U	**8.3**					
CONV	Solids, Total Suspended	mg/L	--							**2.0**										**278**		**78**		**173**		**380**			
M-DISS	Aluminum	mg/L	0.050							0.10	U									0.10	U	**0.24**		**0.59**					
M-DISS	Chromium	mg/L	0.10							0.010	U									**0.016**		0.010	U	0.010	U				
M-DISS	Copper	mg/L	0.0027							0.010	U									**0.029**		**0.013**		**0.018**					
M-DISS	Lead	mg/L	0.00054							0.0030	U									**0.0066**		0.0030	U	0.0050	U				
M-DISS	Manganese	mg/L	0.050							**0.030**										**0.13**		**0.14**		**0.096**					
M-DISS	Molybdenum	mg/L	--							0.025	U									0.025	U	0.025	U	0.025	U				
M-DISS	Nickel	mg/L	0.016							0.020	U									0.020	U	0.020	U	0.020	U				
M-DISS	Zinc	mg/L	0.036							**0.029**										**0.036**		**0.055**		**0.050**					
M-TOTAL	Aluminum	mg/L	0.050							**0.33**										**14**		**5.9**		**11**					
M-TOTAL	Chromium	mg/L	0.10							0.010	U									**0.17**		**0.015**		**0.026**					
M-TOTAL	Copper	mg/L	--	0.010	U					0.010	U	**0.013**				**0.016**				**0.17**		**0.032**		**0.053**				**0.012**	
M-TOTAL	Lead	mg/L	--							0.0030	U									**0.30**		**0.026**		**0.033**					
M-TOTAL	Manganese	mg/L	0.050							**0.063**										**2.1**		**0.35**		**0.45**					
M-TOTAL	Molybdenum	mg/L	--							0.025	U									0.025	U	0.025	U	0.025	U				
M-TOTAL	Nickel	mg/L	--							0.020	U									**0.026**		0.020	U	0.020	U				
M-TOTAL	Zinc	mg/L	--	**0.54**		**0.99**		**0.95**		**0.040**		**0.073**		**0.10**		**0.099**		**0.075**		**1.1**		**0.27**		**0.36**		**0.24**		**1.00**	
PAH	Acenaphthene	mg/L	0.0002	0.000025	U	**0.0000088**	**J**	**0.0000071**	**J**	0.000024	U	0.000024	U	**0.000017**	**J**	**0.000024**		**0.000035**	**J**	0.000047	U	**0.000121**		**0.000694**		**0.000051**	**J**	0.000024	U
PAH	Acenaphthylene	mg/L	0.0002	0.000025	U	**0.0000094**	**J**	**0.0000054**	**J**	0.000024	U	0.000024	U	**0.00003**	**J**	0.000024	U	**0.000016**	**J**	0.000047	U	0.000048	U	0.000264	U	**0.00012**	**J**	0.000024	U
PAH	Anthracene	mg/L	0.0002	**0.000085**		**0.000042**	**J**	**0.000027**	**J**	0.000024	U	**0.000058**		**0.000095**	**J**	**0.000099**		**0.0002**	**J**	**0.00007**		**0.00025**		**0.000524**		**0.00021**	**J**	**0.000064**	
PAH	Benzo (a) anthracene	mg/L	0.000018	**0.00044**		**0.00014**	**J**	**0.000093**	**J**	**0.000025**		**0.00019**		**0.00021**	**J**	**0.00039**		**0.00029**	**J**	**0.000346**		**0.000699**		**0.00134**		**0.00042**	**J**	**0.00022**	
PAH	Benzo (a) pyrene	mg/L	0.000018	**0.00042**		**0.00012**	**J**	**0.000076**	**J**	0.000024	U	**0.00019**		**0.00023**	**J**	**0.00039**		**0.00027**	**J**	**0.000316**		**0.000582**		**0.00163**		**0.00068**	**J**	**0.00022**	
PAH	Benzo (b) fluoranthene	mg/L	0.000018	**0.0011**		**0.00026**	**J**	**0.00017**	**J**	0.000024	U	**0.00043**		**0.0004**	**J**	**0.00075**		**0.00045**	**J**	**0.000828**		**0.00117**		**0.00164**		**0.00094**	**J**	**0.00049**	
PAH	Benzo (g,h,i) perylene	mg/L	0.0002	**0.00036**		**0.000098**	**J**	**0.000069**	**J**	0.000024	U	**0.00018**		**0.00022**	**J**	**0.00031**		**0.00021**	**J**	**0.000483**		**0.000671**		**0.00122**		**0.00054**	**J**	**0.00017**	
PAH	Benzo (k) fluoranthene	mg/L	0.000018	**0.00035**		**0.000085**	**J**	**0.000056**	**J**	0.000024	U	**0.00012**		**0.00012**	**J**	**0.00024**		**0.00013**	**J**	**0.000318**		**0.000466**		**0.00133**		**0.00028**	**J**	**0.00016**	
PAH	Chrysene	mg/L	0.000018	**0.00082**		**0.00028**	**J**	**0.00018**	**J**	0.000024	U	**0.00031**		**0.00034**	**J**	**0.00045**		**0.00046**	**J**	**0.000622**		**0.000986**		**0.00215**		**0.00076**	**J**	**0.00032**	
PAH	Dibenzo (a,h) anthracene	mg/L	0.000018	**0.000059**		**0.000025**	**J**	**0.000019**	**J**	0.000024	U	**0.000027**		**0.000051**	**J**	**0.000067**		**0.00005**	**J**	**0.000154**		**0.000324**		**0.000283**		**0.0001**	**J**	**0.000028**	
PAH	Fluoranthene	mg/L	0.0002	**0.0011**		**0.00034**	**J**	**0.00024**	**J**	**0.000026**		**0.00044**		**0.00048**	**J**	**0.00092**		**0.00078**	**J**	**0.000793**		**0.00218**		**0.00351**		**0.00091**	**J**	**0.00071**	
PAH	Fluorene	mg/L	0.0002	0.000025	U	**0.000012**	**J**	**0.000011**	**J**	0.000024	U	0.000024	U	**0.000021**	**J**	**0.000033**		**0.000062**	**J**	**0.000063**		**0.000128**		**0.00035**		**0.000048**	**J**	0.000024	U
PAH	Indeno (1,2,3-cd) pyrene	mg/L	0.000018	**0.0003**		**0.000081**	**J**	**0.000056**	**J**	0.000024	U	**0.00013**		**0.00017**	**J**	**0.00024**		**0.00016**	**J**	**0.000431**		**0.000656**		**0.00102**		**0.00039**	**J**	**0.00014**	
PAH	Naphthalene	mg/L	0.0002	0.000025	U	0.0026	U	0.0026	U	0.000024	U	0.000024	U	**0.0000096**	**J**	**0.000025**		**0.000051**	**J**	**0.000157**		**0.000143**		0.000264	U	**0.000017**	**J**	0.000024	U
PAH	Phenanthrene	mg/L	0.0002	**0.00023**		**0.000092**	**J**	**0.000078**	**J**	0.000024	U	**0.00016**		**0.00018**	**J**	**0.00038**		**0.00047**	**J**	**0.000596**		**0.00064**		**0.00257**		**0.00032**	**J**	**0.00025**	
PAH	Pyrene	mg/L	0.0002	**0.001**		**0.00036**	**J**	**0.00024**	**J**	0.000024	U	**0.00039**		**0.00046**	**J**	**0.00081**		**0.00066**	**J**	**0.000721**		**0.00161**		**0.00329**		**0.0011**	**J**	**0.00058**	
PEST/PCB	Aroclor-1016	mg/L	0.00096	0.000048	U					0.000048	U	0.000049	U			0.000048	U			**0.000111**		0.000048	U	0.000053	U	0.00026	U	0.000049	U
PEST/PCB	Aroclor-1221	mg/L	0.000034	0.000048	U					0.000048	U	0.000049	U			0.000048	U			0.000048	U	0.000048	U	0.00011	U	0.00026	U	0.000049	U
PEST/PCB	Aroclor-1232	mg/L	0.000034	0.000048	U					0.000048	U	0.000049	U			0.000048	U			0.000048	U	0.000048	U	0.000053	U	0.00026	U	0.000049	U
PEST/PCB	Aroclor-1242	mg/L	0.000034	0.000048	U					0.000048	U	0.000049	U			0.000048	U			0.000048	U	0.000048	U	0.000053	U	0.00026	U	0.000049	U
PEST/PCB	Aroclor-1248	mg/L	0.000034	0.000048	U					0.000048	U	0.000049	U			0.000048	U			0.000048	U	0.000048	U	0.000053	U	0.00026	U	0.000049	U
PEST/PCB	Aroclor-1254	mg/L	0.000033	0.000048	U					0.000048	U	**0.000054**				**0.000085**				**0.000063**		0.000048	U	0.000053	U	0.00026	U	**0.000058**	
PEST/PCB	Aroclor-1260	mg/L	0.000034	0.000048	U					**0.000059**		0.000049	U			0.000048	U			**0.000052**		0.000048	U	0.000053	U	0.00026	U	0.000049	U
TPH	Diesel	mg/L	0.43															**1.0**											
TPH	Oil	mg/L	1.30											**0.66**				**6.4**								**3.2**			

Notes:

Bold result = detection

Shaded cell = screening level exceeded.

-- = Screening criteria not established.

D = Result derived from a dilution.

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

[1] Portland Harbor Joint Source Control Strategy (JSCS) Table 3.1 (July 16, 2007). Initial upland source control screening evaluations for water.

[2] Criteria for diesel and gasoline taken from Oregon Department of Environmental Quality Risk-Based Concentrations table; Groundwater; Ingestion & Inhalation from Tapwater; Occupational (Rev. 6/7/2012).

Table 5-8

Storm Water Analytical Results

Northwest Pipe Company

Station:				SP-002		SP-003		SP-003		SP-003		SP-003		SP-004		SP-004		SP-004		SP-004		SP-005		SW-110		SW-119	
Sample ID:				SW103-120307-0		CB3-9903		CB3-7805		SB3-11072006		SW101-120307-0		CB4-9903		CB4-7805		SB4-11072006		SW117-120307-0		SW102-120307-0		SW110-120307-0		SW119-120307-0	
Date Sampled:				12/03/07		09/09/03		07/08/05		11/07/06		12/03/07		09/09/03		07/08/05		11/07/06		12/03/07		12/03/07		12/03/07		12/03/07	
Chemical Group	Constituents	Units	JSCS Screening Criteria [1,2]																								
CONV	Oil & Grease	mg/L	--			5.0	U	**5.1**		4.8	U			5.0	U	**3.5**		4.9	U								
CONV	Solids, Total Suspended	mg/L	--	**28**		**10**		**80**		**32**				**2.0**		**35**		**5.2**						**478**		**118**	
M-DISS	Aluminum	mg/L	0.050			0.10	U	0.10	U					0.10	U	0.10	U										
M-DISS	Chromium	mg/L	0.10			0.010	U	**0.010**						0.010	U	0.010	U										
M-DISS	Copper	mg/L	0.0027			0.010	U	0.010	U					0.010	U	0.010	U										
M-DISS	Lead	mg/L	0.00054			0.0030	U	0.0050	U					0.0030	U	0.0050	U										
M-DISS	Manganese	mg/L	0.050			**0.28**		**0.010**						**1.2**		**0.031**											
M-DISS	Molybdenum	mg/L	--			0.025	U	0.025	U					0.025	U	0.025	U										
M-DISS	Nickel	mg/L	0.016			0.020	U	0.020	U					0.020	U	0.020	U										
M-DISS	Zinc	mg/L	0.036			**0.12**		**0.14**						**0.066**		**0.28**											
M-TOTAL	Aluminum	mg/L	0.050			**1.6**		**2.4**						0.10	U	**1.9**											
M-TOTAL	Chromium	mg/L	0.10			0.010	U	**0.017**						0.010	U	0.010	U										
M-TOTAL	Copper	mg/L	--			**0.010**		**0.024**		**0.010**				0.010	U	**0.012**		0.010	U								
M-TOTAL	Lead	mg/L	--			**0.0069**		**0.0090**		**0.0052**				0.0030	U	**0.0062**		**0.0057**									
M-TOTAL	Manganese	mg/L	0.050			**0.34**		**0.15**						**1.2**		**0.12**											
M-TOTAL	Molybdenum	mg/L	--			0.025	U	0.025	U					0.025	U	0.025	U										
M-TOTAL	Nickel	mg/L	--			0.020	U	0.020	U					0.020	U	0.020	U										
M-TOTAL	Zinc	mg/L	--	**1.2**		**0.24**		**0.74**		**0.93**				**0.069**		**0.82**		**1.4**						**0.34**		**0.30**	
PAH	Acenaphthene	mg/L	0.0002	**0.000032**	**J**	**0.000315**		**0.0000939**		**0.000092**		**0.000072**	**J**	**0.000046**		**0.00175**		**0.00006**		**0.000018**	**J**	**0.00015**	**J**	**0.00013**	**J**	**0.00011**	**J**
PAH	Acenaphthylene	mg/L	0.0002	**9.1E-06**	**J**	0.000024	U	0.0000257	U	0.000024	U	**0.000014**	**J**	0.000024	U	**0.000028**		0.000024	U	**0.0000096**	**J**	**0.000013**	**J**	**0.000029**	**J**	**0.000063**	**J**
PAH	Anthracene	mg/L	0.0002	**0.00019**	**J**	**0.00044**		**0.000367**		**0.00047**		**0.00042**	**J**	**0.000039**		**0.00127**		**0.000054**		**0.00006**	**J**	**0.00037**	**J**	**0.00034**	**J**	**0.0005**	**J**
PAH	Benzo (a) anthracene	mg/L	0.000018	**0.00027**	**J**	**0.000779**		**0.00038**		**0.0011**		**0.00056**	**J**	**0.00003**		**0.000296**		**0.000073**		**0.00012**	**J**	**0.00089**	**J**	**0.00096**	**J**	**0.00061**	**J**
PAH	Benzo (a) pyrene	mg/L	0.000018	**0.00021**	**J**	**0.000197**		**0.000316**		**0.00089**		**0.00041**	**J**	0.000024	U	**0.000166**		**0.000068**		**0.00012**	**J**	**0.00073**	**J**	**0.00093**	**J**	**0.00067**	**J**
PAH	Benzo (b) fluoranthene	mg/L	0.000018	**0.00037**	**J**	**0.000372**		**0.000683**		**0.0017**		**0.00069**	**J**	0.000024	U	**0.00026**		**0.00015**		**0.00022**	**J**	**0.0011**	**J**	**0.0014**	**J**	**0.001**	**J**
PAH	Benzo (g,h,i) perylene	mg/L	0.0002	**0.00016**	**J**	**0.000153**		**0.000258**		**0.00061**		**0.0003**	**J**	0.000024	U	**0.000129**		**0.00007**		**0.00012**	**J**	**0.0006**	**J**	**0.00072**	**J**	**0.00044**	**J**
PAH	Benzo (k) fluoranthene	mg/L	0.000018	**0.00013**	**J**	**0.000228**		**0.000435**		**0.00053**		**0.00028**	**J**	0.000024	U	**0.000189**		**0.000047**		**0.000061**	**J**	**0.00041**	**J**	**0.00041**	**J**	**0.00035**	**J**
PAH	Chrysene	mg/L	0.000018	**0.00045**	**J**	**0.000711**		**0.000951**		**0.0011**		**0.0008**	**J**	**0.000027**		**0.000513**		**0.00012**		**0.0002**	**J**	**0.0011**	**J**	**0.0014**	**J**	**0.00092**	**J**
PAH	Dibenzo (a,h) anthracene	mg/L	0.000018	**0.000041**	**J**	**0.000081**		**0.0000738**		**0.00012**		**0.000082**	**J**	0.000024	U	**0.0000335**		0.000024	U	**0.000027**	**J**	**0.00015**	**J**	**0.00017**	**J**	**0.00011**	**J**
PAH	Fluoranthene	mg/L	0.0002	**0.001**	**J**	**0.00713**	**D**	**0.00193**		**0.0027**		**0.0017**	**J**	**0.000107**		**0.00168**		**0.00025**		**0.00034**	**J**	**0.0019**	**J**	**0.0026**	**J**	**0.0013**	**J**
PAH	Fluorene	mg/L	0.0002	**0.000058**	**J**	**0.000511**		**0.000166**		**0.00016**		**0.00012**	**J**	**0.000034**		**0.00134**		**0.000047**		**0.000026**	**J**	**0.00021**	**J**	**0.00013**	**J**	**0.00011**	**J**
PAH	Indeno (1,2,3-cd) pyrene	mg/L	0.000018	**0.00013**	**J**	**0.000163**		**0.000228**		**0.00049**		**0.00024**	**J**	0.000024	U	**0.000107**		**0.000052**		**0.000092**	**J**	**0.00047**	**J**	**0.00055**	**J**	**0.00034**	**J**
PAH	Naphthalene	mg/L	0.0002	**0.000035**	**J**	**0.000461**		**0.0000876**		**0.000046**		**0.00006**	**J**	0.000024	U	**0.0000341**		0.000024	U	**0.0000046**	**J**	**0.00014**	**J**	**0.000073**	**J**	**0.000041**	**J**
PAH	Phenanthrene	mg/L	0.0002	**0.00054**	**J**	**0.00583**	**D**	**0.0016**		**0.0014**		**0.00082**	**J**	**0.00012**		**0.00472**	**D**	**0.00017**		**0.00017**	**J**	**0.0011**	**J**	**0.0013**	**J**	**0.00074**	**J**
PAH	Pyrene	mg/L	0.0002	**0.00084**	**J**	**0.00491**	**D**	**0.0014**		**0.0022**		**0.0015**	**J**	**0.000077**		**0.00129**		**0.00019**		**0.00029**	**J**	**0.0018**	**J**	**0.0025**	**J**	**0.0013**	**J**
PEST/PCB	Aroclor-1016	mg/L	0.00096	0.00026	U	0.000049	U	0.000049	U	0.000047	U	0.00026	U	0.000048	U	0.00005	U	0.000048	U	0.00025	U	0.00025	U	0.00026	U	0.00025	U
PEST/PCB	Aroclor-1221	mg/L	0.000034	0.00026	U	0.000049	U	0.000099	U	0.000047	U	0.00026	U	0.000048	U	0.0001	U	0.000048	U	0.00025	U	0.00025	U	0.00026	U	0.00025	U
PEST/PCB	Aroclor-1232	mg/L	0.000034	0.00026	U	0.000049	U	0.000049	U	0.000047	U	0.00026	U	0.000048	U	0.00005	U	0.000048	U	0.00025	U	0.00025	U	0.00026	U	0.00025	U
PEST/PCB	Aroclor-1242	mg/L	0.000034	0.00026	U	0.000049	U	0.000049	U	0.000047	U	0.00026	U	0.000048	U	0.00005	U	0.000048	U	0.00025	U	0.00025	U	0.00026	U	0.00025	U
PEST/PCB	Aroclor-1248	mg/L	0.000034	0.00026	U	0.000049	U	0.000049	U	0.000047	U	0.00026	U	0.000048	U	0.00005	U	0.000048	U	0.00025	U	0.00025	U	0.00026	U	0.00025	U
PEST/PCB	Aroclor-1254	mg/L	0.000033	0.00026	U	0.000049	U	**0.00011**		**0.00017**		**0.00037**		0.000048	U	0.00005	U	0.000048	U	0.00025	U	**0.00034**		**0.00032**		0.00025	U
PEST/PCB	Aroclor-1260	mg/L	0.000034	0.00026	U	**0.000052**		0.000049	U	0.000047	U	0.00026	U	**0.000049**		0.00005	U	0.000048	U	0.00025	U	0.00025	U	0.00026	U	0.00025	U
TPH	Diesel	mg/L	0.43																					**0.63**	**J**	**0.81**	**J**
TPH	Oil	mg/L	1.30									**0.67**										**1.1**		**2.6**		**3.7**	

Notes:

Bold result = detection

Shaded cell = screening level exceeded.

-- = Screening criteria not established.

D = Result derived from a dilution.

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

[1] Portland Harbor Joint Source Control Strategy (JSCS) Table 3.1 (July 16, 2007). Initial upland source control screening evaluations for water.

[2] Criteria for diesel and gasoline taken from Oregon Department of Environmental Quality Risk-Based Concentrations table; Groundwater; Ingestion & Inhalation from Tapwater; Occupational (Rev. 6/7/2012).

Table 5-9

Summary of 2005 Surface Soil Sample Results

Northwest Pipe Company

Station ID			SS101		SS102		SS103		SS104	
Date Sampled			06/21/05		06/21/05		06/21/05		06/21/05	
Analyte	**Units**	**Joint Source Control SLVs[1]**								
PCBs										
Aroclor-1016	mg/Kg	0.530	0.0342	U	0.0348	U	0.0345	U	0.0331	U
Aroclor-1221	mg/Kg	--	0.0342	U	0.0348	U	0.0345	U	0.0331	U
Aroclor-1232	mg/Kg	--	0.0342	U	0.0348	U	0.0345	U	0.0331	U
Aroclor-1242	mg/Kg	--	0.0342	U	0.0348	U	0.0345	U	0.0331	U
Aroclor-1248	mg/Kg	1.500	0.0342	U	0.0348	U	0.0345	U	0.0331	U
Aroclor-1254	mg/Kg	0.300	**0.0657**		**0.0535**		**0.607**		**0.148**	
Aroclor-1260	mg/Kg	0.200	0.0342	U	0.0348	U	**0.139**		**0.0595**	
Aroclor-1262	mg/Kg	--								
Aroclor-1268	mg/Kg	--								
Total PCBs	mg/Kg	0.00039	0.1683		0.1579		0.8323		0.2903	

Notes:

D = Analyzed at a secondary dilution factor

U = analyzed for, but not detected.

Bolded = detect

Shaded = detected result exceeded screening level

-- = Not Established

[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Revised July 2007

Table 5-10
Surface Soil Sample Summary

Data Source				CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL	
Sample ID				SS-01-0		SS-02-0		SS-03-0		SS-04-0		SS-05-0		SS-06-0		SS-07-0		SS-08-0		SS-09-0		SS-10-0	
Date Sampled				10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06	
Sample Depth				0		0		0		0		0		0		0		0		0		0	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Occupational [2]**																				
PAH																							
Acenaphthene	ug/Kg	300	61,000,000	2.3	U							**93.0**						**97.0**		**350**			
Acenaphthylene	ug/Kg	200	--	**6.1**								**86.0**						**320**		**49.0**			
Anthracene	ug/Kg	845	310,000,000	**17.0**								**360**						**810**		**1,000**			
Benzo (a) anthracene	ug/Kg	1,050	2,700	**40.0**								**3,700**	D					**8,600**	D	**5,100**	D		
Benzo (a) pyrene	ug/Kg	1,450	270	**52.0**								**2,800**	D					**5,000**	D	**3,300**	D		
Benzo (b) fluoranthene	ug/Kg	--	2,700	**73.0**								**4,400**	D					**7,400**	D	**5,100**	D		
Benzo (g,h,i) perylene	ug/Kg	300	--	**37.0**								**1,600**						**3,700**	D	**2,800**	D		
Benzo (k) fluoranthene	ug/Kg	13,000	27,000	**27.0**								**1,300**						**3,000**	D	**1,400**			
Chrysene	ug/Kg	1,290	250,000	**61.0**								**4,600**	D					**9,700**	D	**5,200**	D		
Dibenzo (a,h) anthracene	ug/Kg	1,300	--	**9.5**								**570**						**940**		**640**			
Fluoranthene	ug/Kg	2,230	29,000,000	**65.0**								**4,900**	D					**14,000**	D	**9,500**	D		
Fluorene	ug/Kg	536	41,000,000	**2.5**								**65.0**						**110**		**390**			
Indeno (1,2,3-cd) pyrene	ug/Kg	100	2,700	**29.0**								**1,400**						**3,000**	D	**2,300**	D		
Naphthalene	ug/Kg	561	23,000	2.3	U							**46.0**						**84.0**		**72.0**			
Phenanthrene	ug/Kg	1,170	--	**23.0**								**1,100**						**2,300**	D	**5,000**	D		
Pyrene	ug/Kg	1,520	21,000,000	**62.0**								**4,900**	D					**14,000**	D	**8,200**	D		
Total PAHs	ug/Kg			**506.4**								**31,920**						**73,061**		**50,401**			
Metals Total																							
Zinc	ug/Kg	459,000		**31,000**		**150,000**		**260,000**		**200,000**		**390,000**		**240,000**		**100,000**		**200,000**		**140,000**		**1,400,000**	
PCBs																							
Aroclor-1016	ug/Kg	530	**--**	22.0	U							400	U					200	U	43.0	U		
Aroclor-1221	ug/Kg	--	**--**	22.0	U							400	U					200	U	43.0	U		
Aroclor-1232	ug/Kg	--	--	22.0	U							400	U					200	U	43.0	U		
Aroclor-1242	ug/Kg	--	--	22.0	U							400	U					200	U	43.0	U		
Aroclor-1248	ug/Kg	1,500	--	22.0	U							400	U					200	U	43.0	U		
Aroclor-1254	ug/Kg	300	--	22.0	U							**3,700**						**2,200**		**430**			
Aroclor-1260	ug/Kg	200	--	22.0	U							**1,100**						**410**		**100**			
Aroclor-1262	ug/Kg	--	--	22.0	U							400	U					200	U	43.0	U		
Aroclor-1268	ug/Kg	--	--	22.0	U							400	U					200	U	43.0	U		
Total PCBs	ug/Kg	0.39	560	**99.0**								**6,200**						**3,310**		**681**			
TPH																							
Diesel	ug/Kg	--	14,000,000	4,700	U							100,000	U					**360,000**		120,000	U		
TPH	ug/Kg		--																				
VOCs																							

Notes:
B = Blank contamination
D = Analyzed at a secondary dilution factor
U = analyzed for, but not detected.
Bolded = detect
Shaded = detected result exceeded JSCS SLVs
-- = Not Established
[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)
[2] Screening value taken from DEQ Risk-Based Concentrations for the soil Ingestion, dermal contact and inhalation (Occupational). (6/7/12 revision)

Table 5-10
Surface Soil Sample Summary

Data Source				CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL		CH2M HILL	
Sample ID				SS-11-0		SS-12-0		SS-13-0		SS-14-0		SS-15-0		SS-16-0		SS-17-0		SS-18-0		SS-19-0	
Date Sampled				10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06	
Sample Depth				0		0		0		0		0		0		0		0		0	
Analyte	**Units**	**JSCS SLVs [1]**	**DEQ RBCs Occupational [2]**																		
PAH																					
Acenaphthene	ug/Kg	300	61,000,000					**580**				**13.0**						**1,900**	D		
Acenaphthylene	ug/Kg	200	--					**340**				**8.4**						**330**			
Anthracene	ug/Kg	845	310,000,000					**1,800**				**100.0**						**10,000**	D		
Benzo (a) anthracene	ug/Kg	1,050	2,700					**13,000**	D			**300**	D					**34,000**	D		
Benzo (a) pyrene	ug/Kg	1,450	270					**8,900**	D			**270**	D					**19,000**	D		
Benzo (b) fluoranthene	ug/Kg	--	2,700					**14,000**	D			**420**	D					**31,000**	D		
Benzo (g,h,i) perylene	ug/Kg	300	--					**7,200**	D			**250**	D					**14,000**	D		
Benzo (k) fluoranthene	ug/Kg	13,000	27,000					**5,100**	D			**170**						**12,000**	D		
Chrysene	ug/Kg	1,290	250,000					**15,000**	D			**350**	D					**37,000**	D		
Dibenzo (a,h) anthracene	ug/Kg	1,300	--					**1,300**				**79.0**						**4,700**	D		
Fluoranthene	ug/Kg	2,230	29,000,000					**25,000**	D			**440**	D					**59,000**	D		
Fluorene	ug/Kg	536	41,000,000					**510**				**8.7**						**2,400**	D		
Indeno (1,2,3-cd) pyrene	ug/Kg	100	2,700					**6,200**	D			**190**	D					**13,000**	D		
Naphthalene	ug/Kg	561	23,000					**140**				**4.4**						**470**			
Phenanthrene	ug/Kg	1,170	--					**10,000**	D			**130**						**28,000**	D		
Pyrene	ug/Kg	1,520	21,000,000					**22,000**	D			**440**	D					**53,000**	D		
Total PAHs	ug/Kg							**131,070**				**3,174**						**319,800**			
Metals Total																					
Zinc	ug/Kg	459,000		**150,000**		**240,000**		**520,000**		**75,000**		**130,000**		**80,000**		**71,000**		**140,000**		**300,000**	
PCBs																					
Aroclor-1016	ug/Kg	530	**--**					1,300	U			210	U					210	U		
Aroclor-1221	ug/Kg	--	**--**					1,300	U			210	U					210	U		
Aroclor-1232	ug/Kg	--	--					1,300	U			210	U					210	U		
Aroclor-1242	ug/Kg	--	--					1,300	U			210	U					210	U		
Aroclor-1248	ug/Kg	1,500	--					1,300	U			210	U					210	U		
Aroclor-1254	ug/Kg	300	--					**11,000**				**630**						**940**			
Aroclor-1260	ug/Kg	200	--					**1,500**				210	U					210	U		
Aroclor-1262	ug/Kg	--	--					1,300	U			210	U					210	U		
Aroclor-1268	ug/Kg	--	--					1,300	U			210	U					210	U		
Total PCBs	ug/Kg	0.39	560					**17,050**				**1,470**						**1,780**			
TPH																					
Diesel	ug/Kg	--	14,000,000					**270,000**				**42,000**						**650,000**			
TPH	ug/Kg		--																		
VOCs																					

Notes:
B = Blank contamination
D = Analyzed at a secondary dilution factor
U = analyzed for, but not detected.
Bolded = detect
Shaded = detected result exceeded JSCS SLVs
-- = Not Established
[1] Screening level values taken from Table 3-1 of the Portland Harbor Joint Source Control Strategy, Final - December 2005 (7/16/07 Revision)
[2] Screening value taken from DEQ Risk-Based Concentrations for the soil Ingestion, dermal contact and inhalation (Occupational). (6/7/12 revision)

Table 5-11

Catch Basin Solids Analytical Results

October 2006 Sampling Event

Northwest Pipe Company

Station:				**CB-101**		**CB-110**		**CB-111**		**CB-112**		**CB-106**	
Sample ID:				**CB-01-0**		**CB-02-0**		**CB-03-0**		**CB-04-0**		**CB-05-0**	
Date Sampled:				**10/04/06**		**10/04/06**		**10/04/06**		**10/04/06**		**10/04/06**	
Chemical Group	**Parameter**	**Units**	**Portland Harbor JSCS** [1,2]										
M-TOTAL	Zinc	mg/Kg	459	**3,050**		**1,170**		**1,640**		**174**		**467**	
PAH	Acenaphthene	mg/Kg	0.30	**0.37**		**0.61**		**5.3**	**D**	**0.19**		**0.18**	
PAH	Acenaphthylene	mg/Kg	0.20	**0.38**		**0.035**		**0.17**		**0.031**		**0.15**	
PAH	Anthracene	mg/Kg	0.85	**2.0**		**1.6**		**21**	**D**	**0.65**		**0.60**	
PAH	Benzo (a) anthracene	mg/Kg	1.1	**9.9**	**D**	**3.4**	**D**	**14**	**D**	**1.6**		**1.6**	
PAH	Benzo (a) pyrene	mg/Kg	1.5	**7.2**	**D**	**1.9**	**D**	**7.7**	**D**	**1.2**		**1.3**	
PAH	Benzo (b) fluoranthene	mg/Kg	--	**13**	**D**	**3.4**	**D**	**13**	**D**	**1.5**		**1.9**	
PAH	Benzo (g,h,i) perylene	mg/Kg	0.30	**4.5**	**D**	**1.1**		**6.1**	**D**	**0.66**		**0.91**	
PAH	Benzo (k) fluoranthene	mg/Kg	13	**2.5**		**1.0**		**2.8**		**0.56**		**0.72**	
PAH	Chrysene	mg/Kg	1.3	**15**	**D**	**3.9**	**D**	**16**	**D**	**1.9**	**D**	**2.3**	
PAH	Dibenzo (a,h) anthracene	mg/Kg	1.3	**1.1**		**0.41**		**1.3**		**0.25**		**0.33**	
PAH	Fluoranthene	mg/Kg	2.2	**19**	**D**	**8.4**	**D**	**43**	**D**	**3.9**	**D**	**4.0**	**D**
PAH	Fluorene	mg/Kg	0.54	**0.62**		**0.76**		**9.7**	**D**	**0.22**		**0.24**	
PAH	Indeno (1,2,3-cd) pyrene	mg/Kg	0.10	**4.3**	**D**	**0.97**		**3.3**		**0.59**		**0.83**	
PAH	Naphthalene	mg/Kg	0.56	**0.12**		**0.38**		**1.1**		**0.046**		**0.26**	
PAH	Phenanthrene	mg/Kg	1.2	**7.1**	**D**	**6.5**	**D**	**42**	**D**	**2.4**	**D**	**1.9**	
PAH	Pyrene	mg/Kg	1.5	**18**	**D**	**6.9**	**D**	**35**	**D**	**3.2**	**D**	**3.6**	**D**
PEST/PCB	Aroclor-1254	mg/Kg	0.30	**1.7**		**0.86**		**14**		**0.31**		**0.50**	
PEST/PCB	Aroclor-1260	mg/Kg	0.20	**0.27**		0.10	U	1.7	U	**0.071**		**0.080**	
TPH	Diesel by Dx	mg/Kg	14,000	**884**		**180**		**846**		**115**		**382**	

Notes:

D = Data reported from a preparation or analytical dilution.

U = Not detected at specified reporting limit.

Bold result = detection

Shaded = detected result exceeded screening level

-- = Not Established

[1] Portland Harbor Joint Source Control Strategy (JSCS) Table 3.1 (July 16, 2007). Initial upland source control screening evaluation criteria for soil and stormwater sediment.

[2] Diesel screening value from Oregon Department of Environmental Quality Risk-Based Concentrations table; Soil Injestion, Dermal Contact, and Inhalation for Occupational Worker (Rev. June 7, 2012).

Table 5-12
Groundwater Analytical Results
September 2007 Sampling Event
Northwest Pipe Company

Station:					MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		GP201		GP202		GP203		GP203		GP204		GP205		GP206		GP207	
Sample ID:					MW-1-092407		MW-2-092407		MW-3-092407		MW-4-092407		MW-5-092407		MW-6-092407		GP201-W-0		GP202-W-0		GP203-W-0		GP203-W-1		GP204-W-0		GP205-W-0		GP206-W-0		GP207-W-0	
Date Sampled:					09/24/07		09/24/07		09/24/07		09/24/07		09/24/07		09/24/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07	
Sample Type*:					N1		N1		N1		N1		N1		N1		N1		N1		N1		FD1		N1		N1		N1		N1	
Chemical Group	**Constituents**	**Units**	**JSCS Screening Criteria [1,2]**	**US EPA Groundwater and Drinking Water MCLs [3]**	**DEQ RBC GW in Excavation[4]**																											
M-DISS	Zinc	mg/L	0.036	5.0		0.0050	U	**0.0078**		0.0050	U	**0.0064**		0.0050	U	0.0050	U	**0.0064**		**0.0066**		**0.0051**		**0.0061**		**0.011**		**0.0073**		0.0050	U	**0.0096**	
PAH	Acenaphthene	mg/L	0.0002	--		0.00000133	U	**0.0000016**	**J**	0.00000127	U	0.00000127	U	0.00000135	U	0.00000134	U	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Anthracene	mg/L	0.0002	--		**0.000003**	**J**	**0.0000037**	**J**	**0.0000035**	**J**	**0.0000042**	**J**	**0.0000039**	**J**	**0.000006**	**J**	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Benzo (a) anthracene	mg/L	0.000018	--	0.0091	**0.0000017**	**J**	**0.0000014**	**J**	0.00000126	U	0.00000125	U	0.00000134	U	0.00000133	U	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Chrysene	mg/L	0.000018	--		**0.0000018**	**J**	0.00000131	U	0.00000131	U	0.00000131	U	0.0000014	U	0.00000138	U	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Fluorene	mg/L	0.0002	--		0.00000135	U	**0.0000013**	**J**	0.00000129	U	0.00000129	U	0.00000138	U	0.00000137	U	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Naphthalene	mg/L	0.0002	--	0.5	**0.0000045**	**J**	**0.0000048**	**J**	**0.0000038**	**J**	**0.0000045**	**J**	**0.0000072**	**J**	**0.0000057**	**J**	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Phenanthrene	mg/L	0.0002	--		**0.000002**	**J**	**0.0000037**	**J**	0.00000154	U	**0.0000017**	**J**	0.00000165	U	0.00000164	U	NA		NA		NA		NA		NA		NA		NA		NA	
PAH	Pyrene	mg/L	0.0002	--		**0.0000058**	**J**	0.00000395	U	0.00000395	U	0.00000395	U	0.00000421	U	0.00000418	U	NA		NA		NA		NA		NA		NA		NA		NA	
TPH	Diesel	mg/L	0.43	--		0.040	U	0.055	U	0.044	U	0.044	U	0.045	U	0.050	U	**0.067**		**0.100**		**1.1**		**0.98**		**0.091**		**0.11**		**0.019**	**J**	**5.7**	
TPH	Gasoline by Gx	mg/L	0.45	--	14	**0.060**	**J**	**0.032**	**J**	**0.034**	**J**	**0.069**	**J**	**0.30**		**0.44**		**0.031**	**J**	**0.027**	**J**	**0.77**		**0.66**		**0.040**	**J**	**0.028**	**J**	**0.032**	**J**	**0.11**	
VOC	1,1,1-Trichloroethane	mg/L	0.011	0.20	1100	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00015**	**J**	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,1,2-Trichloroethane	mg/L	0.0012	0.0050	0.049	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,1-Dichloroethane	mg/L	0.047	--	10	0.0010	U	0.0010	U	**0.00012**	**J**	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.0002**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,1-Dichloroethene	mg/L	--	0.0070	43	**0.0013**		0.0010	U	0.0010	U	**0.00032**	**J**	**0.00098**	**J**	**0.0024**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,2,4-Trimethylbenzene	mg/L	--	--	1.7	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.00037**	**J**	**0.00038**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.0022**	
VOC	1,3,5-Trimethylbenzene	mg/L	--	--	23	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.0029**		**0.0028**		0.0010	U	0.0010	U	0.0010	U	**0.00072**	**J**
VOC	1,3-Dichlorobenzene	mg/L	--	--		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00007**	**J**	0.0010	U
VOC	1,4-Dichlorobenzene	mg/L	--	0.075	1.5	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00027**	**J**	**0.00078**	**J**
VOC	Benzene	mg/L	0.0012	0.0050	1.7	**0.00011**	**J**	0.0010	U	0.0010	U	**0.0001**	**J**	**0.0002**	**J**	0.0050	U	0.0010	U	0.0010	U	**0.00055**	**J**	**0.00057**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.0001**	**J**
VOC	Chlorobenzene	mg/L	0.05	0.10	10	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.001	U	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Chloroform	mg/L	0.00017	--	0.72	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00033**	**J**	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Chloromethane	mg/L	0.0021	--	22	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00019**	**J**
VOC	Cis-1,2-Dichloroethene	mg/L	0.061	0.070	24	**0.39**	**D**	**0.00037**	**J**	**0.0017**		**0.050**		**0.34**	**D**	**0.64**	**D**	0.0010	U	**0.00031**	**J**	0.0010	U	0.0010	U	**0.00056**	**J**	**0.00014**	**J**	**0.00034**	**J**	**0.00071**	**J**
VOC	Ethylbenzene	mg/L	0.0073	0.70	4.4	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.00064**	**J**	**0.00055**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.00017**	**J**
VOC	Isopropylbenzene	mg/L	0.66	--		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.024**		**0.024**		0.0010	U	0.0010	U	0.0010	U	**0.00048**	**J**
VOC	m+p-Xylenes	mg/L	0.0018	--	23	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.0014**		**0.0014**		0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Naphthalene	mg/L	--	--	0.5	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.00012**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.012**	
VOC	n-Butylbenzene	mg/L	--	--		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.016**		**0.016**		0.0010	U	0.0010	U	0.0010	U	**0.00019**	**J**
VOC	n-Propylbenzene	mg/L	--	--		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	**0.00008**	**J**	0.0010	U	**0.036**		**0.036**		**0.00008**	**J**	0.0010	U	0.0010	U	**0.00096**	**J**
VOC	o-Xylene	mg/L	0.013	10	23	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.00011**	**J**	**0.00011**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.00009**	**J**
VOC	Sec-Butylbenzene	mg/L	--	--		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.0034**		**0.0035**		0.0010	U	0.0010	U	0.0010	U	**0.00012**	**J**
VOC	Tert-Butylbenzene	mg/L	--	--		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Tetrachloroethene	mg/L	0.00012	0.0050	5.4	**0.15**	**D**	**0.00034**	**J**	**0.016**		**0.15**	**D**	**1.4**	**D**	**1.2**	**D**	**0.00032**	**J**	**0.00037**	**J**	**0.00035**	**J**	**0.00017**	**J**	**0.00024**	**J**	**0.00017**	**J**	**0.00014**	**J**	**0.0003**	**J**
VOC	Toluene	mg/L	0.0098	1.0	210	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0050	U	0.0010	U	0.0010	U	**0.00039**	**J**	**0.00038**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.00022**	**J**
VOC	Trans-1,2-Dichloroethene	mg/L	0.11	0.10	14	**0.0031**		0.0010	U	0.0010	U	**0.00097**	**J**	**0.0023**		**0.0042**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Trichloroethene	mg/L	0.00017	0.0050	0.43	**0.015**		0.0010	U	**0.0030**		**0.044**		**0.078**		**0.47**		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00022**	**J**
VOC	Vinyl Chloride	mg/L	0.000015	0.0020	1.2	**0.0066**		0.0010	U	0.0010	U	**0.021**		**0.00028**	**J**	**0.0031**	**J**	0.0010	U	**0.00016**	**J**	0.0010	U	0.0010	U	**0.0015**		**0.00038**	**J**	**0.00068**	**J**	**0.00031**	**J**

Notes:

*Sample Type: N1 = Normal Sample, FD1 - Field Duplicate, TB1 - Trip Blank

Bolded = detect

Shaded = detected result exceeded screening criteria

Purple text = detected result exceeded Oregon DEQ Risk-Based Concentration

-- = Screening criteria not established.

D = Result derived from a dilution.

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

[1] Portland Harbor Joint Source Control Strategy (JSCS) Table 3.1 (July 16, 2007). Initial upland source control screening evaluations for water.

[2] Criteria for diesel and gasoline taken from DEQ Risk-Based Concentrations table; Groundwater; Ingestion & Inhalation from Tapwater; Occupational (Rev. 6/7/2012).

[3] US Environmental Protection Agency (USEPA) Ground Water and Drinking Water list of contaminants & their maximum contaminant levels (MCLs).

Table 5-12
Groundwater Analytical Results
September 2007 Sampling Event
Northwest Pipe Company

Station:					GP208		GP209		GP210		GP211		GP211		GP212		GP213		GP214		NA - QAQC	
Sample ID:					GP208-W-0		GP209-W-0		GP210-W-0		GP211-W-0		GP211-W-1		GP212-W-0		GP213-W-0		GP214-W-0		Trip Blank	
Date Sampled:					09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07	
Sample Type:*					N1		N1		N1		N1		FD1		N1		N1		N1		TB1	
Chemical Group	**Constituents**	**Units**	**JSCS Screening Criteria [1,2]**	**US EPA Groundwater and Drinking Water MCLs [3]**																		
M-DISS	Zinc	mg/L	0.036	5.0	**0.0059**		**0.0072**		0.0050	U	**0.0061**		**0.0053**		**0.0053**		**0.0058**		**0.0058**			
PAH	Acenaphthene	mg/L	0.0002	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Anthracene	mg/L	0.0002	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Benzo (a) anthracene	mg/L	0.000018	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Chrysene	mg/L	0.000018	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Fluorene	mg/L	0.0002	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Naphthalene	mg/L	0.0002	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Phenanthrene	mg/L	0.0002	--	NA		NA		NA		NA		NA		NA		NA		NA			
PAH	Pyrene	mg/L	0.0002	--	NA		NA		NA		NA		NA		NA		NA		NA			
TPH	Diesel	mg/L	0.43	--	0.038	U	0.041	U	**0.093**		0.021	UJ	0.019	UJ	**2.8**		0.078	U	0.077	U		
TPH	Gasoline by Gx	mg/L	0.45	--	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	**0.96**		0.10	U	0.10	U		
VOC	1,1,1-Trichloroethane	mg/L	0.011	0.20	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,1,2-Trichloroethane	mg/L	0.0012	0.0050	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00015**	**J**	0.0010	U	0.0010	U	0.0010	U
VOC	1,1-Dichloroethane	mg/L	0.047	--	**0.0016**		**0.00015**	**J**	**0.00063**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,1-Dichloroethene	mg/L	--	0.0070	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,2,4-Trimethylbenzene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,3,5-Trimethylbenzene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,3-Dichlorobenzene	mg/L	--	--	0.0010	U	**0.00042**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	1,4-Dichlorobenzene	mg/L	--	0.075	0.0010	U	**0.0048**		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Benzene	mg/L	0.0012	0.0050	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Chlorobenzene	mg/L	0.05	0.10	0.0010	U	**0.0032**		0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Chloroform	mg/L	0.00017	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Chloromethane	mg/L	0.0021	--	**0.00035**	**J**	0.0010	U	**0.00047**	**J**	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Cis-1,2-Dichloroethene	mg/L	0.061	0.070	**0.0005**	**J**	**0.00024**	**J**	**0.00062**	**J**	0.0010	U	0.0010	U	**0.0066**		**0.0048**		**0.00041**	**J**	0.0010	U
VOC	Ethylbenzene	mg/L	0.0073	0.70	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Isopropylbenzene	mg/L	0.66	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.0058**		0.0010	U	0.0010	U	0.0010	U
VOC	m+p-Xylenes	mg/L	0.0018	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U
VOC	Naphthalene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00081**	**J**	0.0010	U	0.0010	U	0.0010	U
VOC	n-Butylbenzene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.0079**		0.0010	U	0.0010	U	0.0010	U
VOC	n-Propylbenzene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.013**		0.0010	U	0.0010	U	0.0010	U
VOC	o-Xylene	mg/L	0.013	10	0.0010	U	**0.0001**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.00015**	**J**	0.0010	U	0.0010	U	0.0010	U
VOC	Sec-Butylbenzene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.010**		0.0010	U	0.0010	U	0.0010	U
VOC	Tert-Butylbenzene	mg/L	--	--	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00085**	**J**	0.0010	U	0.0010	U	0.0010	U
VOC	Tetrachloroethene	mg/L	0.00012	0.0050	0.0010	U	0.0010	U	**0.00011**	**J**	0.0010	U	0.0010	U	**0.00034**	**J**	**0.0014**		**0.0006**	**J**	0.0010	U
VOC	Toluene	mg/L	0.0098	1.0	0.0010	U	**0.00013**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.00014**	**J**	0.0010	U	0.0010	U	0.0010	U
VOC	Trans-1,2-Dichloroethene	mg/L	0.11	0.10	0.0010	U	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.00036**	**J**	0.0010	U	0.0010	U	0.0010	U
VOC	Trichloroethene	mg/L	0.00017	0.0050	0.0010	U	0.0010	U	**0.00014**	**J**	0.0010	U	0.0010	U	0.0010	U	**0.00094**	**J**	**0.00072**	**J**	0.0010	U
VOC	Vinyl Chloride	mg/L	0.000015	0.0020	**0.00019**	**J**	**0.00058**	**J**	**0.00067**	**J**	0.0010	U	0.0010	U	**0.0034**		0.0010	U	0.0010	U	0.0010	U

Notes:

*Sample Type: N1 = Normal Sample, FD1 - Field Duplicate, TB1 - Trip Blank

Bolded = detect

Shaded = detected result exceeded screening criteria

Purple text = detected result exceeded Oregon DEQ Risk-Based Concentration

-- = Screening criteria not established.

D = Result derived from a dilution.

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[1] Portland Harbor Joint Source Control Strategy (JSCS) Table 3.1 (July 16, 2007).
Initial upland source control screening evaluations for water.

[2] Criteria for diesel and gasoline taken from DEQ Risk-Based Concentrations table; Groundwa
Inhalation from Tapwater; Occupational (Rev. 6/7/2012).

[3] US Environmental Protection Agency (USEPA) Ground Water and Drinking Water
list of contaminants & their maximum contaminant levels (MCLs).

Table 5-13
Summary of Analytical Results for Surface Soil Samples Collected 10/19/2009
Northwest Pipe Company

Sample ID:							SS-401-101909-0	SS-402-101909-0	SS-403-101909-0	SS-404-101909-0	SS-405-101909-0	SS-406-101909-0	SS-407-101909-0	SS-408-101909-0	SS-409-101909-0	SS-410-101909-0	SS-411-101909-0	SS-411-101909-1
Sample QA Type:							N	N	N	N	N	N	N	N	N	N	N	FD
Chem Group/Chemical	**CAS_NO**	**Method**	**Units**	**Screening Criteria[1]**	**DEQ RBC[2]**	**DEQ[3] Background**												
General Chemistry:																		
% Solids	%SOLIDS	NCA SOP	% by Wei	--	--	--	**90.8**	**93.7**	**92.8**	**85**	**87.3**	**89.7**	**87.5**	**92.9**	**81.6**	**86.9**	**85.4**	**87.7**
Percent Moisture		Moisture	%	--	--	--	**15**	**12**	**9.8**	**19**	**13**	**14**	**15**	**6**	**18**	**12**	**24**	**16**
Percent Solids		Moisture	%	--	--	--	**85**	**88**	**90**	**81**	**87**	**86**	**85**	**94**	**82**	**88**	**76**	**84**
Total Organic Carbon	7440-44-0	9060	mg/Kg	--	--	--	**4,300**	**6,000**	**5,300**	**74,000**	**62,000 J**	**18,000**	**70,000**	**9,300**	**28,000**	**16,000**	**42,000**	**35,000**
Inorganics:																		
Aluminum	7429-90-5	EPA 6010B	mg/kg	--	--	98000	**7,040**	**4,720**	**5,450**	**3,730**	**15,800**	**3,160**	**24,200**	**13,000**	**10,600**	**27,000**	**5,430**	**6,310**
Antimony	7440-36-0	EPA 6010B	mg/kg	64	--	0.557	0.611 U	0.569 U	0.592 U	0.627 U	**3.96**	0.606 U	**2.46**	**2.48**	0.654 U	0.626 U	**1.49 J**	**1.03 J**
Arsenic	7440-38-2	EPA 6010B	mg/kg	7	1.7	8.791	**2.65 J**	**2.28 J**	**2.92 J**	**1.88 J**	**3.57 J**	**7.80 J**	**4.59 J**	**1.57 J**	**7.21 J**	**31.5**	**10.6 J**	**10.1 J**
Cadmium	7440-43-9	EPA 6010B	mg/kg	1	510	0.627	**1.00 J**	**1.08 J**	**1.11 J**	**0.916 J**	**5.73**	**7.31**	**6.26**	**4.53**	**8.97**	**1.73 J**	**9.01**	**8.05**
Chromium	7440-47-3	EPA 6010B	mg/kg	111	--	75.79	**35.6**	**33.6**	**30.0**	**50.5**	**2,360**	**970**	**3,620**	**2,020**	**121**	**45.6**	**261**	**268**
Copper	7440-50-8	EPA 6010B	mg/kg	149	41000	33.75	**46.9**	**40.5**	**27.6**	**31.5**	**114**	**240**	**137**	**75.4**	**152**	**34.7**	**255 J**	**139 J**
Lead	7439-92-1	EPA 6010B	mg/kg	17	800	33.75	**6.48 J**	**16.7**	**9.99 J**	**53.1**	**22.1**	**14.1**	**20.9**	**10.6**	**160**	**35.3**	**195**	**167**
Mercury	7439-97-6	EPA 7471A	mg/kg	70	310	0.23	**0.0140 J**	**0.0104 J**	**0.00633 J**	0.00605 U	**0.00647 J**	0.00614 U	**0.0105 J**	0.00488 U	**0.0897**	**0.0218 J**	**0.0944 J**	**0.203 J**
Nickel	7440-02-0	EPA 6010B	mg/kg	49	20000	47.35	**22.0**	**17.1**	**14.5**	**16.7**	**35.4**	**519**	**36.7**	**12.4**	**52.5**	**29.2**	**61.6**	**54.6**
Selenium	7782-49-2	EPA 6010B	mg/kg	2	--	0.71	0.491 U	0.457 U	0.475 U	0.504 U	0.491 U	0.487 U	**1.94 J**	**0.696 J**	0.525 U	**12.1 J**	0.517 U	0.493 U
Silver	7440-22-4	EPA 6010B	mg/kg	5	5100	0.818	**0.132 J**	**0.182 J**	**0.185 J**	**0.117 J**	**2.54 J**	**0.665 J**	**3.55**	**2.05 J**	**0.922 J**	**4.01**	**1.50 J**	**1.35 J**
Zinc	7440-66-6	EPA 6010B	mg/kg	459	--	182.9	**91.9**	**152**	**98.8**	**87.0**	**126**	**144**	**97.8**	**74.6**	**753**	**163**	**737**	**756**
Organochlorine Pesticides:[4]																		
4,4´-DDD	72-54-8	EPA 8081A	mg/kg	0.00033	11		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.00763 U
4,4´-DDE	72-55-9	EPA 8081A	mg/kg	0.00033	7.6		0.00147 U	0.00532 U	0.00722 U	0.00587 U	0.00764 U	0.00557 U	0.00152 U	0.000708 U	0.0819 U	0.00385 U	0.0117 U	0.0114 U
4,4´-DDT	50-29-3	EPA 8081A	mg/kg	0.00033	7.7		0.00369 U	0.0214 U	0.0289 U	0.0197 U	0.0229 U	0.0224 U	0.00956 U	0.00214 U	0.491 U	0.0154 U	0.0469 U	0.0458 U
Aldrin	309-00-2	EPA 8081A	mg/kg	0.04	0.11		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.00376 U
alpha-BHC	319-84-6	EPA 8081A	mg/kg	--	0.31		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	**0.00678 J**	0.0019 U	0.00385 U	0.00376 U
alpha-Chlordane	5103-71-9	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.0122 U	0.0019 U	0.00385 U	0.00376 U
beta-BHC	319-85-7	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.0153 U
Chlordane (tech)	57-74-9	EPA 8081A	mg/kg	0.00037	7		0.0165 U	0.0399 U	0.0404 U	0.044 U	0.0428 U	0.0418 U	0.0171 U	0.0161 U	0.0917 U	0.0431 U	0.0876 U	0.0854 U
delta-BHC	319-86-8	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.00376 U
Dieldrin	60-57-1	EPA 8081A	mg/kg	0.0000081	0.13		0.00147 U	0.00357 U	0.00722 U	0.00587 U	0.00958 U	0.00373 U	0.00228 U	0.000708 U	0.0573 U	0.00575 U	0.0196 U	0.0153 U
Endosulfan I	959-98-8	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.0205 U	0.0019 U	0.00385 U	0.00376 U
Endosulfan II	33213-65-9	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00361 U	0.00194 U	0.00382 U	0.00184 U	0.000751 U	0.000708 U	0.0409 U	0.0019 U	0.00782 U	0.00763 U
Endosulfan sulfate	1031-07-8	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.00376 U
Endrin	72-20-8	EPA 8081A	mg/kg	0.207	230		0.000726 U	0.00176 U	0.00361 U	0.00194 U	0.00382 U	0.00184 U	0.000751 U	0.000708 U	0.0409 U	0.0019 U	0.00385 U	0.00376 U
Endrin aldehyde	7421-93-4	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00361 U	0.00393 U	0.00382 U	0.00184 U	0.000751 U	0.000708 U	0.0328 U	0.0019 U	0.00782 U	0.0229 U
Endrin ketone	53494-70-5	EPA 8081A	mg/kg	--	--		0.000726 U	0.00176 U	0.00178 U	0.00393 U	0.0134 U	0.00184 U	0.000751 U	0.000708 U	0.0328 U	0.0019 U	0.0274 U	0.0042 U
gamma-BHC (Lindane)	58-89-9	EPA 8081A	mg/kg	0.00499	1.7		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.00376 U
gamma-Chlordane	5103-74-2	EPA 8081A	mg/kg		--		0.000726 U	0.00532 U	0.00178 U	0.00194 U	0.00188 U	0.00557 U	0.000751 U	0.000708 U	0.0819 U	0.0019 U	0.00782 U	0.0114 U
Heptachlor	76-44-8	EPA 8081A	mg/kg	0.01	0.46		0.000726 U	0.00176 U	0.00178 U	0.00194 U	0.00188 U	0.00184 U	0.000751 U	0.000708 U	0.00403 U	0.0019 U	0.00385 U	0.00376 U
Heptachlor epoxide	1024-57-3	EPA 8081A	mg/kg	0.016	0.24		0.000726 U	0.00357 U	0.00361 U	0.00393 U	0.00382 U	0.00373 U	0.00152 U	0.000708 U	0.0491 U	0.0019 U	0.00782 U	0.00763 U
Methoxychlor	72-43-5	EPA 8081A	mg/kg	--	--		0.00147 U	0.00176 U	0.0144 U	0.00393 U	0.0115 U	0.00935 U	0.00457 U	0.000708 U	0.205 U	0.00385 U	0.0313 U	0.0229 U
Toxaphene	8001-35-2	EPA 8081A	mg/kg	--	2		0.022 U	0.0532 U	0.0538 U	0.0587 U	0.057 U	0.0557 U	0.0228 U	0.0214 U	0.122 U	0.0575 U	0.117 U	0.114 U
Polynuclear Aromatic Hydrocabons:																		
Acenaphthene	83-32-9	EPA 8270m	mg/kg	0.3	61000		**0.00545 J**		**0.00567 J**	**0.0589**	**0.0339 J**	**0.0498 J**	**0.0156**	0.00354 U			**2.02**	**2.27**
Acenaphthylene	208-96-8	EPA 8270m	mg/kg	0.2	--		0.00362 U		**0.00366 J**	**0.0116 J**	**0.276**	**0.0846 J**	**0.0163**	**0.00545 J**			**0.197**	**0.155**
Anthracene	120-12-7	EPA 8270m	mg/kg	0.845	310000		**0.0104 J**		**0.025**	**0.272**	**0.413**	**0.156 J**	**0.0411**	**0.0112 J**			**10.1**	**8.41**
Benzo (a) anthracene	56-55-3	EPA 8270m	mg/kg	1.05	2.7		**0.0736**		**0.376**	**1.78**	**1.67 J**	**0.545**	**0.252**	**0.0411**			**54.2**	**37.2**
Benzo (a) pyrene	50-32-8	EPA 8270m	mg/kg	1.45	0.27		**0.0786**		**0.43**	**1.49**	**1.55**	**0.274 J**	**0.257**	**0.0515**			**35.3**	**24.2**
Benzo (b) fluoranthene	205-99-2	EPA 8270m	mg/kg	--	2.7		**0.091**		**0.506**	**1.67**	**2.18**	**2.16**	**0.375**	**0.0965**			**38.6**	**27.6**
Benzo (ghi) perylene	191-24-2	EPA 8270m	mg/kg	0.3	--		**0.0726**		**0.371**	**1.05**	**1.18**	**1.8**	**0.218**	**0.0628**			**19.1**	**13.2**
Benzo (k) fluoranthene	207-08-9	EPA 8270m	mg/kg	13	27		**0.0718**		**0.479**	**1.31**	**1.71**	**1.79**	**0.223**	**0.0687**			**36.7**	**24.3**
Chrysene	218-01-9	EPA 8270m	mg/kg	1.29	250		**0.0941**		**0.51**	**1.98**	**2.09 J**	**1.64**	**0.339**	**0.0685**			**56.2**	**38.2**
Dibenzo (a,h) anthracene	53-70-3	EPA 8270m	mg/kg	1.3	0.27		**0.0181**		**0.105**	**0.367**	**0.451**	**0.29 J**	**0.063**	**0.0163**			**6.35**	**4.34**
Fluoranthene	206-44-0	EPA 8270m	mg/kg	2.23	29000		**0.168**		**0.421**	**3.45**	**1.68**	**1.78**	**0.457**	**0.0701**			**115**	**83.1**
Fluorene	86-73-7	EPA 8270m	mg/kg	0.536	41000		**0.00623 J**		**0.0046 J**	**0.0631**	**0.0387 J**	**0.0582 J**	**0.00944 J**	0.00354 U			**2.13**	**2.01**
Indeno (1,2,3-cd) pyrene	193-39-5	EPA 8270m	mg/kg	0.1	2.7		**0.0614**		**0.326**	**0.959**	**1.16**	**1.14**	**0.199**	**0.0518**			**19.2**	**13.1**
Naphthalene	91-20-3	EPA 8270m	mg/kg	0.561	23		**0.0123 J**		**0.00446 J**	**0.0171**	**0.0178 J**	**0.139**	**0.0075 J**	0.00354 U			**0.631 J**	**0.135 J**

Table 5-13
Summary of Analytical Results for Surface Soil Samples Collected 10/19/2009
Northwest Pipe Company

Sample ID:							SS-401-101909-0	SS-402-101909-0	SS-403-101909-0	SS-404-101909-0	SS-405-101909-0	SS-406-101909-0	SS-407-101909-0	SS-408-101909-0	SS-409-101909-0	SS-410-101909-0	SS-411-101909-0	SS-411-101909-1
Sample QA Type:							N	N	N	N	N	N	N	N	N	N	N	FD
Chem Group/Chemical	**CAS_NO**	**Method**	**Units**	**Screening Criteria[1]**	**DEQ RBC[2]**	**DEQ[3] Background**												
Phenanthrene	85-01-8	EPA 8270m	mg/kg	1.17	--		**0.0773**		**0.0771**	**1.38**	**0.462**	**0.443**	**0.143**	**0.0184**			**46.8**	**35.4**
Pyrene	129-00-0	EPA 8270m	mg/kg	1.52	21000		**0.15**		**0.439**	**3.07**	**1.7**	**1.9**	**0.283**	**0.0633**			**127**	**86.5**
Total PAH[5]				--	--		**0.99**		**4.1**	**18.9**	**16.6**	**14.2**	**2.9**	**0.63**			**569.5**	**400.1**
Polychlorinated Biphenyls:																		
Aroclor 1016	12674-11-2	EPA 8082	mg/kg	0.53	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Aroclor 1221	11104-28-2	EPA 8082	mg/kg	--	--		0.00732 U	0.0355 U	0.0717 U	0.0391 U	0.038 U	0.0742 U	0.0152 U	0.00357 U	0.814 U	0.0153 U	0.194 U	0.152 U
Aroclor 1232	11141-16-5	EPA 8082	mg/kg	--	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Aroclor 1242	53469-21-9	EPA 8082	mg/kg	--	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Aroclor 1248	12672-29-6	EPA 8082	mg/kg	1.5	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Aroclor 1254	11097-69-1	EPA 8082	mg/kg	0.3	--		**0.0658**	**0.368**	**0.54**	**0.302**	**0.399**	**0.46**	**0.12**	**0.025**	**8.74**	**0.181**	**1.14**	**0.948**
Aroclor 1260	11096-82-5	EPA 8082	mg/kg	0.2	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Aroclor 1262	37324-23-5	EPA 8082	mg/kg	--	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Aroclor 1268	11100-14-4	EPA 8082	mg/kg	--	--		0.00367 U	0.0178 U	0.036 U	0.0196 U	0.0191 U	0.0372 U	0.0076 U	0.00179 U	0.408 U	0.00768 U	0.0975 U	0.0761 U
Total PCBs[5]				0.00039	0.56		0.07	0.37	0.54	0.30	0.40	0.46	0.12	0.03	8.7	0.18	1.1	0.9
Phthalates:[4]																		
Bis(2-ethylhexyl)phthalate	117-81-7	EPA 8270m	mg/kg	0.33	150		**0.0668**	**0.389 J**	**0.191**	**0.325**	**0.139**	**0.335**	**0.467**	**0.0603**	**0.667**	**0.178**	**1.9 J**	**2.97**
Butyl benzyl phthalate	85-68-7	EPA 8270m	mg/kg	--	--		**0.382**	**0.0846 J**	**0.0283 J**	**0.075**	**0.0373 J**	0.148 U	**0.031**	**0.0145 J**	0.163 U	**0.0492**	**0.637 J**	**0.501 J**
Diethyl phthalate	84-66-2	EPA 8270m	mg/kg	0.6	--		0.0147 U	0.0707 U	0.0144 U	0.0314 U	0.0306 U	0.148 U	0.0151 U	0.0144 U	0.163 U	0.0153 U	0.157 U	0.304 U
Dimethyl phthalate	131-11-3	EPA 8270m	mg/kg	--	--		0.0147 U	0.0707 U	0.0144 U	0.0314 U	0.0306 U	0.148 U	0.0151 U	0.0144 U	0.163 U	0.0153 U	0.157 U	0.304 U
Di-n-butyl phthalate	84-74-2	EPA 8270m	mg/kg	0.06	--		0.0147 U	0.0707 U	0.0144 U	0.0314 U	0.0306 U	0.148 U	0.0151 U	0.0144 U	0.163 U	0.0153 U	0.157 U	**0.38 J**
Di-n-octyl phthalate	117-84-0	EPA 8270m	mg/kg	--	--		0.0147 U	0.141 U	0.289 U	0.157 U	0.383 U	0.296 U	0.151 U	0.144 U	0.816 U	0.305 U	0.783 U	0.76 U

Notes:
*Samples type: N = Normal sample, FD = Field Duplicate
[1] Portland Harbor Joint Source Control Strategy Table 3-1 Screening Level Values for Soil Stormwater Sediment Stormwater, Groundwater and Surface Water (7/16/07 Revision)
[2] DEQ Risk Based Concentrations Soil Ingestion, Dermal Contact and Inhalation for Occupational Scenario 6/7/12 Revision
[3] DEQ - Development of Oregon Background Metals Concentrations in Soil. Oregon DEQ Technical Report. March 2013.
These preliminary screening levels are intended to provide conservative values that are useful for placing reported constituent concentrations into context. They do not represent cleanup levels and are not based on promulgated regulations.
[4] Phthalates and pesticide non-detects were removed from this table
[5] Total PAHs and PCBs calculated using 0 for non-detects.
mg/Kg = milligrams per kilogram
Bold result = detection
Shaded cell = JSCS and/or DEQ RBC screening criteria exceeded.
-- = no screening level available
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.

Table 5-14

Analytical Results for Hot Spot Confirmation Samples

Northwest Pipe Company

Chemical	Units	Basis of Screening Level	DEQ Soil Ingestion, Dermal Contact, and Inhalation			HSCS-5	HSCS-6	HSCS-7	HSCS-8	HSCS-9	HSCS-10
			Occup.[1]	Const. Wkr.	Excav. Wkr.	Hot Spot Confirmation Samples 9/16/2011					
PAHs (mg/Kg): Method 8270-SIM											
1-Methylnaphthalene	mg/Kg	c	110	--	--	0.0024 U	0.00227 U	0.00249 J	0.00229 U	0.00234 U	0.00227 U
2-Methylnaphthalene	mg/Kg	nc	4700	--	--	0.00171 U	0.00323 J	0.00436 J	0.00163 U	0.00166 U	0.00162 U
Acenaphthene	mg/Kg	nc	61,000	19,000	> max	0.00495 J	0.00661 J	0.00211 U	0.00216 U	0.00221 U	0.00215 U
Acenaphthylene	mg/Kg	--	--	--	--	0.00278 J	0.0159 J	0.0532	0.002 U	0.00204 U	0.00199 U
Anthracene	mg/Kg	nc	310,000	93,000	> max	0.011 J	0.0542	0.0208 J	0.00234 U	0.00239 U	0.0072 J
Benzo (a) anthracene	mg/Kg	c	2.7	21	590	0.0712	0.174	0.0623	0.00206 U	0.00211 U	0.00931 J
Benzo (a) pyrene	mg/Kg	c	0.27	2.1	59	0.0507	0.169	0.143	0.00203 J	0.00144 U	0.0108 J
Benzo (b) fluoranthene	mg/Kg	c	2.7	21	590	0.073	0.266	0.159	0.00275 J	0.00174 U	0.0155 J
Benzo (g,h,i) perylene	mg/Kg	--	--	--	--	0.0425	0.31	0.261	0.00438 U	0.00448 U	0.0188 J
Benzo (k) fluoranthene	mg/Kg	c	27	210	5,900	0.0281	0.0942	0.058	0.00333 U	0.0034 U	0.00779 J
Chrysene	mg/Kg	c	250	2,100	57,000	0.0768	0.228	0.0978	0.00337 U	0.00344 U	0.00799 J
Dibenzo (a,h) anthracene	mg/Kg	c	0.27	2.1	59	0.023 J	0.0286	0.0521	0.00309 U	0.00316 U	0.00307 U
Fluoranthene	mg/Kg	nc	29,000	8,900	250,000	0.141	0.208	0.0471	0.00318 J	0.00223 U	0.0119 J
Fluorene	mg/Kg	nc	41,000	12,000	340,000	0.00301 J	0.00539 J	0.00316 J	0.00221 U	0.00226 U	0.0022 U
Indeno (1,2,3-cd) pyrene	mg/Kg	c	2.7	21	590	0.0461	0.176	0.161	0.0163 J	0.0166 J	0.0256
Naphthalene	mg/Kg	c	23	580	16,000	0.00227 U	0.00462 J	0.00618 J	0.00216 U	0.00221 U	0.00215 U
Phenanthrene	mg/Kg	--	--	--	--	0.0283	0.057	0.0143 J	0.00319 J	0.0023 U	0.00491 J
Pyrene	mg/Kg	nc	21,000	6,700	190,000	0.134	0.265	0.0713	0.00346 J	0.00231 U	0.0134 J

-- = Screening Level Not Established

Bolded = detected result exceeds Construction Worker screening level but falls below Excavation Worker screening level

U = Not detected at or above specified reporting limit.

mg/Kg = milligrams per kilogram

RBC = Values from DEQ guidance document, "Risk-Based Decision Making (RBDM) for the Remediation of Petroleum-Contaminated Sites; Soil Ingestion, Dermal Contact, and Inhalation, Construction Worker, revised June 7, 2012.

[1] EPA regional screening levels for industrial Ingestion used for methylnapthalenes revised May, 2014

NA = Not Analyzed

Table 5-15
Summary of Analytical Results for Soil Samples
Northwest Pipe Company

Location ID									GP301	GP302	GP303	GP304	GP305	GP306	GP307
Sample ID									GP301-10'-11'	GP302-7'-8'	GP303-9.5'-10.5'	GP304-9.5'-10.5'	GP305-9.5'-10.5'	GP306-10.5'-11.5'	GP307-13'-14'
Date Collected									31-May-12	31-May-12	31-May-12	31-May-12	31-May-12	31-May-12	31-May-12
Depth (feet)									10-11	7-8	9.5-10.5	9.5-10.5	9.5-10.5	10.5-11.5	13-14
Chemical Group/Chemical	**CAS**	**Unit**	**[1]DEQ Defalt Background Inorganic Chemicals**	**[2]DEQ Leaching to Groundwater Occupational Scenario**	**[2]DEQ Volatilization to Outdoor Air Occupational Scenario**	**[2]DEQ Vapor Intrusion into Buildings Occupational Scenario**	**[4]DEQ Ingestion, Dermal Contact & Inhalation Occupational Scenario**	**[4]DEQ Ingestion, Dermal Contact & Inhalation Excavation Scenario**							
General Chemistry															
Total Organic Carbon	TOC	mg/kg		--	--	--			--	**13,400**	--	--	--	**269**	**277**
Metals															
Lead	7439-92-1	mg/kg	33.75	30	--	--	800	800		**1.76**	--	--	--	--	--
Manganese	7439-96-5	mg/kg	1762	--	--	--	23000	200000	--	**149**	--	--	--	--	--
Mercury	7439-97-6	mg/kg	0.23	--	--	--	310	2600	--	**0.017**	--	--	--	--	--
Nickel	7440-02-0	mg/kg	47.35	--	--	--	20000	170000	--	**11.7**	--	--	--	--	--
Arsenic	7440-38-2	mg/kg	8.8	--	--	--	1.7	370	--	**2.52**	--	--	--	--	--
Cadmium	7440-43-9	mg/kg	0.63	--	--	--	510	4300	--	**0.15 J**	--	--	--	--	--
Chromium	7440-47-3	mg/kg	76	--	--	--	--	--	--	**7.23**	--	--	--	--	--
Copper	7440-50-8	mg/kg	34	--	--	--	41000	340000	--	**8.23**	--	--	--	--	--
Zinc	7440-66-6	mg/kg	180	--	--	--	--	--	--	**26.8**	--	--	--	--	--
Polynuclear Aromatic Hydrocabons															
Anthracene	120-12-7	mg/kg		--	--	--	310000	--	**0.179 J**	**209 J**	**0.00589**	**0.00219**	0.00031 U	--	--
Pyrene	129-00-0	mg/kg		--	--	--	21000	190000	**1.26 J**	**1,210 J**	**0.0215**	**0.0261**	**0.00262**	--	--
Benzo(g,h,i)perylene	191-24-2	mg/kg		--	--	--	--	--	**0.184 J**	4.17 UJ	**0.00847**	**0.0012**	**0.0008 J**	--	--
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg		--	--	--	2.7	590	**0.207 J**	4.17 UJ	**0.00557**	**0.00116**	**0.00051 J**	--	--
Benzo(b)fluoroanthene	205-99-2	mg/kg		--	--	--	2.7	590	**1.47 J**	**32.4 J**	**0.00748**	**0.00258**	**0.00083 J**	--	--
Fluoranthene	206-44-0	mg/kg		--	--	--	29000	250000	**4.3 J**	**1,490 J**	**0.0232**	**0.016**	**0.00223**	--	--
Benzo(k)fluoranthene	207-08-9	mg/kg		--	--	--	27	5900	**0.483 J**	**15 J**	**0.00256**	**0.0008 J**	0.00057 U	--	--
Acenaphthylene	208-96-8	mg/kg		--	--	--	--	--	**0.0422 J**	**14.1 J**	**0.00191**	**0.00039 J**	0.00022 U	--	--
Chrysene	218-01-9	mg/kg		--	--	--	250	57000	**0.938 J**	**115 J**	**0.00478**	**0.00212**	**0.00059 J**	--	--
Benzo(a)pyrene	50-32-8	mg/kg		--	--	--	0.27	59	**0.917 J**	**17.5 J**	**0.005**	**0.00198**	**0.00062 J**	--	--
Dibenzo(a,h)anthracene	53-70-3	mg/kg		--	--	--	0.27	59	0.00827 UJ	3.83 UJ	0.00038 U	0.00039 U	0.00041 U	--	--
Benzo(a)anthracene	56-55-3	mg/kg		--	--	--	2.7	590	**0.598 J**	**164 J**	**0.00707**	**0.00356**	**0.00071 J**	--	--
Acenaphthene	83-32-9	mg/kg		--	--	--	61000	520000	**0.817 J**	**904 J**	**0.00338**	**0.0065**	**0.0003 J**	--	--
Phenanthrene	85-01-8	mg/kg		--	--	--	--	--	**0.119 J**	**1,160 J**	**0.0081**	**0.00542**	**0.00125**	--	--
Fluorene	86-73-7	mg/kg		--	--	--	41000	340000	**0.324 J**	**324 J**	**0.00147**	**0.00118**	0.00021 U	--	--
1-Methylnaphthalene	90-12-0	mg/kg		--	--	--	--	--	0.00417 UJ	**13.3 J**	0.00019 U	0.0002 U	0.00021 U	--	--
Naphthalene	91-20-3	mg/kg		0.44	99	99	23	16000	**0.00807 J**	**7.41 J**	**0.00048 J**	**0.00057 J**	0.00021 U	--	--
2-Methylnaphthalene	91-57-6	mg/kg		--	--	--	--	--	0.00446 UJ	**11.2 J**	0.00021 U	0.00021 U	0.00022 U	--	--
Total PAH[3]									**11.84627**	**5,687**	**0.10686**	**0.07175**	**0.01046**		
Polychlorinated Biphenyls															
Aroclor-1260	11096-82-5	mg/kg		0.62	--	--	--	--	0.00156 U	0.0303 U	**0.00802 J**	0.00158 U	0.00163 U	--	--
Aroclor-1254	11097-69-1	mg/kg		0.62	--	--	--	--	**0.0862**	**0.507 J**	0.00176 U	0.00182 U	0.00188 U	--	--
Aroclor-1221	11104-28-2	mg/kg		0.62	--	--	--	--	0.0108 U	0.209 U	0.0106 U	0.0109 U	0.0113 U	--	--
Aroclor-1232	11141-16-5	mg/kg		0.62	--	--	--	--	0.00052 U	0.0101 U	0.00051 U	0.00053 U	0.00054 U	--	--
Aroclor-1248	12672-29-6	mg/kg		0.62	--	--	--	--	0.0014 U	0.0272 U	0.00137 U	0.00142 U	0.00146 U	--	--
Aroclor-1016	12674-11-2	mg/kg		0.62	--	--	--	--	0.00519 U	0.1 U	0.00507 U	0.00524 U	0.0054 U	--	--
Aroclor-1242	53469-21-9	mg/kg		0.62	--	--	--	--	0.00182 U	0.0352 U	0.00178 U	0.00183 U	0.00189 U	--	--
Total PCBs[3]							0.56	120	**0.0862**	**0.507**	**0.00802**	**--**	**--**		
Total Petroleum Hydrocarbons:															
TPH-Diesel	TPH-Diesel	mg/kg		--	--	--	14000	--	**84.5**	**13,900 J**	**2.6 J**	**20 J**	**2.24 J**	--	--
TPH-Oil	TPH-Oil	mg/kg		--	--	--	36000	--	**92.2 J**	**2,650 J**	**7.52 J**	**40.7 J**	**6.53 J**	--	--
Volatile Petroleum Hydrocarbons															
C5-C6 Aliphatics		mg/kg		--	--	--	--	--	2.5 U	3.6 U	--	--	--	--	
C6-C8 Aliphatics		mg/kg		--	--	--	--	--	2.5 U	**3.9 JD**	--	--	--	--	
C8-C10 Aliphatics		mg/kg		--	--	--	--	--	0.37 U	**1.2 JD**	--	--	--	--	
C10-C12 Aliphatics		mg/kg		--	--	--	--	--	0.37 U	**2.3 JD**	--	--	--	--	
C8-C10 Aromatics		mg/kg		--	--	--	--	--	2.5 U	**3.7 JD**	--	--	--	--	
C10-C12 Aromatics		mg/kg		--	--	--	--	--	2.5 U	**5.8 JD**	--	--	--	--	
C12-C13 Aromatics		mg/kg		--	--	--	--	--	2.5 U	**50 D**	--	--	--	--	
Total VPH		mg/kg		--	--	--	--	--	2.5 U	**68 JD**	--	--	--	--	
Extractable Petroleum Hydrocarbons															
C10-C12 Aliphatics		mg/kg		--	--	--	--	--	0.24 U	**1.0 J**	--	--	--	--	
C12-C16 Aliphatics		mg/kg		--	--	--	--	--	**1.2 J**	**74 J**	--	--	--	--	
C16-C21 Aliphatics		mg/kg		--	--	--	--	--	**15**	**290 J**	--	--	--	--	
C21-C34 Aliphatics		mg/kg		--	--	--	--	--	**23**	**420 J**	--	--	--	--	
C10-C12 Aromatics		mg/kg		--	--	--	--	--	6.1 U	**10 J**	--	--	--	--	
C12-C16 Aromatics		mg/kg		--	--	--	--	--	**1.3 J**	**510 J**	--	--	--	--	
C16-C21 Aromatics		mg/kg		--	--	--	--	--	**30**	**8,900 D**	--	--	--	--	
C21-C34 Aromatics		mg/kg		--	--	--	--	--	**84**	**3,400 D**	--	--	--	--	

Notes:

[1] DEQ (2013), Table 4, Portland Basin.
[2] DEQ Risk Based Concentrations for soil - Occupational Scenario (June 2012).
[3] Total PAHs and PCBs calculated using 0 for non-detects.
[4] DEQ Risk Based Concentrations for soil - Excavation Scenario (June 2012)
mg/Kg = milligrams per kilogram
Bold result = detection
Shaded cell = screening criteria exceeded.
-- = no screening level available
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
D = Value is from a dilution.

Table 5-16
Summary of Analytical Results for 2012 & 2013 Groundwater Samples
Northwest Pipe Company

Location ID							MW-7		MW-8		MW-9	
Sample ID							MW-7-61512	MW-7-53113	MW-8-61512	MW-8-53113	MW-9-61512	MW-9-53113
Date Collected							15-Jun-12	31-May-13	15-Jun-12	31-May-13	15-Jun-12	31-May-13
Sample Type							N	N	N	N	N	N
Chemical Group/Chemical		**CAS**	**Unit**	**[1]DEQ Volatilization to Outdoor Air Occupational Scenario**	**[1]DEQ Vapor Intrusion into Buildings Occupational Scenario**	**[1] DEQ Groundwater in Excavations**						
General Chemistry												
CONV	Total Suspended Solids (TSS)	TSS	mg/L	--	--	--	**11.3**		**18.7**		**27**	
Metals												
METAL	Lead	7439-92-1	mg/L	--	--	--	**0.00341 J**	0.00146 U	0.00146 U	0.00146 U	0.00146 U	0.00146 U
METAL	Manganese	7439-96-5	mg/L	--	--	3000	**2.2**	**0.919**	**1.2**	**0.713**	**2.11**	**1.9**
METAL	Mercury	7439-97-6	mg/L	--	--	--	**0.000031 J**	0.000015 U	**0.000029 J**	0.000015 U	**0.000045 J**	0.000015 U
METAL	Nickel	7440-02-0	mg/L	--	--	12000	**0.00948 J**	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U
METAL	Arsenic	7440-38-2	mg/L	--	--	5.8	**0.00531**	**0.0033**	**0.00154**	**0.00179**	**0.00312**	**0.00631**
METAL	Cadmium	7440-43-9	mg/L	--	--	57	**0.000076 J**	0.00003 U	**0.000044 J**	0.00003 U	**0.000042 J**	0.00003 U
METAL	Chromium	7440-47-3	mg/L	--	--	8.7	0.00073 U	0.00073 U	0.00073 U	0.00073 U	0.00073 U	0.00073 U
METAL	Copper	7440-50-8	mg/L	--	--	5000	**0.0033 J**	**0.00249 J**	0.00158 U	0.00158 U	0.00158 U	0.00158 U
METAL	Zinc	7440-66-6	mg/L	--	--	--	**0.00704 J**	0.00178 U	**0.00317 J**	**0.00297 J**	**0.00264 J**	**0.00225 J**
Metals Dissolved												
METAL_DISS	Lead	7439-92-1	mg/L	--	--	--	**0.00419 J**	**0.00161 J**	**0.00248 J**	**0.00188 J**	**0.00302 J**	0.00146 U
METAL_DISS	Manganese	7439-96-5	mg/L	--	--	3000	**2.2**	**0.879**	**1.26**	**0.828**	**2.13**	**1.96**
METAL_DISS	Mercury	7439-97-6	mg/L	--	--	--	0.000028 U	0.000015 U	**0.000098 J**	0.000015 U	**0.000061 J**	0.000015 U
METAL_DISS	Nickel	7440-02-0	mg/L	--	--	12000	**0.0101 J**	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U
METAL_DISS	Arsenic	7440-38-2	mg/L	--	--	5.8	**0.00533**	**0.00312**	**0.00144**	**0.00154**	**0.00309**	**0.00704**
METAL_DISS	Cadmium	7440-43-9	mg/L	--	--	57	**0.000073 J**	0.00003 U	**0.000059 J**	0.00003 U	**0.000062 J**	0.00003 U
METAL_DISS	Chromium	7440-47-3	mg/L	--	--	8.7	**0.00075 J**	0.00073 U	0.00073 U	0.00073 U	0.00073 U	0.00073 U
METAL_DISS	Copper	7440-50-8	mg/L	--	--	5000	0.00158 U	0.00158 U	0.00158 U	0.00158 U	0.00158 U	0.00158 U
METAL_DISS	Zinc	7440-66-6	mg/L	--	--	--	**0.00581 J**	0.00178 U	**0.00363 J**	**0.00273 J**	**0.00396 J**	0.00178 U
Polynuclear Aromatic Hydrocabons												
PAH	Anthracene	120-12-7	mg/L	--	--	--	**0.0452**	**0.188**	**0.00257**	**0.00193**	**0.00019**	**0.00026**
PAH	Pyrene	129-00-0	mg/L	--	--	--	**0.0736**	**1.670**	**0.00079 J**	0.00072 U	**0.00018**	**0.00011**
PAH	Benzo(g,h,i)perylene	191-24-2	mg/L	--	--	--	0.00261 U	**0.0066 J**	0.00024 U	0.00045 U	**0.000028 J**	0.000011 U
PAH	Indeno(1,2,3-c,d)pyrene	193-39-5	mg/L	--	--	--	0.00212 U	**0.0837**	0.0002 U	0.00037 U	0.000021 U	0.0000092 U
PAH	Benzo(b)fluoroanthene	205-99-2	mg/L	--	--	--	0.00334 U	**0.0480**	0.00031 U	0.00058 U	0.000033 U	0.000014 U
PAH	Fluoranthene	206-44-0	mg/L	--	--	--	**0.0975**	**2.010**	**0.00131**	0.00062 U	**0.00017**	**0.000024 J**
PAH	Benzo(k)fluoranthene	207-08-9	mg/L	--	--	--	0.00378 U	**0.0719**	0.00036 U	0.00065 U	0.000037 U	0.000016 U
PAH	Acenaphthylene	208-96-8	mg/L	--	--	--	**0.0194**	**0.0534**	**0.00306**	**0.00644**	**0.000084 J**	**0.000086**
PAH	Chrysene	218-01-9	mg/L	--	--	--	**0.00539 J**	**0.1590**	0.00025 U	0.00046 U	0.000026 U	0.000011 U
PAH	Benzo(a)pyrene	50-32-8	mg/L	--	--	0.00053	0.00283 U	**0.100**	0.00027 U	0.00049 U	0.000028 U	0.000012 U
PAH	Dibenzo(a,h)anthracene	53-70-3	mg/L	--	--	0.00021	0.00374 U	**0.0871**	0.00035 U	0.00065 U	0.000037 U	0.000016 U
PAH	Benzo(a)anthracene	56-55-3	mg/L	--	--	0.0091	**0.00896 J**	**0.197**	0.0002 U	0.00037 U	0.000021 U	**0.000012 J**
PAH	Acenaphthene	83-32-9	mg/L	--	--	--	**0.701**	**2.000**	**0.2**	**0.231**	**0.00665**	**0.00291**
PAH	Phenanthrene	85-01-8	mg/L	--	--	--	**0.259**	**2.6500 B**	**0.0176**	**0.0215 B**	**0.00048**	**0.00016 B**
PAH	Fluorene	86-73-7	mg/L	--	--	--	**0.171**	**0.701**	**0.0379**	**0.0357**	**0.00016**	**0.000025 J**
PAH	1-Methylnaphthalene	90-12-0	mg/L	--	--	--	**0.0392**	**0.0899**	**0.014**	**0.017**	**0.000051 J**	**0.000035 J**
PAH	Naphthalene	91-20-3	mg/L	16	10	0.5	**0.0619**	**0.0273**	0.00042 U	0.00078 U	**0.000047 J**	**0.000029 J**
PAH	2-Methylnaphthalene	91-57-6	mg/L	--	--	--	**0.0225**	0.00468 U	0.00025 U	**0.00103 J**	0.000027 U	0.000012 U
	Total PAH[2]						**1.50465**	**10.1429**	**0.27723**	**0.3146**	**0.00804**	**0.003651**
Polychlorinated Biphenyls												
PCB	Aroclor-1260	11096-82-5	mg/L	--	--	--	0.0000062 U		0.0000062 U		0.000006 U	
PCB	Aroclor-1254	11097-69-1	mg/L	--	--	--	0.0000075 U		0.0000075 U		0.0000073 U	
PCB	Aroclor-1221	11104-28-2	mg/L	--	--	--	0.000017 U		0.000017 U		0.000017 U	
PCB	Aroclor-1232	11141-16-5	mg/L	--	--	--	0.000017 U		0.000017 U		0.000016 U	
PCB	Aroclor-1248	12672-29-6	mg/L	--	--	--	0.0000083 U		0.0000083 U		0.000008 U	
PCB	Aroclor-1016	12674-11-2	mg/L	--	--	--	0.000015 U		0.000015 U		0.000015 U	
PCB	Aroclor-1242	53469-21-9	mg/L	--	--	--	0.00002 U		0.00002 U		0.000019 U	
	Total PCBs[2]						--		--		--	
Total Petroleum Hydrocarbons:												
TPH	TPH-Diesel	TPH-Diesel	mg/L	--	--	--	**8.32**	**3.06**	**0.99**	**1.2**	**0.78**	**0.48**
TPH	TPH-Oil	TPH-Oil	mg/L	--	--	--	**1.21**	**15.3**	**0.22 J**	**0.41 J**	**0.55**	**0.54**

Notes:

[1] DEQ Risk Based Concentrations for Groundwater (June 2012).
[2] Total PAHs and PCBs calculated using 0 for non-detects.

mg/L = milligrams per liter
Bold result = detection
-- = no screening level available
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.

Table 5-17

Groundwater Elevation Summary

Northwest Pipe Company

Well ID	Date	Time	MPE [a]	Depth to Water [b]	Elevation [c]
MW-7	6/15/2012	15:18	26.37	5.98	20.39
	5/31/2013	9:36		6.87	19.50
MW-8	6/15/2012	14:22	26.36	6.00	20.36
	5/31/2013	9:34		6.90	19.46
MW-9	6/15/2012	13:17	25.75	5.35	20.40
	5/31/2013	9:32		6.25	19.50
Willamette River [d]	6/15/2012	14:30	0.175	9.44	9.27
	5/31/13	9:30		7.97	7.80

Notes:

[a] MPE = Measuring point elevation in feet City of Portland Vertical datum.
MPE at north edge top of PVC well casing.

[b] Depth to Water in feet below MPE.

[c] Elevation in feet (MPE - depth to water)

[d] Willamette River mean gauge height (Morrison Street Bridge) converted from Willamette River datum by subtracting 0.175 foot from the measured value.

Table 5-18
Field Observations, Groundwater Sampling Event
Northwest Pipe Company

Well ID	Date Sampled	Sample Time	Purge Volume (gallons)	pH [-log (H+)]	Temperature (^{o}Celsius)	Specific Conductance [a] (µS/cm at 25^{o}C)	Turbidity (NTUs)	ORP [b] (millivolts)
MW-7	6/15/2012	15:18	1.5	6.7	14.4	353	11.4	-100
	5/31/2013	17:00	195	6.8	13.2	130	8.81	-93
MW-8	6/15/2012	14:22	1.4	7.0	15.3	312	10.3	-134
	5/31/2013	15:00	40	6.6	14.2	250	0.52	-34
MW-9	6/15/2012	13:17	2.3	6.8	15.9	360	2.8	-128
	5/31/2013	13:20	165	6.6	15.2	242	3.0	-31

Notes:

[a] Specific conductance is electrical conductivity normalized to 25^{o}C.

[b] ORP = Oxidation reduction potential.

^{o}C = degrees Celsius.

µS/cm = micro Siemens per centimeter.

NTUs = nephelometric turbidity units.

Table 5-19

BIOSCREEN Input Parameters

Northwest Pipe Company Stained Soil Investigation

Input Parameter	Value	Units	Comments
Hydraulic conductivity	0.01	cm/sec	Average of hydraulic conductivities for MW-7, MW-8, and MW-9 calculated from specific capacity data based on well purging, using the method described by Driscoll (1986)
Hydraulic gradient	0.0013	unitless	Gradient observed on June 13, 2012
Effective porosity	0.2	unitless	Typical default value
Seepage velocity	67	feet/year	Calculated from above values
Fraction organic carbon	0.0027	decimal %	Average of two aquifer samples collected ouside of the stained soil zone May 2012
Longitudinal dispersivity	11	feet	Recommended value from BIOSCREEN software for a 100-foot modeled area
Transverse dispersivity	1.1	feet	Recommended value from BIOSCREEN software for a 100-foot modeled area
Aquifer bulk density	1.7	kg/L	Typical default value
Acenphthene organic carbon partition coefficient (Koc)	4898	L/kg	Geometric mean value, EPA 1996
Naphthalene Koc	1191	L/kg	Geometric mean value, EPA 1996
Acenphthene source area concentration	0.701	mg/L	Highest concentration observed on June 13, 2012
Naphthalene source area concentration	0.0619	mg/L	Highest concentration observed on June 13, 2012
Source area width	20	feet	Assumed value based on field observation of stained soil
Source area depth	10	feet	Assumed value based on estimated saturated thickness
Acenaphthene anaerobic degradation half life	0.318	year	Chang et al. (2002)
Naphthalene anaerobic degradation half life	0.44	year	Smith (2010)
Sensitivity analysis - adjust half life of acenaphthene	3.18	year	Value 10 times base case (value is directly proportional to constituent potential to persist and migrate in the subsurface)
Sensitivity analysis - adjust half life of naphthalene	4.44	year	Value 10 times base case (value is directly proportional to constituent potential to persist and migrate in the subsurface)
Sensitivity analysis - adjust Koc for acenaphthene	3890	L/kg	Lowest cited value, EPA 1996 (value is inversely proportional to migrate rate)
Sensitivity analysis - adjust Koc for naphthalene	870	L/kg	Lowest cited value, EPA 1996 (value is inversely proportional to migrate rate)
Sensitivity analysis - adjust acenapthene concentration	7.01 20	mg/L	Value 10 times base case value for June 2012 results (value is directly proportional to constituent potential to persist and migrate in the subsurface) and 10 times the slightly higher concentration reported in May 2013 [2 mg/L])
Sensitivity analysis - adjust napthalene concentration	0.619	mg/L	Value 10 times base case (value is directly proportional to constituent potential to persist and migrate in the subsurface)

Table 5-20

Summary of Analytical Results for Stormwater Roof Runoff Samples Collected 10/19/2009

Northwest Pipe Company

Building name:				Main Plant Bay 1 - 6				Bay 9		Lining & Coating			Steam Bay	Maintenance	
Station ID:				DS05	DS06	DS12	DS17	DS117	DS223	DS120	DS120	DS225	DS221	DS224	
Sample ID:				DS005-110709	DS006--110709	DS012-110709	DS017--110709	DS117--110709	DS223-110709	DS120-110709	DS120-110709-1	DS225--110709	DS221-110709	DS224--110709	Trip Blank
Sample Type:				N	N	N	N	N	N	N	FD	N	N	N	TB
Date Collected:				11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009	11/7/2009
Chem Group/Chemical	**Method**	**Units**	**Screening Criteria[1]**												
General Chemistry:															
Total Suspended Solids	SM 2540D	mg/l	--	3.50 U		3.50 U			3.50 U	3.50 U	3.50 U		3.50 U		
Inorganics:															
Aluminum	EPA 6010B	mg/l	0.050	0.0150 U		0.015 U			0.015 U	0.015 U	0.015 U		**0.0209 J**		
Arsenic	EPA 6010B	mg/l	0.000045	**0.00347 J**		0.003 U			**0.00604 J**	0.003 U	**0.00491 J**		0.003 U		
Chromium	EPA 6010B	mg/l	0.100	0.001 U		0.001 U			**0.00107 J**	0.001 U	0.001 U		0.001 U		
Copper	EPA 6010B	mg/l	0.0027	0.002 U		0.002 U			0.002 U	0.002 U	0.002 U		**0.00211 J**		
Zinc	EPA 6010B	mg/l	0.036	**0.0782**	**0.0908**	**0.0617**	**0.0198 J**	**0.818**	**0.983**	**0.0542**	**0.0557**	**0.870**	**0.0171 J**	**0.382**	
Polynuclear Aromatic Hydrocarbons:															
Acenaphthene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Acenaphthylene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Anthracene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Benzo (a) anthracene	EPA 8270m	ug/l	0.018	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Benzo (a) pyrene	EPA 8270m	ug/l	0.018	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Benzo (b) fluoranthene	EPA 8270m	ug/l	0.018	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Benzo (ghi) perylene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Benzo (k) fluoranthene	EPA 8270m	ug/l	0.018	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Chrysene	EPA 8270m	ug/l	0.018	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Dibenzo (a,h) anthracene	EPA 8270m	ug/l	0.018	0.0952 U		0.0952 U			0.0952 U	0.0952 U			0.0952 U		
Fluoranthene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	**0.103**			0.0476 U		
Fluorene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Indeno (1,2,3-cd) pyrene	EPA 8270m	ug/l	0.018	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Naphthalene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Phenanthrene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			**0.0561 J**	**0.182**			**0.0949 J**		
Pyrene	EPA 8270m	ug/l	0.2	0.0476 U		0.0476 U			0.0476 U	**0.0590 J**			0.0476 U		
Total PAH		ug/l		0.40		0.40			0.06	0.34			0.09		
Polychlorinated Biphenyls:															
Aroclor 1016	EPA 8082	ug/l	0.96	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1221	EPA 8082	ug/l	0.034	0.0952 U		0.0952 U			0.0952 U	0.0952 U			0.0952 U		
Aroclor 1232	EPA 8082	ug/l	0.034	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1242	EPA 8082	ug/l	0.034	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1248	EPA 8082	ug/l	0.034	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1254	EPA 8082	ug/l	0.033	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1260	EPA 8082	ug/l	0.034	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1262	EPA 8082	ug/l	--	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Aroclor 1268	EPA 8082	ug/l	--	0.0476 U		0.0476 U			0.0476 U	0.0476 U			0.0476 U		
Phthalates:															
Bis(2-ethylhexyl)phthalate	EPA 8270m	ug/l	2.2	0.501 U		0.501 U			0.501 U	0.501 U			0.501 U		
Butyl benzyl phthalate	EPA 8270m	ug/l	3	0.501 U		0.501 U			0.501 U	0.501 U			0.501 U		
Diethyl phthalate	EPA 8270m	ug/l	3	0.501 U		0.501 U			0.501 U	0.501 U			0.501 U		
Dimethyl phthalate	EPA 8270m	ug/l	3	0.501 U		0.501 U			0.501 U	0.501 U			0.501 U		
Di-n-butyl phthalate	EPA 8270m	ug/l	3	0.501 U		0.501 U			0.501 U	0.501 U			0.501 U		
Di-n-octyl phthalate	EPA 8270m	ug/l	3	0.501 U		0.501 U			0.501 U	0.501 U			0.501 U		
Volatile Organic Carbons:															
2-Butanone (MEK)	EPA 8260B	ug/l	7100	**3.56 J**		**19.7 J**			**5.72 J**	**27.1 J**	**52.0 J**		**3.5 J**		3.5 U
Acetone	EPA 8260B	ug/l	1500	**10.0**		**10.6**			**9.74**	**16.2**	**15.9**		**10.6**		7.76 U

Notes:

[1] Portland Harbor Joint Source Control Strategy Table 3-1 Screening Level Values for Soil Stormwater Sediment Stormwater, Groundwater and Surface Water (7/16/07 Revision)

mg/L = milligrams per liter

ug/L = microgram per liter

Bold result = detection

Shaded cell = screening criteria exceeded.

-- = no screening level available

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

These preliminary screening levels are intended to provide conservative values that are useful for placing reported constituent concentrations into context. They do not represent cleanup levels and are not based on promulgated regulations.

*Samples type: N = Normal sample, FD = Field Duplicate, TB = Trip Blank

Table 5-21

Summary of Historical Stormwater Roof Runoff Sample Results

Northwest Pipe Company

Station ID	Sample ID	Sample Date	Zinc Concentration (mg/L)	Location
DS-011	DS20-11072006	11/7/2006	3.03	Main plant Bay1-6
DS-013	DS19-11072006	11/7/2006	3.19	Main plant Bay1-6
DS-015	DS11-11072006	11/7/2006	2.91	Main plant Bay1-6
DS-117	DS05-11072006	11/7/2006	0.434	Bay 9
DS-120	DS01-11072006	11/7/2006	0.0857	Lining and Coating Facility
DS-007	SW111-120307-0	12/3/2007	1.83	Main plant Bay1-6
DS-008	SW114-120307-0	12/3/2007	2.08	Main plant Bay1-6
DS-011	SW107-120307-0	12/3/2007	2.37	Main plant Bay1-6
DS-013	SW106-120307-0	12/3/2007	2.56	Main plant Bay1-6
DS-015	SW104-120307-0	12/3/2007	2.52	Main plant Bay1-6
DS-016	D5-16-060508	6/5/2008	0.404	Main plant Bay1-6
DS-017	D5-17-060508	6/5/2008	0.248	Main plant Bay1-6
DS-018	D5-18-060508	6/5/2008	0.315	Main plant Bay1-6
DS-019	D5-19-060508	6/5/2008	0.292	Main plant Bay1-6
DS-010	DS10-111208	11/12/2008	0.993	Main plant Bay1-6
DS-005	DS05-121208	12/12/2008	0.605	Main plant Bay1-6

Notes:

mg/L = miligram per liter

A test panel of the roof was coated in 2008 and roof runoff samples collected after then were focused on the coated panel, which exhibited substantially reduced zinc concentrations.