

## **APPENDIX B**

Analytical Chemistry Data Reports

SW08 Through SW12

# **Analytical Chemistry Data Package**

**Project: Non-Dry Dock Stormwater  
SW08 - November 21, 2011 and  
Equipment Blanks  
Chemical Analyses**

Battelle Project No. 54220  
CF No. 3174



Marine Sciences Laboratory  
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# CHEMISTRY ANALYSIS DATA PACKAGE CONTENTS

**Non-Dry Dock Stormwater  
SW08 November 21, 2011 and  
Equipment Blanks (EB)  
Chemical Analyses**

## **Chemistry Analysis Summaries**

Field Data, EB Summary Report Metals .....	3
Field Data, EB Summary Report TPH, TOC/DOC, TSS, Hardness .....	5
QA/QC Summary Reports Metals .....	6
QA/QC Narrative Metals.....	9

## **Sample Custody Information**

Chain of Custody Form .....	12
Laboratory Sample Log-In Form .....	18
Log-In Checklist.....	19
Chain of Custody Form, Shipped to CAS.....	20
Log-In Checklist, Shipped to CAS .....	23
EB Chain of Custody Form.....	24
EB Laboratory Sample Log-In Form.....	25
EB Log-In Checklist.....	26
EB Chain of Custody Form, Shipped to CAS .....	27
EB Log-In Checklist, Shipped to CAS .....	28

## **CVAF Analysis of Samples for Hg**

*Analytical raw data available upon request*

## **ICP-MS Analysis of Samples for Metals**

*Analytical raw data available upon request*

## **Analysis of TPH, TOC/DOC, TSS, Hardness**

CAS Narrative, Batch K1111586.....	29
Summary and QC Report, Batch K1111586 .....	30
CAS Narrative, Batch K1110840 (EB).....	78
Summary and QC Report, Batch K1110840 (EB) .....	79

*Analytical raw data available upon request*

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011\_SW08  
Metals in Water  
UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Collection Date	Hg	As	Ag	Al	Cd
<i>Instrument:</i>						<i>CVAF</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Freshwater)						0.0001	0.03	0.002	0.3	0.004
Freshwater Reporting Limit (MDL* 3.18)						0.0003	0.1	0.006	1.0	0.01

**SW08**

SW08-0013	PSNS015	TME	Composite_equal_time	3174*79	11/22/11	0.0266	0.689	0.0196	408	0.0518
SW08-0014	PSNS015	DME	Composite_equal_time	3174*80	11/22/11	0.00325	0.542	0.002 J	30.2	0.0264
SW08-0015	PSNS084.1	TME	Composite_equal_time	3174*81	11/22/11	0.00409	0.947	0.0190	292	0.163
SW08-0016	PSNS084.1	DME	Composite_equal_time	3174*82	11/22/11	0.00123	0.840	0.00230 J	19.5	0.106
SW08-0017	PSNS115.1	TME	Composite_equal_time	3174*83	11/22/11	0.0168	2.65	0.0739	311	0.531
SW08-0018	PSNS115.1	DME	Composite_equal_time	3174*84	11/22/11	0.00194	2.22	0.0106	6.47	0.270
SW08-0019	PSNS124	TME	Composite_equal_time	3174*85	11/22/11	0.0188	2.21	0.0457	197	0.380
SW08-0020	PSNS124	DME	Composite_equal_time	3174*86	11/22/11	0.00183	1.53	0.00371 J	7.00	0.181
SW08-0021	PSNS124.1	TME	Composite_equal_time	3174*87	11/22/11	0.00701	0.987	0.0311	293	1.02
SW08-0022	PSNS124.1	DME	Composite_equal_time	3174*88	11/22/11	0.00271	0.646	0.002 U	15.4	0.566
SW08-0023	PSNS126	TME	Composite_equal_time	3174*89	11/22/11	0.00568	3.50	0.0418	124	0.202
SW08-0024	PSNS126	DME	Composite_equal_time	3174*90	11/22/11	0.00213	3.28	0.0193	15.3	0.129

**Equipment Blanks**

SW08-001	PSNS 115.1	TME	Composite_equal_time	3174*73	10/31/11	0.000116 J	0.03 U	0.00225 J	0.3 U	0.004 U
SW08-002	PSNS 124	TME	Composite_equal_time	3174*74	10/31/11	0.000158 J	0.03 U	0.002 U	0.323 J	0.004 U
SW08-003	PSNS 84.1	TME	Composite_equal_time	3174*75	11/01/11	0.000176 J	0.03 U	0.002 U	0.375 J	0.004 U
SW08-004	PSNS 015	TME	Composite_equal_time	3174*76	11/01/11	0.000205 J	0.03 U	0.002 U	0.837 J	0.004 U
SW08-005	PSNS 126	TME	Composite_equal_time	3174*77	11/02/11	0.000242 J	0.03 U	0.002 U	0.3 U	0.004 U
SW08-006	PSNS 124.1	TME	Composite_equal_time	3174*78	11/02/11	0.000179 J	0.03 U	0.002 U	0.3 U	0.004 U



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**Non-Dry Dock Stormwater**

**ENVVEST 2011\_SW08**

**Metals in Water**

**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	CVAF Batch ID	ICP-MS Batch ID
					<i>Instrument:</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	
Laboratory Achieved Detection Limits (Freshwater)					0.08	0.007	0.002	0.05		
Freshwater Reporting Limit (MDL* 3.18)					0.3	0.02	0.006	0.2		

**SW08**

SW08-0013	PSNS015	TME	Composite_equal_time	3174*79	2.32	8.05	8.96	56.8	122011HGA	121911-6100
SW08-0014	PSNS015	DME	Composite_equal_time	3174*80	1.49	3.94	2.35	39.7	122011HGA	121911-6100
SW08-0015	PSNS084.1	TME	Composite_equal_time	3174*81	3.10	14.7	3.88	137	122011HGA	121911-6100
SW08-0016	PSNS084.1	DME	Composite_equal_time	3174*82	2.20	7.33	0.207	116	122011HGA	121911-6100
SW08-0017	PSNS115.1	TME	Composite_equal_time	3174*83	14.9	33.5	16.6	206	122011HGA	121911-6100
SW08-0018	PSNS115.1	DME	Composite_equal_time	3174*84	12.6	9.04	0.472	139	122011HGA	121911-6100
SW08-0019	PSNS124	TME	Composite_equal_time	3174*85	7.08	74.2	8.63	114	122011HGA	121911-6100
SW08-0020	PSNS124	DME	Composite_equal_time	3174*86	5.00	19.6	0.245	64.6	122011HGA	121911-6100
SW08-0021	PSNS124.1	TME	Composite_equal_time	3174*87	8.03	43.6	12.9	201	122011HGA	121911-6100
SW08-0022	PSNS124.1	DME	Composite_equal_time	3174*88	3.62	12.2	0.606	127	122011HGA	121911-6100
SW08-0023	PSNS126	TME	Composite_equal_time	3174*89	2.22	16.9	4.50	80.3	122011HGA	121911-6100
SW08-0024	PSNS126	DME	Composite_equal_time	3174*90	1.56	11.4	0.359	61.5	122011HGA	121911-6100

**Equipment Blanks**

SW08-001	PSNS 115.1	TME	Composite_equal_time	3174*73	0.08 U	0.0333	0.00209 J	0.104 J	122011HGA	121911-6100
SW08-002	PSNS 124	TME	Composite_equal_time	3174*74	0.08 U	0.0784	0.00540 J	0.398	122011HGA	121911-6100
SW08-003	PSNS 84.1	TME	Composite_equal_time	3174*75	0.08 U	0.245	0.00526 J	0.247	122011HGA	121911-6100
SW08-004	PSNS 015	TME	Composite_equal_time	3174*76	0.08 U	0.239	0.0183	0.478	122011HGA	121911-6100
SW08-005	PSNS 126	TME	Composite_equal_time	3174*77	0.08 U	0.0636	0.00448 J	0.133 J	122011HGA	121911-6100
SW08-006	PSNS 124.1	TME	Composite_equal_time	3174*78	0.08 U	0.0747	0.0181	0.0865 J	122011HGA	121911-6100

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Non-Dry Dock Stormwater  
ENVVEST 2011\_SW08

Station Code	Type Name	Collection Date	Analysis Date	Analysis Method	Component	Units	Result	Detection Limit	Reporting Limit
PSNS015	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	3.39 =	0.07	0.50
PSNS084.1	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	2.27 =	0.07	0.50
PSNS115.1	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.28 =	0.07	0.50
PSNS124	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.34 =	0.07	0.50
PSNS124.1	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.43 =	0.07	0.50
PSNS126	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	2.52 =	0.07	0.50
PSNS015	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Total Organic	mg/L	3.34 =	0.07	0.50
PSNS084.1	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Total Organic	mg/L	2.48 =	0.07	0.50
PSNS115.1	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Total Organic	mg/L	1.65 =	0.07	0.50
PSNS124	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Total Organic	mg/L	1.79 =	0.07	0.50
PSNS124.1	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Total Organic	mg/L	1.47 =	0.07	0.50
PSNS126	Composite_equal_time	11/22/2011	11/30/2011	SM 5310 C	Carbon, Total Organic	mg/L	2.60 =	0.07	0.50
PSNS015	Composite_equal_time	11/22/2011	12/01/2011	SM 2340 C	Hardness, Total as CaCO3	mg/L	25.2 =	0.8	2.0
PSNS084.1	Composite_equal_time	11/22/2011	12/01/2011	SM 2340 C	Hardness, Total as CaCO3	mg/L	28.4 =	0.8	2.0
PSNS115.1	Composite_equal_time	11/22/2011	12/01/2011	SM 2340 C	Hardness, Total as CaCO3	mg/L	162 =	0.8	2.0
PSNS124	Composite_equal_time	11/22/2011	12/01/2011	SM 2340 C	Hardness, Total as CaCO3	mg/L	66.8 =	0.8	2.0
PSNS124.1	Composite_equal_time	11/22/2011	12/01/2011	SM 2340 C	Hardness, Total as CaCO3	mg/L	28.4 =	0.8	2.0
PSNS126	Composite_equal_time	11/22/2011	12/01/2011	SM 2340 C	Hardness, Total as CaCO3	mg/L	29.2 =	0.8	2.0
PSNS015	Composite_equal_time	11/22/2011	11/29/2011	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	18.0 =		5.0
PSNS084.1	Composite_equal_time	11/22/2011	11/29/2011	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	9.0 =		5.0
PSNS115.1	Composite_equal_time	11/22/2011	11/29/2011	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	28.5 =		5.0
PSNS124	Composite_equal_time	11/22/2011	11/29/2011	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	19.5 =		5.0
PSNS124.1	Composite_equal_time	11/22/2011	11/29/2011	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	12.0 =		5.0
PSNS126	Composite_equal_time	11/22/2011	11/29/2011	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	8.0 =		5.0
PSNS015	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	140 =, J	12	270
PSNS015	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	360 =, J	20	530
PSNS115.1	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	67 =, J	12	270
PSNS115.1	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	200 =, J	21	540
PSNS084.1	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	120 =, J	12	270
PSNS084.1	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	290 =, J	20	530
PSNS124	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	69 =, J	12	270
PSNS124	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	200 =, J	20	530
PSNS124.1	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	110 =, J	12	260
PSNS124.1	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	280 =, J	20	520
PSNS126	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	120 =, J	12	260
PSNS126	Grab	11/22/2011	12/01/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	270 =, J	20	520
<b>Equipment Blanks</b>									
EB_SW08-007	Grab	11/02/2011	11/10/2011	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	14 =, J	12	280
EB_SW08-007	Grab	11/02/2011	11/10/2011	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	35 =, J	21	550

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	ICP-MS Batch ID
<i>Instrument:</i>					<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	
Laboratory Achieved Detection Limits (Freshwater)					0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater Reporting Limit (MDL* 3.18)					0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	

#### METHOD BLANKS

MB-1		TME	Freshwater	TRM Blank R1	0.03 U	0.002 U	0.3 U	0.004 U	0.08 U	0.007 U	0.002 U	0.05 U	121911-6100
MB-2		TME	Freshwater	TRM Blank R2	0.03 U	0.002 U	0.3 U	0.004 U	0.08 U	0.007 U	0.002 U	0.05 U	121911-6100

#### LABORATORY CONTROL SAMPLES

Spiking Level					<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	
LCS-1		TME	Freshwater	TRM LCS R1	2.01	1.93	2.25	2.01	2.05	2.00	2.05	2.03	121911-6100
LCS-2		TME	Freshwater	TRM LCS R2	2.02	1.93	2.16	2.04	2.00	1.97	2.05	2.01	121911-6100
Percent Recovery, LCS					<b>101%</b>	<b>97%</b>	<b>113%</b>	<b>101%</b>	<b>103%</b>	<b>100%</b>	<b>103%</b>	<b>102%</b>	
Percent Recovery, LCS					<b>101%</b>	<b>97%</b>	<b>108%</b>	<b>102%</b>	<b>100%</b>	<b>99%</b>	<b>103%</b>	<b>101%</b>	

#### MATRIX SPIKE RESULTS

SW08-0014	PSNS015	DME	Composite_equal_time	3174*80	0.542	0.002 U	30.2	0.0264	1.49	3.94	2.35	39.7	121911-6100
MS		DME	Composite_equal_time	3174*80 MS	2.66	1.73	81.0	2.06	3.58	5.85	4.42	90.7	121911-6100
MSD		DME	Composite_equal_time	3174*80 MSD	2.65	1.78	80.3	2.08	3.46	5.92	4.35	90.7	121911-6100
Spiking Level					2	2	50	2	2	2	2	50	
Percent Recovery, MS					<b>106%</b>	<b>87%</b>	<b>102%</b>	<b>102%</b>	<b>105%</b>	<b>96%</b>	<b>104%</b>	<b>102%</b>	
Percent Recovery, MSD					<b>105%</b>	<b>89%</b>	<b>100%</b>	<b>103%</b>	<b>99%</b>	<b>99%</b>	<b>100%</b>	<b>102%</b>	
RPD					<b>0.5%</b>	<b>2.8%</b>	<b>1.4%</b>	<b>1.0%</b>	<b>5.9%</b>	<b>3.6%</b>	<b>3.4%</b>	<b>0.0%</b>	

#### REPLICATE PRECISION

SW08-0015	PSNS084.1	TME	Composite_equal_time	3174*81	0.947	0.0190	292	0.163	3.10	14.7	3.88	137	121911-6100
DUP	PSNS032	TME	Composite_equal_time	3174*81r2	0.966	0.0202	305	0.158	3.25	15.0	3.88	140	121911-6100
<i>Mean</i>					<i>0.957</i>	<i>0.0196</i>	<i>299</i>	<i>0.161</i>	<i>3.18</i>	<i>14.9</i>	<i>3.88</i>	<i>139</i>	
RPD					<b>2.0%</b>	<b>6.1%</b>	<b>4.4%</b>	<b>3.1%</b>	<b>4.7%</b>	<b>2.0%</b>	<b>0.0%</b>	<b>2.2%</b>	

#### STANDARD REFERENCE MATERIAL, Seawater

SRM 1640-1		TME	Freshwater	TRM 1640 R1 10x	26.7	6.38	57.5	23.0	38.8	88.4	28.3	57.4	121911-6100
SRM 1640-2		TME	Freshwater	TRM 1640 R2 10x	26.3	6.35	59.7	23.5	37.9	86.0	28.0	57.2	121911-6100
Certified Value					<b>26.7</b>	<b>7.62</b>	<b>52.0</b>	<b>22.8</b>	<b>38.6</b>	<b>85.2</b>	<b>27.9</b>	<b>53.2</b>	
PD					<b>0.1%</b>	<b>16.3%</b>	<b>10.6%</b>	<b>0.9%</b>	<b>1%</b>	<b>3.8%</b>	<b>1.5%</b>	<b>7.9%</b>	
PD					<b>1.4%</b>	<b>16.7%</b>	<b>14.8%</b>	<b>3.1%</b>	<b>2%</b>	<b>0.9%</b>	<b>0.4%</b>	<b>7.5%</b>	

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Non-Dry Dock Stormwater  
 ENVVEST 2011\_SW08  
 Metals in Water  
 UNITS: µg/L

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	Hg	CVA Batch ID
<i>Instrument:</i>					<i>CVA</i>	
Laboratory Achieved Detection Limits					<b>0.0001</b>	
Reporting Limit (MDL* 3.18)					<b>0.0003</b>	
<b><u>METHOD BLANKS</u></b>						
MB-1		TME	Freshwater	MB1_121911	0.0001 U	122011HGA
MB-2		TME	Freshwater	MB2_121911	0.0001 U	122011HGA
MB-3		TME	Freshwater	MB3_121911	0.0001 U	122011HGA
<b><u>LABORATORY CONTROL SAMPLES</u></b>						
Spiking Level					0.00496	
LCS (1)		TME	Freshwater	OPR 121911 run1	0.00524	122011HGA
LCS (2)		TME	Freshwater	OPR 121911 run2	0.00525	122011HGA
LCS Blank (1)		TME	Freshwater	Blank121911	0.000142 J	122011HGA
Percent Recovery, LCS 1					<b>103%</b>	
Percent Recovery, LCS 2					<b>103%</b>	
SW08-0014	PSNS015	DME	Composite_equal_time	3174*80	0.00325	122011HGA
MS1	PSNS015	DME	Composite_equal_time	3174*80 MS	0.0140	122011HGA
MSD1	PSNS015	DME	Composite_equal_time	3174*80 MSD	0.0151	122011HGA
Spiking Level, MS					0.0110	
Spiking Level, MSD					0.0113	
Percent Recovery, MS					<b>98%</b>	
Percent Recovery, MSD					<b>105%</b>	
RPD					<b>7.0%</b>	
SW08-0021	PSNS124.1	TME	Composite_equal_time	3174*87	0.00701	122011HGA
MS2	PSNS124.1	TME	Composite_equal_time	3174*87 MS	0.0338	122011HGA
MSD2	PSNS124.1	TME	Composite_equal_time	3174*87 MSD	0.0345	122011HGA
Spiking Level, MS					0.0271	
Spiking Level, MSD					0.0274	
Percent Recovery, MS					<b>99%</b>	
Percent Recovery, MSD					<b>100%</b>	
RPD					<b>1.3%</b>	
<b><u>REPLICATE PRECISION</u></b>						
SW08-0013	PSNS015	TME	Composite_equal_time	3174*79	0.0266	122011HGA
DUP	PSNS015	TME	Composite_equal_time	3174*79r2	0.0210	122011HGA
Mean					0.0238	
RPD					<b>24%</b>	
<b><u>STANDARD REFERENCE MATERIAL</u></b>						
SRM 1641 (1)		TME	Freshwater	1641d 121911	1601	122011HGA
Certified Value					<b>1590</b>	
range					<b>±18</b>	
SRM 1641 (1)					<b>1%</b>	
PD						

BATTELLE MARINE SCIENCE LABORATORIES  
1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011\_SW08  
Metals in Water**

**DATA QUALIFIERS:**

- c Exceeds DQO but meets contingency criteria of either:
  - 1 SRM certified <10x MDL
  - 2 Insufficient spiking level relative to native sample concentrations
  - 3 Sample concentration <10x MDL
- U Analyte not detected at or above the MDL, MDL reported
- J Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%
- & Accuracy result outside QC criterion of  $\leq 20\%$  PD
- \* Precision result outside QC criterion of  $< 30\%$
- NS Sample not spiked for this analyte
- B Analyte detected in the method blank > RL
  - and sample concentration < 10 times detected blank value
- b Data are blank corrected using the batch specific procedural blank
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- ND Not detected

**Notes:**

- Composite\_equal\_time Equal portion composite of time integrated sample (ISCO samples)
- NC Not Certified
  - Not analyzed
  - NA Not applicable/available
  - TME Total Metals Fraction
  - DME Dissolved Metals Fraction
  - 2 Sample specific MDLs and RLs reported

## QA/QC NARRATIVE

<b>PROJECT:</b>	Non-Dry Dock Stormwater Sampling for SW08
<b>PARAMETER:</b>	Total and Dissolved Metals – Al, Ag, As, Cd, Cr, Cu, Pb, Zn, Hg
<b>LABORATORY:</b>	Battelle Marine Sciences Laboratory (MSL), Sequim, Washington
<b>MATRIX:</b>	Stormwater (as a freshwater matrix)
<b>SAMPLE CUSTODY AND PROCESSING:</b>	<p>Samples were collected from stormwater outfalls located within the Confined Industrial Area (CIA) and Naval Base Kitsap (NBK) at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS &amp; IMF) by TEC, MSL, and the U.S. Navy. This storm is the first of the 2011-12 storm season and outfalls include a combination of new outfall basins and additional sampling of outfalls collected during the 2010-11 storm season. The repeated outfalls include PSNS015 and PSNS126. The new outfalls include PSNS084.1, PSNS115.1, PSNS124, and PSNS124.1. Two types of samples were collected and reported in this delivery group. The first were various equipment blanks to ensure the Teflon tubing, polycarbonate wedge bottles, composite glass jar, and final sample containers would not significantly contribute metals to the composite samples. The second were stormwater composite samples collected from those stations during SW08. The storm event identified as SW08 began on November 21, 2011 with the composites ending 24 hours later.</p> <p>Samples were collected and analyzed in accordance with the Quality Assurance Project Plan (Taylor Associates, Inc. and PNNL 2011 and amended 2012). Two types of samples were to be collected during the storm. The first was a time proportionate composite sample collected using an ISCO sampler at each of the six outfall locations. The second was a grab sample collected during the storm event in amber glass jars provided by Columbia Analytical Services (CAS) for total petroleum hydrocarbons (TPH). The individual time interval composites collected in the 24 wedge bottles inside the ISCO sampler were carried back to the stormwater lab at PSNS &amp; IMF and composited into a single event mean composite (EMC) in a pre-cleaned glass jar. All samples were hand delivered within 24 hours of collection to MSL.</p> <p>Upon receipt at MSL, the condition of all the samples were verified as acceptable and tracked back to the field chain of custody (COC). In the clean laboratory at MSL, each glass composite sample jar was shaken vigorously (prior and between aliquot removal) and aliquots were poured into the following types of containers:</p> <ol style="list-style-type: none"><li>1. 500 mL Teflon bottle for total metals (TME),</li><li>2. 500 mL 0.45µm polyvinylidene fluoride (PVDF) filter unit, vacuum filtered in a class 100 clean bench and then poured into a 500 mL Teflon bottle for dissolved metals,</li><li>3. 250 mL low-density polyethylene (LDPE) bottle provided by CAS that included a nitric acid preservative for samples to be analyzed for hardness (HRD),</li><li>4. 500 mL LDPE container with sulfuric acid preservative provided by CAS for the analysis of total organic carbon (TOC),</li><li>5. 60 mL syringe and ashed glass fiber filter (GFF) in a cleaned filter holder. An aliquot of the sample was filtered into a 250 mL LDPE container with sulfuric acid preservative provided by CAS for the analysis of dissolved organic carbon (DOC),</li><li>6. 500 mL or 1L LDPE bottle provided by CAS for the analysis of total suspended solids (TSS), and turbidity was measured in the field.</li></ol> <p>The total metal fractions and dissolved metal fractions were each acidified inside a Class 100 clean bench to a pH of &lt; 2.0 with double distilled nitric acid. The samples were then assigned a Battelle Central File (CF) identification number (3174) and were entered into Battelle's sample tracking system. The composite aliquots for TOC, DOC, hardness, and TSS were all forwarded to CAS for analysis. The quality control narrative for these parameters was provided separately.</p>

## QA/QC NARRATIVE

The following lists information on sample receipt and processing activities:

<b>Sample Receipt Dates:</b>	EB:11/03/2011 SW08: 11/23/11
<b>Cooler temp.</b> on arrival	All coolers were at 4.0±2°C
<b>Collection dates</b>	Various see table
<b>CVAF analysis dates (Hg)</b>	12/20/11
<b>TRM Prep/Freshwater Analysis by ICP-MS (As, Ag, Al, Cd, Cr, Cu, Pb, Zn)</b>	12/19/11

### QA/QC DATA QUALITY OBJECTIVES:

Analyte	Analytical Method for Seawater	MS Range of Recovery	SRM Percent Difference	Replicate Precision	<u>Method Detection Limits (µg/L)</u>	<u>Reporting Limits (µg/L)</u>
Aluminum	ICP-MS	70-130%	≤20%	≤30%	0.3	1.0
Arsenic	ICP-MS	70-130%	≤20%	≤30%	0.03	0.1
Cadmium	ICP-MS	70-130%	≤20%	≤30%	0.004	0.01
Chromium	ICP-MS	70-130%	≤20%	≤30%	0.08	0.3
Copper	ICP-MS	70-130%	≤20%	≤30%	0.007	0.02
Lead	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Silver	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Zinc	ICP-MS	70-130%	≤20%	≤30%	0.05	0.2
Mercury	CVAF	70-130%	≤20%	≤30%	0.0001	0.0003

### METHODS:

Samples were analyzed for nine metals: aluminum (Al), arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), silver (Ag), zinc (Zn), and mercury (Hg). Samples were submitted for analyses following two methods. All samples were analyzed for Hg by Cold Vapor Atomic Fluorescence (CVAF) in accordance with Battelle SOP *MSL-I-013, Total Mercury in Aqueous Samples by CVAF*, following EPA Method 1631 revision E.

All samples were analyzed for other metals by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) in accordance with Battelle SOP *MSL-I-022, Determination of Elements in Aqueous and Digestate Samples by ICP/MS*. The base methods for this procedure are EPA Method 1638 and EPA Method 1640. All samples were digested following the total metal recoverable (TRM) method established in EPA Method 1640 prior to analysis by ICP-MS. In summary, this preparation brings the pH of the sample to 2% and heats the capped samples for 2.5 hours in a 85°C oven to solubilize particulates. Both the filtered and unfiltered fractions were prepared using this method to destroy any colloidal particles remaining in the filtered (aka. Dissolved) fraction. All results were reported in units of µg/L. Data are not blank corrected.

### HOLDING TIMES:

All samples were analyzed within the established holding times of 90 days for Hg and six months for all other metals.

## QA/QC NARRATIVE

<b>DETECTION LIMITS:</b>	<p>Laboratory method detection limits (MDLs) for TRM freshwater were reported from the MDL study (annually verified) as determined by seven replicates of deionized water spiked at appropriate concentrations and prepared using the TRM method. Reporting limits are determined as 3.18 times the laboratory achieved MDL. The data are evaluated and flagged as follows:</p> <ul style="list-style-type: none"><li>U Analyte not detected at or above the MDL, MDL reported</li><li>J Analyte detected above the MDL, but less than the RL</li><li>N Spiked sample recovery outside QC criterion of 70-130%</li><li>&amp; Accuracy result outside QC criterion of <math>\leq 20\%</math> PD</li><li>* Precision result outside QC criterion of <math>&lt; 30\%</math></li><li>B Analyte detected in the method blank <math>&gt; RL</math> and sample concentration <math>&lt; 10</math> times detected blank value</li><li>c Exceeds data quality objective but meets contingency criterion</li><li>b Result is reagent blank corrected using the batch specific blank (BMRB)</li></ul>
<b>METHOD BLANKS:</b>	<p>A minimum of one method blank was prepared and analyzed by each instrument with each analytical batch. The method blanks were all less than the RL.</p>
<b>LABORATORY CONTROL SAMPLES:</b>	<p>A minimum of one LCS (OPR or blank spike) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for LCS samples were within the QC acceptance criterion of 70% to 130% for all metals. They also met a secondary criterion of <math>\pm 15\%</math> recovery for metals of concern.</p>
<b>MATRIX SPIKE ACCURACY:</b>	<p>A minimum of one set of duplicate matrix spikes (MS/MSD) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for matrix spikes were within the QC limits of 70% to 130% for all metals.</p>
<b>REPLICATE PRECISION:</b>	<p>Laboratory precision was expressed as the relative percent difference (RPD) between laboratory duplicates. The RPD values for the laboratory duplicates were within the QC acceptance criterion of <math>\pm 30\%</math> for all metals detected above the RL.</p>
<b>STANDARD REFERENCE MATERIAL ACCURACY:</b>	<p>Standard reference materials (SRM) were prepared and analyzed with each analytical batch at a minimum frequency of 1 per 20 or fewer samples. Analytical accuracy was expressed as the percent difference (PD) between the measured and the certified value. The freshwater SRMs were 1641d for Hg and 1640 for all other metals. The differences were within the QC acceptance criterion of <math>\leq 20\%</math>.</p>
<b>REFERENCE:</b>	<p>Taylor Associates, Inc. – Division of TEC, Inc. and Pacific Northwest National Laboratory (2011). Non-Dry Dock Stormwater Monitoring Conducted at Puget Sound Naval Shipyard Bremerton, WA, Project ENVVEST Study Area. Document prepared for the United States Navy Puget Sound Naval Shipyard.</p>

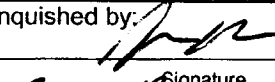
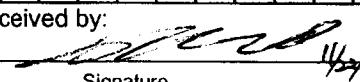


# SAMPLE CHAIN OF CUSTODY FORM

Date: \_\_\_\_\_ of \_\_\_\_\_  
 Page: \_\_\_\_\_ of \_\_\_\_\_  
 Project No.: N4523A10MP00034 Amend.1  
 Project: PSNSNon-dry Dock SW 2010

## Battelle

Marine Sciences Laboratory  
 1529 West Sequim Bay Road  
 Laboratory: Battelle MSL  
 Attention: Jill Brandenberger  
 Phone: (360) 681-4564

Sample Label		Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity ①	Total metals	Organics	No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes / Comp. Cond. (µS/cm) and Turb. (NTU) Readings
Updates 8	SW08-0001	PSNS015	11/22/11 (0932)	Water						X				2	Grab	8	61.6 µS/cm, 9.63 NTU
- 0052	SW08-0002	PSNS115.1	11/22/11 (0950)	Water						X				2	Grab	8	98.9 µS/cm, 8.60 NTU
- 0053	SW08-0003	PSNS084.1	11/22/11 (0906)	Water						X				2	Grab	8	98.6 µS/cm, 3.12 NTU
- 0054	SW08-0004	PSNS124	11/22/11 (0930)	Water						X				2	Grab	8	42.8 µS/cm, 506 NTU
- 0055	SW08-0005	PSNS124.1	11/22/11 (0948)	Water						X				2	Grab	8	6.09 µS/cm, 559 NTU
- 0056	SW08-0006	PSNS126	11/22/11 (1000)	Water						X				2	Grab	8	534 µS/cm, 6.57 NTU
	SW08-0007	PSNS015	11/22/11 (0938)	Water	X	X	X	X	X					1	Comp	8	182 µS/cm, 16 NTU
	SW08-0008	PSNS084.1	11/22/11 (0936)	Water	X	X	X	X	X					1	Comp	8	270 µS/cm, 11 NTU
	SW08-0009	PSNS115.1	11/22/11 (0936)	Water	X	X	X	X	X					1	Comp	8	1692 µS/cm, 4 NTU
	SW08-0010	PSNS124	11/22/11 (0934)	Water	X	X	X	X	X					1	Comp	8	651 µS/cm, 10 NTU
	SW08-0011	PSNS124.1	11/22/11 (0933)	Water	X	X	X	X	X					1	Comp	8	
	SW08-0012	PSNS126	11/22/11 (0927)	Water	X	X	X	X	X					1	Comp	8	
		015	11/10/11 (2230)	Sed								X	X	1	Grab	Pre 8	Sed. sample 015
Relinquished by:  11/24/11 1820					Received by:  11/24/11					Total # of Containers: _____							
Signature: _____ Printed Name: Brian Rupert Company: _____					Signature: _____ Printed Name: Li-Jung Kuo Company: _____					Shipment Method: Hand delivered split @ MSL							
Relinquished by: _____					Received by: _____					Sample Disposition: _____							
Signature: _____ Printed Name: _____ Company: _____					Signature: _____ Printed Name: _____ Company: _____					Distribution: _____							

see below

① Turbidity measurements conducted at Navy SW Lab w/ Hach 2100P benchtop meter

NOTE: sed sample should be logged in as CF 3259, part of SQV07

[illegible]

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 11/22/2011

Page: 1 of 1

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW08-0013	PSNS015	11/22/11 0938	SW					x								1	comp	SW08	3174*79
SW08-0014	PSNS015	11/22/11 0938	SW						x							1	comp	SW08	3174*80
SW08-0015	PSNS084.1	11/22/11 0936	SW				x									1	comp	SW08	3174*81
SW08-0016	PSNS084.1	11/22/11 0936	SW						x							1	comp	SW08	3174*82
SW08-0017	PSNS115.1	11/22/11 0936	SW				x									1	comp	SW08	3174*83
SW08-0018	PSNS115.1	11/22/11 0936	SW						x							1	comp	SW08	3174*84
SW08-0019	PSNS124	11/22/11 0934	SW				x									1	comp	SW08	3174*85
SW08-0020	PSNS124	11/22/11 0934	SW						x							1	comp	SW08	3174*86
SW08-0021	PSNS124.1	11/22/11 0933	SW				x									1	comp	SW08	3174*87
SW08-0022	PSNS124.1	11/22/11 0933	SW						x							1	comp	SW08	3174*88
SW08-0023	PSNS126	11/22/11 0927	SW				x									1	comp	SW08	3174*89
SW08-0024	PSNS126	11/22/11 0927	SW						x							1	comp	SW08	3174*90
--end--																			

Relinquished by:			Received by:			Total # of Containers		
<i>[Signature]</i> 11/23/11 1140			<i>[Signature]</i> 11/23/11			Shipment Method:		
Signature: <i>Li-Jung Kuo</i> Date: <i>Battelle</i> Time: <i>1140</i>			Signature: <i>C. Susser</i> Date: <i>11/23/11</i> Time: <i>1150</i>			Retained at Battelle <input checked="" type="checkbox"/>		
Printed Name: _____ Company: _____			Printed Name: _____			Sample Disposition:		
Relinquished by:			Received by:			Distribution:		
Signature: _____ Date: _____ Time: _____			Signature: _____			1) PNNL		
Printed Name: _____ Company: _____			Printed Name: _____					

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 11/28/2011

Page: 1 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

**Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW08-0001 <i>0051</i>	PSNS015	11/22/11 0938	SW							X					1	comp	SW08	
SW08-0002 <i>0052</i>	PSNS084.1	11/22/11 0936	SW							X					1	comp	SW08	
SW08-0003 <i>0053</i>	PSNS115.1	11/22/11 0936	SW							X					1	comp	SW08	
SW08-0004 <i>0054</i>	PSNS124	11/22/11 0934	SW							X					1	comp	SW08	
SW08-0005 <i>0055</i>	PSNS124.1	11/22/11 0933	SW							X					1	comp	SW08	
SW08-0006 <i>0056</i>	PSNS126	11/22/11 0927	SW							X					1	comp	SW08	
SW08-0027	PSNS015	11/22/11 0938	SW	x											1	comp	SW08	SW08-0007
SW08-0028	PSNS015	11/22/11 0938	SW		x										1	comp	SW08	SW08-0007
SW08-0029	PSNS015	11/22/11 0938	SW			x									1	comp	SW08	SW08-0007
SW08-0030	PSNS015	11/22/11 0938	SW				x								1	comp	SW08	SW08-0007
SW08-0031	PSNS084.1	11/22/11 0936	SW	x											1	comp	SW08	SW08-0008
SW08-0032	PSNS084.1	11/22/11 0936	SW		x										1	comp	SW08	SW08-0008
SW08-0033	PSNS084.1	11/22/11 0936	SW			x									1	comp	SW08	SW08-0008
SW08-0034	PSNS084.1	11/22/11 0936	SW				x								1	comp	SW08	SW08-0008

Relinquished by: *C. Susuck* 11/28/11 1500

Signature \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Printed Name \_\_\_\_\_ Company *MSL to FedEx*

Received by: \_\_\_\_\_

Signature \_\_\_\_\_

Printed Name \_\_\_\_\_

Total # of Containers: \_\_\_\_\_

Shipment Method: Fedex to CAS

Relinquished by: \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Printed Name \_\_\_\_\_ Company \_\_\_\_\_

Received by: \_\_\_\_\_

Signature \_\_\_\_\_

Printed Name \_\_\_\_\_

Sample Disposition: \_\_\_\_\_

Distribution: 1) PNNL  
2) CAS

\* Emailed CAS updated copy 11/30/11 g

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 11/28/2011

Page: 2 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW08-0035	PSNS115.1	11/22/11 0936	SW	x												1	comp	SW08	SW08-0009
SW08-0036	PSNS115.1	11/22/11 0936	SW		x											1	comp	SW08	SW08-0009
SW08-0037	PSNS115.1	11/22/11 0936	SW			x										1	comp	SW08	SW08-0009
SW08-0038	PSNS115.1	11/22/11 0936	SW				x									1	comp	SW08	SW08-0009
SW08-0039	PSNS124	11/22/11 0934	SW	x												1	comp	SW08	SW08-0010
SW08-0040	PSNS124	11/22/11 0934	SW		x											1	comp	SW08	SW08-0010
SW08-0041	PSNS124	11/22/11 0934	SW			x										1	comp	SW08	SW08-0010
SW08-0042	PSNS124	11/22/11 0934	SW				x									1	comp	SW08	SW08-0010
SW08-0043	PSNS124.1	11/22/11 0933	SW	x												1	comp	SW08	SW08-0011
SW08-0044	PSNS124.1	11/22/11 0933	SW		x											1	comp	SW08	SW08-0011
SW08-0045	PSNS124.1	11/22/11 0933	SW			x										1	comp	SW08	SW08-0011
SW08-0046	PSNS124.1	11/22/11 0933	SW				x									1	comp	SW08	SW08-0011
SW08-0047	PSNS126	11/22/11 0927	SW	x												1	comp	SW08	SW08-0012
SW08-0048	PSNS126	11/22/11 0927	SW		x											1	comp	SW08	SW08-0012

Relinquished by:			Received by:			Total # of Containers	
<div> <div>Signature</div> <div>Date</div> <div>Time</div> </div>			<div>Signature</div> <div>Printed Name</div>				

## SAMPLE CHAIN OF CUSTODY FORM

Date: 11/28/2011

Page: 3 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

Analyze parameters per QAP/FSP

**Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

[illegible]

## **SAMPLE LOGIN**

Project Manager: Brandenberger

Date Received: 11/23/2011

Batch: 9

Login Designee: Brandenberger



*Marine Sciences Laboratory*

*1529 West Sequim Bay Road*

*Sequim, Washington 98382*

*PH: (360) 681-4565*

Project: **Non-dry dock Storm water - SW08 (Nov 2011)**

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW08-0013	PSNS015	3174*79	WAT	Prep Lab, K-4-C	Total Metals	11/22/11
SW08-0014	PSNS015	3174*80	WAT	Prep Lab, K-4-C	Dissolved Metals	11/22/11
SW08-0015	PSNS084.1	3174*81	WAT	Prep Lab, K-4-C	Total Metals	11/22/11
SW08-0016	PSNS084.1	3174*82	WAT	Prep Lab, K-4-C	Dissolved Metals	11/22/11
SW08-0017	PSNS115.1	3174*83	WAT	Prep Lab, K-4-C	Total Metals	11/22/11
SW08-0018	PSNS115.1	3174*84	WAT	Prep Lab, K-4-C	Dissolved Metals	11/22/11
SW08-0019	PSNS124	3174*85	WAT	Prep Lab, K-4-C	Total Metals	11/22/11
SW08-0020	PSNS124	3174*86	WAT	Prep Lab, K-4-C	Dissolved Metals	11/22/11
SW08-0021	PSNS124.1	3174*87	WAT	Prep Lab, K-4-C	Total Metals	11/22/11
SW08-0022	PSNS124.1	3174*88	WAT	Prep Lab, K-4-C	Dissolved Metals	11/22/11
SW08-0023	PSNS126	3174*89	WAT	Prep Lab, K-4-C	Total Metals	11/22/11
SW08-0024	PSNS126	3174*90	WAT	Prep Lab, K-4-C	Dissolved Metals	11/22/11

## LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 3174 Sample No(s): 79-92-90 Batch: SW08  
 Project Name: 2011 Storm Water Project Manager: JMB

TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)			
Matrix: _____		WP# _____	
Yes	No		
<input type="checkbox"/>	<input type="checkbox"/>	Navy-type Project (requires high-level sample tracking procedures)	
<input type="checkbox"/>	<input type="checkbox"/>	USDA Samples (see Compliance Agreement Checklist)	PM Verification:
<input type="checkbox"/>	<input type="checkbox"/>	Filter Samples: <u>Amount:</u> <u>Entire sample</u> <u>Half of sample</u>	
<input type="checkbox"/>	<input type="checkbox"/>	Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)	
<input type="checkbox"/>	<input type="checkbox"/>	Special instructions: _____	
Sample Preservation Instructions: _____			
**See LIMS for archive/disposal information**			

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes No N/A Indicate in Appropriate Box

☐ ☒ ☐ Custody seal present Seal intact? YES NO

☒ ☐ ☐ Cooler temperature (acceptable range: 4±2°C or solids:frozen)  
(if multiple coolers, note temp. of each)

☒ ☐ ☐ Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)  
Comment/Remedy: \_\_\_\_\_

☒ ☐ ☐ Were all chain of custody forms signed and dated?

☒ ☐ ☐ Were samples filtered at MSL? (Metals portion; Samples were split for all param. @ MSL)

Sample condition(s):

Acceptable

Other (explain):

SW08-011 only has one bag of ice.

Container type:

Teflon Poly Glass Cap. Vial

Other: \_\_\_\_\_

Notes: \_\_\_\_\_

Completed By: \_\_\_\_\_

Date/Time: 1/22/11 1900

## SAMPLE PRESERVATION

☐ Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)

☐ Random pH checked for ~10% of samples (use dip paper) Sample IDs: \_\_\_\_\_

☐ Complete pH check required for project (use pH meter and record on pH Record form)

☐ Sample(s) were preserved at MSL

Type: ☒ 0.2% HNO<sub>3</sub>Notes: OptimaLot# 1211010☐ 0.5% HCl (Hg samples)

Notes: \_\_\_\_\_

Lot# \_\_\_\_\_

☒ Refrigerate/Freeze SEDNotes: Metals acidified 11/23/11; CAS param stored in Wellen's column☐ Other

Notes: \_\_\_\_\_

Completed By: \_\_\_\_\_

Date/Time: 12:05 11/23/11Storage Shelf: TUC



K 111586

# SAMPLE CHAIN OF CUSTODY FORM

Date: 11/28/2011

Page: 1 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

## Battelle

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW08-0001	PSNS015	11/22/11 0938	SW							X					1	comp	SW08	
SW08-0002	PSNS084.1	11/22/11 0936	SW							X					1	comp	SW08	
SW08-0003	PSNS115.1	11/22/11 0936	SW							X					1	comp	SW08	
SW08-0004	PSNS124	11/22/11 0934	SW							X					1	comp	SW08	
SW08-0005	PSNS124.1	11/22/11 0933	SW							X					1	comp	SW08	
SW08-0006	PSNS126	11/22/11 0927	SW							X					1	comp	SW08	
SW08-0027	PSNS015	11/22/11 0938	SW	x											1	comp	SW08	SW08-0007
SW08-0028	PSNS015	11/22/11 0938	SW		x										1	comp	SW08	SW08-0007
SW08-0029	PSNS015	11/22/11 0938	SW			x									1	comp	SW08	SW08-0007
SW08-0030	PSNS015	11/22/11 0938	SW				x								1	comp	SW08	SW08-0007
SW08-0031	PSNS084.1	11/22/11 0936	SW	x											1	comp	SW08	SW08-0008
SW08-0032	PSNS084.1	11/22/11 0936	SW		x										1	comp	SW08	SW08-0008
SW08-0033	PSNS084.1	11/22/11 0936	SW			x									1	comp	SW08	SW08-0008
SW08-0034	PSNS084.1	11/22/11 0936	SW				x								1	comp	SW08	SW08-0008

Relinquished by:

*[Signature]* 11/28/11 1500

Signature Date Time

C. SUSUCK MSL to FedEx

Printed Name Company

Received by:

*[Signature]* 11/29/11 0920

Signature Date Time

S. WOLF

Printed Name

Total # of Containers

Shipment Method:

Fedex to CAS

Relinquished by:

Signature Date Time

Printed Name Company

Received by:

Signature

Printed Name

Sample Disposition:

Distribution:

1) PNNL

2) CAS

NOTE: Sample Labels SW08-0001 thru -0006 should be SW08-0051 thru -0056 per email communication dtd 30 Nov 2011.

K111586

# SAMPLE CHAIN OF CUSTODY FORM

Date: 11/28/2011

Page: 2 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

## Battelle

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW08-0035	PSNS115.1	11/22/11 0936	SW	x												1	comp	SW08	SW08-0009
SW08-0036	PSNS115.1	11/22/11 0936	SW		x											1	comp	SW08	SW08-0009
SW08-0037	PSNS115.1	11/22/11 0936	SW			x										1	comp	SW08	SW08-0009
SW08-0038	PSNS115.1	11/22/11 0936	SW				x									1	comp	SW08	SW08-0009
SW08-0039	PSNS124	11/22/11 0934	SW	x												1	comp	SW08	SW08-0010
SW08-0040	PSNS124	11/22/11 0934	SW		x											1	comp	SW08	SW08-0010
SW08-0041	PSNS124	11/22/11 0934	SW			x										1	comp	SW08	SW08-0010
SW08-0042	PSNS124	11/22/11 0934	SW				x									1	comp	SW08	SW08-0010
SW08-0043	PSNS124.1	11/22/11 0933	SW	x												1	comp	SW08	SW08-0011
SW08-0044	PSNS124.1	11/22/11 0933	SW		x											1	comp	SW08	SW08-0011
SW08-0045	PSNS124.1	11/22/11 0933	SW			x										1	comp	SW08	SW08-0011
SW08-0046	PSNS124.1	11/22/11 0933	SW				x									1	comp	SW08	SW08-0011
SW08-0047	PSNS126	11/22/11 0927	SW	x												1	comp	SW08	SW08-0012
SW08-0048	PSNS126	11/22/11 0927	SW		x											1	comp	SW08	SW08-0012

Relinquished by:

*[Signature]* 11/28/11 1500

Signature Date Time

C. Suslick MSL

Printed Name Company

Received by:

*[Signature]* 11/29/11

Signature Date

SW08F 0920

Printed Name

Total # of Containers

Shipment Method:

Fedex to CAS

Sample Disposition:

Distribution:

1) PNNL

2) CAS

Relinquished by:

Signature Date Time

Printed Name Company

Received by:

Signature

Printed Name

## SAMPLE CHAIN OF CUSTODY FORM

Date: 11/28/2011

Page: 3 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW08

SW = Stormwater

Analyze parameters per QAP/FSP

**Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

[illegible]

**Columbia Analytical Services, Inc.  
Cooler Receipt and Preservation Form**

PC HJ

Client / Project: Battelle Service Request K11 11586  
 Received: 11/29/11 Opened: 11/29/11 By: SRW Unloaded: 11/29/11 By: SRW

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
-0.3	7.0	316			7977 7182 0781		
-0.1	7.4	294			7977 7182 0681		

7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other \_\_\_\_\_  
 8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N  
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N  
 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N  
 12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N  
 14. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N  
 15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions:  
Rec'd 2 bottles for TPH samples (not one).

## **SAMPLE LOGIN**

Project Manager: Brandenberger

Date Received: 11/3/2011

Batch: 8

Login Designee: Brandenberger

Project: **Non-dry dock Storm water - SW08 (Nov 2011)**



*Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, Washington 98382  
PH: (360) 681-4565*

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW08-001	PSNS 115.1 EB	3174-73	WAT	Lab 227	Total Metals	10/31/11
SW08-002	PSNS 124 EB	3174-74	WAT	Lab 227	Total Metals	10/31/11
SW08-003	PSNS 84.1 EB	3174-75	WAT	Lab 227	Total Metals	11/01/11
SW08-004	PSNS 015 EB	3174-76	WAT	Lab 227	Total Metals	11/01/11
SW08-005	PSNS 126 EB	3174-77	WAT	Lab 227	Total Metals	11/02/11
SW08-006	PSNS 124.1 EB	3174-78	WAT	Lab 227	Total Metals	11/02/11

Date: \_\_\_\_\_  
Page: 1 of 1  
Project No.: N4523A10MP00034 Amend.1  
Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Laboratory: Battelle MSL  
Attention: Jill Brandenberger  
Phone: (360) 681-4564

[illegible]

## LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: \_\_\_\_\_ Sample No(s): \_\_\_\_\_ Batch: \_\_\_\_\_  
Project Name: 2011 Stormwater Project Manager: JMB

## TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: water - DI WP# \_\_\_\_\_

Yes ☐ No ☒ Navy-type Project (requires high-level sample tracking procedures)

☐ ☒ USDA Samples (see Compliance Agreement Checklist) PM Verification: \_\_\_\_\_

☐ ☒ Filter Samples: Amount: Entire sample Half of sample

☐ ☒ Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)

☒ ☐ Special instructions: split samples

Sample Preservation Instructions: 0.290 HNO<sub>3</sub>

**\*\*See LIMS for archive/disposal information\*\***

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes No N/A Indicate in Appropriate Box

☐ ☐ ☒ Custody seal present Seal intact? YES NO

☐ ☐ ☐ Cooler temperature (acceptable range: 4±2°C or solids:frozen) 4.5, 1.5 °C  
(if multiple coolers, note temp. of each) 3.8, 4.9 °C

☐ ☐ ☒ Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)  
Comment/Remedy: \_\_\_\_\_

☒ ☐ ☐ Were all chain of custody forms signed and dated?

☐ ☒ ☐ Were samples filtered at MSL?

Sample condition(s): Acceptable Other (explain): \_\_\_\_\_

Container type: Teflon Poly Glass Cap. Vial Other: \_\_\_\_\_

Notes: \_\_\_\_\_

Completed By: JMBDate/Time: 11/3/11 1800

## SAMPLE PRESERVATION

☐ Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)

☐ Random pH checked for ~10% of samples (use dip paper) Sample IDs: \_\_\_\_\_

☐ Complete pH check required for project (use pH meter and record on pH Record form)

☒ Sample(s) were preserved at MSL

Type: ☒ 0.2% HNO<sub>3</sub> Notes: Optima Lot# 1210040

☐ 0.5% HCl (Hg samples) Notes: \_\_\_\_\_ Lot# \_\_\_\_\_

☐ Refrigerate/Freeze Notes: \_\_\_\_\_

☐ Other Notes: \_\_\_\_\_

Completed By: Kay JohnsonDate/Time: 11/4/11 11:00 AMStorage Shelf: L-6-Bke 11/4/11

Battelle Marine Sciences Labs, 1529 West Sequim Bay Rd, Sequim, Washington 98362 PH: (360) 681-4565

**Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

[illegible]

11/5/11 0845



**Columbia Analytical Services, Inc.**  
Cooler Receipt and Preservation Form

PC HAH

Client / Project: Battelle Service Request K11 10840  
Received: 11/5/11 Opened: 11/5/11 By: JA Unloaded: 11/5/11 By: JA

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered  
2. Samples were received in: (circle) Cooler Box Envelope Other NA  
3. Were custody seals on coolers? NA Y N If yes, how many and where? \_\_\_\_\_  
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
<u>2.7</u>	<u>/</u>	<u>289</u>					<input checked="" type="checkbox"/>

7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other Brown Paper  
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N  
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N  
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N  
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N  
14. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N  
15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Client:** Battelle  
**Project:** Non-dry Dock Stormwater SW08  
**Sample Matrix:** Water

**Service Request No.:** K1111586  
**Date Received:** 11/29/11

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

**Sample Receipt**

Thirty water samples were received for analysis at Columbia Analytical Services on 11/29/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

**General Chemistry Parameters**

No anomalies associated with the analysis of these samples were observed.

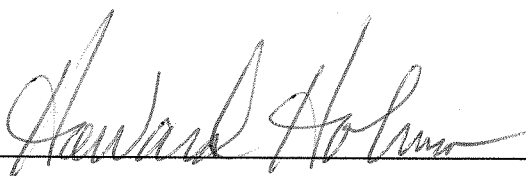
**Diesel Range Organics by NWTPH-Dx**

**Relative Percent Difference Exceptions:**

The Relative Percent Difference (RPD) criterion for the replicate analysis of Diesel Range Organics and Residual Range Organics in sample SW08-0056 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed.

Approved by



Date

12-14-11

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11

Analysis Method: SM 2340 C

Units: mg/L  
Basis: NA

Hardness, Total as CaCO<sub>3</sub>

Sample Name	Lab Code	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
SW08-0027	K1111586-007	25.2		2.0	0.8	1	NA	12/1/11 03:30	
SW08-0031	K1111586-011	28.4		2.0	0.8	1	NA	12/1/11 03:30	
SW08-0035	K1111586-015	162		2.0	0.8	1	NA	12/1/11 03:30	
SW08-0039	K1111586-019	66.8		2.0	0.8	1	NA	12/1/11 03:30	
SW08-0043	K1111586-023	28.4		2.0	0.8	1	NA	12/1/11 03:30	
SW08-0047	K1111586-027	29.2		2.0	0.8	1	NA	12/1/11 03:30	
Method Blank	K1111586-MB1	ND	U	2.0	0.8	1	NA	12/1/11 03:30	

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 12/ 1/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0027  
Lab Code: K1111586-007

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0027DUP Duplicate Sample K1111586-007DUP6		RPD	RPD Limit
					Result	Average		
Hardness, Total as CaCO3	SM 2340 C	2.0	0.8	25.2	26.0	25.6	3	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Analyzed:** 12/ 1/11

**Lab Control Sample Summary**  
**General Chemistry Parameters**

**Units:** mg/L  
**Basis:** NA

Lab Control Sample K1111586-LCS1					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Hardness, Total as CaCO3	SM 2340 C	43.2	43.4	100	90 - 116

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 12/13/11 14:19

\\inflow2\Starlims\LimRep\LabControlSample.rpt

Form 3C

SuperSet Reference: 11-0000196120 rev 00

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/11  
**Date Received:** 11/29/11

**Analysis Method:** SM 2540 D

**Units:** mg/L  
**Basis:** NA

## Solids, Total Suspended (TSS)

Sample Name	Lab Code	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
SW08-0030	K1111586-010	18.0		5.0		1	NA	11/29/11 16:10	
SW08-0034	K1111586-014	9.0		5.0		1	NA	11/29/11 16:10	
SW08-0038	K1111586-018	28.5		5.0		1	NA	11/29/11 16:10	
SW08-0042	K1111586-022	19.5		5.0		1	NA	11/29/11 16:10	
SW08-0046	K1111586-026	12.0		5.0		1	NA	11/29/11 16:10	
SW08-0050	K1111586-030	8.0		5.0		1	NA	11/29/11 16:10	
Method Blank	K1111586-MB1	ND	U	5.0		1	NA	11/29/11 16:10	

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: NA  
Date Received: NA  
Date Analyzed: 11/29/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: Batch QC  
Lab Code: K1110647-039

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	Batch QCDUP Duplicate Sample K1110647-039DUP1		RPD	RPD Limit
					Result	Average		
Solids, Total Suspended (TSS)	SM 2540 D	13		36	39	37.4	7	10

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Analyzed:** 11/29/11

**Lab Control Sample Summary  
 General Chemistry Parameters**

**Units:** mg/L  
**Basis:** NA

Lab Control Sample K1111586-LCS2					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Solids, Total Suspended (TSS)	SM 2540 D	242	240	101	80 - 115

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11

Analysis Method: SM 5310 C

Units: mg/L  
Basis: NA

## Carbon, Dissolved Organic (DOC)

Sample Name	Lab Code	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
SW08-0029	K1111586-009	3.39		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0033	K1111586-013	2.27		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0037	K1111586-017	1.28		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0041	K1111586-021	1.34		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0045	K1111586-025	1.43		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0049	K1111586-029	2.52		0.50	0.07	1	NA	11/30/11 13:44	
Method Blank	K1111586-MB1	ND	U	0.50	0.07	1	NA	11/30/11 13:44	
Method Blank	K1111586-MB2	ND	U	0.50	0.07	1	NA	11/30/11 13:44	
Method Blank	K1111586-MB3	ND	U	0.50	0.07	1	NA	12/2/11 15:04	

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0029  
Lab Code: K1111586-009

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0029DUP Duplicate Sample K1111586-009DUP8		RPD	RPD Limit
					Result	Average		
Carbon, Dissolved Organic (DOC)	SM 5310 C	0.50	0.07	3.39	3.13	3.26	8	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0033  
Lab Code: K1111586-013

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0033DUP Duplicate Sample K1111586-013DUP10			RPD	RPD Limit
					Result	Average			
Carbon, Dissolved Organic (DOC)	SM 5310 C	0.50	0.07	2.27	2.10	2.19	8		33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0037  
Lab Code: K1111586-017

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0037DUP Duplicate Sample K1111586-017DUP12		RPD	RPD Limit
					Result	Average		
Carbon, Dissolved Organic (DOC)	SM 5310 C	0.50	0.07	1.28	1.28	1.28	<1	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0041  
Lab Code: K1111586-021

Units: mg/L  
Basis: NA

SW08-0041DUP Duplicate Sample K1111586-021DUP14								
Analyte Name	Method	MRL	MDL	Sample Result	Result	Average	RPD	RPD Limit
Carbon, Dissolved Organic (DOC)	SM 5310 C	0.50	0.07	1.34	1.43	1.39	6	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0045  
Lab Code: K1111586-025

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0045DUP Duplicate Sample K1111586-025DUP16			RPD	RPD Limit
					Result	Average			
Carbon, Dissolved Organic (DOC)	SM 5310 C	0.50	0.07	1.43	1.41	1.42	1		33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0049  
Lab Code: K1111586-029

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0049DUP Duplicate Sample K1111586-029DUP18		RPD	RPD Limit
					Result	Average		
Carbon, Dissolved Organic (DOC)	SM 5310 C	0.50	0.07	2.52	2.37	2.45	6	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Matrix Spike Summary  
General Chemistry Parameters

Sample Name: SW08-0029  
Lab Code: K1111586-009

Units: mg/L  
Basis: NA

Analytical Method: SM 5310 C

SW08-0029MS  
Matrix Spike  
K1111586-009MS4

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	3.39	28.2	25.0	99	83 - 117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Analyzed: 11/30/11

Lab Control Sample Summary  
General Chemistry Parameters

Units: mg/L  
Basis: NA

Lab Control Sample K1111586-LCS1					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	SM 5310 C	26.3	26.0	101	83 - 117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Analyzed:** 11/30/11

**Lab Control Sample Summary**  
**General Chemistry Parameters**

**Units:** mg/L  
**Basis:** NA

Lab Control Sample K1111586-LCS2					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	SM 5310 C	25.9	26.0	99	83 - 117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Analyzed: 12/ 2/11

Lab Control Sample Summary  
General Chemistry Parameters

Units: mg/L  
Basis: NA

Lab Control Sample K1111586-LCS3					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	SM 5310 C	24.8	26.0	96	83 - 117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220

Service Request: K1111586

Continuing Calibration Verification (CCV) Summary  
Carbon, Dissolved Organic (DOC)

Analytical Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	271463	KQ1113136-24	11/30/11 13:44	25.0	23.4	94	90 - 110
CCV2	271463	KQ1113136-25	11/30/11 13:44	25.0	23.6	94	90 - 110
CCV3	271463	KQ1113136-26	11/30/11 13:44	25.0	23.4	93	90 - 110
CCV4	271463	KQ1113136-27	11/30/11 13:44	25.0	23.1	93	90 - 110
CCV5	271833	KQ1113210-07	12/2/11 15:04	25.0	23.7	95	90 - 110
CCV6	271833	KQ1113210-08	12/2/11 15:04	25.0	23.4	94	90 - 110

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220

Service Request: K1111586

Continuing Calibration Blank (CCB) Summary  
Carbon, Dissolved Organic (DOC)

Analytical Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	MDL	MRL	Result	Q
CCB1	271463	KQ1113136-28	11/30/11 13:44	0.07	0.50	0.21	J
CCB2	271463	KQ1113136-29	11/30/11 13:44	0.07	0.50	ND	U
CCB3	271463	KQ1113136-30	11/30/11 13:44	0.07	0.50	ND	U
CCB4	271463	KQ1113136-31	11/30/11 13:44	0.07	0.50	ND	U
CCB5	271833	KQ1113210-09	12/2/11 15:04	0.07	0.50	ND	U
CCB6	271833	KQ1113210-10	12/2/11 15:04	0.07	0.50	ND	U

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11

Analysis Method: SM 5310 C

Units: mg/L  
Basis: NA

## Carbon, Total Organic

Sample Name	Lab Code	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
SW08-0028	K1111586-008	3.34		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0032	K1111586-012	2.48		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0036	K1111586-016	1.65		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0040	K1111586-020	1.79		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0044	K1111586-024	1.47		0.50	0.07	1	NA	11/30/11 13:44	
SW08-0048	K1111586-028	2.60		0.50	0.07	1	NA	11/30/11 13:44	
Method Blank	K1111586-MB1	ND	U	0.50	0.07	1	NA	11/30/11 13:44	

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0028  
Lab Code: K1111586-008

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0028DUP Duplicate Sample K1111586-008DUP7		RPD	RPD Limit
					Result	Average		
Carbon, Total Organic	SM 5310 C	0.50	0.07	3.34	3.35	3.34	<1	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0032  
Lab Code: K1111586-012

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0032DUP Duplicate Sample K1111586-012DUP9		RPD	RPD Limit
					Result	Average		
Carbon, Total Organic	SM 5310 C	0.50	0.07	2.48	2.33	2.41	6	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0036  
Lab Code: K1111586-016

Units: mg/L  
Basis: NA

SW08-0036DUP Duplicate Sample K1111586-016DUP11								
Analyte Name	Method	MRL	MDL	Sample Result	Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.07	1.65	1.61	1.63	2	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0040  
Lab Code: K1111586-020

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0040DUP Duplicate Sample K1111586-020DUP13			RPD	RPD Limit
					Result	Average			
Carbon, Total Organic	SM 5310 C	0.50	0.07	1.79	1.77	1.78	1		33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0044  
Lab Code: K1111586-024

Units: mg/L  
Basis: NA

Analyte Name	Method	MRL	MDL	Sample Result	SW08-0044DUP Duplicate Sample K1111586-024DUP15		RPD	RPD Limit
					Result	Average		
Carbon, Total Organic	SM 5310 C	0.50	0.07	1.47	1.54	1.50	5	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Replicate Sample Summary  
General Chemistry Parameters

Sample Name: SW08-0048  
Lab Code: K1111586-028

Units: mg/L  
Basis: NA

					SW08-0048DUP Duplicate Sample K1111586-028DUP17			
Analyte Name	Method	MRL	MDL	Sample Result	Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.07	2.60	2.66	2.63	2	33

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Collected: 11/22/11  
Date Received: 11/29/11  
Date Analyzed: 11/30/11

Matrix Spike Summary  
General Chemistry Parameters

Sample Name: SW08-0028  
Lab Code: K1111586-008

Units: mg/L  
Basis: NA

Analytical Method: SM 5310 C

SW08-0028MS					
Matrix Spike					
K1111586-008MS3					
Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	3.34	28.5	25.0	101	83 - 117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Form 3A

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SuperSet Reference: 11-0000196120 rev 00

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220  
Sample Matrix: Water

Service Request: K1111586  
Date Analyzed: 11/30/11

Lab Control Sample Summary  
General Chemistry Parameters

Units: mg/L  
Basis: NA

Lab Control Sample K1111586-LCS1					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	SM 5310 C	25.9	26.0	99	83 - 117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Form 3C

SuperSet Reference: 11-0000196120 rev 00

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220

Service Request: K1111586

Continuing Calibration Verification (CCV) Summary  
Carbon, Total Organic

Analytical Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	271464	KQ1113138-13	11/30/11 13:44	25.0	23.4	94	90 - 110
CCV2	271464	KQ1113138-14	11/30/11 13:44	25.0	23.4	93	90 - 110
CCV3	271464	KQ1113138-15	11/30/11 13:44	25.0	23.1	93	90 - 110
CCV4	271464	KQ1113138-16	11/30/11 13:44	25.0	23.3	93	90 - 110

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW08/54220

Service Request: K1111586

Continuing Calibration Blank (CCB) Summary  
Carbon, Total Organic

Analytical Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	MDL	MRL	Result	Q
CCB1	271464	KQ1113138-17	11/30/11 13:44	0.07	0.50	0.21	J
CCB2	271464	KQ1113138-18	11/30/11 13:44	0.07	0.50	ND	U
CCB3	271464	KQ1113138-19	11/30/11 13:44	0.07	0.50	ND	U
CCB4	271464	KQ1113138-20	11/30/11 13:44	0.07	0.50	ND	U



**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1111586

**Cover Page - Organic Analysis Data Package  
Diesel and Residual Range Organics**

<b>Sample Name</b>	<b>Lab Code</b>	<b>Date Collected</b>	<b>Date Received</b>
SW08-0051	K1111586-001	11/22/2011	11/29/2011
SW08-0052	K1111586-002	11/22/2011	11/29/2011
SW08-0053	K1111586-003	11/22/2011	11/29/2011
SW08-0054	K1111586-004	11/22/2011	11/29/2011
SW08-0055	K1111586-005	11/22/2011	11/29/2011
SW08-0056	K1111586-006	11/22/2011	11/29/2011
SW08-0056	KWG1112166-1	11/22/2011	11/29/2011

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: \_\_\_\_\_

Date: 12/21/11 \_\_\_\_\_

Name: Shawn Wilson \_\_\_\_\_

Title: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/2011  
**Date Received:** 11/29/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-0051  
**Lab Code:** K1111586-001  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	140	J	270	12	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	360	J	530	20	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	111	50-150	12/01/11	Acceptable
n-Triacontane	116	50-150	12/01/11	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/2011  
**Date Received:** 11/29/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-0052  
**Lab Code:** K1111586-002  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	67	J	270	12	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	200	J	540	21	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	50-150	12/01/11	Acceptable
n-Triacontane	104	50-150	12/01/11	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/2011  
**Date Received:** 11/29/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-0053  
**Lab Code:** K1111586-003  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	120	J	270	12	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	290	J	530	20	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	106	50-150	12/01/11	Acceptable
n-Triacontane	108	50-150	12/01/11	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/2011  
**Date Received:** 11/29/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-0054  
**Lab Code:** K1111586-004  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	69	J	270	12	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	200	J	530	20	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	101	50-150	12/01/11	Acceptable
n-Triacontane	107	50-150	12/01/11	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/2011  
**Date Received:** 11/29/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-0055  
**Lab Code:** K1111586-005  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	110	J	260	12	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	280	J	520	20	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	104	50-150	12/01/11	Acceptable
n-Triacontane	110	50-150	12/01/11	Acceptable

**Comments:**

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** 11/22/2011  
**Date Received:** 11/29/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-0056  
**Lab Code:** K1111586-006  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	120	J	260	12	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	270	J	520	20	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	110	50-150	12/01/11	Acceptable
n-Triacontane	113	50-150	12/01/11	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Collected:** NA  
**Date Received:** NA

## Diesel and Residual Range Organics

**Sample Name:** Method Blank  
**Lab Code:** KWG1112166-3  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND U	250	11	1	11/30/11	12/01/11	KWG1112166	
Residual Range Organics (RRO)	35 J	500	19	1	11/30/11	12/01/11	KWG1112166	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	112	50-150	12/01/11	Acceptable
n-Triacontane	118	50-150	12/01/11	Acceptable

**Comments:** \_\_\_\_\_



**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586

**Surrogate Recovery Summary  
Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** PERCENT  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SW08-0051	K1111586-001	111	116
SW08-0052	K1111586-002	102	104
SW08-0053	K1111586-003	106	108
SW08-0054	K1111586-004	101	107
SW08-0055	K1111586-005	104	110
SW08-0056	K1111586-006	110	113
SW08-0056DUP	KWG1112166-1	112	118
Method Blank	KWG1112166-3	112	118
Lab Control Sample	KWG1112166-2	121	125

**Surrogate Recovery Control Limits (%)**

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Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

---

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Extracted:** 11/30/2011  
**Date Analyzed:** 12/01/2011

**Duplicate Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** SW08-0056  
**Lab Code:** K1111586-006  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1112166

Analyte Name	MRL	MDL	Sample Result	SW08-0056DUP KWG1112166-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	260	12	120	88	100	32 #	30
Residual Range Organics (RRO)	520	20	270	200	230	29 #	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Extracted:** 11/30/2011  
**Date Analyzed:** 12/01/2011

**Lab Control Spike Summary  
Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1112166

Lab Control Sample KWG1112166-2 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1920	1600	120	46-140
Residual Range Organics (RRO)	864	800	108	45-159

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Extracted:** 11/30/2011  
**Date Analyzed:** 12/01/2011  
**Time Analyzed:** 20:33

**Method Blank Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Method Blank  
**Lab Code:** KWG1112166-3  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\120111B\1201F015.D  
**Level:** Low  
**Extraction Lot:** KWG1112166

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1112166-2	J:\GC21\DATA\120111B\1201F013.D	12/01/11	20:11
SW08-0052	K1111586-002	J:\GC21\DATA\120111B\1201F021.D	12/01/11	21:39
SW08-0055	K1111586-005	J:\GC21\DATA\120111B\1201F023.D	12/01/11	22:01
SW08-0051	K1111586-001	J:\GC21\DATA\120111B\1201F025.D	12/01/11	22:23
SW08-0053	K1111586-003	J:\GC21\DATA\120111B\1201F027.D	12/01/11	22:45
SW08-0054	K1111586-004	J:\GC21\DATA\120111B\1201F029.D	12/01/11	23:07
SW08-0056	K1111586-006	J:\GC21\DATA\120111B\1201F031.D	12/01/11	23:28
SW08-0056DUP	KWG1112166-1	J:\GC21\DATA\120111B\1201F033.D	12/01/11	23:50

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1111586  
**Date Extracted:** 11/30/2011  
**Date Analyzed:** 12/01/2011  
**Time Analyzed:** 20:11

**Lab Control Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Lab Control Sample  
**Lab Code:** KWG1112166-2  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\120111B\1201F013.D  
**Level:** Low  
**Extraction Lot:** KWG1112166

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1112166-3	J:\GC21\DATA\120111B\1201F015.D	12/01/11	20:33
SW08-0052	K1111586-002	J:\GC21\DATA\120111B\1201F021.D	12/01/11	21:39
SW08-0055	K1111586-005	J:\GC21\DATA\120111B\1201F023.D	12/01/11	22:01
SW08-0051	K1111586-001	J:\GC21\DATA\120111B\1201F025.D	12/01/11	22:23
SW08-0053	K1111586-003	J:\GC21\DATA\120111B\1201F027.D	12/01/11	22:45
SW08-0054	K1111586-004	J:\GC21\DATA\120111B\1201F029.D	12/01/11	23:07
SW08-0056	K1111586-006	J:\GC21\DATA\120111B\1201F031.D	12/01/11	23:28
SW08-0056DUP	KWG1112166-1	J:\GC21\DATA\120111B\1201F033.D	12/01/11	23:50

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1111586  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10701  
**Instrument ID:** GC21

**Column:** ZB-1

Level ID	File ID
A	J:\GC21\DATA\071111B-NW\0711F037.D
B	J:\GC21\DATA\071111B-NW\0711F039.D
C	J:\GC21\DATA\071111B-NW\0711F041.D
D	J:\GC21\DATA\071111B-NW\0711F043.D
E	J:\GC21\DATA\071111B-NW\0711F045.D
F	J:\GC21\DATA\071111B-NW\0711F047.D
G	J:\GC21\DATA\071111B-NW\0711F057.D
H	J:\GC21\DATA\071111B-NW\0711F059.D

Level ID	File ID
I	J:\GC21\DATA\071111B-NW\0711F061.D
J	J:\GC21\DATA\071111B-NW\0711F063.D
K	J:\GC21\DATA\071111B-NW\0711F065.D
L	J:\GC21\DATA\071111B-NW\0711F067.D
M	J:\GC21\DATA\071111B-NW\0711F069.D
N	J:\GC21\DATA\071111B-NW\0711F071.D

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)							H	50	699	I	200	712	J	500	777
	K	2000	797	L	5000	768	M	20000	802	N	50000	809			
Residual Range Organics (RRO)				B	50	588	C	200	510	D	500	513	E	2000	500
	F	5000	545												
o-Terphenyl				G	1.0	988	H	2.5	1000	I	10	998	J	25	1040
	K	100	1100	L	250	1020									
n-Triacontane				G	1.0	803	H	2.5	840	I	10	840	J	25	875
	K	100	936	L	250	872									

Results flagged with an asterisk (\*) indicate values outside control criteria.

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1111586  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10701  
**Instrument ID:** GC21

**Column:** ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	5.7		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.8		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	5.3		≤ 20

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1111586  
**Calibration Date:** 07/12/2011  
**Date Analyzed:** 07/12/2011

**Second Source Calibration Verification**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration ID:** CAL10701  
**Units:** ppm

**File ID:** J:\GC21\DATA\071111B-NW\0711F053.D  
J:\GC21\DATA\071111B-NW\0711F073.D

**Column ID:** ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	990	767	761	-1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1100	531	562	6	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

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Form 6B - Organic

Page 1 of 1

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SuperSet Reference: RR136486



## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1111586  
**Date Analyzed:** 12/01/2011

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1112511  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\120111B\1201F007.D  
J:\GC21\DATA\120111B\1201F009.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	767	847	11	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1000	531	530	0	NA	± 15 %	AverageRF
o-Terphenyl	50	54	1030	1100	7	NA	± 15 %	AverageRF
n-Triacontane	50	55	861	941	9	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1111586  
**Date Analyzed:** 12/02/2011

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1112511  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\120111B\1201F035.D  
J:\GC21\DATA\120111B\1201F037.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	767	828	8	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	990	531	526	-1	NA	± 15 %	AverageRF
o-Terphenyl	50	53	1030	1080	5	NA	± 15 %	AverageRF
n-Triacontane	50	56	861	957	11	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Client:** Battelle  
**Project:** Non-dry Dock Stormwater SW08  
**Sample Matrix:** Water

**Service Request No.:** K1110840  
**Date Received:** 11/5/11

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

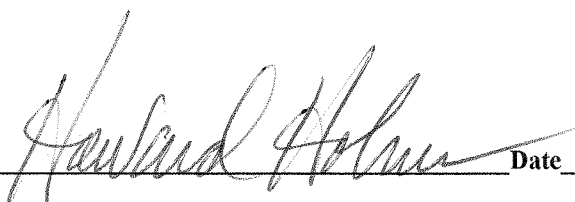
**Sample Receipt**

One water sample was received for analysis at Columbia Analytical Services on 11/5/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

**Diesel Range Organics by NWTPH-Dx**

No anomalies associated with the analysis of these samples were observed.

Approved by \_\_\_\_\_

 \_\_\_\_\_

Date

11-10-11

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Collected:** 11/02/2011  
**Date Received:** 11/05/2011

## Diesel and Residual Range Organics

**Sample Name:** SW08-007  
**Lab Code:** K1110840-001  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	14	J	280	12	1	11/08/11	11/10/11	KWG1111409	
Residual Range Organics (RRO)	35	J	550	21	1	11/08/11	11/10/11	KWG1111409	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	90	50-150	11/10/11	Acceptable
n-Triacontane	88	50-150	11/10/11	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Collected:** NA  
**Date Received:** NA

## Diesel and Residual Range Organics

**Sample Name:** Method Blank  
**Lab Code:** KWG1111409-5  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	11	1	11/08/11	11/10/11	KWG1111409	
Residual Range Organics (RRO)	ND	U	500	19	1	11/08/11	11/10/11	KWG1111409	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	106	50-150	11/10/11	Acceptable
n-Triacontane	103	50-150	11/10/11	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840

**Surrogate Recovery Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** PERCENT  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
Batch QC	K1110642-001	80	77
Batch QC	K1110811-003	117	112
SW08-007	K1110840-001	90	88
Batch QCDUP	KWG1111409-3	95	92
Method Blank	KWG1111409-5	106	103
Batch QCMS	KWG1111409-1	123	121
Batch QCDMS	KWG1111409-2	116	114
Lab Control Sample	KWG1111409-4	121	119

---

**Surrogate Recovery Control Limits (%)**

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

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Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Extracted:** 11/08/2011  
**Date Analyzed:** 11/11/2011

**Matrix Spike/Duplicate Matrix Spike Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Batch QC  
**Lab Code:** K1110811-003  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1111409

Analyte Name	Sample Result	Batch QCMS KWG1111409-1 Matrix Spike			Batch QCDMS KWG1111409-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Diesel Range Organics (DRO)	430	4890	3480	128	4870	3400	130	28-176	0	30
Residual Range Organics (RRO)	370	2220	1740	106	2240	1700	110	45-140	1	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Extracted:** 11/08/2011  
**Date Analyzed:** 11/10/2011

**Duplicate Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Batch QC  
**Lab Code:** K1110642-001

**Units:** ug/L**Basis:** NA

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Level:** Low**Extraction Lot:** KWG1111409

Analyte Name	MRL	MDL	Sample Result	Batch QCDUP KWG1111409-3 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	260	12	ND	ND	ND	-	30
Residual Range Organics (RRO)	520	20	ND	26	NC	NC	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Extracted:** 11/08/2011  
**Date Analyzed:** 11/10/2011

**Lab Control Spike Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1111409

Analyte Name	Lab Control Sample KWG1111409-4 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	2120	1600	133	46-140
Residual Range Organics (RRO)	912	800	114	45-159

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Extracted:** 11/08/2011  
**Date Analyzed:** 11/10/2011  
**Time Analyzed:** 03:48

**Method Blank Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Method Blank  
**Lab Code:** KWG1111409-5

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\110911F\1109F040.D

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Level:** Low  
**Extraction Lot:** KWG1111409

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1111409-4	J:\GC21\DATA\110911F\1109F038.D	11/10/11	03:26
Batch QC	K1110642-001	J:\GC21\DATA\110911F\1109F042.D	11/10/11	04:10
Batch QCDUP	KWG1111409-3	J:\GC21\DATA\110911F\1109F044.D	11/10/11	04:32
SW08-007	K1110840-001	J:\GC21\DATA\110911F\1109F056.D	11/10/11	06:44
Batch QC	K1110811-003	J:\GC21\DATA\11111F\1111F014.D	11/11/11	20:29
Batch QCMS	KWG1111409-1	J:\GC21\DATA\11111F\1111F016.D	11/11/11	20:51
Batch QCDMS	KWG1111409-2	J:\GC21\DATA\11111F\1111F018.D	11/11/11	21:13

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Extracted:** 11/08/2011  
**Date Analyzed:** 11/10/2011  
**Time Analyzed:** 03:26

**Lab Control Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Lab Control Sample  
**Lab Code:** KWG1111409-4  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\110911F\1109F038.D  
**Level:** Low  
**Extraction Lot:** KWG1111409

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1111409-5	J:\GC21\DATA\110911F\1109F040.D	11/10/11	03:48
Batch QC	K1110642-001	J:\GC21\DATA\110911F\1109F042.D	11/10/11	04:10
Batch QCDUP	KWG1111409-3	J:\GC21\DATA\110911F\1109F044.D	11/10/11	04:32
SW08-007	K1110840-001	J:\GC21\DATA\110911F\1109F056.D	11/10/11	06:44
Batch QC	K1110811-003	J:\GC21\DATA\11111F\1111F014.D	11/11/11	20:29
Batch QCMS	KWG1111409-1	J:\GC21\DATA\11111F\1111F016.D	11/11/11	20:51
Batch QCDMS	KWG1111409-2	J:\GC21\DATA\11111F\1111F018.D	11/11/11	21:13

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10661  
**Instrument ID:** GC21

**Column:** ZB-1

Level ID	File ID
A	J:\GC21\DATA\071111F\0711F036.D
B	J:\GC21\DATA\071111F\0711F038.D
C	J:\GC21\DATA\071111F\0711F040.D
D	J:\GC21\DATA\071111F\0711F042.D
E	J:\GC21\DATA\071111F\0711F044.D
F	J:\GC21\DATA\071111F\0711F046.D
G	J:\GC21\DATA\071111F\0711F056.D
H	J:\GC21\DATA\071111F\0711F058.D

Level ID	File ID
I	J:\GC21\DATA\071111F\0711F060.D
J	J:\GC21\DATA\071111F\0711F062.D
K	J:\GC21\DATA\071111F\0711F064.D
L	J:\GC21\DATA\071111F\0711F066.D
M	J:\GC21\DATA\071111F\0711F068.D
N	J:\GC21\DATA\071111F\0711F070.D

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)				G	20	779	H	50	795	I	200	747	J	500	809
	K	2000	847	L	5000	869	M	20000	863	N	50000	907			
Residual Range Organics (RRO)				B	50	627	C	200	597	D	500	551	E	2000	588
	F	5000	645												
o-Terphenyl				G	1.0	1040	H	2.5	1100	I	10	1040	J	25	1090
	K	100	1150	L	250	1150									
n-Triacontane				G	1.0	894	H	2.5	932	I	10	878	J	25	939
	K	100	972	L	250	976									

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10661  
**Instrument ID:** GC21

**Column:** ZB-1

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	6.5		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.1		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.5		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.3		≤ 20

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Calibration Date:** 07/12/2011  
**Date Analyzed:** 07/12/2011

**Second Source Calibration Verification**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration ID:** CAL10661  
**Units:** ppm

**File ID:** J:\GC21\DATA\071111F\0711F052.D  
J:\GC21\DATA\071111F\0711F072.D

**Column ID:** ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	827	844	2	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1000	602	599	0	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Date Analyzed:** 11/10/2011

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10661  
**Analysis Lot:** KWG1111583  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\110911F\1109F032.D  
J:\GC21\DATA\110911F\1109F034.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	827	926	12	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1000	602	609	1	NA	± 15 %	AverageRF
o-Terphenyl	50	55	1100	1210	11	NA	± 15 %	AverageRF
n-Triacontane	50	52	932	967	4	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Date Analyzed:** 11/10/2011

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10661  
**Analysis Lot:** KWG1111583  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\110911F\1109F062.D  
J:\GC21\DATA\110911F\1109F064.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	827	947	14	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1000	602	612	2	NA	± 15 %	AverageRF
o-Terphenyl	50	57	1100	1250	14	NA	± 15 %	AverageRF
n-Triacontane	50	55	932	1020	10	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.



## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Date Analyzed:** 11/11/2011

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10661  
**Analysis Lot:** KWG1111603  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\111111F\1111F008.D  
J:\GC21\DATA\111111F\1111F010.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	827	903	9	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	970	602	582	-3	NA	± 15 %	AverageRF
o-Terphenyl	50	53	1100	1170	7	NA	± 15 %	AverageRF
n-Triacontane	50	46	932	866	-7	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840  
**Date Analyzed:** 11/12/2011

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10661  
**Analysis Lot:** KWG1111603  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\111111F\1111F034.D  
J:\GC21\DATA\111111F\1111F036.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	827	925	12	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1000	602	631	5	NA	± 15 %	AverageRF
o-Terphenyl	50	55	1100	1200	9	NA	± 15 %	AverageRF
n-Triacontane	50	56	932	1040	11	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840

**Analysis Run Log**  
**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx

**Analysis Lot:** KWG1111583  
**Instrument ID:** GC21  
**Column:** ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
1109F032.D	Continuing Calibration Verification	KWG1111583-1	11/10/2011	02:20		11/10/2011	02:36
1109F034.D	Continuing Calibration Verification	KWG1111583-1	11/10/2011	02:42		11/10/2011	02:58
1109F036.D	Instrument Blank	KWG1111583-3	11/10/2011	03:04		11/10/2011	03:20
1109F038.D	Lab Control Sample	KWG1111409-4	11/10/2011	03:26		11/10/2011	03:42
1109F040.D	Method Blank	KWG1111409-5	11/10/2011	03:48		11/10/2011	04:04
1109F042.D	Batch QC	K1110642-001	11/10/2011	04:10		11/10/2011	04:26
1109F044.D	Batch QCDUP	KWG1111409-3	11/10/2011	04:32		11/10/2011	04:48
1109F046.D	ZZZZZZ	ZZZZZZ	11/10/2011	04:54		11/10/2011	05:10
1109F048.D	ZZZZZZ	ZZZZZZ	11/10/2011	05:16		11/10/2011	05:32
1109F050.D	ZZZZZZ	ZZZZZZ	11/10/2011	05:38		11/10/2011	05:54
1109F052.D	ZZZZZZ	ZZZZZZ	11/10/2011	06:00		11/10/2011	06:16
1109F054.D	ZZZZZZ	ZZZZZZ	11/10/2011	06:22		11/10/2011	06:38
1109F056.D	SW08-007	K1110840-001	11/10/2011	06:44		11/10/2011	07:00
1109F058.D	ZZZZZZ	ZZZZZZ	11/10/2011	07:06		11/10/2011	07:22
1109F060.D	ZZZZZZ	ZZZZZZ	11/10/2011	07:27		11/10/2011	07:43
1109F062.D	Continuing Calibration Verification	KWG1111583-2	11/10/2011	07:50		11/10/2011	08:06
1109F064.D	Continuing Calibration Verification	KWG1111583-2	11/10/2011	08:12		11/10/2011	08:28
1109F066.D	Instrument Blank	KWG1111583-4	11/10/2011	08:33		11/10/2011	08:49

Results flagged with an asterisk (\*) indicate the holding time was exceeded for the analysis

## COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220

**Service Request:** K1110840

**Analysis Run Log**  
**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx

**Analysis Lot:** KWG1111603  
**Instrument ID:** GC21  
**Column:** ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
1111F008.D	Continuing Calibration Verification	KWG1111603-1	11/11/2011	19:22		11/11/2011	19:38
1111F010.D	Continuing Calibration Verification	KWG1111603-1	11/11/2011	19:44		11/11/2011	20:00
1111F012.D	Instrument Blank	KWG1111603-3	11/11/2011	20:06		11/11/2011	20:22
1111F014.D	Batch QC	K1110811-003	11/11/2011	20:29		11/11/2011	20:45
1111F016.D	Batch QCMS	KWG1111409-1	11/11/2011	20:51		11/11/2011	21:07
1111F018.D	Batch QCDMS	KWG1111409-2	11/11/2011	21:13		11/11/2011	21:29
1111F020.D	ZZZZZZ	ZZZZZZ	11/11/2011	21:35		11/11/2011	21:51
1111F022.D	ZZZZZZ	ZZZZZZ	11/11/2011	21:57		11/11/2011	22:13
1111F024.D	ZZZZZZ	ZZZZZZ	11/11/2011	22:19		11/11/2011	22:35
1111F026.D	ZZZZZZ	ZZZZZZ	11/11/2011	22:41		11/11/2011	22:57
1111F028.D	ZZZZZZ	ZZZZZZ	11/11/2011	23:04		11/11/2011	23:20
1111F030.D	ZZZZZZ	ZZZZZZ	11/11/2011	23:26		11/11/2011	23:42
1111F032.D	ZZZZZZ	ZZZZZZ	11/11/2011	23:48		11/12/2011	00:04
1111F034.D	Continuing Calibration Verification	KWG1111603-2	11/12/2011	00:10		11/12/2011	00:26
1111F036.D	Continuing Calibration Verification	KWG1111603-2	11/12/2011	00:32		11/12/2011	00:48
1111F038.D	Instrument Blank	KWG1111603-4	11/12/2011	00:54		11/12/2011	01:10

Results flagged with an asterisk (\*) indicate the holding time was exceeded for the analysis

## COLUMBIA ANALYTICAL SERVICES, INC.

## QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW08/54220  
**Sample Matrix:** Water

**Service Request:** K1110840  
**Date Extracted:** 11/08/2011

**Extraction Prep Log**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Extraction Lot:** KWG1111409  
**Level:** Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
SW08-007	K1110840-001	11/02/11	11/05/11	460mL	1mL	NA	
Batch QCDUP	KWG1111409-3	NA	NA	490mL	1mL	NA	
Method Blank	KWG1111409-5	NA	NA	1000mL	2mL	NA	
Batch QC	K1110642-001	NA	NA	490mL	1mL	NA	
Batch QC	K1110811-003	NA	NA	470mL	1mL	NA	
Batch QCMS	KWG1111409-1	NA	NA	460mL	1mL	NA	
Batch QCDMS	KWG1111409-2	NA	NA	470mL	1mL	NA	
Lab Control Sample	KWG1111409-4	NA	NA	1000mL	2mL	NA	

Results flagged with an asterisk (\*) indicate the holding time was exceeded for the analysis

# **Analytical Chemistry Data Package**

**Project: Non-Dry Dock Stormwater  
SW09 - January 21, 2012  
Chemical Analyses**

Battelle Project No. 54220/62375  
CF No. 3174



Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, WA 98382  
PM: Jill Brandenberger  
(360) 681-4564

# CHEMISTRY ANALYSIS DATA PACKAGE CONTENTS

**Non-Dry Dock Stormwater  
SW09 January 21, 2012  
Chemical Analyses**

## **Chemistry Analysis Summaries**

Field Data Report Metals.....	3
Field Data Summary TPH, TOC/DOC, TSS, Hardness .....	5
QA/QC Summary Reports Metals .....	6
QA/QC Narrative Metals.....	9

## **Sample Custody Information**

Chain of Custody Form .....	12
Laboratory Sample Log-In Form .....	15
Log-In Checklist.....	16
Chain of Custody Form, Shipped to CAS.....	17
Log-In Checklist, Shipped to CAS .....	23

## **CVAF Analysis of Samples for Hg**

*Analytical raw data available upon request*

## **ICP-MS Analysis of Samples for Metals**

*Analytical raw data available upon request*

## **Analysis of TPH, TOC/DOC, TSS, Hardness**

CAS Narrative, Batch K1200620.....	24
Summary and QC Report, Batch K1200620 .....	25

*Analytical raw data available upon request*

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW09  
Metals in Water  
UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Collection Date	Hg	As	Ag	Al	Cd
<i>Instrument:</i>						<i>CVAF</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Freshwater)						0.0001	0.03	0.002	0.3	0.004
Freshwater Reporting Limit (MDL* 3.18)						0.0003	0.1	0.006	1.0	0.01

**SW09**

SW09-0041	PSNS084.1	TME	Composite_equal_time	3174*91	01/21/12	0.00455	0.768	0.0134	436	0.255
SW09-0042	PSNS084.1	DME	Composite_equal_time	3174*92	01/21/12	0.00124	0.489	0.002 U	20.9	0.112
SW09-0043	PSNS115.1	TME	Composite_equal_time	3174*93	01/21/12	0.0186	1.80	0.106	394	0.496
SW09-0044	PSNS115.1	DME	Composite_equal_time	3174*94	01/21/12	0.00153	0.455	0.00354 J	10.2	0.170
SW09-0045	PSNS124.1	TME	Composite_equal_time	3174*95	01/21/12	0.00568	0.724	0.0191	348	0.631
SW09-0046	PSNS124.1	DME	Composite_equal_time	3174*96	01/21/12	0.00130	0.532	0.002 U	14.3	0.309
SW09-0047	PSNS126	TME	Composite_equal_time	3174*97	01/21/12	0.00396	2.14	0.0175	163	0.130
SW09-0048	PSNS126	DME	Composite_equal_time	3174*98	01/21/12	0.00185	2.03	0.002 U	12.8	0.0724
SW09-0049	PSNS126Dup	TME	Composite_equal_time	3174*99	01/21/12	0.00591	2.11	0.0212	146	0.134
SW09-0050	PSNS126Dup	DME	Composite_equal_time	3174*100	01/21/12	0.00175	2.10	0.00265 J	16.0	0.0823
SW09-0051	PSNS124	TME	Composite_equal_time	3174*101	01/21/12	0.00727	1.58	0.0179	136	0.286
SW09-0052	PSNS124	DME	Composite_equal_time	3174*102	01/21/12	0.00198	1.37	0.002 U	7.39	0.207
SW09-0053	PSNS015	TME	Composite_equal_time	3174*103	01/21/12	0.0261	0.741	0.0163	1130	0.0842
SW09-0054	PSNS015	DME	Composite_equal_time	3174*104	01/21/12	0.00180	0.503	0.002 U	33.3	0.0386



**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater**

**ENVVEST 2011-12\_SW09**

**Metals in Water**

**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	CVAF Batch ID	ICP-MS Batch ID
					<i>Instrument:</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	
Laboratory Achieved Detection Limits (Freshwater)						0.08	0.007	0.002	0.05	
Freshwater Reporting Limit (MDL* 3.18)						0.3	0.02	0.006	0.2	

**SW09**

SW09-0041	PSNS084.1	TME	Composite_equal_time	3174*91	3.96	21.1	8.91	169	013012HGA	020212-6100
SW09-0042	PSNS084.1	DME	Composite_equal_time	3174*92	1.05	4.41	0.248	120	013012HGA	020212-6100
SW09-0043	PSNS115.1	TME	Composite_equal_time	3174*93	6.33	51.0	35.7	177	013012HGA	020212-6100
SW09-0044	PSNS115.1	DME	Composite_equal_time	3174*94	0.851	7.47	0.438	98.3	013012HGA	020212-6100
SW09-0045	PSNS124.1	TME	Composite_equal_time	3174*95	5.94	35.6	13.7	184	013012HGA	020212-6100
SW09-0046	PSNS124.1	DME	Composite_equal_time	3174*96	1.97	7.65	0.371	115	013012HGA	020212-6100
SW09-0047	PSNS126	TME	Composite_equal_time	3174*97	1.83	8.98	3.52	61.9	013012HGA	020212-6100
SW09-0048	PSNS126	DME	Composite_equal_time	3174*98	1.54	4.78	0.255	48.1	013012HGA	020212-6100
SW09-0049	PSNS126Dup	TME	Composite_equal_time	3174*99	2.09	9.47	3.78	62.8	013012HGA	020212-6100
SW09-0050	PSNS126Dup	DME	Composite_equal_time	3174*100	1.89	4.89	0.299	48.8	013012HGA	020212-6100
SW09-0051	PSNS124	TME	Composite_equal_time	3174*101	6.14	39.5	4.95	76.6	013012HGA	020212-6100
SW09-0052	PSNS124	DME	Composite_equal_time	3174*102	5.33	16.1	0.193	54.5	013012HGA	020212-6100
SW09-0053	PSNS015	TME	Composite_equal_time	3174*103	3.20	9.74	9.47	69.1	013012HGA	020212-6100
SW09-0054	PSNS015	DME	Composite_equal_time	3174*104	1.70	2.80	0.393	37.7	013012HGA	020212-6100

BATTELLE MARINE SCIENCE LABORATORIES

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW09

Station Code	Sample ID	Type Name	Collection Date	Analysis Date	Analysis Method	Component	Units	Result	Detection Limit	Reporting Limit
PSNS015	SW09-0039	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.41 =	0.07	0.50
PSNS015	SW09-0038	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.68 =	0.07	0.50
PSNS015	SW09-0037	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	24.8 =	0.8	2.0
PSNS015	SW09-0040	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	36.0 =	5.0	5.0
PSNS015	SW09-005	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	150 =, J	11	240
PSNS015	SW09-005	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	650 =, O	19	480
PSNS084.1	SW09-0015	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.00 =	0.07	0.50
PSNS084.1	SW09-0014	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.23 =	0.07	0.50
PSNS084.1	SW09-0013	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	16.8 =	0.8	2.0
PSNS084.1	SW09-0016	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	17.0 =	5.0	5.0
PSNS084.1	SW09-004	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	210 =, J	11	240
PSNS084.1	SW09-004	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	630 =, O	19	480
PSNS115.1	SW09-0019	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	0.98 =	0.07	0.50
PSNS115.1	SW09-0018	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.12 =	0.07	0.50
PSNS115.1	SW09-0017	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	12.0 =	0.8	2.0
PSNS115.1	SW09-0020	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	25.0 =	5.0	5.0
PSNS115.1	SW09-006	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	65 =, J	11	240
PSNS115.1	SW09-006	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	210 =, J	19	480
PSNS124	SW09-0035	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	0.89 =	0.07	0.50
PSNS124	SW09-0034	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.03 =	0.07	0.50
PSNS124	SW09-0033	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	97.6 =	0.8	2.0
PSNS124	SW09-0036	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	9.0 =	5.0	5.0
PSNS124	SW09-003	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	95 =, J	11	240
PSNS124	SW09-003	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	280 =, J	19	480
PSNS124.1	SW09-0023	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.07 =	0.07	0.50
PSNS124.1	SW09-0022	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.03 =	0.07	0.50
PSNS124.1	SW09-0021	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	28.4 =	0.8	2.0
PSNS124.1	SW09-0024	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	12.5 =	5.0	5.0
PSNS124.1	SW09-002	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	150 =, J	12	280
PSNS124.1	SW09-002	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	530 =, J	21	550
PSNS126	SW09-0027	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.03 =	0.07	0.50
PSNS126	SW09-0026	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.11 =	0.07	0.50
PSNS126	SW09-0025	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	26.0 =	0.8	2.0
PSNS126	SW09-0028	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	5.0 =	5.0	5.0
PSNS126	SW09-001	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	72 =, J	13	290
PSNS126	SW09-001	Grab	01/20/2012	02/02/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	210 =, J	22	580
PSNS126Dup	SW09-0031	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.09 =	0.07	0.50
PSNS126Dup	SW09-0030	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.22 =	0.07	0.50
PSNS126Dup	SW09-0029	Composite_equal_time	01/21/2012	01/27/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	28.8 =	0.8	2.0
PSNS126Dup	SW09-0032	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	10.0 =	5.0	5.0

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	ICP-MS Batch ID
<i>Instrument:</i>					<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	
Laboratory Achieved Detection Limits (Freshwater)					0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater Reporting Limit (MDL* 3.18)					0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	

#### METHOD BLANKS

MB-1		TME	Freshwater	TRM Blank R1	0.03 U	0.002 U	0.422 J	0.004 U	0.08 U	0.007 U	0.002 U	0.0643 J	020212-6100
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#### LABORATORY CONTROL SAMPLES

Spiking Level					<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	
LCS-1		TME	Freshwater	TRM LCS R1	1.96	1.94	2.45	2.01	1.91	1.98	1.95	1.94	020212-6100
Percent Recovery, LCS					<b>98%</b>	<b>97%</b>	<b>101%</b>	<b>101%</b>	<b>96%</b>	<b>99%</b>	<b>98%</b>	<b>94%</b>	

#### MATRIX SPIKE RESULTS

SW09-0054	PSNS015	DME	Composite_equal_time	3174*104	0.503	0.002 U	33.3	0.0386	1.70	2.80	0.393	37.7	020212-6100
MS		DME	Composite_equal_time	3174*104 MS	2.63	1.72	81.5	2.10	3.79	4.68	2.44	89.2	020212-6100
MSD		DME	Composite_equal_time	3174*104 MSD	2.59	1.73	81.6	2.07	3.73	4.64	2.42	87.9	020212-6100
Spiking Level					2	2	50	2	2	2	2	50	
Percent Recovery, MS					<b>106%</b>	<b>86%</b>	<b>96%</b>	<b>103%</b>	<b>105%</b>	<b>94%</b>	<b>102%</b>	<b>103%</b>	
Percent Recovery, MSD					<b>104%</b>	<b>87%</b>	<b>97%</b>	<b>102%</b>	<b>102%</b>	<b>92%</b>	<b>101%</b>	<b>100%</b>	
RPD					<b>1.9%</b>	<b>0.6%</b>	<b>0.2%</b>	<b>1.5%</b>	<b>2.9%</b>	<b>2.2%</b>	<b>1.0%</b>	<b>2.6%</b>	

#### REPLICATE PRECISION

SW09-0053	PSNS015	TME	Composite_equal_time	3174*103	0.741	0.0163	1130	0.0842	3.20	9.74	9.47	69.1	020212-6100
DUP	PSNS015	TME	Composite_equal_time	3174*103r2	0.724	0.0278	1070	0.082	3.12	9.73	9.46	68.2	020212-6100
<i>Mean</i>					<i>0.733</i>	<i>0.0221</i>	<i>1100</i>	<i>0.083</i>	<i>3.16</i>	<i>9.74</i>	<i>9.47</i>	<i>68.7</i>	
RPD					<b>2.3%</b>	<b>52.2% *</b>	<b>5.5%</b>	<b>3.1%</b>	<b>2.5%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>1.3%</b>	
SW09-0054	PSNS015	DME	Composite_equal_time	3174*104	0.503	0.002 U	33.3	0.0386	1.70	2.80	0.393	37.7	020212-6100
DUP	PSNS015	DME	Composite_equal_time	3174*104r2	0.513	0.002 U	32.6	0.0354	1.78	2.80	0.387	37.8	020212-6100
<i>Mean</i>					<i>0.508</i>	<i>NA</i>	<i>33.0</i>	<i>0.0370</i>	<i>1.74</i>	<i>2.80</i>	<i>0.390</i>	<i>37.8</i>	
RPD					<b>2.0%</b>	<b>NA</b>	<b>2.1%</b>	<b>8.6%</b>	<b>4.6%</b>	<b>0.0%</b>	<b>1.5%</b>	<b>0.3%</b>	

#### STANDARD REFERENCE MATERIAL, Seawater

SRM 1640-1		TME	Freshwater	TRM 1640_020212	26.2	6.35	56.0	23.2	38.0	86.6	27.7	56.2	020212-6100
Certified Value					<b>26.67</b>	<b>7.62</b>	<b>52.0</b>	<b>22.8</b>	<b>38.6</b>	<b>85.2</b>	<b>27.9</b>	<b>53.2</b>	
PD					<b>1.8%</b>	<b>16.7%</b>	<b>7.7%</b>	<b>1.8%</b>	<b>2%</b>	<b>1.6%</b>	<b>0.7%</b>	<b>5.6%</b>	

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 360/681-4564

**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW09**  
**Metals in Water**  
**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	Hg	CVAF Batch ID
<i>Instrument:</i>					<i>CVAF</i>	
Laboratory Achieved Detection Limits					<b>0.0001</b>	
Reporting Limit (MDL* 3.18)					<b>0.0003</b>	
<b><u>METHOD BLANKS</u></b>						
MB-1		TME	Freshwater	MB1_012912	0.000102 J	013012HGA
MB-2		TME	Freshwater	MB2_012912	0.0001 U	013012HGA
MB-3		TME	Freshwater	MB3_012912	0.0001 U	013012HGA
<b><u>LABORATORY CONTROL SAMPLES</u></b>						
Spiking Level					0.00496	
LCS (1)		TME	Freshwater	OPR 012912 run1	0.00495	013012HGA
LCS (2)		TME	Freshwater	OPR 012912 run2	0.00493	013012HGA
LCS Blank (1)		TME	Freshwater	Blank012912	0.000196	013012HGA
Percent Recovery, LCS 1					<b>96%</b>	
Percent Recovery, LCS 2					<b>95%</b>	
SW09-0042	PSNS084.1	DME	Composite_equal_time	3174*92	0.00124	013012HGA
MS1	PSNS084.1	DME	Composite_equal_time	3174*92 MS	0.0123	013012HGA
MSD1	PSNS084.1	DME	Composite_equal_time	3174*92 MSD	0.0127	013012HGA
Spiking Level, MS					0.0114	
Spiking Level, MSD					0.0116	
Percent Recovery, MS					<b>97%</b>	
Percent Recovery, MSD					<b>99%</b>	
RPD					<b>1.8%</b>	
SW09-0051	PSNS124	TME	Composite_equal_time	3174*101	0.00727	013012HGA
MS2	PSNS124	TME	Composite_equal_time	3174*101 MS	0.0277	013012HGA
MSD2	PSNS124	TME	Composite_equal_time	3174*101 MSD	0.0284	013012HGA
Spiking Level, MS					0.0201	
Spiking Level, MSD					0.0207	
Percent Recovery, MS					<b>102%</b>	
Percent Recovery, MSD					<b>102%</b>	
RPD					<b>0.4%</b>	
<b><u>REPLICATE PRECISION</u></b>						
SW09-0053	PSNS015	TME	Composite_equal_time	3174*103	0.0261	013012HGA
DUP	PSNS015	TME	Composite_equal_time	3174*103r2	0.0239	013012HGA
Mean					0.0250	
RPD					<b>9%</b>	
SW09-0054	PSNS015	DME	Composite_equal_time	3174*104	0.00180	013012HGA
DUP	PSNS015	TME	Composite_equal_time	3174*104r2	0.00164	013012HGA
Mean					0.00172	
RPD					<b>9%</b>	
<b><u>STANDARD REFERENCE MATERIAL</u></b>						
SRM 1641 (1)		TME	Freshwater	1641d 012912	1627	
Certified Value					<b>1590</b>	
range					<b>±18</b>	
SRM 1641 (1)					<b>PD</b>	
					<b>2%</b>	

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**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW09  
Metals in Water**

**DATA QUALIFIERS:**

- c Exceeds DQO but meets contingency criteria of either:
  - 1 SRM certified <10x MDL
  - 2 Insufficient spiking level relative to native sample concentrations
  - 3 Sample concentration <10x MDL
- U Analyte not detected at or above the MDL, MDL reported
- J Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%
- & Accuracy result outside QC criterion of  $\leq 20\%$  PD
- \* Precision result outside QC criterion of  $< 30\%$
- NS Sample not spiked for this analyte
- B Analyte detected in the method blank > RL
  - and sample concentration < 10 times detected blank value
- b Data are blank corrected using the batch specific procedural blank
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- ND Not detected

**Notes:**

- Composite\_equal\_time Equal portion composite of time integrated sample (ISCO samples)
- NC Not Certified
  - Not analyzed
  - NA Not applicable/available
  - TME Total Metals Fraction
  - DME Dissolved Metals Fraction
  - 2 Sample specific MDLs and RLs reported

## QA/QC NARRATIVE

**PROJECT:** Non-Dry Dock Stormwater Sampling for SW09

**PARAMETER:** Total and Dissolved Metals – Al, Ag, As, Cd, Cr, Cu, Pb, Zn, Hg

**LABORATORY:** Battelle Marine Sciences Laboratory (MSL), Sequim, Washington

**MATRIX:** Stormwater (as a freshwater matrix)

**SAMPLE CUSTODY AND PROCESSING:** Samples were collected from stormwater outfalls located within the Confined Industrial Area (CIA) and Naval Base Kitsap (NBK) at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) by TEC, MSL, and the U.S. Navy. This storm is the second of the 2011-12 storm season. The outfalls include PSNS015, PSNS126, PSNS084.1, PSNS115.1, PSNS124, and PSNS124.1. This sample delivery includes grab and stormwater composite samples collected from those stations during SW09. The storm event identified as SW09 began on January 20, 2011 with the composites ending 24 hours later.

Samples were collected and analyzed in accordance with the Quality Assurance Project Plan (Taylor Associates, Inc. and PNNL 2011 and amended 2012). Two types of samples were to be collected during the storm. The first was a time proportionate composite sample collected using an ISCO sampler at each of the six outfall locations. The second was a grab sample collected during the storm event in amber glass jars provided by Columbia Analytical Services (CAS) for total petroleum hydrocarbons (TPH). The individual time paced composites collected in the 24 wedge bottles were carried back to the stormwater lab at PSNS & IMF and composited into a single event mean composite (EMC) in a pre-cleaned glass jar. All samples were hand delivered within 24 hours of collection to MSL.

Upon receipt at MSL, the condition of all the samples were verified as acceptable and tracked back to the field chain of custody (COC). In the clean laboratory at MSL, each glass composite sample jar was shaken vigorously (prior and between aliquot removal) and aliquots were poured into the following types of containers:

1. 500 mL Teflon bottle for total metals (TME),
2. 500 mL 0.45µm polyvinylidene fluoride (PVDF) filter unit, vacuum filtered in a class 100 clean bench and then poured into a 500 mL Teflon bottle for dissolved metals,
3. 250 mL low-density polyethylene (LDPE) bottle provided by CAS that included a nitric acid preservative for samples to be analyzed for hardness (HRD),
4. 500 mL LDPE container with sulfuric acid preservative provided by CAS for the analysis of total organic carbon (TOC),
5. 60 mL syringe and ashed glass fiber filter (GFF) in a cleaned filter holder. An aliquot of the sample was filtered into a 250 mL LDPE container with sulfuric acid preservative provided by CAS for the analysis of dissolved organic carbon (DOC),
6. 500 mL or 1L LDPE bottle provided by CAS for the analysis of total suspended solids (TSS), and turbidity was measured in the field.

The total metal fractions and dissolved metal fractions were each acidified inside a Class 100 clean bench to a pH of < 2.0 with double distilled nitric acid. The samples were then assigned a Battelle Central File (CF) identification number (3174) and were entered into Battelle's sample tracking system. The composite aliquots for TOC, DOC, hardness, and TSS were all forwarded to CAS for analysis. The quality control narrative for these parameters was provided separately.

## QA/QC NARRATIVE

The following lists information on sample receipt and processing activities:

<b>Sample Receipt Dates:</b>	SW09: 01/21/12
<b>Cooler temp.</b> on arrival	All coolers were at 4.0±2°C
<b>Collection dates</b>	01/21/12
<b>CVAF analysis dates (Hg)</b>	01/30/12
<b>TRM Prep/Freshwater Analysis by ICP-MS</b> (As, Ag, Al, Cd, Cr, Cu, Pb, Zn)	02/02/12

### QA/QC DATA QUALITY OBJECTIVES:

Analyte	Analytical Method for Seawater	MS Range of Recovery	SRM Percent Difference	Replicate Precision	Method Detection Limits (µg/L)	Reporting Limits (µg/L)
Aluminum	ICP-MS	70-130%	≤20%	≤30%	0.3	1.0
Arsenic	ICP-MS	70-130%	≤20%	≤30%	0.03	0.1
Cadmium	ICP-MS	70-130%	≤20%	≤30%	0.004	0.01
Chromium	ICP-MS	70-130%	≤20%	≤30%	0.08	0.3
Copper	ICP-MS	70-130%	≤20%	≤30%	0.007	0.02
Lead	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Silver	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Zinc	ICP-MS	70-130%	≤20%	≤30%	0.05	0.2
Mercury	CVAF	70-130%	≤20%	≤30%	0.0001	0.0003

### METHODS:

Samples were analyzed for nine metals: aluminum (Al), arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), silver (Ag), zinc (Zn), and mercury (Hg). Samples were submitted for analyses following two methods. All samples were analyzed for Hg by Cold Vapor Atomic Fluorescence (CVAF) in accordance with Battelle SOP *MSL-I-013, Total Mercury in Aqueous Samples by CVAF*, following EPA Method 1631 revision E.

All samples were analyzed for other metals by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) in accordance with Battelle SOP *MSL-I-022, Determination of Elements in Aqueous and Digestate Samples by ICP/MS*. The base methods for this procedure are EPA Method 1638 and EPA Method 1640. All samples were digested following the total metal recoverable (TRM) method established in EPA Method 1640 prior to analysis by ICP-MS. In summary, this preparation brings the pH of the sample to 2% and heats the capped samples for 2.5 hours in a 85°C oven to solubilize particulates. Both the filtered and unfiltered fractions were prepared using this method to destroy any colloidal particles remaining in the filtered (aka. dissolved) fraction. All results were reported in units of µg/L. Data are not blank corrected.

### HOLDING TIMES:

All samples were analyzed within the established holding times of 90 days for Hg and six months for all other metals.

## QA/QC NARRATIVE

<b>DETECTION LIMITS:</b>	<p>Laboratory method detection limits (MDLs) for TRM freshwater were reported from the MDL study (annually verified) as determined by seven replicates of deionized water spiked at appropriate concentrations and prepared using the TRM method. Reporting limits are determined as 3.18 times the laboratory achieved MDL. The data are evaluated and flagged as follows:</p> <ul style="list-style-type: none"><li>U Analyte not detected at or above the MDL, MDL reported</li><li>J Analyte detected above the MDL, but less than the RL</li><li>N Spiked sample recovery outside QC criterion of 70-130%</li><li>&amp; Accuracy result outside QC criterion of <math>\leq 20\%</math> PD</li><li>* Precision result outside QC criterion of <math>&lt; 30\%</math></li><li>B Analyte detected in the method blank <math>&gt; RL</math> and sample concentration <math>&lt; 10</math> times detected blank value</li><li>c Exceeds data quality objective but meets contingency criterion</li></ul>
<b>METHOD BLANKS:</b>	<p>A minimum of one method blank was prepared and analyzed by each instrument with each analytical batch. The method blanks were all less than the RL.</p>
<b>LABORATORY CONTROL SAMPLES:</b>	<p>A minimum of one LCS (OPR or blank spike) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for LCS samples were within the QC acceptance criterion of 70% to 130% for all metals. They also met a secondary criterion of <math>\pm 15\%</math> recovery for metals of concern.</p>
<b>MATRIX SPIKE ACCURACY:</b>	<p>A minimum of one set of duplicate matrix spikes (MS/MSD) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for matrix spikes were within the QC limits of 70% to 130% for all metals.</p>
<b>REPLICATE PRECISION:</b>	<p>Laboratory precision was expressed as the relative percent difference (RPD) between laboratory duplicates. Two sets of duplicates were prepared, one on a total fraction and one on the dissolved fraction. This was used to evaluate previous heterogeneity issues notes for Hg. The RPD values for the laboratory duplicates were within the QC acceptance criterion of <math>\pm 30\%</math> for all metals detected above the RL, with the exception of one replicate for Ag (52% RPD). Acceptable precision for Ag was demonstrated by the duplicate matrix spikes (0.6%).</p>
<b>STANDARD REFERENCE MATERIAL ACCURACY:</b>	<p>Standard reference materials (SRM) were prepared and analyzed with each analytical batch at a minimum frequency of 1 per 20 or fewer samples. Analytical accuracy was expressed as the percent difference (PD) between the measured and the certified value. The freshwater SRMs were 1641d for Hg and 1640 for all other metals. The differences were within the QC acceptance criterion of <math>\leq 20\%</math>.</p>
<b>REFERENCE:</b>	<p>Taylor Associates, Inc. – Division of TEC, Inc. and Pacific Northwest National Laboratory (2011). Non-Dry Dock Stormwater Monitoring Conducted at Puget Sound Naval Shipyard Bremerton, WA, Project ENVVEST Study Area. Document prepared for the United States Navy Puget Sound Naval Shipyard.</p>



Date: 1/21/2012

Project No.: N4523A10MP00034 Amend.1

## Battelle

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

① Turbidity measured at Navy Stormwater Lab during comp'ing session

Date: 1/20/2012

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

# Stormwater Event #09

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

[illegible]

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 1/1/2112 1/21/12 5/2012

Page: 1 of 1

Project No.: 54220

Project: Non-dry Dock Stormwater SW09

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

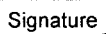
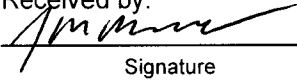
Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW09-0041	PSNS084.1	1/21/2012 1023	SW					x							1	comp	SW09	3174*91
SW09-0042	PSNS084.1	1/21/2012 1023	SW						x						1	comp	SW09	3174*92
SW09-0043	PSNS115.1	1/21/2012 0949	SW					x							1	comp	SW09	3174*93
SW09-0044	PSNS115.1	1/21/2012 0949	SW						x						1	comp	SW09	3174*94
SW09-0045	PSNS124.1	1/21/2012 0127	SW					x							1	comp	SW09	3174*95
SW09-0046	PSNS124.1	1/21/2012 0127	SW						x						1	comp	SW09	3174*96
SW09-0047	PSNS126	1/21/2012 1158	SW					x							1	comp	SW09	3174*97
SW09-0048	PSNS126	1/21/2012 1158	SW						x						1	comp	SW09	3174*98
SW09-0049	PSNS126Dup	1/21/2012 1158	SW					x							1	comp	SW09	3174*99
SW09-0050	PSNS126Dup	1/21/2012 1158	SW						x						1	comp	SW09	3174*100
SW09-0051	PSNS124	1/21/2012 0905	SW					x							1	comp	SW09	3174*101
SW09-0052	PSNS124	1/21/2012 0905	SW						x						1	comp	SW09	3174*102
SW09-0053	PSNS015	1/21/2012 0957	SW					x							1	comp	SW09	3174*103
SW09-0054	PSNS015	1/21/2012 0957	SW						x						1	comp	SW09	3174*104

Relinquished by:	Received by:	Total # of Containers
 <u>NA</u>	 <u>1/21/12</u>	Shipment Method:
Signature _____ Date _____ Time _____	Signature _____ <u>2205</u>	<b>Retained at Battelle</b>
Printed Name _____ Company _____	Printed Name _____	Sample Disposition:
Relinquished by:	Received by:	Distribution:
Signature _____ Date _____ Time _____	Signature _____	1) PNNL
Printed Name _____ Company _____	Printed Name _____	

## **SAMPLE LOGIN**

Project Manager: Brandenberger

Date Received: 1/21/2012

Batch: 10

Login Designee: Brandenberger

Project: **Non-dry dock Storm water - SW09 (Jan 2012)**



*Marine Sciences Laboratory*

*1529 West Sequim Bay Road*

*Sequim, Washington 98382*

*PH: (360) 681-4565*

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW09-0041	PSNS084.1	3174*91	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0042	PSNS084.1	3174*92	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12
SW09-0043	PSNS115.1	3174*93	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0044	PSNS115.1	3174*94	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12
SW09-0045	PSNS124.1	3174*95	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0046	PSNS124.1	3174*96	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12
SW09-0047	PSNS126	3174*97	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0048	PSNS126	3174*98	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12
SW09-0049	PSNS126Dup	3174*99	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0050	PSNS126Dup	3174*100	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12
SW09-0051	PSNS124	3174*101	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0052	PSNS124	3174*102	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12
SW09-0053	PSNS015	3174*103	WAT	Prep Lab, L-5-D	Total Metals	01/21/12
SW09-0054	PSNS015	3174*104	WAT	Prep Lab, L-5-D	Dissolved Metals	01/21/12

## LOG-IN CHECKLIST SW09

Reference SOP# MSL-A-001

Central File #: 3174 Sample No(s): 91-104

Batch: 10 (SW09)

Project Name: Non Dry Dock SW (SW09)

Project Manager: JMS

## TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: \_\_\_\_\_

WP# \_\_\_\_\_

Yes

No

☐☒

Navy-type Project (requires high-level sample tracking procedures)

☐☒

USDA Samples (see Compliance Agreement Checklist)

PM Verification: \_\_\_\_\_

☒☐

Filter Samples:

Amount: \_\_\_\_\_

Entire sample

Half of sample

☐☒

Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)

☒☐

Special instructions:

split per QAPP

Sample Preservation Instructions:

various

\*\*See LIMS for archive/disposal information\*\*

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes

No

N/A

Indicate in Appropriate Box

☐☐☒

Custody seal present

Seal intact?

YES

NO

☒☐☐Cooler temperature (acceptable range:  $4 \pm 2^\circ\text{C}$  or solids: frozen)  
(if multiple coolers, note temp. of each)

4.0 °C

☐☐☒

Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)

Comment/Remedy: \_\_\_\_\_

☒☐☐

Were all chain of custody forms signed and dated?

☒☐☐

Were samples filtered at MSL?

Sample condition(s):

Acceptable

Other (explain): \_\_\_\_\_

Container type:

Teflon

Poly

Glass

Cap. Vial

Other: \_\_\_\_\_

Notes: \_\_\_\_\_

Completed By: JMS

Date/Time:

4/21/12 2205

## SAMPLE PRESERVATION

☐

Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)

☐

Random pH checked for ~10% of samples (use dip paper)

Sample IDs: \_\_\_\_\_

☐

Complete pH check required for project (use pH meter and record on pH Record form)

☐

Sample(s) were preserved at MSL

Type:

☒0.2% HNO<sub>3</sub>

Notes:

TME/OME

Lot#

121020

☐

0.5% HCl (Hg samples)

Notes:

Lot#

☒

Refrigerate/Freeze

Notes:

TSS/mat TOC/DOC/Hardness/TPH

☐

Other

Notes: \_\_\_\_\_

Completed By: JMS

Date/Time:

4/21/12 0115

Storage Shelf:

prep lab - L-5-D

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: ~~1/1/2012~~ 1/21/12

Page: 1 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW09

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW09-001	PSNS126	1/20/2012 1700	SW							X						1	grab	SW09	
SW09-002	PSNS124.1	1/20/2012 1715	SW							X						1	grab	SW09	
SW09-003	PSNS124	1/20/2012 1730	SW							X						1	grab	SW09	
SW09-004	PSNS084.1	1/20/2012 1745	SW							X						1	grab	SW09	
SW09-005	PSNS015	1/20/2012 1800	SW							X						1	grab	SW09	
SW09-006	PSNS115.1	1/20/2012 1827	SW							X						1	grab	SW09	
SW09-0013	PSNS084.1	1/21/2012 1023	SW	x												1	comp	SW09	SW09-007
SW09-0014	PSNS084.1	1/21/2012 1023	SW		x											1	comp	SW09	SW09-007
SW09-0015	PSNS084.1	1/21/2012 1023	SW			x										1	comp	SW09	SW09-007
SW09-0016	PSNS084.1	1/21/2012 1023	SW				x									1	comp	SW09	SW09-007
SW09-0017	PSNS115.1	1/21/2012 0949	SW	x												1	comp	SW09	SW09-008
SW09-0018	PSNS115.1	1/21/2012 0949	SW		x											1	comp	SW09	SW09-008
SW09-0019	PSNS115.1	1/21/2012 0949	SW			x										1	comp	SW09	SW09-008
SW09-0020	PSNS115.1	1/21/2012 0949	SW				x									1	comp	SW09	SW09-008

Relinquished by: Mico 1/23/2012 13:10

Signature: Li-Jung Kao Date: Battelle Time: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Company: \_\_\_\_\_

Received by: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Total # of Containers: \_\_\_\_\_

Shipment Method: \_\_\_\_\_

Fedex to CAS

Relinquished by: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Company: \_\_\_\_\_

Received by: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Distribution:

1) PNNL

2) CAS

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: ~~4/1/2112~~ 1/21/12

Page: 2 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW09

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW09-0021	PSNS124.1	1/21/2012 0127	SW	x											1	comp	SW09	SW09-009
SW09-0022	PSNS124.1	1/21/2012 0127	SW		x										1	comp	SW09	SW09-009
SW09-0023	PSNS124.1	1/21/2012 0127	SW			x									1	comp	SW09	SW09-009
SW09-0024	PSNS124.1	1/21/2012 0127	SW				x								1	comp	SW09	SW09-009
SW09-0025	PSNS126	1/21/2012 1158	SW	x											1	comp	SW09	SW09-010
SW09-0026	PSNS126	1/21/2012 1158	SW		x										1	comp	SW09	SW09-010
SW09-0027	PSNS126	1/21/2012 1158	SW			x									1	comp	SW09	SW09-010
SW09-0028	PSNS126	1/21/2012 1158	SW				x								1	comp	SW09	SW09-010
SW09-0029	PSNS126Dup	1/21/2012 1158	SW	x											1	comp	SW09	SW09-011
SW09-0030	PSNS126Dup	1/21/2012 1158	SW		x										1	comp	SW09	SW09-011
SW09-0031	PSNS126Dup	1/21/2012 1158	SW			x									1	comp	SW09	SW09-011
SW09-0032	PSNS126Dup	1/21/2012 1158	SW				x								1	comp	SW09	SW09-011
SW09-0033	PSNS124	1/21/2012 0905	SW	x											1	comp	SW09	SW09-012
SW09-0034	PSNS124	1/21/2012 0905	SW		x										1	comp	SW09	SW09-012

Relinquished by:			Received by:			Total # of Containers		
<div>Signature</div> <div>Date</div> <div>Time</div>			<div>Signature</div> <div>Date</div> <div>Time</div>			<div>Signature</div> <div>Date</div> <div>Time</div>		
<div>Printed Name</div> <div>Company</div>			<div>Printed Name</div> <div>Company</div>			<div>Printed Name</div> <div>Company</div>		
Relinquished by:			Received by:			Sample Disposition:		
<div>Signature</div> <div>Date</div> <div>Time</div>			<div>Signature</div> <div>Date</div> <div>Time</div>			<div>Signature</div> <div>Date</div> <div>Time</div>		
<div>Printed Name</div> <div>Company</div>			<div>Printed Name</div> <div>Company</div>			<div>Printed Name</div> <div>Company</div>		

Shipment Method:

Fedex to CAS

Distribution:

- 1) PNNL
- 2) CAS

**Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

SW = Stormwater

Analyze parameters per QAP/FSP

[illegible]



K1200670

# SAMPLE CHAIN OF CUSTODY FORM

Date: 1/1/2112

Page: 1 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW09

SW = Stormwater

## Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
1 SW09-001	PSNS126	1/20/2012 1700	SW							X					1	grab	SW09	
2 SW09-002	PSNS124.1	1/20/2012 1715	SW							X					1	grab	SW09	
3 SW09-003	PSNS124	1/20/2012 1730	SW							X					1	grab	SW09	
4 SW09-004	PSNS084.1	1/20/2012 1745	SW							X					1	grab	SW09	
5 SW09-005	PSNS015	1/20/2012 1800	SW							X					1	grab	SW09	
6 SW09-006	PSNS115.1	1/20/2012 1827	SW							X					1	grab	SW09	
7 SW09-0013	PSNS084.1	1/21/2012 1023	SW	x											1	comp	SW09	SW09-007
8 SW09-0014	PSNS084.1	1/21/2012 1023	SW		x										1	comp	SW09	SW09-007
9 SW09-0015	PSNS084.1	1/21/2012 1023	SW			x									1	comp	SW09	SW09-007
10 SW09-0016	PSNS084.1	1/21/2012 1023	SW				x								1	comp	SW09	SW09-007
11 SW09-0017	PSNS115.1	1/21/2012 0949	SW	x											1	comp	SW09	SW09-008
12 SW09-0018	PSNS115.1	1/21/2012 0949	SW		x										1	comp	SW09	SW09-008
13 SW09-0019	PSNS115.1	1/21/2012 0949	SW			x									1	comp	SW09	SW09-008
14 SW09-0020	PSNS115.1	1/21/2012 0949	SW				x								1	comp	SW09	SW09-008

Relinquished by: <u>Mico</u> <u>1/3/2012</u> <u>13:10</u>	Received by: <u>Shell</u> <u>1/24/12</u>	Total # of Containers
Signature: <u>L7-Jung Kuo</u> Date: <u>Battelle</u> Time:	Signature: <u>Shell</u> <u>0900</u>	Shipment Method:
Printed Name: _____ Company: _____	Printed Name: _____	Fedex to CAS
Relinquished by:	Received by:	Sample Disposition:
Signature: _____ Date: _____ Time: _____	Signature: _____	Distribution:
Printed Name: _____ Company: _____	Printed Name: _____	1) PNNL
		2) CAS

K1200620

## SAMPLE CHAIN OF CUSTODY FORM

Date: 1/1/2112

Page: 2 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW09

SW = Stormwater

## Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

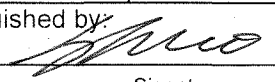
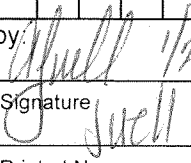
Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
15 SW09-0021	PSNS124.1	1/21/2012 0127	SW	x											1	comp	SW09	SW09-009
16 SW09-0022	PSNS124.1	1/21/2012 0127	SW		x										1	comp	SW09	SW09-009
17 SW09-0023	PSNS124.1	1/21/2012 0127	SW			x									1	comp	SW09	SW09-009
18 SW09-0024	PSNS124.1	1/21/2012 0127	SW				x								1	comp	SW09	SW09-009
19 SW09-0025	PSNS126	1/21/2012 1158	SW	x											1	comp	SW09	SW09-010
20 SW09-0026	PSNS126	1/21/2012 1158	SW		x										1	comp	SW09	SW09-010
21 SW09-0027	PSNS126	1/21/2012 1158	SW			x									1	comp	SW09	SW09-010
22 SW09-0028	PSNS126	1/21/2012 1158	SW				x								1	comp	SW09	SW09-010
23 SW09-0029	PSNS126Dup	1/21/2012 1158	SW	x											1	comp	SW09	SW09-011
24 SW09-0030	PSNS126Dup	1/21/2012 1158	SW		x										1	comp	SW09	SW09-011
25 SW09-0031	PSNS126Dup	1/21/2012 1158	SW			x									1	comp	SW09	SW09-011
26 SW09-0032	PSNS126Dup	1/21/2012 1158	SW				x								1	comp	SW09	SW09-011
27 SW09-0033	PSNS124	1/21/2012 0905	SW	x											1	comp	SW09	SW09-012
28 SW09-0034	PSNS124	1/21/2012 0905	SW		x										1	comp	SW09	SW09-012

Relinquished by:  Signature: L7-Jung Kuo Date: 1/21/12 Time: 13:10 Printed Name: L7-Jung Kuo Company: Battelle	Received by:  Signature: J. Well Date: 1/24/12 0900 Printed Name: J. Well	Total # of Containers Shipment Method: Fedex to CAS
Relinquished by: Signature: _____ Date: _____ Time: _____ Printed Name: _____ Company: _____	Received by: Signature: _____ Printed Name: _____	Sample Disposition: Distribution: 1) PNNL 2) CAS

K1200620

Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

SW = Stormwater

Analyze parameters per QAP/FSP

10

**Columbia Analytical Services, Inc.**  
**Cooler Receipt and Preservation Form**

PC HJ

Client / Project: Battelle Service Request K12  
 Received: 1/24/12 Opened: 1/24/12 By: AF Unloaded: 1/24/12 By: AF

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
<u>2.6</u>	<u>—</u>	<u>274</u>			<u>7931 4690 7456</u>		
<u>1.5</u>		<u>299</u>			<u>7931 4690 7331</u>		

7. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves hard ice packs  
 8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N  
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N  
 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N  
 12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N  
 14. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N  
 15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

**Client:** Battelle  
**Project:** Non-dry Dock Stormwater SW09  
**Sample Matrix:** Water

**Service Request No.:** K1200620  
**Date Received:** 1/24/12

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

#### Sample Receipt

Thirty-four water samples were received for analysis at Columbia Analytical Services on 1/24/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

#### General Chemistry Parameters

##### **Dissolved Organic Carbon by Standard Method 5310 C:**

The Relative Percent Difference (RPD) criterion for the replicate analysis of Dissolved Organic Carbon in samples SW09-0019 and SW09-0023 were not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed.

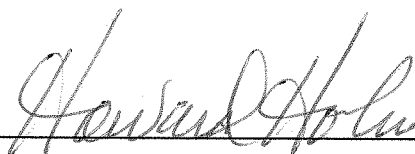
#### Diesel Range Organics by EPA Method 8015

##### **Relative Percent Difference Exceptions:**

The Relative Percent Difference (RPD) criterion for the replicate analysis of Diesel Range Organics and Residual Range Organics in sample SW09-001 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed.

Approved by



Date

2-8-12

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 2340 C

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12

**Units:** mg/L  
**Basis:** NA

**Hardness, Total as CaCO3**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW09-0013	K1200620-007	16.8	2.0	0.8	1	01/27/12 10:00	
SW09-0017	K1200620-011	12.0	2.0	0.8	1	01/27/12 10:00	
SW09-0021	K1200620-015	28.4	2.0	0.8	1	01/27/12 10:00	
SW09-0025	K1200620-019	26.0	2.0	0.8	1	01/27/12 10:00	
SW09-0029	K1200620-023	28.8	2.0	0.8	1	01/27/12 10:00	
SW09-0033	K1200620-027	97.6	2.0	0.8	1	01/27/12 10:00	
SW09-0037	K1200620-031	24.8	2.0	0.8	1	01/27/12 10:00	
Method Blank	K1200620-MB1	ND U	2.0	0.8	1	01/27/12 10:00	

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12  
**Date Analyzed:** 01/27/12

**Replicate Sample Summary**  
**Hardness, Total EDTA Titration, 20th ed**

**Sample Name:** SW09-0013  
**Lab Code:** K1200620-007

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1200620- 007DUP20	Average	RPD	RPD Limit
					Result			
Hardness, Total as CaCO <sub>3</sub>	SM 2340 C	2.0	0.8	16.8	16.0	16.4	5	20

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620

**Date Analyzed:** 01/27/12

**Lab Control Sample Summary  
General Chemistry Parameters**

**Analysis Method:** SM 2340 C

**Units:** mg/L

**Basis:** NA

**Analysis Lot:** 277938

**Lab Control Sample  
K1200620-LCS2**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Hardness, Total as CaCO3	44.0	43.4	101	90-116



**COLUMBIA ANALYTICAL SERVICES, INC.**

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## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Suspended (TSS)**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW09-0016	K1200620-010	17.0	5.0	-	1	01/26/12 12:05	
SW09-0020	K1200620-014	25.0	5.0	-	1	01/26/12 12:05	
SW09-0024	K1200620-018	12.5	5.0	-	1	01/26/12 12:05	
SW09-0028	K1200620-022	5.0	5.0	-	1	01/26/12 12:05	
SW09-0032	K1200620-026	10.0	5.0	-	1	01/26/12 12:05	
SW09-0036	K1200620-030	9.0	5.0	-	1	01/26/12 12:05	
SW09-0040	K1200620-034	36.0	5.0	-	1	01/26/12 12:05	
Method Blank	K1200620-MB1	ND U	5.0	-	1	01/26/12 12:05	
Method Blank	K1200620-MB2	ND U	5.0	-	1	01/26/12 12:05	

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D

**Service Request:** K1200620  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** mg/L  
**Basis:** NA

**Duplicate Sample Summary**  
**Solids, Total Suspended (TSS)**

<b>Sample Name:</b>	<b>Lab Code:</b>	<b>MRL</b>	<b>MDL</b>	<b>Sample Result</b>	<b>Duplicate Result</b>	<b>Average</b>	<b>RPD</b>	<b>RPD Limit</b>	<b>Date Analyzed</b>
Batch QC	K1200578-004DUP15	5.0		ND	ND	NC	NC	10	01/26/12
Batch QC	K1200594-001DUP18	5.0		5.5	5.0	5.25	10	10	01/26/12

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620

**Date Analyzed:** 01/26/12

**Lab Control Sample Summary  
General Chemistry Parameters**

**Analysis Method:** SM 2540 D

**Units:** mg/L

**Basis:** NA

**Analysis Lot:** 277793

**Lab Control Sample  
K1200620-LCS2**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Solids, Total Suspended (TSS)	308	305	101	85-111

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12  
**Units:** mg/L  
**Basis:** NA

**Carbon, Dissolved Organic (DOC)**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW09-0015	K1200620-009	1.00	0.50	0.07	1	01/24/12 16:21	
SW09-0019	K1200620-013	0.98	0.50	0.07	1	01/24/12 16:21	
SW09-0023	K1200620-017	1.07	0.50	0.07	1	01/24/12 16:21	
SW09-0027	K1200620-021	1.03	0.50	0.07	1	01/24/12 16:21	
SW09-0031	K1200620-025	1.09	0.50	0.07	1	01/24/12 16:21	
SW09-0035	K1200620-029	0.89	0.50	0.07	1	01/24/12 16:21	
SW09-0039	K1200620-033	1.41	0.50	0.07	1	01/24/12 16:21	
Method Blank	K1200620-MB1	ND U	0.50	0.07	1	01/24/12 16:21	

## COLUMBIA ANALYTICAL SERVICES, INC.

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## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12

**Units:** mg/L  
**Basis:** NA

**Duplicate Sample Summary**  
**Carbon, Dissolved Organic (DOC)**

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
SW09-0015	K1200620-009DUP22	0.50	0.07	1.00	1.03	1.02	3	10	01/24/12
SW09-0019	K1200620-013DUP24	0.50	0.07	0.98	0.82	0.898	18 *	10	01/24/12
SW09-0023	K1200620-017DUP26	0.50	0.07	1.07	0.95	1.01	12 *	10	01/24/12
SW09-0027	K1200620-021DUP28	0.50	0.07	1.03	0.96	0.999	7	10	01/24/12
SW09-0031	K1200620-025DUP30	0.50	0.07	1.09	1.06	1.08	2	10	01/24/12
SW09-0035	K1200620-029DUP32	0.50	0.07	0.89	0.94	0.917	5	10	01/24/12
SW09-0039	K1200620-033DUP34	0.50	0.07	1.41	1.46	1.44	4	10	01/24/12

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## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12  
**Date Analyzed:** 01/24/12

**Matrix Spike Summary****Dissolved Organic Carbon (DOC), Persulfate-Ultraviolet or Heated-Persulfate Oxidation 20th Ed.**

**Sample Name:** SW09-0015 **Units:** mg/L  
**Lab Code:** K1200620-009 **Basis:** NA  
**Analysis Method:** SM 5310 C

**Matrix Spike**

K1200620-009MS6

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Dissolved Organic (DOC)	1.00	26.8	25.0	103	60-134

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620**Date Analyzed:** 01/24/12

**Lab Control Sample Summary**  
**General Chemistry Parameters**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 277500

**Lab Control Sample**  
**K1200620-LCS2**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Dissolved Organic (DOC)	22.2	22.7	98	87-112

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620**Continuing Calibration Verification (CCV) Summary****Carbon, Dissolved Organic (DOC)****Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>True Value</b>	<b>Measured Value</b>	<b>Percent Recovery</b>	<b>Acceptance Limits</b>
CCV1	277500	KQ1200715-03	01/24/12 16:21	25.0	24.2	97	90-110
CCV2	277500	KQ1200715-04	01/24/12 16:21	25.0	24.3	97	90-110
CCV3	277500	KQ1200715-05	01/24/12 16:21	25.0	23.9	96	90-110
CCV4	277500	KQ1200715-06	01/24/12 16:21	25.0	24.1	97	90-110



**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620

**Continuing Calibration Blank (CCB) Summary**  
**Carbon, Dissolved Organic (DOC)**

**Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>MRL</b>	<b>MDL</b>	<b>Result</b>	<b>Q</b>
CCB1	277500	KQ1200715-07	01/24/12 16:21	0.50	0.07	0.14	J
CCB2	277500	KQ1200715-08	01/24/12 16:21	0.50	0.07	ND	U
CCB3	277500	KQ1200715-09	01/24/12 16:21	0.50	0.07	ND	U
CCB4	277500	KQ1200715-10	01/24/12 16:21	0.50	0.07	ND	U

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1200620  
**Date Collected:** 01/21/12  
**Date Received:** 01/24/12

**Units:** mg/L  
**Basis:** NA

**Carbon, Total Organic**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW09-0014	K1200620-008	1.23	0.50	0.07	1	01/24/12 16:21	
SW09-0018	K1200620-012	1.12	0.50	0.07	1	01/24/12 16:21	
SW09-0022	K1200620-016	1.03	0.50	0.07	1	01/24/12 16:21	
SW09-0026	K1200620-020	1.11	0.50	0.07	1	01/24/12 16:21	
SW09-0030	K1200620-024	1.22	0.50	0.07	1	01/24/12 16:21	
SW09-0034	K1200620-028	1.03	0.50	0.07	1	01/24/12 16:21	
SW09-0038	K1200620-032	1.68	0.50	0.07	1	01/24/12 16:21	
Method Blank	K1200620-MB1	ND U	0.50	0.07	1	01/24/12 16:21	
Method Blank	K1200620-MB2	ND U	0.50	0.07	1	01/24/12 16:21	

## COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW09/54220  
Sample Matrix: Water  
Analysis Method: SM 5310 C

Service Request: K1200620  
Date Collected: 01/21/12  
Date Received: 01/24/12

Units: mg/L  
Basis: NA

Duplicate Sample Summary  
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
SW09-0014	K1200620-008DUP21	0.50	0.07	1.23	1.23	1.23	<1	10	01/24/12
SW09-0018	K1200620-012DUP23	0.50	0.07	1.12	1.04	1.08	7	10	01/24/12
SW09-0022	K1200620-016DUP25	0.50	0.07	1.03	1.04	1.04	1	10	01/24/12
SW09-0026	K1200620-020DUP27	0.50	0.07	1.11	1.15	1.13	4	10	01/24/12
SW09-0030	K1200620-024DUP29	0.50	0.07	1.22	1.20	1.21	1	10	01/24/12
SW09-0034	K1200620-028DUP31	0.50	0.07	1.03	1.06	1.05	3	10	01/24/12
SW09-0038	K1200620-032DUP33	0.50	0.07	1.68	1.67	1.67	<1	10	01/24/12

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## COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** N/A  
**Date Received:** N/A  
**Date Analyzed:** 01/24/12

## Duplicate Matrix Spike Summary

## Total Organic Carbon (TOC), Persulfate-Ultraviolet or Heated-Persulfate Oxidation 20th Ed.

**Sample Name:** Batch QC **Units:** mg/L  
**Lab Code:** K1200252-012 **Basis:** NA  
**Analysis Method:** SM 5310 C

Analyte Name	Sample Result	Result	Matrix Spike K1200252-012MS1		Result	Duplicate Matrix Spike K1200252-012DMS1		% Rec Limits	RPD	RPD Limit
			Spike Amount	% Rec		Spike Amount	% Rec			
Carbon, Total Organic	0.13	25.4	25.0	101	24.9	25.0	99	60-134	2	20

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** N/A  
**Date Received:** N/A  
**Date Analyzed:** 01/24/12

**Matrix Spike Summary****Total Organic Carbon (TOC), Persulfate-Ultraviolet or Heated-Persulfate Oxidation 20th Ed.**

**Sample Name:** Batch QC **Units:** mg/L  
**Lab Code:** K1200471-003 **Basis:** NA  
**Analysis Method:** SM 5310 C

**Matrix Spike**  
K1200471-003MS2

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD Limit</b>
Carbon, Total Organic	0.20	25.9	25.0	103	60-134	

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** N/A  
**Date Received:** N/A  
**Date Analyzed:** 01/24/12

**Matrix Spike Summary****Total Organic Carbon (TOC), Persulfate-Ultraviolet or Heated-Persulfate Oxidation 20th Ed.**

**Sample Name:** Batch QC **Units:** mg/L  
**Lab Code:** K1200496-001 **Basis:** NA  
**Analysis Method:** SM 5310 C

**Matrix Spike**

K1200496-001MS3

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD Limit</b>
Carbon, Total Organic	5	508	500	101	60-134	

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** N/A  
**Date Received:** N/A  
**Date Analyzed:** 01/24/12

**Matrix Spike Summary****Total Organic Carbon (TOC), Persulfate-Ultraviolet or Heated-Persulfate Oxidation 20th Ed.**

**Sample Name:** Batch QC **Units:** mg/L  
**Lab Code:** K1200531-001 **Basis:** NA  
**Analysis Method:** SM 5310 C

**Matrix Spike**

K1200531-001MS4

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD Limit</b>
Carbon, Total Organic	0.93	26.1	25.0	101	60-134	

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620**Date Analyzed:** 01/24/12**Duplicate Lab Control Sample Summary****Total Organic Carbon (TOC), Persulfate-Ultraviolet or Heated-Persulfate Oxidation 20th Ed.****Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 277499**Lab Control Sample  
K1200620-LCS1****Duplicate Lab Control Sample  
K1200620-DLCS1**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
Carbon, Total Organic	22.3	22.7	98	21.9	22.7	96	87-112	2	20



**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620**Date Analyzed:** 01/24/12

**Lab Control Sample Summary**  
**General Chemistry Parameters**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 277499

**Lab Control Sample**  
**K1200620-LCS2**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Total Organic	22.1	22.7	97	87-112

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620**Continuing Calibration Verification (CCV) Summary****Carbon, Total Organic****Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>True Value</b>	<b>Measured Value</b>	<b>Percent Recovery</b>	<b>Acceptance Limits</b>
CCV1	277499	KQ1200713-03	01/24/12 16:21	25.0	24.2	97	90-110
CCV2	277499	KQ1200713-04	01/24/12 16:21	25.0	24.1	97	90-110
CCV3	277499	KQ1200713-05	01/24/12 16:21	25.0	24.4	98	90-110
CCV4	277499	KQ1200713-06	01/24/12 16:21	25.0	24.3	97	90-110
CCV5	277499	KQ1200713-07	01/24/12 16:21	25.0	23.9	96	90-110

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620

**Continuing Calibration Blank (CCB) Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>MRL</b>	<b>MDL</b>	<b>Result</b>	<b>Q</b>
CCB1	277499	KQ1200713-08	01/24/12 16:21	0.50	0.07	0.14	J
CCB2	277499	KQ1200713-09	01/24/12 16:21	0.50	0.07	ND	U
CCB3	277499	KQ1200713-10	01/24/12 16:21	0.50	0.07	0.11	J
CCB4	277499	KQ1200713-11	01/24/12 16:21	0.50	0.07	ND	U
CCB5	277499	KQ1200713-12	01/24/12 16:21	0.50	0.07	ND	U

## COLUMBIA ANALYTICAL SERVICES, INC.

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Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Cover Page - Organic Analysis Data Package  
Diesel and Residual Range Organics

Sample Name	Lab Code	Date Collected	Date Received
SW09-001	K1200620-001	01/20/2012	01/24/2012
SW09-002	K1200620-002	01/20/2012	01/24/2012
SW09-003	K1200620-003	01/20/2012	01/24/2012
SW09-004	K1200620-004	01/20/2012	01/24/2012
SW09-005	K1200620-005	01/20/2012	01/24/2012
SW09-006	K1200620-006	01/20/2012	01/24/2012
SW09-001	KWG1201126-1	01/20/2012	01/24/2012

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: Date: 

Title: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/20/2012  
**Date Received:** 01/24/2012

## Diesel and Residual Range Organics

**Sample Name:** SW09-001  
**Lab Code:** K1200620-001  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	72	J	290	13	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	210	J	580	22	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	50-150	02/02/12	Acceptable
n-Triacontane	103	50-150	02/02/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/20/2012  
**Date Received:** 01/24/2012

## Diesel and Residual Range Organics

**Sample Name:** SW09-002  
**Lab Code:** K1200620-002  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	150 J	280	12	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	530 J	550	21	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	50-150	02/02/12	Acceptable
n-Triacontane	106	50-150	02/02/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/20/2012  
**Date Received:** 01/24/2012

## Diesel and Residual Range Organics

**Sample Name:** SW09-003  
**Lab Code:** K1200620-003  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	95	J	240	11	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	280	J	480	19	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	101	50-150	02/02/12	Acceptable
n-Triacontane	106	50-150	02/02/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/20/2012  
**Date Received:** 01/24/2012

## Diesel and Residual Range Organics

**Sample Name:** SW09-004  
**Lab Code:** K1200620-004  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	210	J	240	11	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	630	O	480	19	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	98	50-150	02/02/12	Acceptable
n-Triacontane	103	50-150	02/02/12	Acceptable

Comments:



## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/20/2012  
**Date Received:** 01/24/2012

## Diesel and Residual Range Organics

**Sample Name:** SW09-005  
**Lab Code:** K1200620-005  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	150	J	240	11	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	650	O	480	19	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	02/02/12	Acceptable
n-Triacontane	104	50-150	02/02/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** 01/20/2012  
**Date Received:** 01/24/2012

## Diesel and Residual Range Organics

**Sample Name:** SW09-006  
**Lab Code:** K1200620-006  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	65	J	240	11	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	210	J	480	19	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	02/02/12	Acceptable
n-Triacontane	105	50-150	02/02/12	Acceptable

Comments: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Collected:** NA  
**Date Received:** NA

**Diesel and Residual Range Organics**

**Sample Name:** Method Blank  
**Lab Code:** KWG1201126-3  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	11	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	25	J	500	19	1	01/31/12	02/02/12	KWG1201126	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	99	50-150	02/02/12	Acceptable
n-Triacontane	98	50-150	02/02/12	Acceptable

**Comments:** \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620

**Surrogate Recovery Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** PERCENT  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SW09-001	K1200620-001	96	103
SW09-002	K1200620-002	102	106
SW09-003	K1200620-003	101	106
SW09-004	K1200620-004	98	103
SW09-005	K1200620-005	97	104
SW09-006	K1200620-006	97	105
SW09-001DUP	KWG1201126-1	99	104
Method Blank	KWG1201126-3	99	98
Lab Control Sample	KWG1201126-2	103	102

**Surrogate Recovery Control Limits (%)**

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Extracted:** 01/31/2012  
**Date Analyzed:** 02/02/2012

**Duplicate Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** SW09-001  
**Lab Code:** K1200620-001  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1201126

Analyte Name	MRL	MDL	Sample Result	SW09-001DUP KWG1201126-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	260	12	72	74	73	3 #	30
Residual Range Organics (RRO)	520	20	210	190	200	6 #	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Extracted:** 01/31/2012  
**Date Analyzed:** 02/02/2012

**Lab Control Spike Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1201126

Lab Control Sample  
KWG1201126-2  
Lab Control Spike

Analyte Name	Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	1540	1600	96	46-140
Residual Range Organics (RRO)	700	800	87	45-159

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Extracted:** 01/31/2012  
**Date Analyzed:** 02/02/2012  
**Time Analyzed:** 03:34

**Method Blank Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Method Blank  
**Lab Code:** KWG1201126-3  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\020112B-NW\0201F033.D  
**Level:** Low  
**Extraction Lot:** KWG1201126

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1201126-2	J:\GC21\DATA\020112B-NW\0201F031.D	02/02/12	03:12
SW09-001	K1200620-001	J:\GC21\DATA\020112B-NW\0201F039.D	02/02/12	04:39
SW09-001DUP	KWG1201126-1	J:\GC21\DATA\020112B-NW\0201F041.D	02/02/12	05:01
SW09-006	K1200620-006	J:\GC21\DATA\020112B-NW\0201F043.D	02/02/12	05:23
SW09-002	K1200620-002	J:\GC21\DATA\020112B-NW\0201F045.D	02/02/12	05:44
SW09-003	K1200620-003	J:\GC21\DATA\020112B-NW\0201F047.D	02/02/12	06:06
SW09-005	K1200620-005	J:\GC21\DATA\020112B-NW\0201F049.D	02/02/12	06:28
SW09-004	K1200620-004	J:\GC21\DATA\020112B-NW\0201F051.D	02/02/12	06:49

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Extracted:** 01/31/2012  
**Date Analyzed:** 02/02/2012  
**Time Analyzed:** 03:12

**Lab Control Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Lab Control Sample  
**Lab Code:** KWG1201126-2  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\020112B-NW\0201F031.D  
**Level:** Low  
**Extraction Lot:** KWG1201126

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1201126-3	J:\GC21\DATA\020112B-NW\0201F033.D	02/02/12	03:34
SW09-001	K1200620-001	J:\GC21\DATA\020112B-NW\0201F039.D	02/02/12	04:39
SW09-001DUP	KWG1201126-1	J:\GC21\DATA\020112B-NW\0201F041.D	02/02/12	05:01
SW09-006	K1200620-006	J:\GC21\DATA\020112B-NW\0201F043.D	02/02/12	05:23
SW09-002	K1200620-002	J:\GC21\DATA\020112B-NW\0201F045.D	02/02/12	05:44
SW09-003	K1200620-003	J:\GC21\DATA\020112B-NW\0201F047.D	02/02/12	06:06
SW09-005	K1200620-005	J:\GC21\DATA\020112B-NW\0201F049.D	02/02/12	06:28
SW09-004	K1200620-004	J:\GC21\DATA\020112B-NW\0201F051.D	02/02/12	06:49



## COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10701  
**Instrument ID:** GC21

**Column:** ZB-1

Level ID	File ID
A	J:\GC21\DATA\071111B-NW\0711F037.D
B	J:\GC21\DATA\071111B-NW\0711F039.D
C	J:\GC21\DATA\071111B-NW\0711F041.D
D	J:\GC21\DATA\071111B-NW\0711F043.D
E	J:\GC21\DATA\071111B-NW\0711F045.D
F	J:\GC21\DATA\071111B-NW\0711F047.D
G	J:\GC21\DATA\071111B-NW\0711F057.D
H	J:\GC21\DATA\071111B-NW\0711F059.D

Level ID	File ID
I	J:\GC21\DATA\071111B-NW\0711F061.D
J	J:\GC21\DATA\071111B-NW\0711F063.D
K	J:\GC21\DATA\071111B-NW\0711F065.D
L	J:\GC21\DATA\071111B-NW\0711F067.D
M	J:\GC21\DATA\071111B-NW\0711F069.D
N	J:\GC21\DATA\071111B-NW\0711F071.D

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)							H	50	699	I	200	712	J	500	777
	K	2000	797	L	5000	768	M	20000	802	N	50000	809			
Residual Range Organics (RRO)				B	50	588	C	200	510	D	500	513	E	2000	500
	F	5000	545												
o-Terphenyl				G	1.0	988	H	2.5	1000	I	10	998	J	25	1040
	K	100	1100	L	250	1020									
n-Triacontane				G	1.0	803	H	2.5	840	I	10	840	J	25	875
	K	100	936	L	250	872									

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary  
 Diesel and Residual Range Organics**

**Calibration ID:** CAL10701  
**Instrument ID:** GC21

**Column:** ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	5.7		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.8		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	5.3		≤ 20

Results flagged with an asterisk (\*) indicate values outside control criteria.

# COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620  
**Calibration Date:** 07/12/2011  
**Date Analyzed:** 07/12/2011

## Second Source Calibration Verification Diesel and Residual Range Organics

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration ID:** CAL10701  
**Units:** ppm

**File ID:** J:\GC21\DATA\071111B-NW\0711F053.D  
 J:\GC21\DATA\071111B-NW\0711F073.D

**Column ID:** ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	990	767	761	-1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1100	531	562	6	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620  
**Date Analyzed:** 02/02/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1201222  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\020112B-NW\0201F025.D  
J:\GC21\DATA\020112B-NW\0201F027.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	792	3	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	980	531	519	-2	NA	± 15 %	AverageRF
o-Terphenyl	50	51	1030	1040	1	NA	± 15 %	AverageRF
n-Triacontane	50	51	861	872	1	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620  
**Date Analyzed:** 02/02/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1201222  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\020112B-NW\0201F061.D  
J:\GC21\DATA\020112B-NW\0201F063.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	980	767	753	-2	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	970	531	514	-3	NA	± 15 %	AverageRF
o-Terphenyl	50	49	1030	1000	-2	NA	± 15 %	AverageRF
n-Triacontane	50	52	861	887	3	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220

**Service Request:** K1200620

**Analysis Run Log  
 Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx

**Analysis Lot:** KWG1201222

**Instrument ID:** GC21

**Column:** ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0201F025.D	Continuing Calibration Verification	KWG1201222-1	2/2/2012	02:06		2/2/2012	02:22
0201F027.D	Continuing Calibration Verification	KWG1201222-1	2/2/2012	02:28		2/2/2012	02:44
0201F029.D	Instrument Blank	KWG1201222-3	2/2/2012	02:50		2/2/2012	03:06
0201F031.D	Lab Control Sample	KWG1201126-2	2/2/2012	03:12		2/2/2012	03:28
0201F033.D	Method Blank	KWG1201126-3	2/2/2012	03:34		2/2/2012	03:50
0201F035.D	ZZZZZZ	ZZZZZZ	2/2/2012	03:55		2/2/2012	04:11
0201F037.D	ZZZZZZ	ZZZZZZ	2/2/2012	04:17		2/2/2012	04:33
0201F039.D	SW09-001	K1200620-001	2/2/2012	04:39		2/2/2012	04:55
0201F041.D	SW09-001DUP	KWG1201126-1	2/2/2012	05:01		2/2/2012	05:17
0201F043.D	SW09-006	K1200620-006	2/2/2012	05:23		2/2/2012	05:39
0201F045.D	SW09-002	K1200620-002	2/2/2012	05:44		2/2/2012	06:00
0201F047.D	SW09-003	K1200620-003	2/2/2012	06:06		2/2/2012	06:22
0201F049.D	SW09-005	K1200620-005	2/2/2012	06:28		2/2/2012	06:44
0201F051.D	SW09-004	K1200620-004	2/2/2012	06:49		2/2/2012	07:05
0201F053.D	ZZZZZZ	ZZZZZZ	2/2/2012	07:11		2/2/2012	07:27
0201F061.D	Continuing Calibration Verification	KWG1201222-2	2/2/2012	08:39		2/2/2012	08:55
0201F063.D	Continuing Calibration Verification	KWG1201222-2	2/2/2012	09:01		2/2/2012	09:17
0201F065.D	Instrument Blank	KWG1201222-4	2/2/2012	09:23		2/2/2012	09:39

Results flagged with an asterisk (\*) indicate the holding time was exceeded for the analysis

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW09/54220  
**Sample Matrix:** Water

**Service Request:** K1200620  
**Date Extracted:** 01/31/2012

**Extraction Prep Log**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Extraction Lot:** KWG1201126  
**Level:** Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
SW09-001	K1200620-001	01/20/12	01/24/12	435mL	1mL	NA	
SW09-002	K1200620-002	01/20/12	01/24/12	460mL	1mL	NA	
SW09-003	K1200620-003	01/20/12	01/24/12	1060mL	2mL	NA	
SW09-004	K1200620-004	01/20/12	01/24/12	1060mL	2mL	NA	
SW09-005	K1200620-005	01/20/12	01/24/12	1060mL	2mL	NA	
SW09-006	K1200620-006	01/20/12	01/24/12	1050mL	2mL	NA	
SW09-001DUP	KWG1201126-1	01/20/12	01/24/12	490mL	1mL	NA	
Method Blank	KWG1201126-3	NA	NA	1000mL	2mL	NA	
Lab Control Sample	KWG1201126-2	NA	NA	1000mL	2mL	NA	

Results flagged with an asterisk (\*) indicate the holding time was exceeded for the analysis

# **Analytical Chemistry Data Package**

**Project: Non-Dry Dock Stormwater  
SW10 – February 29, 2012  
SW11 – March 15, 2012  
Chemical Analyses**

Battelle Project No. 54220/62375  
CF No. 3174



Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, WA 98382  
PM: Jill Brandenberger  
(360) 681-4564



# CHEMISTRY ANALYSIS DATA PACKAGE CONTENTS

## Non-Dry Dock Stormwater

SW10 February 29, 2012

SW11 March 15, 2012

## Chemical Analyses

### Chemistry Analysis Summaries

Field Data Report Metals.....	3
Field Data Summary TPH, TOC/DOC, TSS, Hardness .....	7
QA/QC Summary Reports Metals .....	10
QA/QC Narrative Metals.....	14

### Sample Custody Information

#### **SW10:**

Chain of Custody Form .....	18
Laboratory Sample Log-In Form .....	20
Log-In Checklist.....	21
Chain of Custody Form, Shipped to CAS.....	22
Log-In Checklist, Shipped to CAS .....	28

#### **SW10 Supplemental Samples of Opportunity:**

Chain of Custody Form .....	29
Laboratory Sample Log-In Form .....	31
Log-In Checklist.....	32

#### **SW11:**

Chain of Custody Form .....	33
Laboratory Sample Log-In Form .....	36
Log-In Checklist.....	37
Chain of Custody Form, Shipped to CAS.....	38
Log-In Checklist, Shipped to CAS .....	42

### **CVAF Analysis of Samples for Hg**

*Analytical raw data available upon request*

### **ICP-MS Analysis of Samples for Metals**

*Analytical raw data available upon request*

### **Analysis of TPH, TOC/DOC, TSS, Hardness**

CAS Narrative, Batch K1200620.....	46
Summary and QC Report, Batch K1200620 .....	47
CAS Narrative, Batch K1202461 .....	86
Summary and QC Report, Batch K1202461 .....	87
CAS Narrative, Batch K1202509.....	112
Summary and QC Report, Batch K1202509 .....	113

*Analytical raw data available upon request*

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW10 and SW11**  
**Metals in Water**  
**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Collection Date	Hg	As	Ag	Al	Cd
<i>Instrument:</i>						<i>CVAE</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Freshwater)						0.0001	0.03	0.002	0.3	0.004
Freshwater Reporting Limit (MDL* 3.18)						0.0003	0.1	0.006	1.0	0.01
<b>SW10</b>										
SW10-043	PSNS015	TME	Composite_equal_time	3174-105 R1	02/29/12	0.0119	0.615	0.0173	443	0.207
SW10-044	PSNS015	DME	Composite_equal_time	3174-106	02/29/12	0.00281	0.513	0.00579 J	38.5	0.0325
SW10-045	PSNS084.1	TME	Composite_equal_time	3174-107	02/29/12	0.00381	1.56	0.0217	189	0.150
SW10-046	PSNA084.1	DME	Composite_equal_time	3174-108	02/29/12	0.00171	1.46	0.00795	23.1	0.101
SW10-047	PSNS126	TME	Composite_equal_time	3174-109	02/29/12	0.0159	6.22	0.190	127	0.256
SW10-048	PSNS126	DME	Composite_equal_time	3174-110	02/29/12	0.00982	6.34	0.128	17.0	0.194
SW10-049	PSNS126DUP	TME	Composite_equal_time	3174-111	02/29/12	0.0167	6.48	0.197	142	0.276
SW10-050	PSNS126DUP	DME	Composite_equal_time	3174-112	02/29/12	0.0103	6.05	0.131	19.4	0.184
SW10-051	PSNS124	TME	Composite_equal_time	3174-113	02/29/12	0.0476	7.69	0.170	336	0.945
SW10-052	PSNS124	DME	Composite_equal_time	3174-114	02/29/12	0.0151	7.32	0.0913	25.7	0.319
SW10-053	PSNS115.1	TME	Composite_equal_time	3174-115	02/29/12	0.0118	1.22	0.0529	64.8	0.232
SW10-054	PSNS115.1	DME	Composite_equal_time	3174-116	02/29/12	0.00357	1.21	0.0235	9.47	0.194
SW10-055	PSNS124.1	TME	Composite_equal_time	3174-117	02/29/12	0.00330	1.62	0.0230	152	0.640
SW10-056	PSNS124.1	DME	Composite_equal_time	3174-118	02/29/12	0.00357	1.55	0.00455 J	20.8	0.486
SW10-101	Anderson Creek-Blank	TME	Grab	3174-119 SUP	02/29/12	0.0001 U	0.03 U	0.002 U	0.3 U	0.004 U
SW10-102	Gorst Creek	TME	Grab	3174-120 SUP	02/29/12	0.00217	0.426	0.002 U	161	0.00600 J
SW10-103	Anderson Creek	TME	Grab	3174-121 SUP	02/29/12	0.00427	0.484	0.00578 J	1440 E	0.0223
SW10-104	Annapolis Creek	TME	Grab	3174-122 SUP	02/29/12	0.00535	0.514	0.00366 J	404	0.0157
SW10-105	Blackjack Creek	TME	Grab	3174-123 SUP	02/29/12	0.00500	1.11	0.00651	594	0.0110

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11**

**Metals in Water**

**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	CVAF Batch ID	ICP-MS Batch ID
					<i>Instrument: ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>		
Laboratory Achieved Detection Limits (Freshwater)					0.08	0.007	0.002	0.05		
Freshwater Reporting Limit (MDL* 3.18)					0.3	0.02	0.006	0.2		

**SW10**

SW10-043	PSNS015	TME	Composite_equal_time	3174-105 R1	1.92	8.71	8.40	74.8	032912HGA	032612-6100
SW10-044	PSNS015	DME	Composite_equal_time	3174-106	0.876	4.91	1.39	57.2	032912HGA	032612-6100
SW10-045	PSNS084.1	TME	Composite_equal_time	3174-107	2.09	19.1	4.33	157	032912HGA	032612-6100
SW10-046	PSNA084.1	DME	Composite_equal_time	3174-108	1.03	11.0	0.375	134	032912HGA	032612-6100
SW10-047	PSNS126	TME	Composite_equal_time	3174-109	1.54	27.0	3.00	75.4	032912HGA	032612-6100
SW10-048	PSNS126	DME	Composite_equal_time	3174-110	0.951	23.6	0.327	61.0	032912HGA	032612-6100
SW10-049	PSNS126DUP	TME	Composite_equal_time	3174-111	1.52	27.3	3.13	79.5	032912HGA	032612-6100
SW10-050	PSNS126DUP	DME	Composite_equal_time	3174-112	0.888	23.1	0.380	58.7	032912HGA	032612-6100
SW10-051	PSNS124	TME	Composite_equal_time	3174-113	5.66	170	14.5	408	032912HGA	032612-6100
SW10-052	PSNS124	DME	Composite_equal_time	3174-114	1.61	107	0.694	145	032912HGA	032612-6100
SW10-053	PSNS115.1	TME	Composite_equal_time	3174-115	1.65	22.7	2.59	127	032912HGA	032612-6100
SW10-054	PSNS115.1	DME	Composite_equal_time	3174-116	0.987	17.5	0.487	117	032912HGA	032612-6100
SW10-055	PSNS124.1	TME	Composite_equal_time	3174-117	4.57	34.6	6.04	100	032912HGA	032612-6100
SW10-056	PSNS124.1	DME	Composite_equal_time	3174-118	2.82	20.3	0.631	71.1	032912HGA	032612-6100
SW10-101	Anderson Creek-Blank	TME	Grab	3174-119 SUP	0.245 J	0.185	0.002 U	0.173 J	040312HGA	032612-6100
SW10-102	Gorst Creek	TME	Grab	3174-120 SUP	2.24	1.55	0.225	1.67	040312HGA	032612-6100
SW10-103	Anderson Creek	TME	Grab	3174-121 SUP	4.14	3.96	0.716	6.68	040312HGA	032612-6100
SW10-104	Annapolis Creek	TME	Grab	3174-122 SUP	1.93	2.52	0.867	8.67	040312HGA	032612-6100
SW10-105	Blackjack Creek	TME	Grab	3174-123 SUP	2.86	1.80	0.665	5.32	040312HGA	032612-6100

**BATTELLE MARINE SCIENCE LABORATORIES**

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**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11  
Metals in Water  
UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Collection Date	Hg	As	Ag	Al	Cd
<i>Instrument:</i>						<i>CVAE</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Freshwater)						0.0001	0.03	0.002	0.3	0.004
Freshwater Reporting Limit (MDL* 3.18)						0.0003	0.1	0.006	1.0	0.01

**SW11**

SW11-044	PSNS015	TME	Composite_equal_time	3174-119	03/15/12	0.0210	0.606	0.0280	851	0.0891
SW11-045	PSNS015	DME	Composite_equal_time	3174-120	03/15/12	0.00216	0.356	0.00313 J	46.8	0.0308
SW11-046	PSNS015DUP	TME	Composite_equal_time	3174-121	03/15/12	0.0312	0.609	0.0350	939	0.0797
SW11-047	PSNS015DUP	DME	Composite_equal_time	3174-122	03/15/12	0.00221	0.380	0.00336 J	47.4	0.0258
SW11-048	PSNS84.1	TME	Composite_equal_time	3174-123	03/15/12	0.00400	0.985	0.0183	230	0.171
SW11-049	PSNS84.1	DME	Composite_equal_time	3174-124	03/15/12	0.000958	0.818	0.00552 J	16.2	0.0976
SW11-050	PSNS115.1	TME	Composite_equal_time	3174-125	03/15/12	0.00912	1.16	0.0666	303	0.512
SW11-051	PSNS115.1	DME	Composite_equal_time	3174-126	03/15/12	0.00175	0.826	0.0113	12.0	0.228
SW11-052	PSNS126	TME	Composite_equal_time	3174-127	03/15/12	0.0126	4.05	0.148	162	0.254
SW11-053	PSNS126	DME	Composite_equal_time	3174-128	03/15/12	0.00420	3.79	0.0664	15.0	0.121
SW11-054	PSNS124.1	TME	Composite_equal_time	3174-129	03/15/12	0.00652	0.932	0.0399	314	1.21
SW11-055	PSNS124.1	DME	Composite_equal_time	3174-130	03/15/12	0.00178	0.606	0.00532 J	21.3	0.535
SW11-056	PSNS124	TME	Composite_equal_time	3174-131	03/15/12	0.0171	1.37	0.227	273	0.585
SW11-057	PSNS124	DME	Composite_equal_time	3174-132	03/15/12	0.00187	0.851	0.0139	11.5	0.218

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11**

**Metals in Water**

**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	CVAF Batch ID	ICP-MS Batch ID
					<i>Instrument: ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>		
Laboratory Achieved Detection Limits (Freshwater)					0.08	0.007	0.002	0.05		
Freshwater Reporting Limit (MDL* 3.18)					0.3	0.02	0.006	0.2		

**SW11**

SW11-044	PSNS015	TME	Composite_equal_time	3174-119	2.56	10.8	13.1	68.0	032912HGA	032612-6100
SW11-045	PSNS015	DME	Composite_equal_time	3174-120	0.917	3.07	0.880	35.5	032912HGA	032612-6100
SW11-046	PSNS015DUP	TME	Composite_equal_time	3174-121	2.63	12.0	14.3	72.5	040312HGA	032612-6100
SW11-047	PSNS015DUP	DME	Composite_equal_time	3174-122	0.899	3.11	0.845	35.7	040312HGA	032612-6100
SW11-048	PSNS84.1	TME	Composite_equal_time	3174-123	1.88	17.3	5.18	135	040312HGA	032612-6100
SW11-049	PSNS84.1	DME	Composite_equal_time	3174-124	0.732	5.88	0.201	106	040312HGA	032612-6100
SW11-050	PSNS115.1	TME	Composite_equal_time	3174-125	2.90	33.0	11.8	190	040312HGA	032612-6100
SW11-051	PSNS115.1	DME	Composite_equal_time	3174-126	0.764	8.57	0.339	119	040312HGA	032612-6100
SW11-052	PSNS126	TME	Composite_equal_time	3174-127	1.59	15.9	4.56	76.6	040312HGA	032612-6100
SW11-053	PSNS126	DME	Composite_equal_time	3174-128	0.720	9.98	0.290	49.2	040312HGA	032612-6100
SW11-054	PSNS124.1	TME	Composite_equal_time	3174-129	8.07	57.5	14.8	201	040312HGA	032612-6100
SW11-055	PSNS124.1	DME	Composite_equal_time	3174-130	1.70	12.1	0.797	106	040312HGA	032612-6100
SW11-056	PSNS124	TME	Composite_equal_time	3174-131	4.65	54.2	10.4	153	040312HGA	032612-6100
SW11-057	PSNS124	DME	Composite_equal_time	3174-132	1.05	15.3	0.260	68.6	040312HGA	032612-6100

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11**

Station	Code	Type Name	Collection Date	Analysis Date	Analysis Method	Component	Units	Result	Detection Limit	Reporting Limit
<b>SW10</b>										
PSNS124.1		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	280 =,H	11	250
PSNS124.1		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	650 =,O	19	500
PSNS126		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	87 =,J	12	270
PSNS126		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	270 =,J	20	530
PSNS126 Dup		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	73 =,J	11	250
PSNS126 Dup		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	260 =,J	19	500
PSNS124		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	85 =,J	12	260
PSNS124		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	180 =,J	20	520
PSNS 115.1		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	72 =,J	11	250
PSNS 115.1		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	170 =,J	19	500
PSNS084.1		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	200 =,J	12	260
PSNS084.1		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	720 =,O	20	520
PSNS015		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	89 =,J	12	270
PSNS015		Grab	02/29/2012	03/09/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	230 =,J	20	530
PSNS015		Composite_equal_time	02/29/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	30.0 =	0.8	2.0
PSNS015		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	2.71 =	0.07	0.50
PSNS015		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	2.30 =	0.07	0.50
PSNS015		Composite_equal_time	02/29/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	13.0 =	5.0	5.0
PSNS084.1		Composite_equal_time	02/29/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	21.2 =	0.8	2.0
PSNS084.1		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	2.21 =	0.07	0.50
PSNS084.1		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.85 =	0.07	0.50
PSNS084.1		Composite_equal_time	02/29/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	6.0 =	5.0	5.0
PSNS126		Composite_equal_time	02/29/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	44.8 =	0.8	2.0
PSNS126		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	17.7 =	0.07	0.50
PSNS126		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	15.7 =	0.07	0.50
PSNS126		Composite_equal_time	02/29/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	9.5 =	5.0	5.0
PSNS126DUP		Composite_equal_time	02/29/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	45.6 =	0.8	2.0
PSNS126DUP		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	18.3 =	0.07	0.50
PSNS126DUP		Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	16.1 =	0.07	0.50
PSNS126DUP		Composite_equal_time	02/29/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	10.5 =	5.0	5.0
PSNS124		Composite_equal_time	02/28/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	109 =	0.8	2.0
PSNS124		Composite_equal_time	02/28/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	33.9 =	0.07	0.50
PSNS124		Composite_equal_time	02/28/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	31.5 =	0.07	0.50
PSNS124		Composite_equal_time	02/28/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	48.0 =	5.0	5.0

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11**

Station Code	Type Name	Collection Date	Analysis Date	Analysis Method	Component	Units	Result	Detection Limit	Reporting Limit
PSNS115.1	Composite_equal_time	02/29/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	50.0 =	0.8	2.0
PSNS115.1	Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	2.86 =	0.07	0.50
PSNS115.1	Composite_equal_time	02/29/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	2.30 =	0.07	0.50
PSNS115.1	Composite_equal_time	02/29/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	ND ND	5.0	5.0
PSNS124.1	Composite_equal_time	02/28/2012	03/09/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	90.0 =	0.8	2.0
PSNS124.1	Composite_equal_time	02/28/2012	03/05/2012	SM 5310 C	Carbon, Total Organic	mg/L	3.04 =	0.07	0.50
PSNS124.1	Composite_equal_time	02/28/2012	03/05/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	2.77 =	0.07	0.50
PSNS124.1	Composite_equal_time	02/28/2012	03/06/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	8.0 =	5.0	5.0

**SW11**

PSNS015	Grab	03/14/2012	03/22/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	110 =,J	12	270
PSNS015	Grab	03/14/2012	03/22/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	330 =,J	20	530
PSNS84.1	Grab	03/14/2012	03/22/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	130 =,J	12	270
PSNS84.1	Grab	03/14/2012	03/22/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	250 =,J	20	530
PSNS126	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	190 =,J	13	290
PSNS126	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	780 =,Z	22	570
PSNS115.1	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	110 =,J	12	270
PSNS115.1	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	330 =,J	21	540
PSNS124	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	390 =,H	12	270
PSNS124	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	1100 =,O	20	530
PSNS124DUP	Grab	03/15/2012	03/23/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	570 =,H	12	280
PSNS124DUP	Grab	03/15/2012	03/23/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	2500 =,O	21	550
PSNS124.1	Grab	03/15/2012	03/23/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	600 =,H	12	280
PSNS124.1	Grab	03/15/2012	03/23/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	2600 =,O	21	550
PSNS124.1DUP	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	350 =,H	13	280
PSNS124.1DUP	Grab	03/15/2012	03/22/2012	NWTPH-Dx	Residual Range Organics (RRO)	ug/L	1000 =,O	22	560
PSNS015	Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	20.0 =	0.8	2.0
PSNS015	Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.62 =	0.07	0.50
PSNS015	Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.57 =	0.07	0.50
PSNS015	Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	39.0 =	5.0	5.0
PSNS015DUP	Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	20.4 =	0.8	2.0
PSNS015DUP	Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.82 =	0.07	0.50
PSNS015DUP	Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.64 =	0.07	0.50
PSNS015DUP	Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	44.0 =	5.0	5.0

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
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**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11**

Station	Code	Type Name	Collection Date	Analysis Date	Analysis Method	Component	Units	Result	Detection Limit	Reporting Limit
PSNS84.1		Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO <sub>3</sub>	mg/L	20.0 =	0.8	2.0
PSNS84.1		Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.26 =	0.07	0.50
PSNS84.1		Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.84 =	0.07	0.50
PSNS84.1		Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	19.5 =	5.0	5.0
PSNS115.1		Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO <sub>3</sub>	mg/L	30.8 =	0.8	2.0
PSNS115.1		Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.28 =	0.07	0.50
PSNS115.1		Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.26 =	0.07	0.50
PSNS115.1		Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	20.5 =	5.0	5.0
PSNS126		Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO <sub>3</sub>	mg/L	30.0 =	0.8	2.0
PSNS126		Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	3.75 =	0.07	0.50
PSNS126		Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	4.22 =	0.07	0.50
PSNS126		Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	16.0 =	5.0	5.0
PSNS124.1		Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO <sub>3</sub>	mg/L	22.0 =	0.8	2.0
PSNS124.1		Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.71 =	0.07	0.50
PSNS124.1		Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.56 =	0.07	0.50
PSNS124.1		Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	20.5 =	5.0	5.0
PSNS124		Composite_equal_time	03/15/2012	03/28/2012	SM 2340 C	Hardness, Total as CaCO <sub>3</sub>	mg/L	50.0 =	0.8	2.0
PSNS124		Composite_equal_time	03/15/2012	03/29/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.93 =	0.07	0.50
PSNS124		Composite_equal_time	03/15/2012	03/21/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.20 =	0.07	0.50
PSNS124		Composite_equal_time	03/15/2012	03/21/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L	27.5 =	5.0	5.0



Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	ICP-MS Batch ID
Instrument:					ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
Laboratory Achieved Detection Limits (Freshwater)					0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater Reporting Limit (MDL* 3.18)					0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	
<b>METHOD BLANKS</b>													
MB-1		TME	Freshwater	TRM Blank R1	0.03 U	0.002 U	0.3 U	0.004 U	0.161 J	0.007 U	0.002 U	0.05 U	032612-6100
MB-2		TME	Freshwater	TRM Blank R2	0.03 U	0.002 U	0.3 U	0.004 U	0.188 J	0.007 U	0.002 U	0.05 U	032612-6100
<b>LABORATORY CONTROL SAMPLES</b>													
Spiking Level					2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
LCS-1		TME	Freshwater	TRM LCS R1	1.95	1.92	1.89	2.00	2.01	1.90	2.00	1.94	032612-6100
				Percent Recovery, LCS	98%	96%	95%	100%	101%	95%	100%	97%	
Spiking Level					2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
LCS-2		TME	Freshwater	TRM LCS R2	1.95	1.95	2.02	1.97	2.14	1.96	1.98	1.94	032612-6100
				Percent Recovery, LCS	98%	98%	101%	99%	107%	98%	99%	97%	
<b>MATRIX SPIKE RESULTS</b>													
SW10-048	PSNS126	DME	Composite_equal_time	3174-110	6.34	0.128	17.0	0.194	0.951	23.6	0.327	61.0	032612-6100
MS	PSNS126	DME	Composite_equal_time	3174-110 MS	8.37	2.09	72.1	2.22	3.01	75.1	2.46	112	032612-6100
MSD	PSNS126	DME	Composite_equal_time	3174-110 MSD	8.53	2.12	71.5	2.29	3.08	75.1	2.47	113	032612-6100
			Spiking Level		2	2	50	2	2	50	2	50	
			Percent Recovery, MS		102%	105%	110%	101%	103%	103%	107%	102%	
			Percent Recovery, MSD		110%	106%	109%	105%	106%	103%	107%	104%	
			RPD		7.6%	1.4%	1.1%	3.4%	3.3%	0.0%	0.5%	1.9%	
SW11-047	PSNS015DUP	DME	Composite_equal_time	3174-122	0.380	0.00336 J	47.4	0.0258	0.899	3.11	0.845	35.7	032612-6100
MS	PSNS015DUP	DME	Composite_equal_time	3174-122 MS	2.39	1.95	96.3	2.05	2.90	5.04	2.87	82.8	032612-6100
MSD	PSNS015DUP	DME	Composite_equal_time	3174-122 MSD	2.30	1.89	97.7	1.97	2.87	4.86	2.83	84.5	032612-6100
			Spiking Level		2	2	50	2	2	2	2	50	
			Percent Recovery, MS		101%	98%	98%	101%	100%	97%	101%	94%	
			Percent Recovery, MSD		96%	95%	101%	97%	99%	88%	99%	98%	
			RPD		4.6%	3.1%	2.8%	4.0%	1.5%	9.8%	2.0%	3.5%	
<b>REPLICATE PRECISION</b>													
SW10-043	PSNS015	TME	Composite_equal_time	3174-105 R1	0.615	0.0173	443	0.207	1.92	8.71	8.40	74.8	032612-6100
DUP	PSNS015	TME	Composite_equal_time	3174-105 R2	0.601	0.0162	426	0.211	1.84	8.42	8.13	72.3	032612-6100
			Mean		0.608	0.0168	435	0.209	1.88	8.57	8.27	73.6	032612-6100
			RPD		2.3%	6.6%	3.9%	1.9%	4.3%	3.4%	3.3%	3.4%	
SW11-048	PSNS84.1	TME	Composite_equal_time	3174-123	0.985	0.0183	230	0.171	1.88	17.3	5.18	135	032612-6100
DUP	PSNS84.1	TME	Composite_equal_time	3174-123r2	1.01	0.0198	231	0.166	1.86	17.3	5.18	134	032612-6100
			Mean		0.998	0.0191	231	0.169	1.87	17.3	5.18	135	032612-6100
			RPD		2.5%	7.9%	0.4%	3.0%	1.1%	0.0%	0.0%	0.7%	
<b>STANDARD REFERENCE MATERIAL, Seawater</b>													
SRM 1640a-1		TME	Freshwater	TRM 1640a 10x R1	7.60	7.31	48.5	3.72	38.4	77.4	11.4	53.4	032612-6100
SRM 1640a-2		TME	Freshwater	TRM 1640a 10x R2	7.49	7.34	53.0	3.69	41.4	81.3	11.4	53.1	032612-6100
				Certified Value	8.08	8.081	53.0	4.0	40.54	85.8	12.1	55.64	
				PD	5.9%	9.5%	8.5%	6.8%	5.3%	9.7%	5.8%	4.0%	
				PD	7.2%	9.2%	0.0%	7.6%	2.1%	5.2%	5.8%	4.6%	

**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW10 and SW11**  
**Metals in Water**  
**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	Hg	CVA Batch ID
<i>Instrument:</i>					<i>CVA</i>	
Laboratory Achieved Detection Limits					<b>0.0001</b>	
Reporting Limit (MDL* 3.18)					<b>0.0003</b>	

**METHOD BLANKS**

MB-1		TME	Freshwater	MB1_032912	0.0001 U	032912HGA
MB-2		TME	Freshwater	MB2_032912	0.0001 U	032912HGA
MB-3		TME	Freshwater	MB3_032912	0.0001 U	032912HGA

MB-1		TME	Freshwater	MB1_040312	0.0001 U	040312HGA
MB-2		TME	Freshwater	MB2_040312	0.0001 U	040312HGA
MB-3		TME	Freshwater	MB3_040312	0.0001 U	040312HGA

**LABORATORY CONTROL SAMPLES**

Spiking Level					0.00496	
LCS (1)		TME	Freshwater	OPR 032812 run1	0.00521	032912HGA
LCS (2)		TME	Freshwater	OPR 032812 run2	0.00515	032912HGA
LCS Blank (1)		TME	Freshwater	Blank 032812	0.0001 U	032912HGA

**Percent Recovery, LCS 1**

**105%**

**Percent Recovery, LCS 2**

**104%**

Spiking Level					0.00496	
LCS (1)		TME	Freshwater	OPR 040212 run1	0.00504	040312HGA
LCS (2)		TME	Freshwater	OPR 040212 run2	0.00496	040312HGA
LCS Blank (1)		TME	Freshwater	Blank 040212	0.0001 U	040312HGA

**Percent Recovery, LCS 1**

**102%**

**Percent Recovery, LCS 2**

**100%**

MS1	PSNS015	DME	Composite_equal_time	3174-106 MS	0.0142	032912HGA
MSD1	PSNS015	DME	Composite_equal_time	3174-106 MSD	0.0145	032912HGA
SW10-044	PSNS015	DME	Composite_equal_time	3174-106	0.00281	032912HGA

Spiking Level, MS

0.0112

Spiking Level, MSD

0.0111

**Percent Recovery, MS**

**101%**

**Percent Recovery, MSD**

**106%**

**RPD**

**4.1%**

MS2	PSNS126DUP	DME	Composite_equal_time	3174-112 MS	0.0220	032912HGA
MSD2	PSNS126DUP	DME	Composite_equal_time	3174-112 MSD	0.0222	032912HGA
SW10-050	PSNS126DUP	DME	Composite_equal_time	3174-112	0.0103	032912HGA

Spiking Level, MS

0.0115

Spiking Level, MSD

0.0112

**Percent Recovery, MS**

**102%**

**Percent Recovery, MSD**

**106%**

**RPD**

**3.8%**

MS1	PSNS126	TME	Composite_equal_time	3174-127 MS	0.0344	040312HGA
MSD1	PSNS126	TME	Composite_equal_time	3174-127 MSD	0.0390	040312HGA
SW11-052	PSNS126	TME	Composite_equal_time	3174-127	0.0126	040312HGA

Spiking Level, MS

0.0238

Spiking Level, MSD

0.0239

**Percent Recovery, MS**

**92%**

**Percent Recovery, MSD**

**111%**

**RPD**

**18.9%**

**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW10 and SW11**  
**Metals in Water**  
**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	Hg	CVA Batch ID
<i>Instrument:</i>					<i>CVA</i>	
Laboratory Achieved Detection Limits					<b>0.0001</b>	
Reporting Limit (MDL* 3.18)					<b>0.0003</b>	
MS2	PSNS124.1	DME	Composite_equal_time	3174-130 MS	0.0163	040312HGA
MSD2	PSNS124.1	DME	Composite_equal_time	3174-130 MSD	0.0170	040312HGA
SW11-055	PSNS124.1	DME	Composite_equal_time	3174-130	0.00178	040312HGA
				Spiking Level, MS	0.0149	
				Spiking Level, MSD	0.0145	
				<b>Percent Recovery, MS</b>	<b>97%</b>	
				<b>Percent Recovery, MSD</b>	<b>105%</b>	
				<b>RPD</b>	<b>7.3%</b>	
<b><u>REPLICATE PRECISION</u></b>						
SW10-043	PSNS015	TME	Composite_equal_time	3174-105 R1	0.0119	032912HGA
DUP	PSNS015	TME	Composite_equal_time	3174-105 R2	0.0154	032912HGA
				<i>Mean</i>	<i>0.0136</i>	
				<b>RPD</b>	<b>26%</b>	
SW10-043	PSNS015	TME	Composite_equal_time	3174-105 R1re	0.0115	032912HGA
DUP	PSNS015	TME	Composite_equal_time	3174-105 R2re	0.0148	032912HGA
				<i>Mean</i>	<i>0.0131</i>	
				<b>RPD</b>	<b>25%</b>	
SW11-048	PSNS84.1	TME	Composite_equal_time	3174-123	0.00400	040312HGA
DUP	PSNS84.1	TME	Composite_equal_time	3174-123r2	0.00416	040312HGA
				<i>Mean</i>	<i>0.00408</i>	
				<b>RPD</b>	<b>4%</b>	
<b><u>STANDARD REFERENCE MATERIAL</u></b>						
SRM 1641 (1)		TME	Freshwater	1641d 032812	1637	032912HGA
SRM 1641 (1)		TME	Freshwater	1641d 040212	1550	040312HGA
				<b>Certified Value</b>	<b>1590</b>	
				<b>range</b>	<b>±18</b>	
	<b>SRM 1641 (1)</b>			<b>PD</b>	<b>3%</b>	
	<b>SRM 1641 (2)</b>			<b>PD</b>	<b>3%</b>	

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**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW10 and SW11  
Metals in Water**

**DATA QUALIFIERS:**

- c Exceeds DQO but meets contingency criteria of either:
  - 1 SRM certified <10x MDL
  - 2 Insufficient spiking level relative to native sample concentrations
  - 3 Sample concentration <10x MDL
- U Analyte not detected at or above the MDL, MDL reported
- J Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%
- & Accuracy result outside QC criterion of  $\leq 20\%$  PD
- \* Precision result outside QC criterion of  $< 30\%$
- NS Sample not spiked for this analyte
- B Analyte detected in the method blank > RL
  - and sample concentration < 10 times detected blank value
- b Data are blank corrected using the batch specific procedural blank
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- ND Not detected
- Z The chromatographic fingerprint of the sample does not resemble a petroleum product.
- E Reported result exceeds linear range; use with caution

**Notes:**

Composite\_equal\_time Equal portion composite of time integrated sample (ISCO samples)

NC Not Certified

-- Not analyzed

NA Not applicable/available

TME Total Metals Fraction

DME Dissolved Metals Fraction

2 Sample specific MDLs and RLs reported

## QA/QC NARRATIVE

**PROJECT:** Non-Dry Dock Stormwater Sampling for SW10 and SW11

**PARAMETER:** Total and Dissolved Metals – Al, Ag, As, Cd, Cr, Cu, Pb, Zn, Hg

**LABORATORY:** Battelle Marine Sciences Laboratory (MSL), Sequim, Washington

**MATRIX:** Stormwater (as a freshwater matrix)

**SAMPLE CUSTODY AND PROCESSING:** Samples were collected from stormwater outfalls located within the Confined Industrial Area (CIA) and Naval Base Kitsap (NBK) at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) by TEC, MSL, and the U.S. Navy. These storms are the third and fourth of the 2011-12 storm season. The outfalls include PSNS015, PSNS126, PSNS084.1, PSNS115.1, PSNS124, and PSNS124.1. This sample delivery groups includes grab and stormwater composite samples collected from those stations during SW10 and SW11 plus additional samples collected by the USGS from surrounding streams during SW10.

The storm event identified as SW10 began on February 28, 2012 with the composites ending 24 hours later. The storm event identified as SW11 began on March 14, 2012 with the composites ending 24 hours later. Five supplemental samples were collected by USGS during SW10 and received at MSL on 03/2/12. They were collected from the streams in the area as grab samples during the SW10 event. The samples were collected using a 10-ft section of PFA tubing, and C-flex tubing cleaned at the Wisconsin Mercury Research Lab (WMRL). The samples were collected in Apex HDPE bottles as they came from the manufacturers. A field blank was provided by USGS since the HDPE bottles were not specifically cleaned for trace metal samples. The blank was collected by pumping WMRL blank water from the 2-L PETG bottle through the PFA and C-FLex into the respective bottles. Water was pumped peristaltically from the centroid of the stream into the 1-L PETG, 250-ml and 500-ml Apex HDPE bottles using clean hands dirty hands and stored on ice until shipment to MSL.

All samples, except those collected by USGS (separate project), were collected and analyzed in accordance with the Quality Assurance Project Plan (Taylor Associates, Inc. and PNNL 2011 and amended 2012). Two types of samples were collected during the storm. The first was a time proportionate composite sample collected using an ISCO sampler at each of the six outfall locations. The second was a grab sample collected during the storm event in amber glass jars provided by Columbia Analytical Services (CAS) for total petroleum hydrocarbons (TPH). The individual time paced composites collected in the 24 wedge bottles were carried back to the stormwater lab at PSNS & IMF and composited into a single event mean composite (EMC) in a pre-cleaned glass jar. All samples were hand delivered within 24 hours of collection to MSL.

Upon receipt at MSL, the condition of all the samples were verified as acceptable and tracked back to the field chain of custody (COC). In the clean laboratory at MSL, each glass composite sample jar was shaken vigorously (prior and between aliquot removal) and aliquots were poured into the following types of containers:

1. 500 mL Teflon bottle for total metals (TME),
2. 500 mL 0.45µm polyvinylidene fluoride (PVDF) filter unit, vacuum filtered in a class 100 clean bench and then poured into a 500 mL Teflon bottle for dissolved metals,
3. 250 mL low-density polyethylene (LDPE) bottle provided by CAS that included a nitric acid preservative for samples to be analyzed for hardness (HRD),
4. 500 mL LDPE container with sulfuric acid preservative provided by CAS for the analysis of total organic carbon (TOC),
5. 60 mL syringe and ashed glass fiber filter (GFF) in a cleaned filter holder. An aliquot of the sample was filtered into a 250 mL LDPE container with sulfuric acid preservative provided by CAS for the analysis of dissolved organic carbon (DOC),

## QA/QC NARRATIVE

6. 500 mL or 1L LDPE bottle provided by CAS for the analysis of total suspended solids (TSS), and turbidity was measured in the field.

The total metal fractions and dissolved metal fractions were each acidified inside a Class 100 clean bench to a pH of < 2.0 with double distilled nitric acid. The samples were then assigned a Battelle Central File (CF) identification number (3174) and were entered into Battelle's sample tracking system. The composite aliquots for TOC, DOC, hardness, and TSS were all forwarded to CAS for analysis. The quality control narrative for these parameters was provided separately.

The following lists information on sample receipt and processing activities:

**Sample Receipt Dates:** SW10: 03/01/12 and 03/02/12  
SW11: 03/16/12

**Cooler temp.** on arrival All coolers were at 4.0±2°C

**Collection dates** 02/29/12 and 03/15/12

**CVAF analysis dates (Hg)** 03/29/12 and 04/03/12

**TRM Prep/Freshwater Analysis by ICP-MS** 03/26/12  
(As, Ag, Al, Cd, Cr, Cu, Pb, Zn)

### QA/QC DATA QUALITY OBJECTIVES:

Analyte	Analytical Method for Seawater	MS Range of Recovery	SRM Percent Difference	Replicate Precision	Method Detection Limits (ug/L)	Reporting Limits (ug/L)
Aluminum	ICP-MS	70-130%	≤20%	≤30%	0.3	1.0
Arsenic	ICP-MS	70-130%	≤20%	≤30%	0.03	0.1
Cadmium	ICP-MS	70-130%	≤20%	≤30%	0.004	0.01
Chromium	ICP-MS	70-130%	≤20%	≤30%	0.08	0.3
Copper	ICP-MS	70-130%	≤20%	≤30%	0.007	0.02
Lead	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Silver	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Zinc	ICP-MS	70-130%	≤20%	≤30%	0.05	0.2
Mercury	CVAF	70-130%	≤20%	≤30%	0.0001	0.0003

### METHODS:

Samples were analyzed for nine metals: aluminum (Al), arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), silver (Ag), zinc (Zn), and mercury (Hg). Samples were submitted for analyses following two methods. All samples were analyzed for Hg by Cold Vapor Atomic Fluorescence (CVAF) in accordance with Battelle SOP *MSL-I-013, Total Mercury in Aqueous Samples by CVAF*, following EPA Method 1631 revision E.

All samples were analyzed for other metals by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) in accordance with Battelle SOP *MSL-I-022, Determination of Elements in Aqueous and Digestate Samples by ICP/MS*. The base methods for this procedure are EPA Method 1638 and EPA Method 1640. All samples were digested following the total metal recoverable (TRM) method established in EPA Method 1640 prior to analysis by ICP-MS. In summary, this preparation brings the pH of the sample to 2% and heats the capped samples for 2.5 hours in a 85°C oven to solubilize

## QA/QC NARRATIVE

particulates. Both the filtered and unfiltered fractions were prepared using this method to destroy any colloidal particles remaining in the filtered (aka. dissolved) fraction. All results were reported in units of  $\mu\text{g/L}$ . Data are not blank corrected.

**HOLDING TIMES:** All samples were analyzed within the established holding times of 90 days for Hg and six months for all other metals.

**DETECTION LIMITS:** Laboratory method detection limits (MDLs) for TRM freshwater were reported from the MDL study (annually verified) as determined by seven replicates of deionized water spiked at appropriate concentrations and prepared using the TRM method. Reporting limits are determined as 3.18 times the laboratory achieved MDL. The data are evaluated and flagged as follows:

- U Analyte not detected at or above the MDL, MDL reported
- J Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%
- & Accuracy result outside QC criterion of  $\leq 20\%$  PD
- \* Precision result outside QC criterion of  $< 30\%$
- B Analyte detected in the method blank  $>$  RL and sample concentration  $<$  10 times detected blank value
- E Reported result exceeds linear range; use with caution
- c Exceeds data quality objective but meets contingency criterion

**METHOD BLANKS:** A minimum of one method blank was prepared and analyzed by each instrument with each analytical batch. The method blanks were all less than the RL.

**LABORATORY CONTROL SAMPLES:** A minimum of one LCS (OPR or blank spike) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for LCS samples were within the QC acceptance criterion of 70% to 130% for all metals. They also met a secondary criterion of  $\pm 15\%$  recovery for metals of concern.

**MATRIX SPIKE ACCURACY:** A minimum of one set of duplicate matrix spikes (MS/MSD) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for matrix spikes were within the QC limits of 70% to 130% for all metals.

**REPLICATE PRECISION:** Laboratory precision was expressed as the relative percent difference (RPD) between laboratory duplicates. The RPD values for the laboratory duplicates were within the QC acceptance criterion of  $\pm 30\%$  for all metals detected above the RL. The sample collected from PSNS015 was used for one duplicate to evaluate previous heterogeneity issues notes for Hg. The duplicate for PSNS015 illustrated a higher RPD for Hg only, as was noted in previous analyses for this site. Two pairs of duplicates were analyzed, and although the results (26% and 25% RPD) still meet the acceptance criteria, typical analytical precision is  $< 5\%$ . This confirms that the site is highly variable and grab sampling should be considered with caution due to representation issues.

**STANDARD REFERENCE MATERIAL ACCURACY:** Standard reference materials (SRM) were prepared and analyzed with each analytical batch at a minimum frequency of 1 per 20 or fewer samples. Analytical accuracy was expressed as the percent difference (PD) between the measured and the certified value. The freshwater SRMs were 1641d for Hg and 1640a for all other metals. The differences were within the QC acceptance criterion of  $\leq 20\%$ .

**ANALYTICAL NOTES:** One result for Al (Anderson Creek grab sample, 3174-121SUP) exceeded the linear range for the analytical batch. The result was flagged "E" and should be used with caution; however, both high level spikes (HLS) recovered well (400ppb = 93% recovery and 1000ppb = 106% recovery), and demonstrate good linearity, supporting the reported concentration.

## QA/QC NARRATIVE

**REFERENCES:** Taylor Associates, Inc. – Division of TEC, Inc. and Pacific Northwest National Laboratory (2011). Non-Dry Dock Stormwater Monitoring Conducted at Puget Sound Naval Shipyard Bremerton, WA, Project ENVVEST Study Area. Document prepared for the United States Navy Puget Sound Naval Shipyard.



# SAMPLE CHAIN OF CUSTODY FORM

Date: 2/29/2012 <sup>pm</sup> 1  
 Page: 1 of 2  
 Project No.: N4523A10MP00034 Amend.1  
 Project: PSNSNon-dry Dock SW 2010

## Battelle

Marine Sciences Laboratory  
 1529 West Sequim Bay Road  
 Laboratory: Battelle MSL  
 Attention: Jill Brandenberger  
 Phone: (360) 681-4564

				Analyze parameters per QAP/FSP													
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity - ①				No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes / Comp. Cond. (µS/cm) and Turb. (NTU) Readings
SW106-001	PSNS124.1	2/29/2012 1535	SW						X					2	G	SW10	2882 62.8
SW106-002	PSNS126	2/29/2012 1558	SW						X					2	G	SW10	338 2.72
SW106-003	PSNS126 DUP	2/29/2012 1600	SW						X					2	G	SW10	
SW106-004	PSNS124	2/29/2012 1618	SW						X					2	G	SW10	5180 3.21 smelled @ exhaust
SW106-005	PSNS115.1	2/29/2012 1640	SW						X					2	G	SW10	2840 2.81
SW106-006	PSNS084.1	2/29/2012 1658	SW						X					2	G	SW10	253 5.72 break in sample
SW106-007	PSNS015	2/29/2012 1720	SW						X					2	G	SW10	405 16.2
SW106-0018	PSNS015	2/29/2012 1327	SW	X	X	X	X	X						1	C	SW10	222 17
SW106-0029	PSNS084.1	2/29/2012 1336	SW	X	X	X	X	X						1	C	SW10	146 16
SW106-00310	PSNS H5.7 126	2/29/2012 1237	SW	X	X	X	X	X						1	C	SW10	245 8
SW106-00411	PSNS126 DUP	2/29/2012 1237	SW	X	X	X	X	X						1	C	SW10	252 8
SW106-00512	PSNS124	2/29/2012 (1851)	SW	X	X	X	X	X						1	C	SW10	1162 20
SW106-00613	PSNS115.1	2/29/2012 (1340)	SW	X	X	X	X	X						1	C	SW10	493 7
SW106-00714	PSNS124.1	2/29/2012 (2026)	SW	X	X	X	X	X						1	C	SW10	1493 15

Relinquished by: RF 2/29/2012 1825  
 Signature Date Time

Printed Name Company

Received by: BG Beckwith  
 Signature  
BG Beckwith  
 Printed Name

Relinquished by: BG Beckwith 3/1/2012 1000  
 Signature Date Time

BG Beckwith Cardno TEC  
 Printed Name Company

Received by: Jill Brandenberger 3/1/12 1000  
 Signature  
Jill Brandenberger PNNL  
 Printed Name

Total # of Containers:

Shipment Method: Hand carry

Sample Disposition:

Distribution:

1) PNNL

2) CAS

3) TAI

- ① Turbidity measured in SW Lab w/ Hach 2100P meter
- ② Very low sample vol. > 2000ml
- ③ Extremely low sample vol. > 1000 ml

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/1/2012

Page: 1 of 1

Project No.: 54220

Project: Non-dry Dock Stormwater SW10

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-043	PSNS015	02/29/12 1327	SW					x								1	comp	SW10	3174*105
SW10-044	PSNS015	02/29/12 1327	SW						x							1	comp	SW10	3174*106
SW10-045	PSNS084.1	02/29/12 1336	SW					x								1	comp	SW10	3174*107
SW10-046	PSNS084.1	02/29/12 1336	SW						x							1	comp	SW10	3174*108
SW10-047	PSNS126	02/29/12 1237	SW					x								1	comp	SW10	3174*109
SW10-048	PSNS126	02/29/12 1237	SW						x							1	comp	SW10	3174*110
SW10-049	PSNS126DUP	02/29/12 1237	SW					x								1	comp	SW10	3174*111
SW10-050	PSNS126DUP	02/29/12 1237	SW						x							1	comp	SW10	3174*112
SW10-051	PSNS124	02/28/12 1851	SW					x								1	comp	SW10	3174*113
SW10-052	PSNS124	02/28/12 1851	SW						x							1	comp	SW10	3174*114
SW10-053	PSNS115.1	02/29/12 1340	SW					x								1	comp	SW10	3174*115
SW10-054	PSNS115.1	02/29/12 1340	SW						x							1	comp	SW10	3174*116
SW10-055	PSNS124.1	02/28/12 2026	SW					x								1	comp	SW10	3174*117
SW10-056	PSNS124.1	02/28/12 2026	SW						x							1	comp	SW10	3174*118

Relinquished by:

*[Signature]*  
Jill Brandenberger

Signature

Date

Time

Printed Name

Company

Received by:

Signature

Printed Name

Total # of Containers

Shipment Method:

**Retained at PNNL**

Sample Disposition:

Distribution:

1) PNNL

Relinquished by:

Signature

Date

Time

Printed Name

Company

Received by:

Signature

Printed Name

# SAMPLE LOGIN



Project Manager: Brandenberger  
 Date Received: 3/1/2012  
 Batch: 11  
 Login Designee: Brandenberger

Marine Sciences Laboratory  
 1529 West Sequim Bay Road  
 Sequim, Washington 98382  
 PH: (360) 681-4565

Project: **ENVVEST Non-Dry Dock Storm water - SW10**

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW10-043	PSNS015	3174-105	SW	K-4-D	Total Metals	02/29/12
SW10-044	PSNS015	3174-106	SW	K-4-D	Dissolved Metals	02/29/12
SW10-045	PSNS084.1	3174-107	SW	K-4-D	Total Metals	02/29/12
SW10-046	PSNA084.1	3174-108	SW	K-4-D	Dissolved Metals	02/29/12
SW10-047	PSNS126	3174-109	SW	K-4-D	Total Metals	02/29/12
SW10-048	PSNS126	3174-110	SW	K-4-D	Dissolved Metals	02/29/12
SW10-049	PSNS126DUP	3174-111	SW	K-4-D	Total Metals	02/29/12
SW10-050	PSNS126DUP	3174-112	SW	K-4-D	Dissolved Metals	02/29/12
SW10-051	PSNS124	3174-113	SW	K-4-D	Total Metals	02/29/12
SW10-052	PSNS124	3174-114	SW	K-4-D	Dissolved Metals	02/29/12
SW10-053	PSNS115.1	3174-115	SW	K-4-D	Total Metals	02/29/12
SW10-054	PSNS115.1	3174-116	SW	K-4-D	Dissolved Metals	02/29/12
SW10-055	PSNS124.1	3174-117	SW	K-4-D	Total Metals	02/29/12
SW10-056	PSNS124.1	3174-118	SW	K-4-D	Dissolved Metals	02/29/12

SW = STORMWATER

## LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 3174 Sample No(s): 105-118 Batch: 19  
Project Name: SW10 Project Manager: JMB

## TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: storm water WP# \_\_\_\_\_

Yes ☐ No ☒ Navy-type Project (requires high-level sample tracking procedures)

☐ ☒ USDA Samples (see Compliance Agreement Checklist) PM Verification: \_\_\_\_\_

☒ ☐ Filter Samples: Amount: Entire sample Half of sample

☐ ☒ Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)

☒ ☐ Special instructions: split

Sample Preservation Instructions: various

\*\*See LIMS for archive/disposal information\*\*

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes ☐ No ☐ N/A ☒ Indicate in Appropriate Box

☐ ☐ ☒ Custody seal present Seal intact? YES ☐ NO ☐

☒ ☐ ☐ Cooler temperature (acceptable range:  $4 \pm 2^\circ\text{C}$  or solids: frozen) 6 coolers  $\pm 4^\circ\text{C}$   
(if multiple coolers, note temp. of each) °C

☐ ☐ ☒ Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)  
Comment/Remedy: \_\_\_\_\_

☒ ☐ ☐ Were all chain of custody forms signed and dated?

☒ ☐ ☐ Were samples filtered at MSL?

Sample condition(s): Acceptable Other (explain): \_\_\_\_\_

Container type: Teflon Poly Glass Cap. Vial Other: \_\_\_\_\_

Notes: \_\_\_\_\_

Completed By: [Signature]Date/Time: 3/1/12 1000

## SAMPLE PRESERVATION

☐ Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)

☐ Random pH checked for ~10% of samples (use dip paper) Sample IDs: \_\_\_\_\_

☐ Complete pH check required for project (use pH meter and record on pH Record form)

☒ Sample(s) were preserved at MSL

Type: ☒ 0.2% HNO<sub>3</sub> Notes: Optima Lot# 1211020

☐ 0.5% HCl (Hg samples) Notes: \_\_\_\_\_ Lot# \_\_\_\_\_

☐ Refrigerate/Freeze Notes: \_\_\_\_\_

☐ Other Notes: \_\_\_\_\_

Completed By: [Signature]Date/Time: 3/1/12 17:50Storage Shelf: K-4-D

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/1/2012  
 Page: 1 of 3  
 Project No.: 54220  
 Project: Non-dry Dock Stormwater SW10

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
 1529 West Sequim Bay Road  
 Laboratory: Battelle MSL

Attention: Jill Brandenberger  
 Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-001	PSNS124.1	02/29/12 1535	SW							X						2	grab	SW10	
SW10-002	PSNS126	02/29/12 1558	SW							X						2	grab	SW10	
SW10-003	PSNS126 Dup	02/29/12 1600	SW							X						2	grab	SW10	
SW10-004	PSNS124	02/29/12 1618	SW							X						2	grab	SW10	
SW10-005	PSNS 115.1	02/29/12 1640	SW							X						2	grab	SW10	
SW10-006	PSNS084.1	02/29/12 1658	SW							X						2	grab	SW10	
SW10-007	PSNS015	02/29/12 1720	SW							X						2	grab	SW10	
SW10-015	PSNS015	02/29/12 1327	SW	x												1	comp	SW10	
SW10-016	PSNS015	02/29/12 1327	SW		x											1	comp	SW10	
SW10-017	PSNS015	02/29/12 1327	SW			x										1	comp	SW10	
SW10-018	PSNS015	02/29/12 1327	SW				x									1	comp	SW10	
SW10-019	PSNS084.1	02/29/12 1336	SW	x												1	comp	SW10	
SW10-020	PSNS084.1	02/29/12 1336	SW		x											1	comp	SW10	
SW10-021	PSNS084.1	02/29/12 1336	SW			x										1	comp	SW10	

Relinquished by: C. Suslick 3/2/12 1500  
 Signature Date Time  
C. SUSLICK Battelle MSL  
 Printed Name Company

Received by: FedEx  
 Signature

Total # of Containers

Shipment Method:

Fedex to CAS

Printed Name

Sample Disposition:

Relinquished by: \_\_\_\_\_  
 Signature Date Time  
 \_\_\_\_\_  
 Printed Name Company

Received by:

Signature

Distribution:

- 1) PNNL
- 2) CAS

Printed Name

2 Coolers

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/1/2012

Page: 2 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW10

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH							No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-022	PSNS084.1	02/29/12 1336	SW				X										1	comp	SW10	
SW10-023	PSNS126	02/29/12 1237	SW	x													1	comp	SW10	
SW10-024	PSNS126	02/29/12 1237	SW		x												1	comp	SW10	
SW10-025	PSNS126	02/29/12 1237	SW			x											1	comp	SW10	
SW10-026	PSNS126	02/29/12 1237	SW				x										1	comp	SW10	
SW10-027	PSNS126DUP	02/29/12 1237	SW	x													1	comp	SW10	
SW10-028	PSNS126DUP	02/29/12 1237	SW		x												1	comp	SW10	
SW10-029	PSNS126DUP	02/29/12 1237	SW			x											1	comp	SW10	
SW10-030	PSNS126DUP	02/29/12 1237	SW				x										1	comp	SW10	
SW10-031	PSNS124	02/28/12 1851	SW	x													1	comp	SW10	
SW10-032	PSNS124	02/28/12 1851	SW		x												1	comp	SW10	
SW10-033	PSNS124	02/28/12 1851	SW			x											1	comp	SW10	
SW10-034	PSNS124	02/28/12 1851	SW				x										1	comp	SW10	
SW10-035	PSNS115.1	02/29/12 1340	SW	X													1	comp	SW10	

Relinquished by:

*[Signature]*

3/2/12

1500

Signature

Date

Time

*C. Sushick*

*Battelle*

Printed Name

Company

Relinquished by:

Signature

Date

Time

Printed Name

Company

Received by:

*[Signature]*

Signature

Printed Name

Received by:

Signature

Printed Name

Total # of Containers

Shipment Method:

Fedex to CAS

Sample Disposition:

Distribution:

1) PNNL

2) CAS

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/1/2012

Page: 3 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW10

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH							No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-036	PSNS115.1	02/29/12 1340	SW		X												1	comp	SW10	
SW10-037	PSNS115.1	02/29/12 1340	SW			X											1	comp	SW10	
SW10-038	PSNS115.1	02/29/12 1340	SW				X										1	comp	SW10	
SW10-039	PSNS124.1	02/28/12 2026	SW	X													1	comp	SW10	
SW10-040	PSNS124.1	02/28/12 2026	SW		X												1	comp	SW10	
SW10-041	PSNS124.1	02/28/12 2026	SW			X											1	comp	SW10	
SW10-042	PSNS124.1	02/28/12 2026	SW				X										1	comp	SW10	
--end--																				

Relinquished by:

*[Signature]*

Signature

3/2/12

Date

1500

Time

*C. Suslick*

Printed Name

Company

*Battelle*

Received by:

*Fedex*

Signature

Printed Name

Total # of Containers

Shipment Method:

Fedex to CAS

Sample Disposition:

Distribution:

1) PNNL

2) CAS

Relinquished by:

Signature

Date

Time

Printed Name

Company

Received by:

Signature

Printed Name

1C1201959

## SAMPLE CHAIN OF CUSTODY FORM

Date: 3/1/2012

Page: 1 of 3

Project No.: 54220

Project: Non-dry Dock Stormwater SW10

SW = Stormwater

## Battelle

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-001	PSNS124.1	02/29/12 1535	SW							X						2	grab	SW10	
SW10-002	PSNS126	02/29/12 1558	SW							X						2	grab	SW10	
SW10-003	PSNS126 Dup	02/29/12 1600	SW							X						2	grab	SW10	
SW10-004	PSNS124	02/29/12 1618	SW							X						2	grab	SW10	
SW10-005	PSNS 115.1	02/29/12 1640	SW							X						2	grab	SW10	
SW10-006	PSNS084.1	02/29/12 1658	SW							X						2	grab	SW10	
SW10-007	PSNS015	02/29/12 1720	SW							X						2	grab	SW10	
SW10-015	PSNS015	02/29/12 1327	SW	x												1	comp	SW10	
SW10-016	PSNS015	02/29/12 1327	SW		x											1	comp	SW10	
SW10-017	PSNS015	02/29/12 1327	SW			x										1	comp	SW10	
SW10-018	PSNS015	02/29/12 1327	SW				x									1	comp	SW10	
SW10-019	PSNS084.1	02/29/12 1336	SW	x												1	comp	SW10	
SW10-020	PSNS084.1	02/29/12 1336	SW		x											1	comp	SW10	
SW10-021	PSNS084.1	02/29/12 1336	SW			x										1	comp	SW10	

Relinquished by:	Received by:	Total # of Containers
<i>C. Sushick</i> Signature	<i>Fedex</i> Signature	Shipment Method:
3/2/12 Date		Fedex to CAS
1500 Time		
C. SUSHICK Printed Name		Sample Disposition:
Battelle MSL Company		Distribution:
		1) PNNL
		2) CAS

Relinquished by:	Received by:	
	<i>Bredt</i> Signature	
	3-3-12 Date	
	Bredt Printed Name	

2 Coolers



101201959

**SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/1/2012  
 Page: 2 of 3  
 Project No.: 54220  
 Project: Non-dry Dock Stormwater SW10

SW = Stormwater

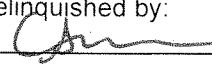
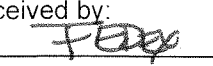
**Battelle**

Marine Sciences Laboratory  
 1529 West Sequim Bay Road  
 Laboratory: Battelle MSL  
 Attention: Jill Brandenberger  
 Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-022	PSNS084.1	02/29/12 1336	SW				X								1	comp	SW10	
SW10-023	PSNS126	02/29/12 1237	SW	x											1	comp	SW10	
SW10-024	PSNS126	02/29/12 1237	SW		x										1	comp	SW10	
SW10-025	PSNS126	02/29/12 1237	SW			x									1	comp	SW10	
SW10-026	PSNS126	02/29/12 1237	SW				x								1	comp	SW10	
SW10-027	PSNS126DUP	02/29/12 1237	SW	x											1	comp	SW10	
SW10-028	PSNS126DUP	02/29/12 1237	SW		x										1	comp	SW10	
SW10-029	PSNS126DUP	02/29/12 1237	SW			x									1	comp	SW10	
SW10-030	PSNS126DUP	02/29/12 1237	SW				x								1	comp	SW10	
SW10-031	PSNS124	02/28/12 1851	SW	x											1	comp	SW10	
SW10-032	PSNS124	02/28/12 1851	SW		x										1	comp	SW10	
SW10-033	PSNS124	02/28/12 1851	SW			x									1	comp	SW10	
SW10-034	PSNS124	02/28/12 1851	SW				x								1	comp	SW10	
SW10-035	PSNS115.1	02/29/12 1340	SW	X											1	comp	SW10	

Relinquished by:			Received by:			Total # of Containers		
						Shipment Method:		
Signature	Date	Time	Signature			Fedex to CAS		
C. S. Slick	3/2/12	1500	Printed Name			Sample Disposition:		
	Battelle		Printed Name			Distribution:		
			Signature			1) PNNL		
			3-3-12			2) CAS		
			Printed Name					
			Printed Name					

K1201959

Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix		Hardness	TOC	DOC	TSS	TME/DME	DME	TPH				No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-036	PSNS115.1	02/29/12 1340	SW		X	X									1	comp	SW10	
SW10-037	PSNS115.1	02/29/12 1340	SW				X								1	comp	SW10	
SW10-038	PSNS115.1	02/29/12 1340	SW					X							1	comp	SW10	
SW10-039	PSNS124.1	02/28/12 2026	SW	X											1	comp	SW10	
SW10-040	PSNS124.1	02/28/12 2026	SW		X										1	comp	SW10	
SW10-041	PSNS124.1	02/28/12 2026	SW			X									1	comp	SW10	
SW10-042	PSNS124.1	02/28/12 2026	SW					X							1	comp	SW10	
--end--																		

<b>Relinquished by:</b>			<b>Received by:</b>			Total # of Containers
Signature _____ Date <u>3/2/12</u> Time <u>1500</u>			Signature <u>Fedex</u>			Shipment Method:
Printed Name C. SUSLICK Company Battelle			Printed Name _____			Fedex to CAS
			Sample Disposition:			

<b>Relinquished by:</b>			<b>Received by:</b>			Distribution:
Signature _____ Date _____ Time _____			Signature <u>Bruce Tubin</u> Date <u>3-3-12</u>			1) PNNL
Printed Name _____ Company _____			Printed Name <u>moo</u>			2) CAS

**Columbia Analytical Services, Inc.**  
**Cooler Receipt and Preservation Form**

PC AA

Client / Project: Buttelle Service Request K12 01957

Received: 3-3-12 Opened: 3-3-12 By: BT Unloaded: 3-3-12 By: BT

1. Samples were received via? *Mail* FedEx *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? \_\_\_\_\_
- If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
4.7	2.1	302	<u>NA</u>			<u>Y</u>
3.3	1.9	315				<u>X</u>

7. Packing material: *Inserts* *Baggies* Bubble Wrap Gel Packs *Wet Ice* *Dry Ice* *Sleeves* \_\_\_\_\_
8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* Y *N*
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* Y *N*
12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* *NA* Y *N*
14. Were VOA vials received without headspace? *Indicate in the table below.* NA *Y* *N*
15. Was C12/Res negative? NA *Y* *N*

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**Appendix A. Description of stream and stormwater drainage outfall stations, Watershed Sources Project, Sinclair Inlet, Washington, May 2008 through February 2010.**

[Study site name: Location of study sites are shown in figure 2-3. Field Identifier: Shortened Study Site Name for field use. PSNS, Puget Sound Naval Shipyard. USGS Site identifier: Unique number for each site based on latitude and longitude of the site. First six digits are latitude, next seven digits are longitude, and final two digits are a sequence number to uniquely identify each site. Latitude and longitude: Latitude and longitude at site, in degrees, minutes, and seconds referenced to NAD 83.]

Study Site Name	Field Identifier	USGS Site identifier	Sample date	Latitude	Longitude
<b>Stream Sites</b>					
Gorst Creek at W. Belfair Valley Rd. at Gorst, WA	Gorst	12072370	05/09/08 07/14/08	473145.4	1224230.6
Anderson Creek nr SW Cook Rd nr Gorst, WA	Anderson	12072430	05/08/08 07/15/08	473125.4	1224059.7
Blackjack Creek at mouth at Port Orchard, WA	Blackjack	12072510	05/07/08 07/14/08	473232.5	1223738.4
Annapolis Creek at Arnold Ave. at Annapolis, WA	Anapolis	12072520	05/09/08 07/15/08	473248.6	1223705.4
Olney Creek at WWTP at Annapolis, WA	Olney	12072530	05/08/08 07/14/08	473244.4	1223645.4
<b>Storm Water Sites</b>					
Drainage outfall at navy city recycle near Gorst, WA	Navy City	473144122415401	01/07/09	473144.9	1224153.8
PSNS015 Storm vault A42 PIPE 4 NR BREMERTON WA	PSNS 015	473329122390304	01/07/09	473333.9	1223747.8
PSNS124 Storm vault I/55-9 NR BREMERTON WA	PSNS 124	473336122374701	01/07/09	473340.3	1223748.2
PSNS124.1 Storm vault J/56-1 NR BREMERTON WA	PSNS 124.1	473336122374401	01/07/09	473339.9	1223744.7
Storm outfall at sheridan Rd. near Bremerton, WA	Sheridan Road	473510122384701	01/08/09	473510	1223847
Stormwater outfall at Port Orchard boat ramp	PO boat ramp	473225122382801	01/08/09	473222.9	1223828.7
PSNS 015-2253	PSNS 015-2253*	473322122390201	12/29/09 03/31/10	473322.6	1223902.9

\* PSNS 015-2253 is not the NPDES site for the PSNS-015 storm drain, 2253 is the label of the manhole vault.

# SAMPLE LOGIN

Project Manager: Brandenberger

Date Received: 3/2/2012

Batch: 12

Login Designee: McGahan

Project: **Envvest SW10**

Pacific Northwest  
NATIONAL LABORATORY

Battelle  
The Business of Innovation

Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, Washington 98382  
PH: (360) 681-4565

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW10-101	Anderson Creek-Blank	3174-119	water	Prep Lab K-4-C, TOC Deep Freezer	Metals, TOC	02/29/12
SW10-102	Gorst Creek	3174-120	water	Prep Lab K-4-C, TOC Deep Freezer	Metals, TOC	02/29/12
SW10-103	Anderson Creek	3174-121	water	Prep Lab K-4-C, TOC Deep Freezer	Metals, TOC	02/29/12
SW10-104	Annapolis Creek	3174-122	water	Prep Lab K-4-C, TOC Deep Freezer	Metals, TOC	02/29/12
SW10-105	Blackjack Creek	3174-123	water	Prep Lab K-4-C, TOC Deep Freezer	Metals, TOC	02/29/12



## LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 3174 Sample No(s): 119-123Batch: 12Project Name: SWID EavesProject Manager: Braunenberg

## TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: _____		WP# _____
Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Navy-type Project (requires high-level sample tracking procedures)
<input type="checkbox"/>	<input type="checkbox"/>	USDA Samples (see Compliance Agreement Checklist)
		PM Verification:
<input type="checkbox"/>	<input type="checkbox"/>	Filter Samples: <u>Amount:</u> <u>Entire sample</u> <u>Half of sample</u>
<input type="checkbox"/>	<input type="checkbox"/>	Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)
<input type="checkbox"/>	<input type="checkbox"/>	Special instructions: _____
Sample Preservation Instructions: _____		
**See LIMS for archive/disposal information**		

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes	No	N/A	Indicate in Appropriate Box	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Custody seal present	Seal intact? YES NO
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cooler temperature (acceptable range: $4 \pm 2^\circ\text{C}$ or solids: frozen)	<u>5.1</u> °C
				(if multiple coolers, note temp. of each) _____ °C
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)	
Comment/Remedy: _____				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Were all chain of custody forms signed and dated?	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Were samples filtered at MSL?	
Sample condition(s):		<input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain): _____		
Container type:		<input type="checkbox"/> Teflon <input type="checkbox"/> Poly <input type="checkbox"/> Glass <input type="checkbox"/> Cap. Vial <input type="checkbox"/> Other: _____		
Notes: <u>500ml poly - Field Samples</u> <u>Blank = 250ml Poly 3 Blank</u>				
Completed By: <u>[Signature]</u>		Date/Time: <u>03/02/12 1100</u>		

## SAMPLE PRESERVATION

<input type="checkbox"/>	Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)	
<input type="checkbox"/>	Random pH checked for ~10% of samples (use dip paper)	Sample IDs: _____
<input type="checkbox"/>	Complete pH check required for project (use pH meter and record on pH Record form)	
<input checked="" type="checkbox"/>	Sample(s) were preserved at MSL	
Type: <input checked="" type="checkbox"/>	0.2% HNO <sub>3</sub>	Notes: <u>optima</u> Lot# <u>1211020</u>
<input type="checkbox"/>	0.5% HCl (Hg samples)	Notes: _____ Lot# _____
<input type="checkbox"/>	Refrigerate/Freeze	Notes: _____
<input type="checkbox"/>	Other	Notes: <u>Doc to dup for 5/</u>
Completed By: <u>[Signature]</u>		Date/Time: <u>3/2/12 15:30</u>
Storage Shelf: <u>K-4-X-D</u>		
		<u>ku 3/2/12</u>

Date: 3/14/12

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

## Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

A } Smith-D01  
B }  
A } Smith-D02  
B } 3/16/12



Date: 3/15/12

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

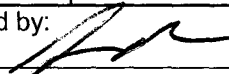
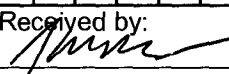
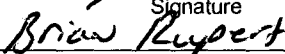
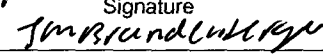
## Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

				Analyze parameters per QAP/FSP												Phone: (360) 681-4564	
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity				No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes / Comp. Cond. (µS/cm) and Turb. (NTU) Readings
SW11-009	PSNS 015	3/15/12 1601	SW	X	X	X	X	X						1	Comp	SW11	83/NAO
SW11-010	PSNS 015 Dup	3/15/12 1601	SW	X	X	X	X	X						1	Comp	SW11	82/NAO
SW11-011	PSNS 84.1	3/15/12 1656	SW	X	X	X	X	X						1	Comp	SW11	142/17
SW11-012	PSNS 115.1	3/15/12 1558	SW	X	X	X	X	X						1	Comp	SW11	293/9
SW11-013	PSNS 126	3/15/12 1529	SW	X	X	X	X	X						1	Comp	SW11	192/12
SW11-014	PSNS 124.1	3/15/12 1658	SW	X	X	X	X	X						1	Comp	SW11	190/4
SW11-015	PSNS 124	3/15/12 1400	SW	X	X	X	X	X						1	Comp	SW11	521/20
Relinquished by:  3/16/12 0920				Received by:  3/16/12 0920										Total # of Containers: _____			
Signature:  Date: _____ Time: _____				Signature:  Date: _____ Time: _____										Shipment Method: <u>Hand Carry</u>			
Printed Name: <u>Brian Rupert</u> Company: <u>Cardno TIEC</u>				Printed Name: _____										Sample Disposition: _____			
Relinquished by: _____				Received by: _____										Distribution: _____			
Signature: _____ Date: _____ Time: _____				Signature: _____										1) PNNL			
Printed Name: _____ Company: _____				Printed Name: _____										2) CAS			
														3) TAI			

NA<sup>①</sup> - Did not have Turbidity meter during collection

② Turbidity measured in SW Lab w/ Tech 2100p meter

# SAMPLE CHAIN OF CUSTODY FORM

Date: 3/16/2012

Page: 1 of 1

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW11

SW = Stormwater

## Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW11-044	PSNS015	3/15/12 1601	SW					x								1	comp	SW11	3174*119
SW11-045	PSNS015	3/15/12 1601	SW						x							1	comp	SW11	3174*120
SW11-046	PSNS015DUP	3/15/12 1601	SW					x								1	comp	SW11	3174*121
SW11-047	PSNS015DUP	3/15/12 1601	SW						x							1	comp	SW11	3174*122
SW11-048	PSNS84.1	3/15/12 1656	SW					x								1	comp	SW11	3174*123
SW11-049	PSNS84.1	3/15/12 1656	SW						x							1	comp	SW11	3174*124
SW11-050	PSNS115.1	3/15/12 1558	SW					x								1	comp	SW11	3174*125
SW11-051	PSNS115.1	3/15/12 1558	SW						x							1	comp	SW11	3174*126
SW11-052	PSNS126	3/15/12 1529	SW					x								1	comp	SW11	3174*127
SW11-053	PSNS126	3/15/12 1529	SW						x							1	comp	SW11	3174*128
SW11-054	PSNS124.1	3/15/12 1658	SW					x								1	comp	SW11	3174*129
SW11-055	PSNS124.1	3/15/12 1658	SW						x							1	comp	SW11	3174*130
SW11-056	PSNS124	3/15/12 1400	SW					x								1	comp	SW11	3174*131
SW11-057	PSNS124	3/15/12 1400	SW						x							1	comp	SW11	3174*132

Relinquished by:

*Jill Brandenberger* 3/16/12 1700  
 Signature Date Time  
 Jill Brandenberger  
 Printed Name Company

Received by:

*C. Susner* 3/16/12 1700  
 Signature  
 C. Susner  
 Printed Name

Total # of Containers

Shipment Method:

Retained at PNNL

Sample Disposition:

Relinquished by:

Signature Date Time  
 Printed Name Company

Received by:

Signature  
 Printed Name

Distribution:

1) PNNL

# **SAMPLE LOGIN**

Project Manager: Brandenberger  
 Date Received: 3/16/2012  
 Batch: 12  
 Login Designee: Brandenberger/Suslick



Marine Sciences Laboratory  
 1529 West Sequim Bay Road  
 Sequim, Washington 98382  
 PH: (360) 681-4565

Project: **ENVVEST Non-Dry Dock Storm water - SW11 (March 2012)**

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW11-044	PSNS015	3174*119	Water	Prep Lab	Total Metals	03/15/12
SW11-045	PSNS015	3174*120	Water	Prep Lab	Dissolved Metals	03/15/12
SW11-046	PSNS015DUP	3174*121	Water	Prep Lab	Total Metals	03/15/12
SW11-047	PSNS015DUP	3174*122	Water	Prep Lab	Dissolved Metals	03/15/12
SW11-048	PSNS84.1	3174*123	Water	Prep Lab	Total Metals	03/15/12
SW11-049	PSNS84.1	3174*124	Water	Prep Lab	Dissolved Metals	03/15/12
SW11-050	PSNS115.1	3174*125	Water	Prep Lab	Total Metals	03/15/12
SW11-051	PSNS115.1	3174*126	Water	Prep Lab	Dissolved Metals	03/15/12
SW11-052	PSNS126	3174*127	Water	Prep Lab	Total Metals	03/15/12
SW11-053	PSNS126	3174*128	Water	Prep Lab	Dissolved Metals	03/15/12
SW11-054	PSNS124.1	3174*129	Water	Prep Lab	Total Metals	03/15/12
SW11-055	PSNS124.1	3174*130	Water	Prep Lab	Dissolved Metals	03/15/12
SW11-056	PSNS124	3174*131	Water	Prep Lab	Total Metals	03/15/12
SW11-057	PSNS124	3174*132	Water	Prep Lab	Dissolved Metals	03/15/12

## LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 3174 Sample No(s): 119-132 Batch: 12  
Project Name: ENVEST SWII Project Manager: JMB

## TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: <u>Water</u>		WP#
Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Navy-type Project (requires high-level sample tracking procedures)
<input type="checkbox"/>	<input type="checkbox"/>	USDA Samples (see Compliance Agreement Checklist)
		PM Verification:
<input type="checkbox"/>	<input type="checkbox"/>	Filter Samples: <u>Amount:</u> <u>Entire sample</u> <u>Half of sample</u>
<input type="checkbox"/>	<input type="checkbox"/>	Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)
<input type="checkbox"/>	<input type="checkbox"/>	Special instructions:
Sample Preservation Instructions:		
**See LIMS for archive/disposal information**		

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Hand delivered

Yes	No	N/A	Indicate in Appropriate Box
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Custody seal present
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cooler temperature (acceptable range: $4 \pm 2^\circ\text{C}$ or solids: frozen) (if multiple coolers, note temp. of each)
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Were all chain of custody forms signed and dated?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Were samples filtered at MSL? <u>as noted</u>
Sample condition(s): <u>Acceptable</u> Other (explain):			
Container type: <u>Teflon</u> <u>Poly</u> <u>Glass</u> Cap. Vial Other:			
Notes:			

Completed By: Date/Time: 3/16/12 0920

## SAMPLE PRESERVATION

<input type="checkbox"/>	Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)	
<input type="checkbox"/>	Random pH checked for ~10% of samples (use dip paper)	Sample IDs:
<input type="checkbox"/>	Complete pH check required for project (use pH meter and record on pH Record form)	
<input type="checkbox"/>	Sample(s) were preserved at MSL	
Type:	<input checked="" type="checkbox"/> 0.2% HNO <sub>3</sub>	Notes: <u>Notes</u> Lot# <u>1211020</u>
	<input type="checkbox"/> 0.5% HCl (Hg samples)	Notes: Lot#
	<input checked="" type="checkbox"/> Refrigerate/Freeze	Notes: <u>Conv. to CoC</u>
	<input type="checkbox"/> Other	Notes:

Completed By: Date/Time: 3/16/12 1800

Storage Shelf:

## SAMPLE CHAIN OF CUSTODY FORM

Date: 3/16/2012

Page: 1 of 1

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW11

SW = Stormwater

## Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

[illegible]

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/16/2012

Page: 2 of 2

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW11

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW11-030	PSNS115.1	3/15/12 1558	SW			X										1	comp	SW11	
SW11-031	PSNS115.1	3/15/12 1558	SW				X									1	comp	SW11	
SW11-032	PSNS126	3/15/12 1529	SW	X												1	comp	SW11	
SW11-033	PSNS126	3/15/12 1529	SW		X											1	comp	SW11	
SW11-034	PSNS126	3/15/12 1529	SW			X										1	comp	SW11	
SW11-035	PSNS126	3/15/12 1529	SW				X									1	comp	SW11	
SW11-036	PSNS124.1	3/15/12 1658	SW	X												1	comp	SW11	
SW11-037	PSNS124.1	3/15/12 1658	SW		X											1	comp	SW11	
SW11-038	PSNS124.1	3/15/12 1658	SW			X										1	comp	SW11	
SW11-039	PSNS124.1	3/15/12 1658	SW				X									1	comp	SW11	
SW11-040	PSNS124	3/15/12 1400	SW	X												1	comp	SW11	
SW11-041	PSNS124	3/15/12 1400	SW		X											1	comp	SW11	
SW11-042	PSNS124	3/15/12 1400	SW			X										1	comp	SW11	
SW11-043	PSNS124	3/15/12 1400	SW				X									1	comp	SW11	

Relinquished by:			Received by:			Total # of Containers	
Signature	Date	Time	Signature			Shipment Method:	
						Fedex to CAS	
Printed Name Company			Printed Name			Sample Disposition:	
Relinquished by:			Received by:			Distribution:	
Signature	Date	Time	Signature			1) PNNL	
						2) CAS	
Printed Name Company			Printed Name				

# **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/16/2012

Page: 1 of 2

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW11

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH						No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW11-016	PSNS015	3/15/12 1601	SW	X												1	comp	SW11	
SW11-017	PSNS015	3/15/12 1601	SW		X											1	comp	SW11	
SW11-018	PSNS015	3/15/12 1601	SW			X										1	comp	SW11	
SW11-019	PSNS015	3/15/12 1601	SW				X									1	comp	SW11	
SW11-020	PSNS015DUP	3/15/12 1601	SW	X												1	comp	SW11	
SW11-021	PSNS015DUP	3/15/12 1601	SW		X											1	comp	SW11	
SW11-022	PSNS015DUP	3/15/12 1601	SW			X										1	comp	SW11	
SW11-023	PSNS015DUP	3/15/12 1601	SW				X									1	comp	SW11	
SW11-024	PSNS84.1	3/15/12 1656	SW	X												1	comp	SW11	
SW11-025	PSNS84.1	3/15/12 1656	SW		X											1	comp	SW11	
SW11-026	PSNS84.1	3/15/12 1656	SW			X										1	comp	SW11	
SW11-027	PSNS84.1	3/15/12 1656	SW				X									1	comp	SW11	
SW11-028	PSNS115.1	3/15/12 1558	SW	X												1	comp	SW11	
SW11-029	PSNS115.1	3/15/12 1558	SW		X											1	comp	SW11	

Relinquished by:			Received by:			Total # of Containers	
Signature	Date	Time	Signature			Shipment Method:	
						Fedex to CAS	
Printed Name Company			Printed Name			Sample Disposition:	
Relinquished by:			Received by:			Distribution:	
Signature	Date	Time	Signature			1) PNNL	
						2) CAS	
Printed Name Company			Printed Name				

## Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

88



**Columbia Analytical Services, Inc.**  
**Cooler Receipt and Preservation Form**

PC HA

Client / Project: Battelle Marine Sciences Service Request K12 02461

Received: 3-17-12 Opened: 3-17-12 By: BT Unloaded: 3-17-12 By: BT

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? \_\_\_\_\_
- If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
<u>3.0</u>	<u>2.2</u>	<u>315</u>	<u>(NA)</u>			<u>X</u>

7. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves \_\_\_\_\_
8. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA (Y) N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
14. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
15. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

51202609

# SAMPLE CHAIN OF CUSTODY FORM

Date: 3/19/2012

Page: 1 of 2

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW11

SW = Stormwater

## Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

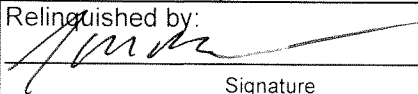
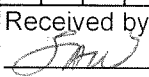
Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
1 SW11-016	PSNS015	3/15/12 1601	SW	X											1	comp	SW11	
2 SW11-017	PSNS015	3/15/12 1601	SW		X										1	comp	SW11	
3 SW11-018	PSNS015	3/15/12 1601	SW			X									1	comp	SW11	
4 SW11-019	PSNS015	3/15/12 1601	SW				X								1	comp	SW11	
5 SW11-020	PSNS015DUP	3/15/12 1601	SW	X											1	comp	SW11	
6 SW11-021	PSNS015DUP	3/15/12 1601	SW		X										1	comp	SW11	
7 SW11-022	PSNS015DUP	3/15/12 1601	SW			X									1	comp	SW11	
8 SW11-023	PSNS015DUP	3/15/12 1601	SW				X								1	comp	SW11	
9 SW11-024	PSNS84.1	3/15/12 1656	SW	X											1	comp	SW11	
10 SW11-025	PSNS84.1	3/15/12 1656	SW		X										1	comp	SW11	
11 SW11-026	PSNS84.1	3/15/12 1656	SW			X									1	comp	SW11	
12 SW11-027	PSNS84.1	3/15/12 1656	SW				X								1	comp	SW11	
13 SW11-028	PSNS115.1	3/15/12 1558	SW	X											1	comp	SW11	
14 SW11-029	PSNS115.1	3/15/12 1558	SW		X										1	comp	SW11	

Relinquished by:	Received by:	Total # of Containers
 3/19/12 1341	 3/20/12 0920	
Signature	Signature	Shipment Method:
Printed Name	Printed Name	Fedex to CAS
Relinquished by:	Received by:	Sample Disposition:
		Distribution:
Signature	Signature	1) PNNL
Printed Name	Printed Name	2) CAS

K1202509

# SAMPLE CHAIN OF CUSTODY FORM

Date: 3/19/2012

Page: 2 of 2

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW11

SW = Stormwater

## Battelle

Marine Sciences Laboratory  
1529 West Sequim Bay Road

Laboratory: Battelle MSL

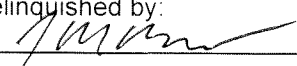

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
15 SW11-030	PSNS115.1	3/15/12 1558	SW			X									1	comp	SW11	
16 SW11-031	PSNS115.1	3/15/12 1558	SW				X								1	comp	SW11	
17 SW11-032	PSNS126	3/15/12 1529	SW	X											1	comp	SW11	
18 SW11-033	PSNS126	3/15/12 1529	SW		X										1	comp	SW11	
19 SW11-034	PSNS126	3/15/12 1529	SW			X									1	comp	SW11	
20 SW11-035	PSNS126	3/15/12 1529	SW				X								1	comp	SW11	
21 SW11-036	PSNS124.1	3/15/12 1658	SW	X											1	comp	SW11	
22 SW11-037	PSNS124.1	3/15/12 1658	SW		X										1	comp	SW11	
23 SW11-038	PSNS124.1	3/15/12 1658	SW			X									1	comp	SW11	
24 SW11-039	PSNS124.1	3/15/12 1658	SW				X								1	comp	SW11	
25 SW11-040	PSNS124	3/15/12 1400	SW	X											1	comp	SW11	
26 SW11-041	PSNS124	3/15/12 1400	SW		X										1	comp	SW11	
27 SW11-042	PSNS124	3/15/12 1400	SW			X									1	comp	SW11	
28 SW11-043	PSNS124	3/15/12 1400	SW				X								1	comp	SW11	

Relinquished by:			Received by:			Total # of Containers		
								
Signature	Date	Time	Signature	Date	Time	Shipment Method:		
Jill Brandenberger	3/19/12	1341	SWOLF	3/20/12	0920	Fedex to CAS		
Printed Name	Company		Printed Name			Sample Disposition:		
Relinquished by:			Received by:			Distribution:		
						1) PNNL		
						2) CAS		
Printed Name			Printed Name					

**Columbia Analytical Services, Inc.**  
**Cooler Receipt and Preservation Form**

PC 40

Client / Project: Battelle Service Request K12 02609  
 Received: 3/20/12 Opened: 3/20/12 By: SRW Unloaded: 3/20/12 By: SRW

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
-0.2	1.4	313	<u>NA</u>	7433 5476 3432		
1.5		310		" " 3400		

7. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves \_\_\_\_\_  
 8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N  
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N  
 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N  
 12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N  
 14. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N  
 15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Client:** Battelle  
**Project:** Non-dry Dock Stormwater SW10  
**Sample Matrix:** Water

**Service Request No.:** K1201959  
**Date Received:** 3/3/12

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

**Sample Receipt**

Forty-two water samples were received for analysis at Columbia Analytical Services on 3/3/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

**General Chemistry Parameters**

**Total Suspended Solids by Standard Method 2540 D:**

The Relative Percent Difference (RPD) for the replicate analysis of Total Suspended Solids in the Batch QC sample was outside the normal CAS control limits. The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

No other anomalies associated with the analysis of these samples were observed.

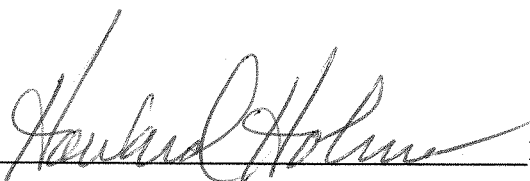
**Diesel Range Organics by EPA Method 8015**

**Relative Percent Difference Exceptions:**

The Relative Percent Difference (RPD) criterion for the replicate analysis of DRO (Diesel Range Organics) and RRO (Residual Range Organics) in sample SW10-001 and SW10-002 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed.

Approved by \_\_\_\_\_



Date \_\_\_\_\_

3-19-12

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 2340 C

**Service Request:** K1201959  
**Date Collected:** 02/28/12 - 02/29/12  
**Date Received:** 03/3/12  
**Units:** mg/L  
**Basis:** NA

**Hardness, Total as CaCO<sub>3</sub>**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW10-015	K1201959-008	30.0	2.0	0.8	1	03/09/12 10:00	
SW10-019	K1201959-012	21.2	2.0	0.8	1	03/09/12 10:00	
SW10-023	K1201959-016	44.8	2.0	0.8	1	03/09/12 10:00	
SW10-027	K1201959-020	45.6	2.0	0.8	1	03/09/12 10:00	
SW10-031	K1201959-024	109	2.0	0.8	1	03/09/12 10:00	
SW10-035	K1201959-028	50.0	2.0	0.8	1	03/09/12 10:00	
SW10-039	K1201959-032	90.0	2.0	0.8	1	03/09/12 10:00	
Method Blank	K1201959-MB1	ND U	2.0	0.8	1	03/09/12 10:00	
Method Blank	K1201959-MB2	ND U	2.0	0.8	1	03/09/12 10:00	

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Collected:** 02/29/12  
**Date Received:** 03/03/12  
**Date Analyzed:** 03/09/12

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** SW10-015  
**Lab Code:** K1201959-008

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1201959-008DUP6	Average	RPD	RPD Limit
					Result			
Hardness, Total as CaCO <sub>3</sub>	SM 2340 C	2.0	0.8	30.0	30.0	30.0	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 3/12/2012 2:21:57 PM

Superset Reference: 12-0000204887 rev 00

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959**Date Analyzed:** 03/09/12

**Lab Control Sample Summary**  
**Hardness, Total as CaCO<sub>3</sub>**

**Analysis Method:** SM 2340 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 282981

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1201959-LCS2	89.2	86.3	103	90-116
Lab Control Sample	K1201959-LCS3	88.0	86.3	102	90-116



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D

**Service Request:** K1201959  
**Date Collected:** 02/28/12 - 02/29/12  
**Date Received:** 03/3/12  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Suspended (TSS)**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW10-018	K1201959-011	13.0	5.0	-	1	03/06/12 16:20	
SW10-022	K1201959-015	6.0	5.0	-	1	03/06/12 16:20	
SW10-026	K1201959-019	9.5	5.0	-	1	03/06/12 16:20	
SW10-030	K1201959-023	10.5	5.0	-	1	03/06/12 16:20	
SW10-034	K1201959-027	48.0	5.0	-	1	03/06/12 16:20	
SW10-038	K1201959-031	ND U	5.0	-	1	03/06/12 16:20	
SW10-042	K1201959-035	8.0	5.0	-	1	03/06/12 16:20	
Method Blank	K1201959-MB1	ND U	5.0	-	1	03/06/12 16:20	

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 03/06/12

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** Batch QC  
**Lab Code:** K1201908-001

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1201908-001DUP5	Average	RPD	RPD Limit
					Result			
Solids, Total Suspended (TSS)	SM 2540 D	10	-	86	105	95.5	20 *	10

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 3/12/2012 2:21:57 PM

Superset Reference: 12-0000204887 rev 00

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959**Date Analyzed:** 03/06/12

**Lab Control Sample Summary**  
**Solids, Total Suspended (TSS)**

**Analysis Method:** SM 2540 D**Units:** mg/L**Basis:** NA**Analysis Lot:** 282542

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1201959-LCS2	300	305	98	85-111

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1201959  
**Date Collected:** 02/28/12 - 02/29/12  
**Date Received:** 03/3/12

**Units:** mg/L**Basis:** NA**Carbon, Dissolved Organic (DOC)**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW10-017	K1201959-010	2.30	0.50	0.07	1	03/05/12 17:05	
SW10-021	K1201959-014	1.85	0.50	0.07	1	03/05/12 17:05	
SW10-025	K1201959-018	15.7	0.50	0.07	1	03/05/12 17:05	
SW10-029	K1201959-022	16.1	0.50	0.07	1	03/05/12 17:05	
SW10-033	K1201959-026	31.5	0.50	0.07	1	03/05/12 17:05	
SW10-037	K1201959-030	2.30	0.50	0.07	1	03/05/12 17:05	
SW10-041	K1201959-034	2.77	0.50	0.07	1	03/05/12 17:05	
Method Blank	K1201959-MB1	ND U	0.50	0.07	1	03/05/12 17:05	
Method Blank	K1201959-MB2	ND U	0.50	0.07	1	03/05/12 17:05	

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## QA/QC Report

Client: Battelle Marine Sciences Lab  
 Project: Non-dry Dock Stormwater SW10/54220  
 Sample Matrix: Water  
 Analysis Method: SM 5310 C

Service Request: K1201959  
 Date Collected: 02/28/12 - 02/29/12  
 Date Received: 03/03/12  
 Units: mg/L  
 Basis: NA

**Duplicate Sample Summary**  
**Carbon, Dissolved Organic (DOC)**

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
SW10-017	K1201959-010DUP8	0.50	0.07	2.30	2.39	2.35	4	10	03/05/12
SW10-021	K1201959-014DUP10	0.50	0.07	1.85	1.77	1.81	5	10	03/05/12
SW10-025	K1201959-018DUP12	0.50	0.07	15.7	15.8	15.7	<1	10	03/05/12
SW10-029	K1201959-022DUP14	0.50	0.07	16.1	16.2	16.2	1	10	03/05/12
SW10-033	K1201959-026DUP16	0.50	0.07	31.5	32.2	31.8	2	10	03/05/12
SW10-037	K1201959-030DUP18	0.50	0.07	2.30	2.39	2.35	4	10	03/05/12
SW10-041	K1201959-034DUP20	0.50	0.07	2.77	2.72	2.74	2	10	03/05/12

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959**Date Collected:** 02/29/12**Date Received:** 03/03/12**Date Analyzed:** 03/5/12

**Matrix Spike Summary**  
**Carbon, Dissolved Organic (DOC)**

**Sample Name:** SW10-017  
**Lab Code:** K1201959-010  
**Analysis Method:** SM 5310 C

**Units:** mg/L**Basis:** NA

**Matrix Spike**  
K1201959-010MS3

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Carbon, Dissolved Organic (DOC)	2.30	25.4	25.0	92	60-134

Results flagged with an asterisk (\*) indicate values outside control criteria.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959**Date Analyzed:** 03/05/12

**Duplicate Lab Control Sample Summary**  
**General Chemistry Parameters**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 282378

Analyte Name	Lab Control Sample K1201959-LCS1			Duplicate Lab Control Sample K1201959-DLCS1			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Carbon, Dissolved Organic (DOC)	20.6	22.7	91	20.4	22.7	90	87-112	1	33

**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220

Service Request: K1201959

**Continuing Calibration Verification (CCV) Summary****Carbon, Dissolved Organic (DOC)**

Analysis Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	282378	KQ1202328-18	03/05/12 17:05	25.0	24.5	98	90-110
CCV2	282378	KQ1202328-19	03/05/12 17:05	25.0	23.9	96	90-110
CCV3	282378	KQ1202328-20	03/05/12 17:05	25.0	24.8	99	90-110
CCV4	282378	KQ1202328-21	03/05/12 17:05	25.0	25.0	100	90-110
CCV5	282378	KQ1202328-22	03/05/12 17:05	25.0	24.7	99	90-110



**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959

**Continuing Calibration Blank (CCB) Summary**  
**Carbon, Dissolved Organic (DOC)**

**Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>MRL</b>	<b>MDL</b>	<b>Result</b>	<b>Q</b>
CCB1	282378	KQ1202328-23	03/05/12 17:05	0.50	0.07	ND	U
CCB2	282378	KQ1202328-24	03/05/12 17:05	0.50	0.07	ND	U
CCB3	282378	KQ1202328-25	03/05/12 17:05	0.50	0.07	ND	U
CCB4	282378	KQ1202328-26	03/05/12 17:05	0.50	0.07	ND	U
CCB5	282378	KQ1202328-27	03/05/12 17:05	0.50	0.07	0.08	J

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1201959  
**Date Collected:** 02/28/12 - 02/29/12  
**Date Received:** 03/3/12

**Units:** mg/L  
**Basis:** NA

**Carbon, Total Organic**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW10-016	K1201959-009	2.71	0.50	0.07	1	03/05/12 17:05	
SW10-020	K1201959-013	2.21	0.50	0.07	1	03/05/12 17:05	
SW10-024	K1201959-017	17.7	0.50	0.07	1	03/05/12 17:05	
SW10-028	K1201959-021	18.3	0.50	0.07	1	03/05/12 17:05	
SW10-032	K1201959-025	33.9	0.50	0.07	1	03/05/12 17:05	
SW10-036	K1201959-029	2.86	0.50	0.07	1	03/05/12 17:05	
SW10-040	K1201959-033	3.04	0.50	0.07	1	03/05/12 17:05	
Method Blank	K1201959-MB1	ND U	0.50	0.07	1	03/05/12 17:05	

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water  
Analysis Method: SM 5310 C

Service Request: K1201959  
Date Collected: 02/28/12 - 02/29/12  
Date Received: 03/03/12

Units: mg/L  
Basis: NA

Duplicate Sample Summary  
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
SW10-016	K1201959-009DUP7	0.50	0.07	2.71	2.83	2.77	4	10	03/05/12
SW10-020	K1201959-013DUP9	0.50	0.07	2.21	2.38	2.29	7	10	03/05/12
SW10-024	K1201959-017DUP11	0.50	0.07	17.7	17.9	17.8	1	10	03/05/12
SW10-028	K1201959-021DUP13	0.50	0.07	18.3	17.6	18.0	4	10	03/05/12
SW10-032	K1201959-025DUP15	0.50	0.07	33.9	34.4	34.2	1	10	03/05/12
SW10-036	K1201959-029DUP17	0.50	0.07	2.86	2.78	2.82	3	10	03/05/12
SW10-040	K1201959-033DUP19	0.50	0.07	3.04	3.18	3.11	4	10	03/05/12

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959**Date Collected:** 02/29/12**Date Received:** 03/03/12**Date Analyzed:** 03/5/12**Matrix Spike Summary  
Carbon, Total Organic**

**Sample Name:** SW10-016  
**Lab Code:** K1201959-009  
**Analysis Method:** SM 5310 C

**Units:** mg/L**Basis:** NA**Matrix Spike  
K1201959-009MS2**

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Total Organic	2.71	27.0	25.0	97	60-134

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959**Date Analyzed:** 03/05/12

**Lab Control Sample Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 282377

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1201959-LCS2	20.5	22.7	90	87-112

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959**Continuing Calibration Verification (CCV) Summary****Carbon, Total Organic****Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>True Value</b>	<b>Measured Value</b>	<b>Percent Recovery</b>	<b>Acceptance Limits</b>
CCV1	282377	KQ1202324-11	03/05/12 17:05	25.0	24.5	98	90-110
CCV2	282377	KQ1202324-12	03/05/12 17:05	25.0	25.0	100	90-110
CCV3	282377	KQ1202324-13	03/05/12 17:05	25.0	24.7	99	90-110
CCV4	282377	KQ1202324-14	03/05/12 17:05	25.0	25.0	100	90-110

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959

**Continuing Calibration Blank (CCB) Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>MRL</b>	<b>MDL</b>	<b>Result</b>	<b>Q</b>
CCB1	282377	KQ1202324-15	03/05/12 17:05	0.50	0.07	ND	U
CCB2	282377	KQ1202324-16	03/05/12 17:05	0.50	0.07	ND	U
CCB3	282377	KQ1202324-17	03/05/12 17:05	0.50	0.07	0.08	J
CCB4	282377	KQ1202324-18	03/05/12 17:05	0.50	0.07	ND	U

**COLUMBIA ANALYTICAL SERVICES, INC.**  
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**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959

**Cover Page - Organic Analysis Data Package**  
**Diesel and Residual Range Organics**

<b>Sample Name</b>	<b>Lab Code</b>	<b>Date Collected</b>	<b>Date Received</b>
SW10-001	K1201959-001	02/29/2012	03/03/2012
SW10-002	K1201959-002	02/29/2012	03/03/2012
SW10-003	K1201959-003	02/29/2012	03/03/2012
SW10-004	K1201959-004	02/29/2012	03/03/2012
SW10-005	K1201959-005	02/29/2012	03/03/2012
SW10-006	K1201959-006	02/29/2012	03/03/2012
SW10-007	K1201959-007	02/29/2012	03/03/2012
SW10-001	KWG1202421-1	02/29/2012	03/03/2012
SW10-002	KWG1202421-2	02/29/2012	03/03/2012

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_



## COLUMBIA ANALYTICAL SERVICES, INC.

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## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Collected: 02/29/2012  
Date Received: 03/03/2012

## Diesel and Residual Range Organics

Sample Name: SW10-001  
Lab Code: K1201959-001  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	280	H	250	11	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	650	O	500	19	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	03/09/12	Acceptable
n-Triacontane	103	50-150	03/09/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Collected:** 02/29/2012  
**Date Received:** 03/03/2012

## Diesel and Residual Range Organics

**Sample Name:** SW10-002  
**Lab Code:** K1201959-002  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	87	J	270	12	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	270	J	530	20	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	107	50-150	03/09/12	Acceptable
n-Triacontane	115	50-150	03/09/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Collected: 02/29/2012  
Date Received: 03/03/2012

## Diesel and Residual Range Organics

Sample Name: SW10-003  
Lab Code: K1201959-003  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	73	J	250	11	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	260	J	500	19	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	103	50-150	03/09/12	Acceptable
n-Triacontane	112	50-150	03/09/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Collected:** 02/29/2012  
**Date Received:** 03/03/2012

## Diesel and Residual Range Organics

**Sample Name:** SW10-004  
**Lab Code:** K1201959-004  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	85	J	260	12	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	180	J	520	20	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	103	50-150	03/09/12	Acceptable
n-Triacontane	110	50-150	03/09/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

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## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Collected: 02/29/2012  
Date Received: 03/03/2012

## Diesel and Residual Range Organics

Sample Name: SW10-005  
Lab Code: K1201959-005  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	72 J	250	11	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	170 J	500	19	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	95	50-150	03/09/12	Acceptable
n-Triacontane	100	50-150	03/09/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Collected:** 02/29/2012  
**Date Received:** 03/03/2012

## Diesel and Residual Range Organics

**Sample Name:** SW10-006  
**Lab Code:** K1201959-006  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	200	J	260	12	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	720	O	520	20	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	92	50-150	03/09/12	Acceptable
n-Triacontane	98	50-150	03/09/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Collected: 02/29/2012  
Date Received: 03/03/2012

## Diesel and Residual Range Organics

Sample Name: SW10-007  
Lab Code: K1201959-007  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	89	J	270	12	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	230	J	530	20	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	88	50-150	03/09/12	Acceptable
n-Triacontane	94	50-150	03/09/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Collected: NA  
Date Received: NA

## Diesel and Residual Range Organics

Sample Name: Method Blank  
Lab Code: KWG1202421-4  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	11	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	31	J	490	19	1	03/08/12	03/09/12	KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	50-150	03/09/12	Acceptable
n-Triacontane	97	50-150	03/09/12	Acceptable

Comments:



## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959

Surrogate Recovery Summary  
Diesel and Residual Range Organics

Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: PERCENT  
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SW10-001	K1201959-001	97	103
SW10-002	K1201959-002	107	115
SW10-003	K1201959-003	103	112
SW10-004	K1201959-004	103	110
SW10-005	K1201959-005	95	100
SW10-006	K1201959-006	92	98
SW10-007	K1201959-007	88	94
SW10-001DUP	KWG1202421-1	92	99
SW10-002DUP	KWG1202421-2	98	105
Method Blank	KWG1202421-4	96	97
Lab Control Sample	KWG1202421-3	103	101

## Surrogate Recovery Control Limits (%)

---

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

---

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Extracted: 03/08/2012  
Date Analyzed: 03/09/2012

Duplicate Sample Summary  
Diesel and Residual Range Organics

Sample Name: SW10-001  
Lab Code: K1201959-001  
Extraction Method: Method  
Analysis Method: NWT PH-Dx

Units: ug/L  
Basis: NA  
Level: Low  
Extraction Lot: KWG1202421

Analyte Name	MRL	MDL	Sample Result	SW10-001DUP KWG1202421-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	260	12	280	280	280	1 #	30
Residual Range Organics (RRO)	520	20	650	650	650	1 #	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220  
Sample Matrix: Water

Service Request: K1201959  
Date Extracted: 03/08/2012  
Date Analyzed: 03/09/2012

**Duplicate Sample Summary**  
**Diesel and Residual Range Organics**

Sample Name: SW10-002  
Lab Code: K1201959-002  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low  
Extraction Lot: KWG1202421

Analyte Name	MRL	MDL	Sample Result	SW10-002DUP KWG1202421-2 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	270	12	87	75	81	15 #	30
Residual Range Organics (RRO)	530	20	270	270	270	2 #	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Extracted:** 03/08/2012  
**Date Analyzed:** 03/09/2012

**Lab Control Spike Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1202421

Lab Control Sample KWG1202421-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1690	1600	106	46-140
Residual Range Organics (RRO)	770	800	96	45-159

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Extracted:** 03/08/2012  
**Date Analyzed:** 03/09/2012  
**Time Analyzed:** 01:21

**Method Blank Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Method Blank  
**Lab Code:** KWG1202421-4

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\030812B-NW\0308F047.D

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Level:** Low  
**Extraction Lot:** KWG1202421

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1202421-3	J:\GC21\DATA\030812B-NW\0308F045.D	03/09/12	00:59
SW10-002	K1201959-002	J:\GC21\DATA\030812B-NW\0308F053.D	03/09/12	02:27
SW10-002DUP	KWG1202421-2	J:\GC21\DATA\030812B-NW\0308F055.D	03/09/12	02:50
SW10-003	K1201959-003	J:\GC21\DATA\030812B-NW\0308F057.D	03/09/12	03:12
SW10-004	K1201959-004	J:\GC21\DATA\030812B-NW\0308F059.D	03/09/12	03:34
SW10-005	K1201959-005	J:\GC21\DATA\030812B-NW\0308F061.D	03/09/12	03:55
SW10-007	K1201959-007	J:\GC21\DATA\030812B-NW\0308F063.D	03/09/12	04:18
SW10-001	K1201959-001	J:\GC21\DATA\030812B-NW\0308F077.D	03/09/12	06:52
SW10-001DUP	KWG1202421-1	J:\GC21\DATA\030812B-NW\0308F079.D	03/09/12	07:13
SW10-006	K1201959-006	J:\GC21\DATA\030812B-NW\0308F083.D	03/09/12	07:57

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220  
**Sample Matrix:** Water

**Service Request:** K1201959  
**Date Extracted:** 03/08/2012  
**Date Analyzed:** 03/09/2012  
**Time Analyzed:** 00:59

**Lab Control Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Lab Control Sample  
**Lab Code:** KWG1202421-3

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\030812B-NW\0308F045.D

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Level:** Low  
**Extraction Lot:** KWG1202421

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1202421-4	J:\GC21\DATA\030812B-NW\0308F047.D	03/09/12	01:21
SW10-002	K1201959-002	J:\GC21\DATA\030812B-NW\0308F053.D	03/09/12	02:27
SW10-002DUP	KWG1202421-2	J:\GC21\DATA\030812B-NW\0308F055.D	03/09/12	02:50
SW10-003	K1201959-003	J:\GC21\DATA\030812B-NW\0308F057.D	03/09/12	03:12
SW10-004	K1201959-004	J:\GC21\DATA\030812B-NW\0308F059.D	03/09/12	03:34
SW10-005	K1201959-005	J:\GC21\DATA\030812B-NW\0308F061.D	03/09/12	03:55
SW10-007	K1201959-007	J:\GC21\DATA\030812B-NW\0308F063.D	03/09/12	04:18
SW10-001	K1201959-001	J:\GC21\DATA\030812B-NW\0308F077.D	03/09/12	06:52
SW10-001DUP	KWG1202421-1	J:\GC21\DATA\030812B-NW\0308F079.D	03/09/12	07:13
SW10-006	K1201959-006	J:\GC21\DATA\030812B-NW\0308F083.D	03/09/12	07:57

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Results

Client: Battelle Marine Sciences Lab  
 Project: Non-dry Dock Stormwater SW10/54220

Service Request: K1201959  
 Calibration Date: 07/12/2011

Initial Calibration Summary  
 Diesel and Residual Range Organics

Calibration ID: CAL10701  
 Instrument ID: GC21

Column: ZB-1

Level ID	File ID
A	J:\GC21\DATA\071111B-NW\0711F037.D
B	J:\GC21\DATA\071111B-NW\0711F039.D
C	J:\GC21\DATA\071111B-NW\0711F041.D
D	J:\GC21\DATA\071111B-NW\0711F043.D
E	J:\GC21\DATA\071111B-NW\0711F045.D
F	J:\GC21\DATA\071111B-NW\0711F047.D
G	J:\GC21\DATA\071111B-NW\0711F057.D
H	J:\GC21\DATA\071111B-NW\0711F059.D

Level ID	File ID
J	J:\GC21\DATA\071111B-NW\0711F063.D
K	J:\GC21\DATA\071111B-NW\0711F065.D
L	J:\GC21\DATA\071111B-NW\0711F067.D
M	J:\GC21\DATA\071111B-NW\0711F069.D
N	J:\GC21\DATA\071111B-NW\0711F071.D
I	J:\GC21\DATA\071111B-NW\0711F061.D

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)							H	50	699	I	200	712	J	500	777
	K	2000	797	L	5000	768	M	20000	802	N	50000	809			
Residual Range Organics (RRO)				B	50	588	C	200	510	D	500	513	E	2000	500
	F	5000	545												
o-Terphenyl				G	1.0	988	H	2.5	1000	I	10	998	J	25	1040
	K	100	1100	L	250	1020									
n-Triacontane				G	1.0	803	H	2.5	840	I	10	840	J	25	875
	K	100	936	L	250	872									

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10701  
**Instrument ID:** GC21

**Column:** ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	5.7		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.8		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	5.3		≤ 20

Results flagged with an asterisk (\*) indicate values outside control criteria.



## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW10/54220

Service Request: K1201959  
Calibration Date: 07/12/2011  
Date Analyzed: 07/12/2011

Second Source Calibration Verification  
Diesel and Residual Range Organics

Calibration Type: External Standard  
Analysis Method: NWTPH-Dx

Calibration ID: CAL10701  
Units: ppm

File ID: J:\GC21\DATA\071111B-NW\0711F053.D  
J:\GC21\DATA\071111B-NW\0711F073.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	990	767	761	-1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1100	531	562	6	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959  
**Date Analyzed:** 03/08/2012 -  
03/09/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1202464  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC2\DATA\030812B-NW\0308F039.D  
J:\GC2\DATA\030812B-NW\0308F041.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	802	5	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	960	531	511	-4	NA	± 15 %	AverageRF
o-Terphenyl	50	52	1030	1060	3	NA	± 15 %	AverageRF
n-Triacontane	50	52	861	903	5	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959  
**Date Analyzed:** 03/09/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1202464  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\030812B-NW\0308F069.D  
J:\GC21\DATA\030812B-NW\0308F071.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	767	844	10	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	960	531	510	-4	NA	± 15 %	AverageRF
o-Terphenyl	50	54	1030	1100	7	NA	± 15 %	AverageRF
n-Triacontane	50	54	861	931	8	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW10/54220

**Service Request:** K1201959  
**Date Analyzed:** 03/09/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1202464  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\030812B-NW\0308F087.D  
J:\GC21\DATA\030812B-NW\0308F089.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	767	806	5	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	980	531	519	-2	NA	± 15 %	AverageRF
o-Terphenyl	50	52	1030	1070	4	NA	± 15 %	AverageRF
n-Triacontane	50	54	861	928	8	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Client:** Battelle  
**Project:** Non-dry Dock Stormwater SW11  
**Sample Matrix:** Water

**Service Request No.:** K1202461  
**Date Received:** 3/17/12

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

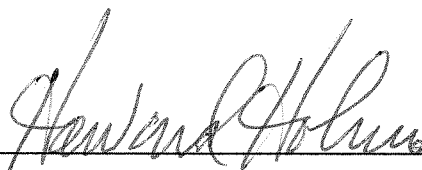
**Sample Receipt**

Eight water samples were received for analysis at Columbia Analytical Services on 3/17/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

**Diesel Range Organics by NWTPH-Dx**

No anomalies associated with the analysis of these samples were observed.

Approved by



Date

4-1-12

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375

Service Request: K1202461

Cover Page - Organic Analysis Data Package  
Diesel and Residual Range Organics

Sample Name	Lab Code	Date Collected	Date Received
SW11-001	K1202461-001	03/14/2012	03/17/2012
SW11-002	K1202461-002	03/14/2012	03/17/2012
SW11-003	K1202461-003	03/15/2012	03/17/2012
SW11-004	K1202461-004	03/15/2012	03/17/2012
SW11-005	K1202461-005	03/15/2012	03/17/2012
SW11-006	K1202461-006	03/15/2012	03/17/2012
SW11-007	K1202461-007	03/15/2012	03/17/2012
SW11-008	K1202461-008	03/15/2012	03/17/2012
SW11-001	KWG1202820-2	03/14/2012	03/17/2012

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_

Cover Page - Organic

Page 1 of 1

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Collected:** 03/14/2012  
**Date Received:** 03/17/2012

## Diesel and Residual Range Organics

**Sample Name:** SW11-001  
**Lab Code:** K1202461-001  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	110	J	270	12	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	330	J	530	20	1	03/19/12	03/22/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	70	50-150	03/22/12	Acceptable
n-Triacontane	77	50-150	03/22/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Collected:** 03/14/2012  
**Date Received:** 03/17/2012

## Diesel and Residual Range Organics

**Sample Name:** SW11-002  
**Lab Code:** K1202461-002  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	130	J	270	12	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	250	J	530	20	1	03/19/12	03/22/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	82	50-150	03/22/12	Acceptable
n-Triacontane	88	50-150	03/22/12	Acceptable

Comments: \_\_\_\_\_



## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375  
Sample Matrix: Storm water

Service Request: K1202461  
Date Collected: 03/15/2012  
Date Received: 03/17/2012

## Diesel and Residual Range Organics

Sample Name: SW11-003  
Lab Code: K1202461-003  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	190	J	290	13	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	780	Z	570	22	1	03/19/12	03/22/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	76	50-150	03/22/12	Acceptable
n-Triacontane	84	50-150	03/22/12	Acceptable

Comments:

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Collected:** 03/15/2012  
**Date Received:** 03/17/2012

## Diesel and Residual Range Organics

**Sample Name:** SW11-004  
**Lab Code:** K1202461-004  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	110	J	270	12	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	330	J	540	21	1	03/19/12	03/22/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	70	50-150	03/22/12	Acceptable
n-Triacontane	76	50-150	03/22/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Collected:** 03/15/2012  
**Date Received:** 03/17/2012

## Diesel and Residual Range Organics

**Sample Name:** SW11-005  
**Lab Code:** K1202461-005  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	390	H	270	12	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	1100	O	530	20	1	03/19/12	03/22/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	78	50-150	03/22/12	Acceptable
n-Triacontane	84	50-150	03/22/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Collected:** 03/15/2012  
**Date Received:** 03/17/2012

## Diesel and Residual Range Organics

**Sample Name:** SW11-006  
**Lab Code:** K1202461-006  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	570	H	280	12	1	03/19/12	03/23/12	KWG1202820	
Residual Range Organics (RRO)	2500	O	550	21	1	03/19/12	03/23/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	76	50-150	03/23/12	Acceptable
n-Triacontane	84	50-150	03/23/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Collected:** 03/15/2012  
**Date Received:** 03/17/2012

## Diesel and Residual Range Organics

**Sample Name:** SW11-007  
**Lab Code:** K1202461-007  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	600	H	280	12	1	03/19/12	03/23/12	KWG1202820	
Residual Range Organics (RRO)	2600	O	550	21	1	03/19/12	03/23/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	81	50-150	03/23/12	Acceptable
n-Triacontane	89	50-150	03/23/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375  
Sample Matrix: Storm water

Service Request: K1202461  
Date Collected: 03/15/2012  
Date Received: 03/17/2012

## Diesel and Residual Range Organics

Sample Name: SW11-008  
Lab Code: K1202461-008  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	350	H	280	13	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	1000	O	560	22	1	03/19/12	03/22/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	76	50-150	03/22/12	Acceptable
n-Triacontane	83	50-150	03/22/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## Analytical Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375  
Sample Matrix: Storm water

Service Request: K1202461  
Date Collected: NA  
Date Received: NA

## Diesel and Residual Range Organics

Sample Name: Method Blank  
Lab Code: KWG1202820-4  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	11	1	03/19/12	03/21/12	KWG1202820	
Residual Range Organics (RRO)	25	J	500	19	1	03/19/12	03/21/12	KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	83	50-150	03/21/12	Acceptable
n-Triacontane	90	50-150	03/21/12	Acceptable

Comments: \_\_\_\_\_

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375  
Sample Matrix: Water

Service Request: K1202461

Surrogate Recovery Summary  
Diesel and Residual Range Organics

Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: PERCENT  
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
Batch QC	K1202250-001	80	89
SW11-001	K1202461-001	70	77
SW11-002	K1202461-002	82	88
SW11-003	K1202461-003	76	84
SW11-004	K1202461-004	70	76
SW11-005	K1202461-005	78	84
SW11-006	K1202461-006	76	84
SW11-007	K1202461-007	81	89
SW11-008	K1202461-008	76	83
Batch QCDUP	KWG1202820-1	80	89
SW11-001DUP	KWG1202820-2	75	82
Method Blank	KWG1202820-4	83	90
Lab Control Sample	KWG1202820-3	89	92

## Surrogate Recovery Control Limits (%)

---

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

---

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.



## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375  
Sample Matrix: Water

Service Request: K1202461  
Date Extracted: 03/19/2012  
Date Analyzed: 03/22/2012

**Duplicate Sample Summary**  
**Diesel and Residual Range Organics**

Sample Name: Batch QC  
Lab Code: K1202250-001  
Extraction Method: Method  
Analysis Method: NWTPH-Dx

Units: ug/L  
Basis: NA  
Level: Low  
Extraction Lot: KWG1202820

Analyte Name	MRL	MDL	Sample Result	Batch QCDUP KWG1202820-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	260	12	97	110	100	9 #	30
Residual Range Organics (RRO)	520	20	87	96	91	9 #	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Extracted:** 03/19/2012  
**Date Analyzed:** 03/22/2012

**Duplicate Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** SW11-001  
**Lab Code:** K1202461-001  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1202820

Analyte Name	MRL	MDL	Sample Result	SW11-001DUP KWG1202820-2 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	270	12	110	120	110	10 #	30
Residual Range Organics (RRO)	530	20	330	260	290	25 #	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Extracted:** 03/19/2012  
**Date Analyzed:** 03/21/2012

**Lab Control Spike Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1202820

Analyte Name	Lab Control Sample KWG1202820-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	3320	3200	104	46-140
Residual Range Organics (RRO)	1520	1600	95	45-159

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Extracted:** 03/19/2012  
**Date Analyzed:** 03/21/2012  
**Time Analyzed:** 23:37

**Method Blank Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Method Blank  
**Lab Code:** KWG1202820-4  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\032112B\0321F015.D  
**Level:** Low  
**Extraction Lot:** KWG1202820

This Method Blank applies to the following analyses:

<b>Sample Name</b>	<b>Lab Code</b>	<b>File ID</b>	<b>Date Analyzed</b>	<b>Time Analyzed</b>
Lab Control Sample	KWG1202820-3	J:\GC21\DATA\032112B\0321F013.D	03/21/12	23:15
Batch QC	K1202250-001	J:\GC21\DATA\032112B\0321F025.D	03/22/12	01:27
Batch QCDUP	KWG1202820-1	J:\GC21\DATA\032112B\0321F027.D	03/22/12	01:49
SW11-001	K1202461-001	J:\GC21\DATA\032112B\0321F045.D	03/22/12	05:06
SW11-001DUP	KWG1202820-2	J:\GC21\DATA\032112B\0321F047.D	03/22/12	05:28
SW11-002	K1202461-002	J:\GC21\DATA\032112B\0321F049.D	03/22/12	05:50
SW11-003	K1202461-003	J:\GC21\DATA\032112B\0321F051.D	03/22/12	06:12
SW11-004	K1202461-004	J:\GC21\DATA\032112B\0321F053.D	03/22/12	06:34
SW11-008	K1202461-008	J:\GC21\DATA\032112B\0321F067.D	03/22/12	09:08
SW11-005	K1202461-005	J:\GC21\DATA\032112B\0321F069.D	03/22/12	09:30
SW11-006	K1202461-006	J:\GC21\DATA\032212B\0322F047.D	03/23/12	02:06
SW11-007	K1202461-007	J:\GC21\DATA\032212B\0322F049.D	03/23/12	02:28

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375  
**Sample Matrix:** Storm water

**Service Request:** K1202461  
**Date Extracted:** 03/19/2012  
**Date Analyzed:** 03/21/2012  
**Time Analyzed:** 23:15

**Lab Control Sample Summary**  
**Diesel and Residual Range Organics**

**Sample Name:** Lab Control Sample  
**Lab Code:** KWG1202820-3  
**Extraction Method:** Method  
**Analysis Method:** NWTPH-Dx

**Instrument ID:** GC21  
**File ID:** J:\GC21\DATA\032112B\0321F013.D  
**Level:** Low  
**Extraction Lot:** KWG1202820

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1202820-4	J:\GC21\DATA\032112B\0321F015.D	03/21/12	23:37
Batch QC	K1202250-001	J:\GC21\DATA\032112B\0321F025.D	03/22/12	01:27
Batch QCDUP	KWG1202820-1	J:\GC21\DATA\032112B\0321F027.D	03/22/12	01:49
SW11-001	K1202461-001	J:\GC21\DATA\032112B\0321F045.D	03/22/12	05:06
SW11-001DUP	KWG1202820-2	J:\GC21\DATA\032112B\0321F047.D	03/22/12	05:28
SW11-002	K1202461-002	J:\GC21\DATA\032112B\0321F049.D	03/22/12	05:50
SW11-003	K1202461-003	J:\GC21\DATA\032112B\0321F051.D	03/22/12	06:12
SW11-004	K1202461-004	J:\GC21\DATA\032112B\0321F053.D	03/22/12	06:34
SW11-008	K1202461-008	J:\GC21\DATA\032112B\0321F067.D	03/22/12	09:08
SW11-005	K1202461-005	J:\GC21\DATA\032112B\0321F069.D	03/22/12	09:30
SW11-006	K1202461-006	J:\GC21\DATA\032212B\0322F047.D	03/23/12	02:06
SW11-007	K1202461-007	J:\GC21\DATA\032212B\0322F049.D	03/23/12	02:28

## COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Calibration Date:** 07/12/2011

**Initial Calibration Summary**  
**Diesel and Residual Range Organics**

**Calibration ID:** CAL10701  
**Instrument ID:** GC21

**Column:** ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\071111B-NW\0711F037.D	I	J:\GC21\DATA\071111B-NW\0711F061.D
B	J:\GC21\DATA\071111B-NW\0711F039.D	J	J:\GC21\DATA\071111B-NW\0711F063.D
C	J:\GC21\DATA\071111B-NW\0711F041.D	K	J:\GC21\DATA\071111B-NW\0711F065.D
D	J:\GC21\DATA\071111B-NW\0711F043.D	L	J:\GC21\DATA\071111B-NW\0711F067.D
E	J:\GC21\DATA\071111B-NW\0711F045.D	M	J:\GC21\DATA\071111B-NW\0711F069.D
F	J:\GC21\DATA\071111B-NW\0711F047.D	N	J:\GC21\DATA\071111B-NW\0711F071.D
G	J:\GC21\DATA\071111B-NW\0711F057.D		
H	J:\GC21\DATA\071111B-NW\0711F059.D		

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)							H	50	699	I	200	712	J	500	777
	K	2000	797	L	5000	768	M	20000	802	N	50000	809			
Residual Range Organics (RRO)				B	50	588	C	200	510	D	500	513	E	2000	500
	F	5000	545												
o-Terphenyl				G	1.0	988	H	2.5	1000	I	10	998	J	25	1040
	K	100	1100	L	250	1020									
n-Triacontane				G	1.0	803	H	2.5	840	I	10	840	J	25	875
	K	100	936	L	250	872									

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Results

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220 / 62375

Service Request: K1202461  
Calibration Date: 07/12/2011

Initial Calibration Summary  
Diesel and Residual Range Organics

Calibration ID: CAL10701  
Instrument ID: GC21

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	5.7		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.8		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	5.3		≤ 20

Results flagged with an asterisk (\*) indicate values outside control criteria.

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Calibration Date:** 07/12/2011  
**Date Analyzed:** 07/12/2011

**Second Source Calibration Verification**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration ID:** CAL10701  
**Units:** ppm

**File ID:** J:\GC21\DATA\071111B-NW\0711F053.D  
J:\GC21\DATA\071111B-NW\0711F073.D

**Column ID:** ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	990	767	761	-1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	1100	531	562	6	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Date Analyzed:** 03/21/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1203223  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\032112B\0321F007.D  
J:\GC21\DATA\032112B\0321F009.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	786	2	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	950	531	505	-5	NA	± 15 %	AverageRF
o-Terphenyl	50	51	1030	1040	1	NA	± 15 %	AverageRF
n-Triacontane	50	52	861	889	3	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Date Analyzed:** 03/22/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1203223  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\032112B\0321F033.D  
J:\GC21\DATA\032112B\0321F035.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	782	2	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	950	531	503	-5	NA	± 15 %	AverageRF
o-Terphenyl	50	50	1030	1040	1	NA	± 15 %	AverageRF
n-Triacontane	50	53	861	905	5	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Date Analyzed:** 03/22/2012

**Continuing Calibration Verification Summary  
Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1203223  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\032112B\0321F055.D  
J:\GC21\DATA\032112B\0321F057.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	783	2	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	960	531	509	-4	NA	± 15 %	AverageRF
o-Terphenyl	50	50	1030	1040	1	NA	± 15 %	AverageRF
n-Triacontane	50	53	861	909	6	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Date Analyzed:** 03/22/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1203223  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\032112B\0321F071.D  
J:\GC21\DATA\032112B\0321F073.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	772	1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	990	531	526	-1	NA	± 15 %	AverageRF
o-Terphenyl	50	50	1030	1020	0	NA	± 15 %	AverageRF
n-Triacontane	50	52	861	899	4	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Date Analyzed:** 03/23/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1202964  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\032212B\0322F041.D  
J:\GC21\DATA\032212B\0322F043.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	764	0	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	970	531	515	-3	NA	± 15 %	AverageRF
o-Terphenyl	50	49	1030	1010	-1	NA	± 15 %	AverageRF
n-Triacontane	50	52	861	896	4	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Results

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220 / 62375

**Service Request:** K1202461  
**Date Analyzed:** 03/23/2012

**Continuing Calibration Verification Summary**  
**Diesel and Residual Range Organics**

**Calibration Type:** External Standard  
**Analysis Method:** NWTPH-Dx

**Calibration Date:** 07/12/2011  
**Calibration ID:** CAL10701  
**Analysis Lot:** KWG1202964  
**Units:** ppm  
**Column ID:** ZB-1

**File ID:** J:\GC21\DATA\032212B\0322F051.D  
J:\GC21\DATA\032212B\0322F053.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	789	3	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	940	531	501	-6	NA	± 15 %	AverageRF
o-Terphenyl	50	51	1030	1040	1	NA	± 15 %	AverageRF
n-Triacontane	50	53	861	911	6	NA	± 15 %	AverageRF

Results flagged with an asterisk (\*) indicate values outside control criteria.

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Client:** Battelle  
**Project:** Non-dry Dock Stormwater SW11  
**Sample Matrix:** Water

**Service Request No.:** K1202509  
**Date Received:** 3/20/12

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

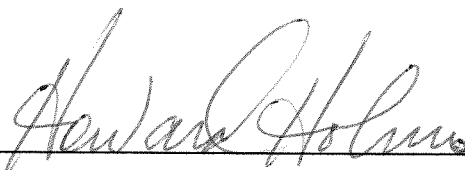
**Sample Receipt**

Twenty-eight water samples were received for analysis at Columbia Analytical Services on 3/20/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

**General Chemistry Parameters**

No anomalies associated with the analysis of these samples were observed.

Approved by



Date

4-2-12

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water  
**Analysis Method:** SM 2340 C

**Service Request:** K1202509  
**Date Collected:** 03/15/12  
**Date Received:** 03/20/12

**Units:** mg/L**Basis:** NA**Hardness, Total as CaCO<sub>3</sub>**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW11-016	K1202509-001	20.0	2.0	0.8	1	03/28/12 09:00	
SW11-020	K1202509-005	20.4	2.0	0.8	1	03/28/12 09:00	
SW11-024	K1202509-009	20.0	2.0	0.8	1	03/28/12 09:00	
SW11-028	K1202509-013	30.8	2.0	0.8	1	03/28/12 09:00	
SW11-032	K1202509-017	30.0	2.0	0.8	1	03/28/12 09:00	
SW11-036	K1202509-021	22.0	2.0	0.8	1	03/28/12 09:00	
SW11-040	K1202509-025	50.0	2.0	0.8	1	03/28/12 09:00	
Method Blank	K1202509-MB	ND U	2.0	0.8	1	03/28/12 09:00	



# COLUMBIA ANALYTICAL SERVICES, INC.

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## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509  
**Date Collected:** 03/15/12  
**Date Received:** 03/20/12  
**Date Analyzed:** 03/28/12

### Replicate Sample Summary General Chemistry Parameters

**Sample Name:** SW11-032  
**Lab Code:** K1202509-017

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1202509-017DUP10	Average	RPD	RPD Limit
					Result			
Hardness, Total as CaCO <sub>3</sub>	SM 2340 C	2.0	0.8	30.0	30.4	30.2	1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509  
**Date Analyzed:** 03/28/12

**Lab Control Sample Summary**  
**Hardness, Total as CaCO<sub>3</sub>**

**Analysis Method:** SM 2340 C

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 285179

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1202509-LCS1	90.8	86.3	105	90-116

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D

**Service Request:** K1202509  
**Date Collected:** 03/15/12  
**Date Received:** 03/20/12  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Suspended (TSS)**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW11-019	K1202509-004	39.0	5.0	-	1	03/21/12 12:05	
SW11-023	K1202509-008	44.0	5.0	-	1	03/21/12 12:05	
SW11-027	K1202509-012	19.5	5.0	-	1	03/21/12 12:05	
SW11-031	K1202509-016	20.5	5.0	-	1	03/21/12 12:05	
SW11-035	K1202509-020	16.0	5.0	-	1	03/21/12 12:05	
SW11-039	K1202509-024	20.5	5.0	-	1	03/21/12 12:05	
SW11-043	K1202509-028	27.5	5.0	-	1	03/21/12 12:05	
Method Blank	K1202509-MB	ND U	5.0	-	1	03/21/12 12:05	

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509  
**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 03/21/12

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** Batch QC  
**Lab Code:** K1202546-001

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1202546-001DUP23	Average	RPD	RPD Limit
					Result			
Solids, Total Suspended (TSS)	SM 2540 D	5.0	-	16.5	ND	NC	NC	10

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509**Date Analyzed:** 03/21/12

**Lab Control Sample Summary**  
**Solids, Total Suspended (TSS)**

**Analysis Method:** SM 2540 D**Units:** mg/L**Basis:** NA**Analysis Lot:** 284358

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1202509-LCS1	300	305	98	85-111

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1202509  
**Date Collected:** 03/15/12  
**Date Received:** 03/20/12

**Units:** mg/L

**Basis:** NA

**Carbon, Total Organic**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW11-017	K1202509-002	1.62	0.50	0.07	1	03/29/12 23:00	
SW11-021	K1202509-006	1.82	0.50	0.07	1	03/29/12 23:00	
SW11-025	K1202509-010	1.26	0.50	0.07	1	03/29/12 23:00	
SW11-029	K1202509-014	1.28	0.50	0.07	1	03/29/12 23:00	
SW11-033	K1202509-018	3.75	0.50	0.07	1	03/29/12 23:00	
SW11-037	K1202509-022	1.71	0.50	0.07	1	03/29/12 23:00	
SW11-041	K1202509-026	1.93	0.50	0.07	1	03/29/12 23:00	
Method Blank	K1202509-MB1	ND U	0.50	0.07	1	03/21/12 19:09	
Method Blank	K1202509-MB2	ND U	0.50	0.07	1	03/29/12 23:00	

## COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: Battelle Marine Sciences Lab  
 Project: Non-dry Dock Stormwater SW11/54220/62375  
 Sample Matrix: Water  
 Analysis Method: SM 5310 C

Service Request: K1202509  
 Date Collected: 03/15/12  
 Date Received: 03/20/12  
 Units: mg/L  
 Basis: NA

**Duplicate Sample Summary**  
**Carbon, Total Organic**

Sample Name:	Lab Code:	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
SW11-017	K1202509-002DUP2	0.50	0.07	1.62	1.67	1.65	3	10	03/21/12
SW11-017	K1202509-002DUP3	0.50	0.07	1.62	1.63	1.63	<1	10	03/29/12
SW11-021	K1202509-006DUP6	0.50	0.07	1.82	1.72	1.77	5	10	03/21/12
SW11-021	K1202509-006DUP7	0.50	0.07	1.82	1.76	1.79	3	10	03/29/12
SW11-025	K1202509-010DUP10	0.50	0.07	1.26	1.31	1.28	4	10	03/29/12
SW11-025	K1202509-010DUP9	0.50	0.07	1.26	1.32	1.29	5	10	03/21/12
SW11-029	K1202509-014DUP12	0.50	0.07	1.28	1.29	1.29	<1	10	03/21/12
SW11-029	K1202509-014DUP13	0.50	0.07	1.28	1.30	1.29	1	10	03/29/12
SW11-033	K1202509-018DUP16	2.5	0.4	3.75	3.7	3.74	<1	10	03/21/12
SW11-033	K1202509-018DUP17	0.50	0.07	3.75	3.85	3.80	3	10	03/29/12
SW11-037	K1202509-022DUP19	0.50	0.07	1.71	1.60	1.65	7	10	03/21/12
SW11-037	K1202509-022DUP20	0.50	0.07	1.71	1.63	1.67	5	10	03/29/12
SW11-041	K1202509-026DUP22	0.50	0.07	1.93	1.78	1.85	8	10	03/21/12
SW11-041	K1202509-026DUP23	0.50	0.07	1.93	1.98	1.96	3	10	03/29/12

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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## QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509**Date Collected:** 03/15/12**Date Received:** 03/20/12**Date Analyzed:** 03/29/12**Matrix Spike Summary  
Carbon, Total Organic**

**Sample Name:** SW11-017  
**Lab Code:** K1202509-002  
**Analysis Method:** SM 5310 C

**Units:** mg/L**Basis:** NA**Matrix Spike  
K1202509-002MS1**

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Total Organic	1.62	26.8	25.0	101	60-134

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509**Date Analyzed:** 03/21/12

**Lab Control Sample Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 284408

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1202509-LCS1	18.9	22.7	83 *	87-112
Lab Control Sample	K1202509-LCS2	22.3	22.7	98	87-112

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509**Date Analyzed:** 03/29/12

**Lab Control Sample Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 285428

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1202509-LCS3	22.5	22.7	99	87-112

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375

**Service Request:** K1202509**Continuing Calibration Verification (CCV) Summary****Carbon, Total Organic****Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>True Value</b>	<b>Measured Value</b>	<b>Percent Recovery</b>	<b>Acceptance Limits</b>
CCV1	284408	KQ1202921-20	03/21/12 19:09	25.0	24.7	99	90-110
CCV2	284408	KQ1202921-21	03/21/12 19:09	25.0	24.4	98	90-110
CCV3	284408	KQ1202921-22	03/21/12 19:09	25.0	24.5	98	90-110
CCV4	284408	KQ1202921-27	03/21/12 19:09	25.0	24.6	99	90-110
CCV5	285428	KQ1203306-19	03/29/12 23:00	25.0	24.9	100	90-110
CCV6	285428	KQ1203306-20	03/29/12 23:00	25.0	24.9	100	90-110
CCV7	285428	KQ1203306-21	03/29/12 23:00	25.0	24.8	99	90-110

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
Project: Non-dry Dock Stormwater SW11/54220/62375

Service Request: K1202509

**Continuing Calibration Blank (CCB) Summary**  
**Carbon, Total Organic**

Analysis Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	MRL	MDL	Result	Q
CCB1	284408	KQ1202921- 23.R01	03/21/12 19:09	0.50	0.07	0.13	J
CCB2	284408	KQ1202921- 24.R01	03/21/12 19:09	0.50	0.07	ND	U
CCB3	284408	KQ1202921- 25.R01	03/21/12 19:09	0.50	0.07	0.09	J
CCB4	284408	KQ1202921- 28.R01	03/21/12 19:09	0.50	0.07	ND	U
CCB5	285428	KQ1203306-22	03/29/12 23:00	0.50	0.07	ND	U
CCB6	285428	KQ1203306-23	03/29/12 23:00	0.50	0.07	ND	U
CCB7	285428	KQ1203306-24	03/29/12 23:00	0.50	0.07	ND	U

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

## Analytical Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C

**Service Request:** K1202509  
**Date Collected:** 03/15/12  
**Date Received:** 03/20/12  
**Units:** mg/L  
**Basis:** NA

**Carbon, Dissolved Organic (DOC)**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SW11-018	K1202509-003	1.57	0.50	0.07	1	03/21/12 19:09	
SW11-022	K1202509-007	1.64	0.50	0.07	1	03/21/12 19:09	
SW11-026	K1202509-011	1.84	0.50	0.07	1	03/21/12 19:09	
SW11-030	K1202509-015	1.26	0.50	0.07	1	03/21/12 19:09	
SW11-034	K1202509-019	4.22	0.50	0.07	1	03/21/12 19:09	
SW11-038	K1202509-023	1.56	0.50	0.07	1	03/21/12 19:09	
SW11-042	K1202509-027	1.20	0.50	0.07	1	03/21/12 19:09	
Method Blank	K1202509-MB	ND U	0.50	0.07	1	03/21/12 19:09	

## COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab  
 Project: Non-dry Dock Stormwater SW11/54220/62375  
 Sample Matrix: Water  
 Analysis Method: SM 5310 C

Service Request: K1202509  
 Date Collected: 03/15/12  
 Date Received: 03/20/12  
 Units: mg/L  
 Basis: NA

**Duplicate Sample Summary**  
**Carbon, Dissolved Organic (DOC)**

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
SW11-018	K1202509-003DUP3	0.50	0.07	1.57	1.58	1.57	<1	10	03/21/12
SW11-022	K1202509-007DUP5	0.50	0.07	1.64	1.54	1.59	7	10	03/21/12
SW11-026	K1202509-011DUP7	0.50	0.07	1.84	1.84	1.84	<1	10	03/21/12
SW11-030	K1202509-015DUP9	0.50	0.07	1.26	1.21	1.24	4	10	03/21/12
SW11-034	K1202509-019DUP12	0.50	0.07	4.22	4.32	4.27	2	10	03/21/12
SW11-038	K1202509-023DUP14	0.50	0.07	1.56	1.51	1.53	3	10	03/21/12
SW11-042	K1202509-027DUP16	0.50	0.07	1.20	1.24	1.22	3	10	03/21/12

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509**Date Collected:** 03/15/12**Date Received:** 03/20/12**Date Analyzed:** 03/21/12

**Matrix Spike Summary**  
**Carbon, Dissolved Organic (DOC)**

**Sample Name:** SW11-018  
**Lab Code:** K1202509-003  
**Analysis Method:** SM 5310 C

**Units:** mg/L**Basis:** NA

**Matrix Spike**  
K1202509-003MS1

<b>Analyte Name</b>	<b>Sample Result</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Dissolved Organic (DOC)	1.57	26.2	25.0	98	60-134

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375  
**Sample Matrix:** Water

**Service Request:** K1202509**Date Analyzed:** 03/21/12

**Lab Control Sample Summary**  
**Carbon, Dissolved Organic (DOC)**

**Analysis Method:** SM 5310 C**Units:** mg/L**Basis:** NA**Analysis Lot:** 284409

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1202509-LCS1	22.4	22.7	99	87-112



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375

**Service Request:** K1202509**Continuing Calibration Verification (CCV) Summary****Carbon, Dissolved Organic (DOC)****Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>True Value</b>	<b>Measured Value</b>	<b>Percent Recovery</b>	<b>Acceptance Limits</b>
CCV1	284409	KQ1202922-11	03/21/12 19:09	25.0	24.7	99	90-110
CCV2	284409	KQ1202922-12	03/21/12 19:09	25.0	24.4	98	90-110
CCV3	284409	KQ1202922-13	03/21/12 19:09	25.0	24.5	98	90-110
CCV4	284409	KQ1202922-14	03/21/12 19:09	25.0	24.6	99	90-110

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

QA/QC Report

**Client:** Battelle Marine Sciences Lab  
**Project:** Non-dry Dock Stormwater SW11/54220/62375

**Service Request:** K1202509

**Continuing Calibration Blank (CCB) Summary**  
**Carbon, Dissolved Organic (DOC)**

**Analysis Method:** SM 5310 C**Units:** mg/L

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>MRL</b>	<b>MDL</b>	<b>Result</b>	<b>Q</b>
CCB1	284409	KQ1202922-15	03/21/12 19:09	0.50	0.07	0.13	J
CCB2	284409	KQ1202922-16	03/21/12 19:09	0.50	0.07	ND	U
CCB3	284409	KQ1202922-17	03/21/12 19:09	0.50	0.07	0.09	J
CCB4	284409	KQ1202922-18	03/21/12 19:09	0.50	0.07	ND	U

# **Analytical Chemistry Data Package**

**Project: Non-Dry Dock Stormwater  
SW12 Bonus Storm (April 2012)  
Chemical Analyses**

Battelle Project No. 54220/62375  
CF No. 3174



Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, WA 98382  
PM: Jill Brandenberger  
(360) 681-4564

# CHEMISTRY ANALYSIS DATA PACKAGE CONTENTS

Non-Dry Dock Stormwater  
SW12 Bonus Storm (April 2012)  
Chemical Analyses

## **Chemistry Analysis Summaries**

Field Data Report Metals, DOC, TSS, Conductivity, Turbidity .....	3
QA/QC Summary Reports.....	11
QA/QC Narrative, Discussion and Graphs .....	18

## **Sample Custody Information**

Chain of Custody Form .....	28
Laboratory Sample Log-In Form .....	30
Log-In Checklist.....	34

*Analytical raw data available upon request*

BATTELLE MARINE SCIENCE LABORATORIES

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	Collection Date	Used in Comp	Conductivity	Turbidity	TSS	OC	OC
Instrument:								Probe (µS/cm)	Probe (NTU)	mg/L	HTCO (mg/L)	HTCO (µM)
Laboratory Achieved Detection Limits (Seawater)										0.49	0.030	2.5
Seawater Reporting Limit (MDL* 3.18)											0.095	8.0
Laboratory Achieved Detection Limits (Freshwater)										0.49	0.030	2.5
Freshwater Reporting Limit (MDL* 3.18)											0.095	8.0
<b>SW12</b>												
SW12-001	PSNS015-1	Total	composite_time	Freshwater	3174-133	04/20/12	Y	1200	42	41.8	--	--
SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-134	04/20/12	--	--	--	--	4.01	334
SW12-002	PSNS015-2	Total	composite_time	Freshwater	3174-135	04/20/12	Y	70	25	23.3	--	--
SW12-002	PSNS015-2	Diss	composite_time	Freshwater	3174-136	04/20/12	--	--	--	--	3.47	289
SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-137	04/20/12	Y	42	16	14.6	--	--
SW12-003	PSNS015-3	Diss	composite_time	Freshwater	3174-138	04/20/12	--	--	--	--	3.71	309 E
SW12-004	PSNS015-4	Total	composite_time	Freshwater	3174-139	04/20/12	Y	67	17	11.9	--	--
SW12-004	PSNS015-4	Diss	composite_time	Freshwater	3174-140	04/20/12	--	--	--	--	3.27	273
SW12-005	PSNS015-5	Total	composite_time	Freshwater	3174-141	04/20/12	Y	168	20	58.3	--	--
SW12-005	PSNS015-5	Diss	composite_time	Freshwater	3174-142	04/20/12	--	--	--	--	4.67	389 E
SW12-006	PSNS015-6	Total	composite_time	Freshwater	3174-143	04/20/12	Y	304	18	13.8	--	--
SW12-006	PSNS015-6	Diss	composite_time	Freshwater	3174-144	04/20/12	--	--	--	--	3.10	258
SW12-007	PSNS015-7	Total	composite_time	Freshwater	3174-145	04/20/12	Y	417	9	3.34	--	--
SW12-007	PSNS015-7	Diss	composite_time	Freshwater	3174-146	04/20/12	--	--	--	--	4.55	379 E
SW12-008	PSNS015-8	Total	composite_time	Freshwater	3174-147	04/20/12	Y	228	13	6.34	--	--
SW12-008	PSNS015-8	Diss	composite_time	Freshwater	3174-148	04/20/12	--	--	--	--	3.22	268
SW12-009	PSNS015-9	Total	composite_time	Freshwater	3174-149	04/20/12	Y	581	11	5.70	--	--
SW12-009	PSNS015-9	Diss	composite_time	Freshwater	3174-150	04/20/12	--	--	--	--	3.27	272
SW12-010	PSNS015-10	Total	composite_time	Seawater	3174-151	04/20/12	N	8300	10	10.6	--	--
SW12-010	PSNS015-10	Diss	composite_time	Seawater	3174-152	04/20/12	--	--	--	--	3.12	260
SW12-011	PSNS015-11	Total	composite_time	Seawater	3174-153	04/20/12	N	40100	6	6.57	--	--
SW12-011	PSNS015-11	Diss	composite_time	Seawater	3174-154	04/20/12	--	--	--	--	1.87	155
SW12-012	PSNS015-12	Total	composite_time	Seawater	3174-155	04/20/12	N	42350	4	4.14	--	--
SW12-012	PSNS015-12	Diss	composite_time	Seawater	3174-156	04/20/12	--	--	--	--	1.36	113
SW12-013	PSNS015-13	Total	composite_time	Seawater	3174-157	04/20/12	N	15750	8	1.90	--	--
SW12-013	PSNS015-13	Diss	composite_time	Seawater	3174-158	04/20/12	--	--	--	--	2.96	247
SW12-014	PSNS015-14	Total	composite_time	Freshwater	3174-159	04/20/12	Y	1065	10	2.95	--	--
SW12-014	PSNS015-14	Diss	composite_time	Freshwater	3174-160	04/20/12	--	--	--	--	3.14	262

BATTELLE MARINE SCIENCE LABORATORIES

1529 West Sequim Bay Road  
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Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water  
UNITS: µg/L

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	Hg	As	Ag	Al	Cd
						<i>Instrument:</i>	<i>CVAF</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Seawater)						0.0001	NA	<b>0.0042</b>	<b>2.14</b>	<b>0.00110</b>
Seawater Reporting Limit (MDL* 3.18)						0.00032	NA	<b>0.013</b>	<b>6.8</b>	<b>0.0035</b>
Laboratory Achieved Detection Limits (Freshwater)						0.0001	0.03	0.002	0.3	0.004
Freshwater Reporting Limit (MDL* 3.18)						0.0003	0.1	0.006	1.0	0.01
<b>SW12</b>										
SW12-001	PSNS015-1	Total	composite_time	Freshwater	3174-133	0.0197	1.85	0.0296	1040	0.117
SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-134	0.00340	1.55	0.00369 J	25.6	0.0569
SW12-002	PSNS015-2	Total	composite_time	Freshwater	3174-135	0.0119	0.513	0.0192	571	0.0594
SW12-002	PSNS015-2	Diss	composite_time	Freshwater	3174-136	0.00304	0.366	0.002 U	31.8	0.0183
SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-137	0.0137	0.454	0.0138	409	0.0459
SW12-003	PSNS015-3	Diss	composite_time	Freshwater	3174-138	0.00258	0.370	0.00311 J	27.8	0.0146
SW12-004	PSNS015-4	Total	composite_time	Freshwater	3174-139	0.0396	0.504	0.0331	329	0.0453
SW12-004	PSNS015-4	Diss	composite_time	Freshwater	3174-140	0.00371	0.394	0.00241 J	26.2	0.0260
SW12-005	PSNS015-5	Total	composite_time	Freshwater	3174-141	0.0478	0.707	0.0433	507	0.0588
SW12-005	PSNS015-5	Diss	composite_time	Freshwater	3174-142	0.00434	0.508	0.00249 J	24.4	0.0198
SW12-006	PSNS015-6	Total	composite_time	Freshwater	3174-143	0.0257	0.760	0.0241	380	0.0722
SW12-006	PSNS015-6	Diss	composite_time	Freshwater	3174-144	0.00309	0.677	0.00448 J	22.7	0.0261
SW12-007	PSNS015-7	Total	composite_time	Freshwater	3174-145	0.0129	0.923	0.0144	243	0.0378
SW12-007	PSNS015-7	Diss	composite_time	Freshwater	3174-146	0.00527	0.848	0.00427 J	33.9	0.0284
SW12-008	PSNS015-8	Total	composite_time	Freshwater	3174-147	0.0103	0.678	0.0148	284	0.0463
SW12-008	PSNS015-8	Diss	composite_time	Freshwater	3174-148	0.00343	0.649	0.00474 J	46.2	0.0314
SW12-009	PSNS015-9	Total	composite_time	Freshwater	3174-149	0.0142	1.15	0.0133	265	0.0408
SW12-009	PSNS015-9	Diss	composite_time	Freshwater	3174-150	0.00529	1.08	0.00531 J	43.2	0.0332
SW12-010	PSNS015-10	Total	composite_time	Seawater	3174-151	0.0219	NA	0.0512 b	171 b	0.0962 b
SW12-010	PSNS015-10	Diss	composite_time	Seawater	3174-152	0.00497	NA	0.00526 Jb	11.5 b	0.0732 b
SW12-011	PSNS015-11	Total	composite_time	Seawater	3174-153	0.0173	NA	0.0225 b	111 b	0.224 b
SW12-011	PSNS015-11	Diss	composite_time	Seawater	3174-154	0.00237	NA	0.0042 Ub	5.25 Jb	0.204 b
SW12-012	PSNS015-12	Total	composite_time	Seawater	3174-155	0.0101	NA	0.0122 Jb	90.9 b	0.141 b
SW12-012	PSNS015-12	Diss	composite_time	Seawater	3174-156	0.00131	NA	0.0042 Ub	4.11 Jb	0.128 b
SW12-013	PSNS015-13	Total	composite_time	Seawater	3174-157	0.0143	NA	0.0204 b	184 b	0.128 b
SW12-013	PSNS015-13	Diss	composite_time	Seawater	3174-158	0.00549	NA	0.00519 Jb	12.7 b	0.120 b
SW12-014	PSNS015-14	Total	composite_time	Freshwater	3174-159	0.0140	1.22	0.0125	260	0.0382
SW12-014	PSNS015-14	Diss	composite_time	Freshwater	3174-160	0.00525	1.19	0.00493 J	28.5	0.0301

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Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water  
UNITS: µg/L

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	Cr	Cu	Pb	Zn
<i>Instrument:</i>						<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Seawater)						<b>0.0293</b>	<b>0.0351</b>	<b>0.0019</b>	<b>0.0263</b>
Seawater Reporting Limit (MDL* 3.18)						<b>0.093</b>	<b>0.11</b>	<b>0.0060</b>	<b>0.084</b>
Laboratory Achieved Detection Limits (Freshwater)						0.08	0.007	0.002	0.05
Freshwater Reporting Limit (MDL* 3.18)						0.3	0.02	0.006	0.2
<b>SW12</b>									
SW12-001	PSNS015-1	Total	composite_time	Freshwater	3174-133	2.69	17.4	14.4	76.2
SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-134	0.949	7.43	0.872	43.7
SW12-002	PSNS015-2	Total	composite_time	Freshwater	3174-135	1.61	12.3	9.77	62.6
SW12-002	PSNS015-2	Diss	composite_time	Freshwater	3174-136	0.746	6.02	1.18	34.2
SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-137	1.28	9.88	9.39	57.1
SW12-003	PSNS015-3	Diss	composite_time	Freshwater	3174-138	0.715	5.77	1.54	37.5
SW12-004	PSNS015-4	Total	composite_time	Freshwater	3174-139	1.36	11.2	9.73	70.6
SW12-004	PSNS015-4	Diss	composite_time	Freshwater	3174-140	0.801	7.18	2.28	52.5
SW12-005	PSNS015-5	Total	composite_time	Freshwater	3174-141	1.93	14.8	12.3	84.8
SW12-005	PSNS015-5	Diss	composite_time	Freshwater	3174-142	0.782	7.38	1.67	54.0
SW12-006	PSNS015-6	Total	composite_time	Freshwater	3174-143	1.60	12.6	9.75	76.1
SW12-006	PSNS015-6	Diss	composite_time	Freshwater	3174-144	0.950	7.08	1.84	51.8
SW12-007	PSNS015-7	Total	composite_time	Freshwater	3174-145	1.73	9.47	6.12	64.4
SW12-007	PSNS015-7	Diss	composite_time	Freshwater	3174-146	1.39	7.13	2.22	55.6
SW12-008	PSNS015-8	Total	composite_time	Freshwater	3174-147	1.63	10.1	7.06	92.8
SW12-008	PSNS015-8	Diss	composite_time	Freshwater	3174-148	1.21	7.22	2.32	79.2
SW12-009	PSNS015-9	Total	composite_time	Freshwater	3174-149	1.87	9.67	6.45	82.1
SW12-009	PSNS015-9	Diss	composite_time	Freshwater	3174-150	1.40	7.32	2.18	72.2
SW12-010	PSNS015-10	Total	composite_time	Seawater	3174-151	1.37 b	8.95 b	6.43 b	92.0 b
SW12-010	PSNS015-10	Diss	composite_time	Seawater	3174-152	0.698 b	4.49 b	1.49 b	71.0 b
SW12-011	PSNS015-11	Total	composite_time	Seawater	3174-153	0.420 b	3.49 b	2.70 b	70.5 b
SW12-011	PSNS015-11	Diss	composite_time	Seawater	3174-154	0.119 b	1.68 b	0.470 b	65.1 b
SW12-012	PSNS015-12	Total	composite_time	Seawater	3174-155	0.378 b	2.87 b	1.91 b	32.8 b
SW12-012	PSNS015-12	Diss	composite_time	Seawater	3174-156	0.138 b	1.41 b	0.301 b	30.3 b
SW12-013	PSNS015-13	Total	composite_time	Seawater	3174-157	0.968 b	7.73 b	5.07 b	83.3 b
SW12-013	PSNS015-13	Diss	composite_time	Seawater	3174-158	0.694 b	5.45 b	1.34 b	79.4 b
SW12-014	PSNS015-14	Total	composite_time	Freshwater	3174-159	1.39	10.7	6.08	69.9
SW12-014	PSNS015-14	Diss	composite_time	Freshwater	3174-160	1.02	8.06	1.79	61.7

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1529 West Sequim Bay Road  
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**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water**

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	CVAF Batch ID	ICP-MS Batch ID	TSS Nucleopore	HTCO
<i>Instrument:</i>									
Laboratory Achieved Detection Limits (Seawater)									
Seawater Reporting Limit (MDL* 3.18)									
Laboratory Achieved Detection Limits (Freshwater)									
Freshwater Reporting Limit (MDL* 3.18)									

**SW12**

SW12-001	PSNS015-1	Total	composite_time	Freshwater	3174-133	060612HGA	061112-6100	042712TSS	
SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-134	060612HGA	061112-6100		DOC061912
SW12-002	PSNS015-2	Total	composite_time	Freshwater	3174-135	060612HGA	061112-6100	042712TSS	
SW12-002	PSNS015-2	Diss	composite_time	Freshwater	3174-136	060612HGA	061112-6100		DOC061912
SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-137	060612HGA	061112-6100	042712TSS	
SW12-003	PSNS015-3	Diss	composite_time	Freshwater	3174-138	060612HGA	061112-6100		DOC061512
SW12-004	PSNS015-4	Total	composite_time	Freshwater	3174-139	060612HGA	061112-6100	042712TSS	
SW12-004	PSNS015-4	Diss	composite_time	Freshwater	3174-140	060612HGA	061112-6100		DOC061512
SW12-005	PSNS015-5	Total	composite_time	Freshwater	3174-141	060612HGA	061112-6100	042712TSS	
SW12-005	PSNS015-5	Diss	composite_time	Freshwater	3174-142	060612HGA	061112-6100		DOC061612
SW12-006	PSNS015-6	Total	composite_time	Freshwater	3174-143	060612HGA	061112-6100	042712TSS	
SW12-006	PSNS015-6	Diss	composite_time	Freshwater	3174-144	060612HGA	061112-6100		DOC061512
SW12-007	PSNS015-7	Total	composite_time	Freshwater	3174-145	060612HGA	061112-6100	042712TSS	
SW12-007	PSNS015-7	Diss	composite_time	Freshwater	3174-146	060612HGA	061112-6100		DOC061612
SW12-008	PSNS015-8	Total	composite_time	Freshwater	3174-147	060612HGA	061112-6100	042712TSS	
SW12-008	PSNS015-8	Diss	composite_time	Freshwater	3174-148	060612HGA	061112-6100		DOC061512
SW12-009	PSNS015-9	Total	composite_time	Freshwater	3174-149	060612HGA	061112-6100	042712TSS	
SW12-009	PSNS015-9	Diss	composite_time	Freshwater	3174-150	060612HGA	061112-6100		DOC061912
SW12-010	PSNS015-10	Total	composite_time	Seawater	3174-151	060612HGA	062712-6100	042712TSS	
SW12-010	PSNS015-10	Diss	composite_time	Seawater	3174-152	060612HGA	062712-6100		DOC061512
SW12-011	PSNS015-11	Total	composite_time	Seawater	3174-153	061212HGA	062712-6100	042712TSS	
SW12-011	PSNS015-11	Diss	composite_time	Seawater	3174-154	061212HGA	062712-6100		DOC061512
SW12-012	PSNS015-12	Total	composite_time	Seawater	3174-155	061212HGA	062712-6100	042712TSS	
SW12-012	PSNS015-12	Diss	composite_time	Seawater	3174-156	061212HGA	062712-6100		DOC061512
SW12-013	PSNS015-13	Total	composite_time	Seawater	3174-157	061212HGA	062712-6100	042712TSS	
SW12-013	PSNS015-13	Diss	composite_time	Seawater	3174-158	061212HGA	062712-6100		DOC061512
SW12-014	PSNS015-14	Total	composite_time	Freshwater	3174-159	061212HGA	061112-6100	042712TSS	
SW12-014	PSNS015-14	Diss	composite_time	Freshwater	3174-160	061212HGA	061112-6100		DOC061512



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1529 West Sequim Bay Road  
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**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW12 (Bonus Storm)**  
**Metals in Water**

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	Collection Date	Used in Comp	Conductivity	Turbidity	TSS	OC	OC
								<i>Probe</i> <i>Probe (μS/cm)</i>	<i>Probe</i> <i>(NTU)</i>	mg/L	HTCO (mg/L)	HTCO (μM)
Laboratory Achieved Detection Limits (Seawater)										0.49	0.030	2.5
Seawater Reporting Limit (MDL* 3.18)											0.095	8.0
Laboratory Achieved Detection Limits (Freshwater)										0.49	0.030	2.5
Freshwater Reporting Limit (MDL* 3.18)											0.095	8.0
SW12-015	PSNS015-15	Total	composite_time	Freshwater	3174-161	04/20/12	Y	311	8	5.57	--	--
SW12-015	PSNS015-15	Diss	composite_time	Freshwater	3174-162	04/20/12	--	--	--	--	3.44	287 E
SW12-016	PSNS015-16	Total	composite_time	Freshwater	3174-163	04/20/12	Y	236	33	181	--	--
SW12-016	PSNS015-16	Diss	composite_time	Freshwater	3174-164	04/20/12	--	--	--	--	1.65	137
SW12-017	PSNS015-17	Total	composite_time	Freshwater	3174-165	04/20/12	Y	158	12	8.41	--	--
SW12-017	PSNS015-17	Diss	composite_time	Freshwater	3174-166	04/20/12	--	--	--	--	3.45	287 E
SW12-018	PSNS015-18	Total	composite_time	Freshwater	3174-167	04/20/12	Y	186	9	8.90	--	--
SW12-018	PSNS015-18	Diss	composite_time	Freshwater	3174-168	04/20/12	--	--	--	--	4.38	365 E
SW12-020	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169	04/20/12	--	338	17	60.3	--	--
SW12-020	PSNS015-COMP	Diss	Composite_equal_time	Freshwater	3174-170	04/20/12	--	--	--	--	3.07	255

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**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW12 (Bonus Storm)**  
**Metals in Water**  
**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	Hg	As	Ag	Al	Cd
<i>Instrument:</i>						<i>CVAF</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Seawater)						0.0001	NA	<b>0.0042</b>	<b>2.14</b>	<b>0.00110</b>
Seawater Reporting Limit (MDL* 3.18)						0.00032	NA	<b>0.013</b>	<b>6.8</b>	<b>0.0035</b>
Laboratory Achieved Detection Limits (Freshwater)						0.0001	0.03	0.002	0.3	0.004
Freshwater Reporting Limit (MDL* 3.18)						0.0003	0.1	0.006	1.0	0.01
SW12-015	PSNS015-15	Total	composite_time	Freshwater	3174-161	0.0124	0.709	0.0118	158	0.0394
SW12-015	PSNS015-15	Diss	composite_time	Freshwater	3174-162	0.00283	0.673	0.00332 J	22.0	0.0329
SW12-016	PSNS015-16	Total	composite_time	Freshwater	3174-163	0.271	1.41	0.129	1480	0.125
SW12-016	PSNS015-16	Diss	composite_time	Freshwater	3174-164	0.0130	0.725	0.002 U	16.6	0.0200
SW12-017	PSNS015-17	Total	composite_time	Freshwater	3174-165	0.0284	0.667	0.0242	189	0.0434
SW12-017	PSNS015-17	Diss	composite_time	Freshwater	3174-166	0.00835	0.600	0.00926	36.0	0.0279
SW12-018	PSNS015-18	Total	composite_time	Freshwater	3174-167	0.0126	0.661	0.0220	143	0.0470
SW12-018	PSNS015-18	Diss	composite_time	Freshwater	3174-168	0.00723	0.626	0.0103	34.1	0.0282
SW12-020	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169	0.0462	1.01	0.0445	592	0.0610
SW12-020	PSNS015-COMP	Diss	Composite_equal_time	Freshwater	3174-170	0.00398	0.812	0.00468 J	26.4	0.0277

BATTELLE MARINE SCIENCE LABORATORIES

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water  
UNITS: µg/L

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	Cr	Cu	Pb	Zn
<i>Instrument:</i>						<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>	<i>ICP-MS</i>
Laboratory Achieved Detection Limits (Seawater)						<b>0.0293</b>	<b>0.0351</b>	<b>0.0019</b>	<b>0.0263</b>
Seawater Reporting Limit (MDL* 3.18)						<b>0.093</b>	<b>0.11</b>	<b>0.0060</b>	<b>0.084</b>
Laboratory Achieved Detection Limits (Freshwater)						0.08	0.007	0.002	0.05
Freshwater Reporting Limit (MDL* 3.18)						0.3	0.02	0.006	0.2
SW12-015	PSNS015-15	Total	composite_time	Freshwater	3174-161	0.970	8.95	8.34	98.5
SW12-015	PSNS015-15	Diss	composite_time	Freshwater	3174-162	0.774	6.71	3.55	87.6
SW12-016	PSNS015-16	Total	composite_time	Freshwater	3174-163	3.38	28.5	22.5	108
SW12-016	PSNS015-16	Diss	composite_time	Freshwater	3174-164	0.411	2.96	0.350	22.1
SW12-017	PSNS015-17	Total	composite_time	Freshwater	3174-165	0.971	8.69	5.40	80.7
SW12-017	PSNS015-17	Diss	composite_time	Freshwater	3174-166	0.687	6.07	1.58	65.7
SW12-018	PSNS015-18	Total	composite_time	Freshwater	3174-167	1.06	10.0	5.70	80.7
SW12-018	PSNS015-18	Diss	composite_time	Freshwater	3174-168	0.740	7.51	2.29	68.0
SW12-020	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169	2.32	14.4	12.0	78.4
SW12-020	PSNS015-COMP	Diss	Composite_equal_time	Freshwater	3174-170	0.888	6.89	1.55	48.7

**BATTELLE MARINE SCIENCE LABORATORIES**

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water**

Sample ID - Metals	Station Code	Fraction Total/Diss	Type Name	Matrix	MSL Code	CVAF Batch ID	ICP-MS Batch ID	TSS Nucleopore	HTCO
<i>Instrument:</i>									
Laboratory Achieved Detection Limits (Seawater)									
Seawater Reporting Limit (MDL* 3.18)									
Laboratory Achieved Detection Limits (Freshwater)									
Freshwater Reporting Limit (MDL* 3.18)									
SW12-015	PSNS015-15	Total	composite_time	Freshwater	3174-161	061212HGA	061112-6100	042712TSS	
SW12-015	PSNS015-15	Diss	composite_time	Freshwater	3174-162	061212HGA	061112-6100		DOC061612
SW12-016	PSNS015-16	Total	composite_time	Freshwater	3174-163	061212HGA	061112-6100	042712TSS	
SW12-016	PSNS015-16	Diss	composite_time	Freshwater	3174-164	061212HGA	061112-6100		DOC061512
SW12-017	PSNS015-17	Total	composite_time	Freshwater	3174-165	061212HGA	061112-6100	042712TSS	
SW12-017	PSNS015-17	Diss	composite_time	Freshwater	3174-166	061212HGA	061112-6100		DOC061612
SW12-018	PSNS015-18	Total	composite_time	Freshwater	3174-167	061212HGA	061112-6100	042712TSS	
SW12-018	PSNS015-18	Diss	composite_time	Freshwater	3174-168	061212HGA	061112-6100		DOC061612
SW12-020	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169	061212HGA	061112-6100	042712TSS	
SW12-020	PSNS015-COMP	Diss	Composite_equal_time	Freshwater	3174-170	061212HGA	061112-6100		DOC061512

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	Matrix	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	ICP-MS Batch ID
Instrument:						ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
Laboratory Achieved Detection Limits (Seawater)						NA	0.0042	2.14	0.00110	0.0293	0.0351	0.0019	0.0263	
Seawater Reporting Limit (MDL* 3.18)						NA	0.013	6.8	0.0035	0.093	0.11	0.0060	0.084	
Laboratory Achieved Detection Limits (Freshwater)						0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater Reporting Limit (MDL* 3.18)						0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	
<b>METHOD BLANKS</b>														
MB-1		Total		Freshwater	TRM Blank R1	0.03 U	0.002 U	0.3 U	0.004 U	0.08 U	0.007 U	0.002 U	0.05 U	061112-6100
MB-2		Total		Freshwater	TRM Blank R2	0.03 U	0.002 U	0.3 U	0.004 U	0.201 J	0.007 U	0.002 U	0.05 U	061112-6100
MB-1		Total		Seawater	DI Blank R2	NA	0.0000 U	0.550 U	0.00001 U	0.0443 J	0.0381 J	0.00144 U	0.0786 J	062712-6100
MB-2		Total		Seawater	DI Blank R3	NA	0.0002 U	0.484 U	0.00012 U	0.0375 J	0.0492 J	0.00222 J	0.0803 J	062712-6100
MB-3		Total		Seawater	DI Blank R4	NA	0.0000 U	0.488 U	0.00001 U	0.0450 J	0.0351 J	0.00156 U	0.123	062712-6100
<b>MEAN REAGENT BLANK</b>				Seawater	<b>BMRB_062712</b>	NA	0.0001 U	0.507 U	0.00005 U	0.0423 J	0.0408 J	0.00174 U	0.0940	
<b>LABORATORY CONTROL SAMPLES</b>														
Spiking Level						2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
LCS-1		Total		Freshwater	TRM LCS R1	1.98	2.00	2.01	1.93	2.04	2.08	1.99	1.93	061112-6100
<b>Percent Recovery, LCS</b>						<b>99%</b>	<b>100%</b>	<b>101%</b>	<b>97%</b>	<b>102%</b>	<b>104%</b>	<b>100%</b>	<b>97%</b>	
Spiking Level						2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
LCS-2		Total		Freshwater	TRM LCS R2	1.88	1.96	2.07	1.93	2.11	2.02	1.99	1.93	061112-6100
<b>Percent Recovery, LCS</b>						<b>94%</b>	<b>98%</b>	<b>104%</b>	<b>97%</b>	<b>106%</b>	<b>101%</b>	<b>100%</b>	<b>97%</b>	
Spiking Level						NA	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
LCS Blank		Total		Seawater	SB Blank R1	NA	0.0042 Ub	0.252 b	0.0555 b	0.127 b	0.246 b	0.00147 b	0.194 b	062712-6100
LCS		Total		Seawater	SB LCS	NA	1.74	2.08 b	1.87 b	2.07 b	2.06 b	1.93 b	1.89 b	062712-6100
LCS D		Total		Seawater	SB LCS D	NA	1.85	2.29 b	1.97 b	2.17 b	2.20 b	2.04 b	1.96 b	062712-6100
<b>Percent Recovery, LCS</b>						NA	<b>87%</b>	<b>92%</b>	<b>91%</b>	<b>97%</b>	<b>91%</b>	<b>96%</b>	<b>85%</b>	
<b>Percent Recovery, LCS D</b>						NA	<b>92%</b>	<b>102%</b>	<b>96%</b>	<b>102%</b>	<b>98%</b>	<b>102%</b>	<b>88%</b>	
<b>RPD</b>						NA	<b>6.1%</b>	<b>10.8%</b>	<b>5.4%</b>	<b>5.0%</b>	<b>7.4%</b>	<b>5.6%</b>	<b>4.1%</b>	
<b>MATRIX SPIKE RESULTS</b>														
SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-134	1.55	0.00369 J	25.6	0.0569	0.949	7.43	0.872	43.7	061112-6100
MS					3174-134 MS	3.56	1.81	137	1.98	2.99	9.49	3.00	145	061112-6100
MSD					3174-134MSD	3.59	1.81	139	1.97	3.02	9.48	2.98	147	061112-6100
Spiking Level						2	2	100	2	2	2	2	100	
<b>Percent Recovery, MS</b>						<b>101%</b>	<b>91%</b>	<b>111%</b>	<b>96%</b>	<b>102%</b>	<b>103%</b>	<b>106%</b>	<b>101%</b>	
<b>Percent Recovery, MSD</b>						<b>102%</b>	<b>91%</b>	<b>113%</b>	<b>96%</b>	<b>104%</b>	<b>103%</b>	<b>105%</b>	<b>103%</b>	
<b>RPD</b>						<b>1.5%</b>	<b>0.0%</b>	<b>1.8%</b>	<b>0.5%</b>	<b>1.5%</b>	<b>0.5%</b>	<b>0.9%</b>	<b>2.0%</b>	
SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-137	0.454	0.0138	409	0.0459	1.28	9.88	9.39	57.1	061112-6100
MS					3174-137MS	94.5	0.0125	500	97.7	98.5	110	110	155	061112-6100
MSD					3174-137MSD	95.4	0.0105	516	98.5	98.6	111	111	155	061112-6100
Spiking Level						100	NA	100	100	100	100	100	100	
<b>Percent Recovery, MS</b>						<b>94%</b>	NA	<b>91%</b>	<b>98%</b>	<b>97%</b>	<b>100%</b>	<b>101%</b>	<b>98%</b>	
<b>Percent Recovery, MSD</b>						<b>95%</b>	NA	<b>107%</b>	<b>98%</b>	<b>97%</b>	<b>101%</b>	<b>102%</b>	<b>98%</b>	
<b>RPD</b>						<b>1.0%</b>	NA	<b>16%</b>	<b>0.8%</b>	<b>0.1%</b>	<b>1.0%</b>	<b>1.0%</b>	<b>0.0%</b>	

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	Matrix	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	ICP-MS Batch ID
Instrument:						ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
Laboratory Achieved Detection Limits (Seawater)						NA	0.0042	2.14	0.00110	0.0293	0.0351	0.0019	0.0263	
Seawater Reporting Limit (MDL* 3.18)						NA	0.013	6.8	0.0035	0.093	0.11	0.0060	0.084	
Laboratory Achieved Detection Limits (Freshwater)						0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater Reporting Limit (MDL* 3.18)						0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	
SW12-017	PSNS015-17	Diss	composite_time	Freshwater	3174-166	0.600	0.00926	36.0	0.0279	0.687	6.07	1.58	65.7	061112-6100
MS					3174-166 MS	2.47	1.90	37.8	1.92	2.57	7.93	3.58	162	061112-6100
MSD					3174-166MSD	2.52	1.93	37.6	1.97	2.61	8.00	3.56	162	061112-6100
					Spiking Level	2	2	2	2	2	2	2	100	
					Percent Recovery, MS	94%	95%	90%	95%	94%	93%	100%	96%	
					Percent Recovery, MSD	96%	97%	80%	97%	96%	97%	99%	96%	
					RPD	2.6%	1.6%	12%	2.6%	2.1%	3.7%	1.0%	0.0%	
<b>REPLICATE PRECISION</b>														
SW12-007	PSNS015-7	Total	composite_time	Freshwater	3174-145	0.923	0.0144	243	0.0378	1.73	9.47	6.12	64.4	061112-6100
DUP	PSNS015-7	Total	composite_time	Freshwater	3174-145r2	0.874	0.0164	236	0.0387	1.73	9.36	6.12	64.1	061112-6100
					Mean	0.899	0.0154	240	0.0383	1.73	9.42	6.12	64.3	061112-6100
					RPD	5.5%	13%	2.9%	2.4%	0.0%	1.2%	0.0%	0.5%	
SW12-015	PSNS015-15	Diss	composite_time	Freshwater	3174-162	0.673	0.00332 J	22.0	0.0329	0.774	6.71	3.55	87.6	061112-6100
DUP	PSNS015-15	Diss	composite_time	Freshwater	3174-162r2	0.654	0.00405 J	21.8	0.0335	0.745	6.82	3.56	87.5	061112-6100
					Mean	0.664	0.00369 J	21.9	0.0332	0.760	6.77	3.56	87.6	061112-6100
					RPD	2.9%	20%	0.9%	1.8%	3.8%	1.6%	0.3%	0.1%	
<b>STANDARD REFERENCE MATERIAL</b>														
SRM 1640a-1		Total		Freshwater	TRM 1640a 10x R1	7.72	8.03	54.9	3.99	41.0	88.3	12.3	56.0	061112-6100
SRM 1640a-2		Total		Freshwater	TRM 1640a 10x R2	7.61	7.78	56.6	3.94	41.6	87.1	12.4	55.1	061112-6100
					Certified Value	8.08	8.081	53.0	4.0	40.54	85.8	12.1	55.64	
					PD	4.4%	0.6%	3.6%	0.1%	1.1%	3.0%	1.6%	0.6%	
					PD	5.8%	3.7%	6.8%	1.3%	2.6%	1.6%	2.5%	1.0%	
<b>STANDARD REFERENCE MATERIAL, Seawater</b>														
SRM CASS-5		Total		Seawater	CASS-5 062712	NA	0.0042 Ub	2.14 Ub	0.0237 b	0.160 b	0.457 b	0.00966 b	0.582 b	062712-6100
					Certified Value	NA	NC	NC	0.0215	0.106	0.38	0.011	0.719	
					PD	NA	--	--	10%	51% c	20%	12%	19%	
SRM SLEW-2		Total		Seawater	SLEW-3 062712	NA	0.0042 Ub	2.14 Ub	0.0478 b	0.203 b	1.50 b	0.00669 b	0.194 b	062712-6100
					Certified Value	NA	NC	NC	0.0480	0.183	1.55	0.009	0.201	
					PD	NA	--	--	1%	11%	3%	26% c	3%	

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	Matrix	MSL Code	Hg	CVAF Batch ID
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Instrument: CVAF

Laboratory Achieved Detection Limits

0.0001

Reporting Limit (MDL\* 3.18)

0.0003

#### METHOD BLANKS

MB-1	Total	Freshwater	Method Blank1	0.0001 U	060612HGA
MB-2	Total	Freshwater	Method Blank2	0.0001 U	060612HGA
MB-3	Total	Freshwater	Method Blank3	0.0001 U	060612HGA
MB-1	Total	Freshwater	Method Blank1	0.0001 U	061212HGA
MB-2	Total	Freshwater	Method Blank2	0.0001 U	061212HGA
MB-3	Total	Freshwater	Method Blank3	0.0001 U	061212HGA

#### LABORATORY CONTROL SAMPLES

Spiking Level				0.00496	
LCS (1)	Total	Freshwater	OPR 060512 run1	0.00519	060612HGA
LCS (2)	Total	Freshwater	OPR 060512 run2	0.00531	060612HGA
LCS Blank (1)	Total	Freshwater	BLANK 060512	0.000129 J	060612HGA
			Percent Recovery, LCS 1	102%	
			Percent Recovery, LCS 2	105%	

Spiking Level				0.00496	
LCS (1)	Total	Freshwater	OPR 061112 run1	0.00524	061212HGA
LCS (2)	Total	Freshwater	OPR 061112 run2	0.00513	061212HGA
LCS Blank (1)	Total	Freshwater	BLANK 061112	0.0001 U	061212HGA
			Percent Recovery, LCS 1	106%	
			Percent Recovery, LCS 2	103%	

#### MATRIX SPIKES

MS1	PSNS015-2	Total	composite_time	Freshwater	3174-135 ms	0.0248	060612HGA
MSD1	PSNS015-2	Total	composite_time	Freshwater	3174-135 msd	0.0252	060612HGA
SW12-002	PSNS015-2	Total	composite_time	Freshwater	3174-135	0.0119	060612HGA
					Spiking Level, MS	0.0132	
					Spiking Level, MSD	0.0134	
					Percent Recovery, MS	98%	
					Percent Recovery, MSD	99%	
					RPD	1.0%	

MS2	PSNS015-9	Total	composite_time	Freshwater	3174-149 MS	0.0459	060612HGA
MSD2	PSNS015-9	Total	composite_time	Freshwater	3174-149 MSD	0.0446	060612HGA
SW12-009	PSNS015-9	Total	composite_time	Freshwater	3174-149	0.0142	060612HGA
					Spiking Level, MS	0.0279	
					Spiking Level, MSD	0.0288	
					Percent Recovery, MS	114%	
					Percent Recovery, MSD	106%	
					RPD	7.5%	

MS1	PSNS015-14	Total	composite_time	Freshwater	3174-159 MS	0.0235	061212HGA
MSD1	PSNS015-14	Total	composite_time	Freshwater	3174-159 MSD	0.0244	061212HGA
SW12-014	PSNS015-14	Total	composite_time	Freshwater	3174-159	0.0140	061212HGA
					Spiking Level, MS	0.0103	
					Spiking Level, MSD	0.0107	
					Percent Recovery, MS	92%	
					Percent Recovery, MSD	97%	
					RPD	4.9%	

BATTELLE MARINE SCIENCE LABORATORIES  
 1529 West Sequim Bay Road  
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 360/681-4564

**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW12 (Bonus Storm)**  
**Metals in Water**  
**UNITS: µg/L**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	Matrix	MSL Code	Hg	CVAF Batch ID
<i>Instrument:</i>						<i>CVAF</i>	
Laboratory Achieved Detection Limits						<b>0.0001</b>	
Reporting Limit (MDL* 3.18)						<b>0.0003</b>	
MS2	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169 MS	0.0718	061212HGA
MSD2	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169 MSD	0.0741	061212HGA
SW12-020	PSNS015-COMP	Total	Composite_equal_time	Freshwater	3174-169	0.0462	061212HGA
Spiking Level, MS						0.0266	
Spiking Level, MSD						0.0257	
Percent Recovery, MS						<b>96%</b>	
Percent Recovery, MSD						<b>108%</b>	
RPD						<b>11.9%</b>	
<b><u>REPLICATE PRECISION</u></b>							
SW12-004	PSNS015-4	Total	composite_time	Freshwater	3174-139	0.0396	060612HGA
DUP	PSNS015-4	Total	composite_time	Freshwater	3174-139r2	0.0401	060612HGA
<i>Mean</i>						<i>0.0398</i>	
RPD						<b>1%</b>	
SW12-016	PSNS015-16	Total	composite_time	Freshwater	3174-163	0.271	061212HGA
DUP	PSNS015-16	Total	composite_time	Freshwater	3174-163r2	0.264	061212HGA
<i>Mean</i>						<i>0.267</i>	
RPD						<b>2%</b>	
SW12-016	PSNS015-16	Total	composite_time	Freshwater	3174-163	0.271	061212HGA
DUP	PSNS015-16	Total	composite_time	Freshwater	3174-163r2	0.260	061212HGA
<i>Mean</i>						<i>0.266</i>	
RPD						<b>4%</b>	
<b><u>STANDARD REFERENCE MATERIAL</u></b>							
SRM 1641 (1)		Total		Freshwater	1641d 060512	1638	060612HGA
SRM 1641 (1)		Total		Freshwater	1641d 061112	1681	061212HGA
Certified Value						<b>1590</b>	
range						<b>±18</b>	
SRM 1641 (1)						<b>PD</b>	
SRM 1641 (2)						<b>PD</b>	
						<b>3%</b>	
						<b>6%</b>	



BATTELLE MARINE SCIENCE LABORATORIES

1529 West Sequim Bay Road  
Sequim, Washington 98382-9099  
360/681-4564

Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
QC Sample Results for TOC/DOC by HTOCO

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Matrix	MSL Code	TOC/DOC mg/L	TOC/DOC µM	Batch ID
Laboratory Achieved Detection Limits (Seawater)					0.030	2.5	
Seawater Reporting Limit (MDL* 3.18)					0.095	8.0	
Instrument:					HTCO	HTCO	

**Method Blanks**

MB		DIWater	MB_DIW061512r1	0.030	2.5 U	DOC061512
MB		DIWater	MB_DIW061512r2	0.030	2.5 U	DOC061512
MB		DIWater	MB_DIW061612	0.0667	5.56 J	DOC061612
MB		DIWater	MB_DIW061912	0.030	2.5 U	DOC061912
MB		DIWater	MB_DIW062012	0.030	2.5 U	DOC062012

**Consensus Value for Interlaboratory Sample<sup>2</sup>**

CRM-11	DOC	Seawater	UM CRM0615R1	0.524	43.6	DOC061512
CRM-12	DOC	Seawater	UM CRM0615R2	0.523	43.5	DOC061512
CRM-13	DOC	Seawater	UM CRM0619R1	0.505	42.1	DOC061912
CRM-14	DOC	Seawater	UM CRM0619R2	0.493	41.1	DOC061912
Average Consensus Value				0.510	42.5	
Range				0.492-0.528	41-44	
CRM-11			PD	2.7%	2.7%	
CRM-12			PD	2.5%	2.5%	
CRM-13			PD	1.0%	1.0%	
CRM-14			PD	3.4%	3.4%	

**CALIBRATION RESULTS**

ICV/CCV-1		CCV	1.05	87.3	DOC061512
ICV/CCV-2		CCV	1.07	89.2	DOC061512
ICV/CCV-3		CCV	0.98	82.0	DOC061912
ICV/CCV-4		CCV	1.02	84.7	DOC061912
ICV/CCV-5		CCV-5 ppm	4.86	405	DOC061912
ICV/CCV-6		CCV-5ppm	4.88	406	DOC061512
ICV/CCV-7		CCV-5ppm	4.90	408	DOC061612
ICV/CCV-8		ICV	0.98	81.5	DOC061512
ICV/CCV-9		ICV	1.05	87.2	DOC061912
TRUE VALUE			1 or 5		
ICV/CCV-1		% RECOVERY	105%		
ICV/CCV-2		% RECOVERY	107%		
ICV/CCV-3		% RECOVERY	98%		
ICV/CCV-4		% RECOVERY	102%		
ICV/CCV-5		% RECOVERY	97%		
ICV/CCV-6		% RECOVERY	98%		
ICV/CCV-7		% RECOVERY	98%		
ICV/CCV-8		% RECOVERY	98%		
ICV/CCV-9		% RECOVERY	105%		

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 1529 West Sequim Bay Road  
 Sequim, Washington 98382-9099  
 360/681-4564

**Non-Dry Dock Stormwater**  
**ENVVEST 2011-12\_SW12 (Bonus Storm)**  
**QC Sample Results for TSS**

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Matrix	MSL Code	TSS	Units	Batch ID
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Method: SM2540D - Mod

MDL 0.49 mg/L

**Method Blanks**

MB1	Total	Freshwater	Blank042712r1	0.49 U	mg/L	042712TSS
MB2	Total	Freshwater	Blank042712r2	0.49 U	mg/L	042712TSS
MB3	Total	Freshwater	Blank042712r3	0.49 U	mg/L	042712TSS

**LABORATORY CONTROL SAMPLES**

LCS-1	Total	Freshwater	LCS042712r1	34.8	mg/L	042712TSS
LCS-2	Total	Freshwater	LCS042712r2	38.4	mg/L	042712TSS

			<b>TRUE VALUE</b>	<b>40</b>	mg/L	
<b>LCS-1</b>			<b>% RECOVERY</b>	<b>87%</b>		
<b>LCS-2</b>			<b>% RECOVERY</b>	<b>96%</b>		

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**Non-Dry Dock Stormwater  
ENVVEST 2011-12\_SW12 (Bonus Storm)  
Metals in Water**

**DATA QUALIFIERS:**

- c Exceeds DQO but meets contingency criteria of either:
  - 1 SRM certified <10x MDL
  - 2 Insufficient spiking level relative to native sample concentrations
  - 3 Sample concentration <10x MDL
- U Analyte not detected at or above the MDL, MDL reported
- J Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%  
& Accuracy result outside QC criterion of  $\leq 20\%$  PD  
\* Precision result outside QC criterion of  $< 30\%$
- NS Sample not spiked for this analyte
- B Analyte detected in the method blank > RL  
and sample concentration < 10 times detected blank value
- b Data are blank corrected using the batch specific procedural blank
- ND Not detected
- E Estimated, sample container cracked

**Notes:**

- Composite\_equal\_time Equal portion composite of time integrated sample (ISCO samples)
- Composite\_time A time integrated sample. One bottle generated by the ISCO sampler.
- NC Not Certified
- Not analyzed
- NA Not applicable/available
- Total Total or unfiltered fraction
- Diss Dissolved or fraction filtered

## QA/QC NARRATIVE

**PROJECT:** Non-Dry Dock Stormwater Sampling for SW12  
**PARAMETER:** Total and Dissolved Metals – Al, Ag, As, Cd, Cr, Cu, Pb, Zn, Hg; dissolved organic carbon (DOC); and total suspended solids (TSS)  
**LABORATORY:** Battelle Marine Sciences Laboratory (MSL), Sequim, Washington  
**MATRIX:** Stormwater (with select seawater and freshwater matrices)

**SAMPLE CUSTODY AND PROCESSING:** Samples were collected from stormwater outfalls located within the Confined Industrial Area (CIA) and Naval Base Kitsap (NBK) at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) by TEC, MSL, and the U.S. Navy during the 2011-12 storm season. The following narrative addresses the collection of the bonus storm at the PSNS015 outfall. This outfall was selected for a special study to determine the concentrations of metals during the progression of the storm, as well as the composite similar to those reported for previous storms. The samples were collected as discrete intervals of the storm collected by the ISCO and also composited as described in the sampling and analysis plan (SAP; Taylor Associates, Inc. – Division of TEC, Inc. and Pacific Northwest National Laboratory 2011).

The storm event identified as SW12 began on April 19, 2012 and ended on April 20, 2012. The samples were collected in individual ISCO wedge bottles as described in the SAP and Addendum A written for this storm (Taylor Associates, Inc. and PNNL 2011 and appended to this narrative). Two types of composite samples were collected during the storm. The first was a time proportionate discrete sample from 18 intervals of the storm. Each interval represents a time composite of one hour of the storm. The second was a storm event composite to represent the average concentration of the entire storm. The individual time paced composites collected in the 18 wedge bottles were carried back to the stormwater lab at PSNS & IMF and sub-sampled for total and dissolved metals, TSS and DOC. The remaining samples from the discrete fractions were composited into a single event mean composite (EMC) in a pre-cleaned glass jar following the same protocol as all Phase I and II sampling. The samples were hand delivered within 24 hours of collection to MSL.

Upon receipt at MSL, the condition of all the samples were verified as acceptable and tracked back to the field chain of custody (COC). In the clean laboratory at MSL, the glass composite sample jar and the Teflon total metals container were shaken vigorously before pouring an aliquot into a 0.45µm polyvinylidene fluoride (PVDF) filter unit for filtration. Each sample was vacuum filtered in a class 100 clean bench and the filtrate was poured into a 500 mL Teflon bottle for dissolved metals (DME). The total and dissolved metal fractions were each acidified inside a Class 100 clean bench to a pH of < 2.0 with double distilled nitric acid. The samples were then assigned a MSL Central File (CF) identification number (3174) and were entered into Battelle's sample tracking system. The composite aliquots for DOC were stored frozen and TSS was stored at 4.0±2°C.

The following lists information on sample receipt and processing activities:

<b>Sample Receipt Dates:</b>	SW12: 04/20/12
<b>Cooler temp.</b> on arrival	All coolers were at 4.0±2°C
<b>Collection dates</b>	04/19/12 and 04/20/12
<b>TSS analysis dates</b>	04/27/12
<b>DOC analysis dates</b>	06/15/12, 06/16/12, 06/19/12, 06/20/12
<b>CVAF analysis dates (Hg)</b>	06/06/12 and 06/12/12
<b>TRM Prep/Freshwater Analysis by ICP-MS</b> (As, Ag, Al, Cd, Cr, Cu, Pb, Zn)	06/11/12
<b>Fe/Pd Prep/seawater Analysis by ICP-MS</b> (Ag, Al, Cd, Cr, Cu, Pb, Zn)	06/26-27/12

## QA/QC NARRATIVE

### QA/QC DATA QUALITY OBJECTIVES:

FRESHWATER						
Analyte	Analytical Method for Seawater	MS Range of Recovery	SRM Percent Difference	Replicate Precision	Method Detection Limits (µg/L)	Reporting Limits (µg/L)
Aluminum	ICP-MS	70-130%	≤20%	≤30%	0.3	1.0
Arsenic	ICP-MS	70-130%	≤20%	≤30%	0.03	0.1
Cadmium	ICP-MS	70-130%	≤20%	≤30%	0.004	0.01
Chromium	ICP-MS	70-130%	≤20%	≤30%	0.08	0.3
Copper	ICP-MS	70-130%	≤20%	≤30%	0.007	0.02
Lead	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Silver	ICP-MS	70-130%	≤20%	≤30%	0.002	0.006
Zinc	ICP-MS	70-130%	≤20%	≤30%	0.05	0.2
Mercury	CVAF	70-130%	≤20%	≤30%	0.0001	0.00032
TSS	SM2540D	NA	≤20%	≤30%	0.49 mg/L	0.49 mg/L
DOC	HTCO	NA	≤20%	≤30%	0.03 mg/L	0.095 mg/L

SEAWATER (only if different than freshwater)						
Analyte	Analytical Method for Seawater	MS Range of Recovery	SRM Percent Difference	Replicate Precision	Method Detection Limits (µg/L)	Reporting Limits (µg/L)
Aluminum	ICP-MS	70-130%	≤20%	≤30%	2.14	6.8
Arsenic	NA	NA	NA	NA	NA	NA
Cadmium	ICP-MS	70-130%	≤20%	≤30%	0.0011	0.0035
Chromium	ICP-MS	70-130%	≤20%	≤30%	0.0293	0.093
Copper	ICP-MS	70-130%	≤20%	≤30%	0.0351	0.11
Lead	ICP-MS	70-130%	≤20%	≤30%	0.0019	0.0060
Silver	ICP-MS	70-130%	≤20%	≤30%	0.0042	0.013
Zinc	ICP-MS	70-130%	≤20%	≤30%	0.0263	0.084
Mercury	CVAF	70-130%	≤20%	≤30%	0.0001	0.00032

### METHODS:

Samples were analyzed for nine metals: aluminum (Al), arsenic (As – only in freshwater), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), silver (Ag), zinc (Zn), and mercury (Hg). Samples were submitted for analyses by the following preparation and analytical methods. All samples were analyzed for Hg by Cold Vapor Atomic Fluorescence (CVAF) in accordance with Battelle SOP *MSL-I-013, Total Mercury in Aqueous Samples by CVAF*, following EPA Method 1631 revision E.

All samples for other metals were analyzed by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) in accordance with Battelle SOP *MSL-I-022, Determination of Elements in Aqueous and Digestate Samples by ICP/MS*. The base methods for this procedure are EPA Method 1638 and EPA Method 1640. Freshwater samples (defined as salinity < 2ppt) were digested following the total metal recoverable (TRM) method established in EPA Method 1640 prior to analysis by ICP-MS. In summary, this preparation brings the pH of the sample to 2% and heats the capped samples for 2.5 hours in a 85°C oven to solubilize particulates. Both the filtered and unfiltered fractions were prepared using this method to destroy any colloidal particles remaining in the filtered (aka. dissolved) fraction.

Seawater samples were preconcentrated via a precipitation step followed by reconstituted in a salt free solution in accordance with Battelle SOP *MSL-I-025*,

## QA/QC NARRATIVE

*Methods of Sample Preconcentration: Iron and Palladium/APDC Coprecipitation and Borohydride Reductive Precipitation for Trace Metals Analysis in Water.*

Preconcentrated seawater samples were analyzed for Al, Ag, Cd, Cr, Cu, Pb and Zn by ICP-MS as described above.

All results were reported in units of µg/L. Seawater data are reported as reagent corrected for the metals requiring Fe/Pd preconcentration (Al, Ag, Cd, Cr, Cu, Pb, and Zn) and denoted with a b-flag. The required preconcentration procedure for ICP-MS analyses includes the addition of chelating agents to induce precipitation of metals under specific conditions. Subsequently, reagents added to the samples should be of the purest quality to result in zero addition of metals to the seawater samples. Required reagents have trace impurities of these metals; therefore, the data are blank corrected for these elements. Results were corrected using the mean batch reagent blank identified for each preparation batch as BMRB\_analysis date and provided in the table identified as the QC Results for ICP-MS.

The conductivity and turbidity data were recorded in the field using probes as described by Taylor Associates, Inc. – Division of TEC, Inc. and Pacific Northwest National Laboratory (2011). The TSS samples were analyzed at MSL following SM2540D using a gravimetric analysis with modification to use a nucleopore membrane. The data are reported in units of mg/L.

The DOC samples were analyzed using a High Temperature Catalytic Oxidation (HTCO) method. The instrument is specially equipped with high-salt sample combustion tube kit and halogen scrubber for seawater analysis. Seawater samples were acidified to pH <2 by concentrated hydrochloric acid (trace metal grade, Fisher Chemical) prior to analysis then sparged for 2 min to remove inorganic carbon (IC). The non-purgeable organic carbons (NPOC) in samples were further converted to CO<sub>2</sub> by oxidation at 680°C with a platinum catalyst. A non-dispersive infrared detector (NDIR) was used to detect the converted CO<sub>2</sub> for quantification of NPOC. The data are reported as both mg/L and µM.

**HOLDING TIMES:** All samples were analyzed within the established holding times of 90 days for Hg, six months for all other metals, and 7 days for TSS.

**DETECTION LIMITS:** Laboratory method detection limits (MDLs) for both TRM freshwater and Fe/Pd seawater were reported from the MDL study (annually verified) as determined by seven replicates of deionized water and Sequim Bay seawater, respectively. Reporting limits were determined as 3.18 times the laboratory achieved MDL. The data are evaluated and flagged as follows:

- U Analyte not detected at or above the MDL, MDL reported
- J Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%
- & Accuracy result outside QC criterion of ≤20% PD
- \* Precision result outside QC criterion of <30%
- B Analyte detected in the method blank > RL and sample concentration < 10 times detected blank value
- E Reported result exceeds linear range; use with caution
- c Exceeds data quality objective but meets contingency criterion

**METHOD BLANKS:** A minimum of one method blank was prepared and analyzed by each instrument with each analytical batch. The freshwater method blanks were all less than the RL. For seawater, a minimum of three method blanks were analyzed by each instrument with each analytical batch for metals. The average method blank for each batch was less than the RL for all metals except Zn. The seawater preconcentration procedure required to

## QA/QC NARRATIVE

remove salt interferences prior to ICP-MS analyses includes the addition of chelating agents to induce precipitation of metals under specific conditions as discussed in the method section above. The data were evaluated and qualified with a “B” if the sample concentration was less than ten times the mean detected blank detected above the RL for the analytical batch. The reagent blank correction takes into consideration the detected blank for each batch and the data should be reported as corrected in order to more accurately represent the true sample concentrations.

The method blank for TSS is a nucleopore filter taken through the analytical process with each batch of samples. The blanks were all less than the MDL. For DOC, low carbon water (LCW) was purchased from University of Miami and analyzed as part of the HTCO calibration curve to demonstrate that the instrumentation was not contributing carbon.

### **LABORATORY CONTROL SAMPLES:**

For freshwater, a minimum of one LCS (OPR or blank spike) was prepared and analyzed with each analytical batch of 20 or fewer samples. For seawater, the LCS matrix for the seawater samples was Sequim Bay Seawater prepared as both spiked and unspiked samples. Percent recoveries for LCS samples were within the QC acceptance criterion of 70% to 130% for all metals. They also met a secondary criterion of  $\pm 15\%$  recovery for metals of concern.

### **MATRIX SPIKE ACCURACY:**

A minimum of one set of duplicate matrix spikes (MS/MSD) was prepared and analyzed with each analytical batch of 20 or fewer samples. Percent recoveries for matrix spikes were within the QC limits of 70% to 130% for all metals.

### **REPLICATE PRECISION:**

Laboratory precision was expressed as the relative percent difference (RPD) between laboratory duplicates. The RPD values for the laboratory duplicates were within the QC acceptance criterion of  $\pm 30\%$  for all metals detected above the RL.

### **STANDARD REFERENCE MATERIAL ACCURACY:**

Standard reference materials (SRM – if available) were prepared and analyzed with each analytical batch at a minimum frequency of 1 per 20 or fewer samples. Analytical accuracy was expressed as the percent difference (PD) between the measured and the certified value. The freshwater SRMs were 1641d for Hg and 1640a for all other metals. The differences were within the QC acceptance criterion of  $\leq 20\%$ .

For seawater, the SRM for Hg was also 1641d, as no seawater SRM was available. Three different SRMs were analyzed for the other metals. The freshwater SRM 1640a demonstrated analytical accuracy for each batch analyzed by ICP-MS. Percent recoveries were within the QC acceptance criterion. There are no seawater SRMs certified for Ag or Al. High purity standards and the freshwater SRM were used to evaluate analytical accuracy.

Two seawater SRMs were analyzed with each batch. The primary SRM was the coastal SRM CASS-5 and the secondary was the estuarine SRM SLEW-3. Both were prepared with each batch of preconcentrated samples. The PDs were within the QC criterion for all metals certified greater than 10x the MDL. In CASS-5, Cr is certified less than 10x the MDL and SLEW-3 was used to demonstrate acceptable accuracy.

There are no SRMs available for TOC or DOC. University of Miami provides a laboratory consensus value for DOC in estuarine water <http://yyy.rsmas.miami.edu/groups/biogeochem/CRM.html>. The average of the reference value range was used to calculate the PD for each replicate. The PD ranged from 1-3.4%.

## QA/QC NARRATIVE

**REFERENCES:** Taylor Associates, Inc. – Division of TEC, Inc. and Pacific Northwest National Laboratory (2011). Non-Dry Dock Stormwater Monitoring Conducted at Puget Sound Naval Shipyard Bremerton, WA, Project ENVVEST Study Area. Document prepared for the United States Navy Puget Sound Naval Shipyard.

### DISCUSSION:

The interpretation of the results will be provided in the annual non-dry dock stormwater report available in September 2012. However, some data are plotted in order to provide guidance on next steps during the Phase III planning meeting in August 2012. Figure 1 illustrates the results of the precipitation (inches), water level in the pipe (ft.), total concentration of particles as measured by the Laser In-Situ Scattering and Transmissometry (LISST;  $\mu\text{L/L}$ ) and mean particle size ( $\mu\text{m}$ ) of the stormwater during the SW12 event. The *in-situ* sensors also collected conductivity and more detailed size measurements of particles during the progression of the storm. The LISST data is reported as 32 size classification; however, the data were grouped into three size classes for easier visualization. The size classes were  $< 63 \mu\text{m}$  (silt/clay),  $63\text{-}234 \mu\text{m}$  (very fine and fine sand), and  $234\text{-}386 \mu\text{m}$  (medium sand).

These *in-situ* measurements were then plotted against the concentrations of DOC and particulate and dissolved Hg (Figure 2) determined during the intervals of the storm. The total recoverable Hg concentrations are equal to the top of the stacked bars. The *in-situ* measurements were collected at roughly 15 minute intervals, while the chemistry data were determined from the one hour composites collected by the ISCO. The data show that as the rainfall begins you have smaller particles moving through the outfall and the Hg concentration does not begin to increase until about 4 hours into the storm event. The first increase in Hg occurs around the time there is a peak in the size and volume of particles moving through the outfall around 23:00 to 24:00. By this time the precipitation volumes have begun to decrease and the tide begins to move into the pipe with conductivity rising around 03:00. While the denser salt water is filling the pipe, the fresh stormwater is trapped behind the salt water and the DOC concentrations are closer to those measured in the ambient seawater ( $\sim 1\text{-}2 \text{ mg/L}$ ). As the tide recedes, the DOC goes up there is a peak in the total Hg concentration along with a high concentration of particles of the silt/clay and fine sand size. After this peak, the Hg concentrations go down. However, the portion of the total Hg that is in the dissolved phase increases to as much as 57% compared to earlier values averaging 23%. The pulse of particulates traveling through the pipe during the collection of interval 16 around 0900 on 20 April is reflected in all the metals as spike in the particulate fraction (see Figure 3 for Cu).

Coupling the stormwater chemistry data with the storm drain data will provide additional information on the nature of the types of particles moving through the stormwater system at PSNS015. The annual report of progress will include the chemistry results from the storm drain sediment collected at PSNS015 and several other outfalls in both the CIA and NBK portions of PSNS.



## QA/QC NARRATIVE

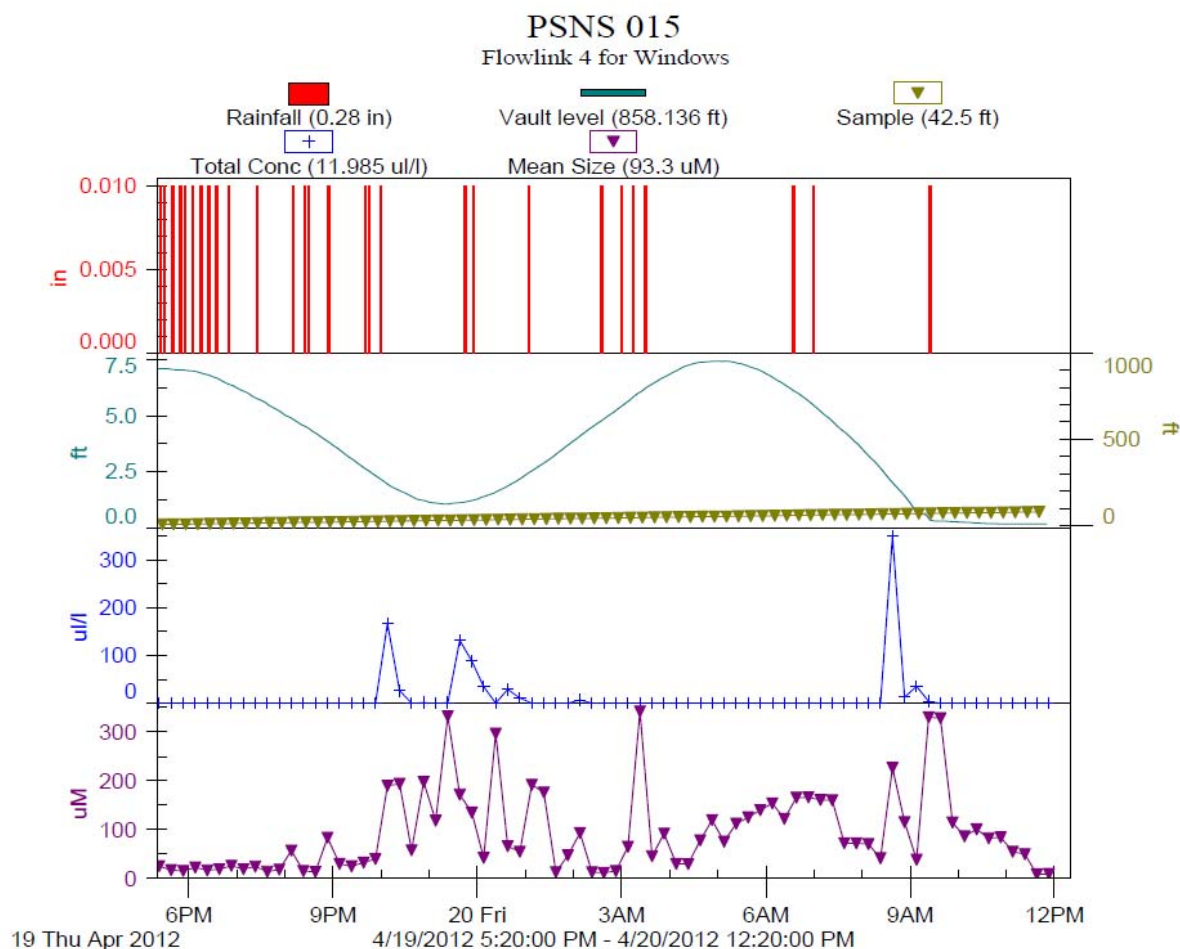


Figure 1. From top to bottom, graphs of the precipitation (inches), water level in the pipe (ft.), total concentration of particles as measured by the Laser In-Situ Scattering and Transmissometry (LISST;  $\mu\text{L/L}$ ) and mean particle size ( $\mu\text{m}$ ) of the stormwater during the SW12 event.

## QA/QC NARRATIVE

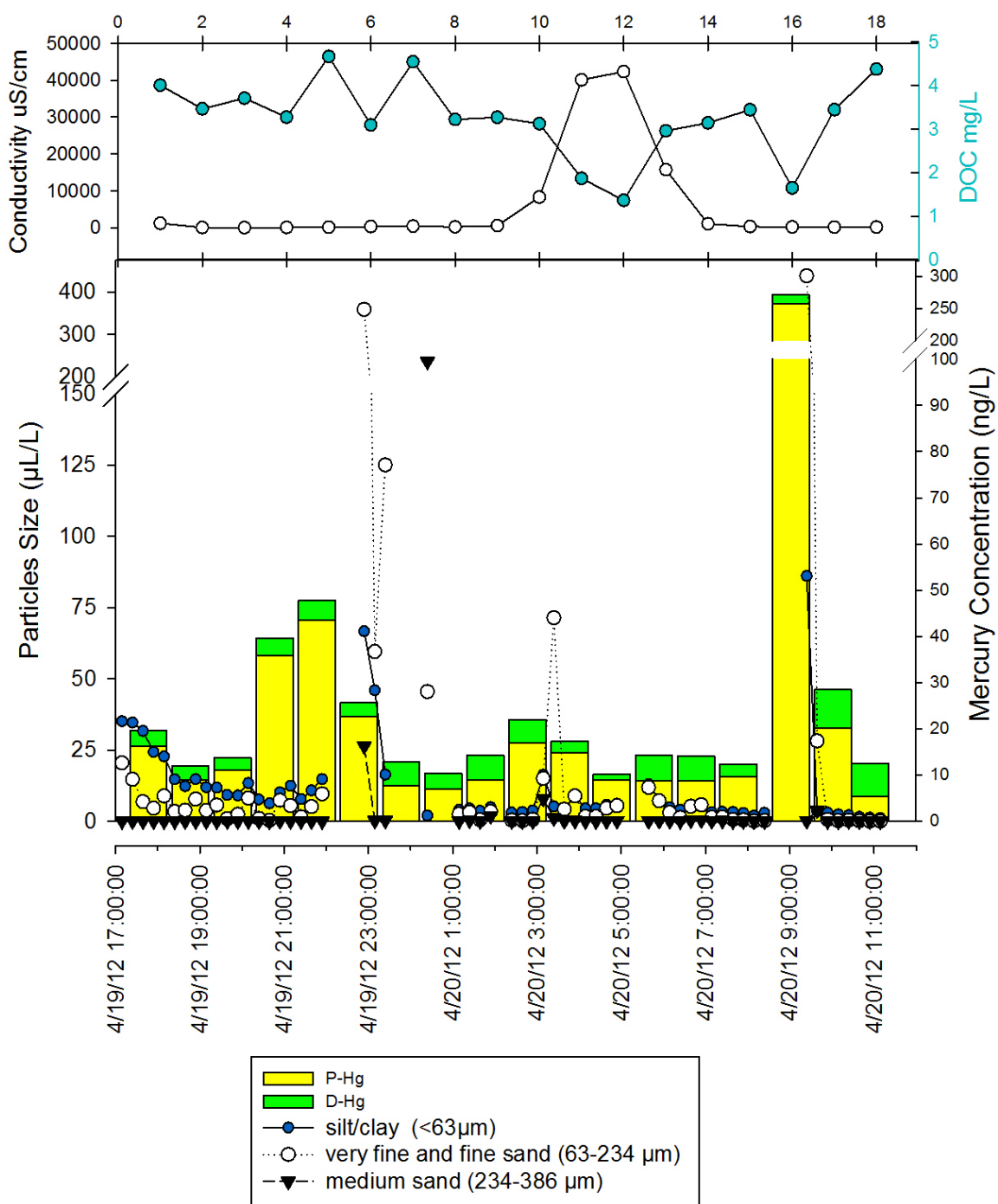


Figure 2. The top graph is the conductivity and dissolved organic carbon (DOC) during the storm event starting April 19, 2012. The bottom graph includes the concentrations of particulate mercury (P-Hg), dissolved Hg (D-Hg), silt/clay, fine sand, and medium sand. The top of the bar presents total recoverable Hg.

## QA/QC NARRATIVE

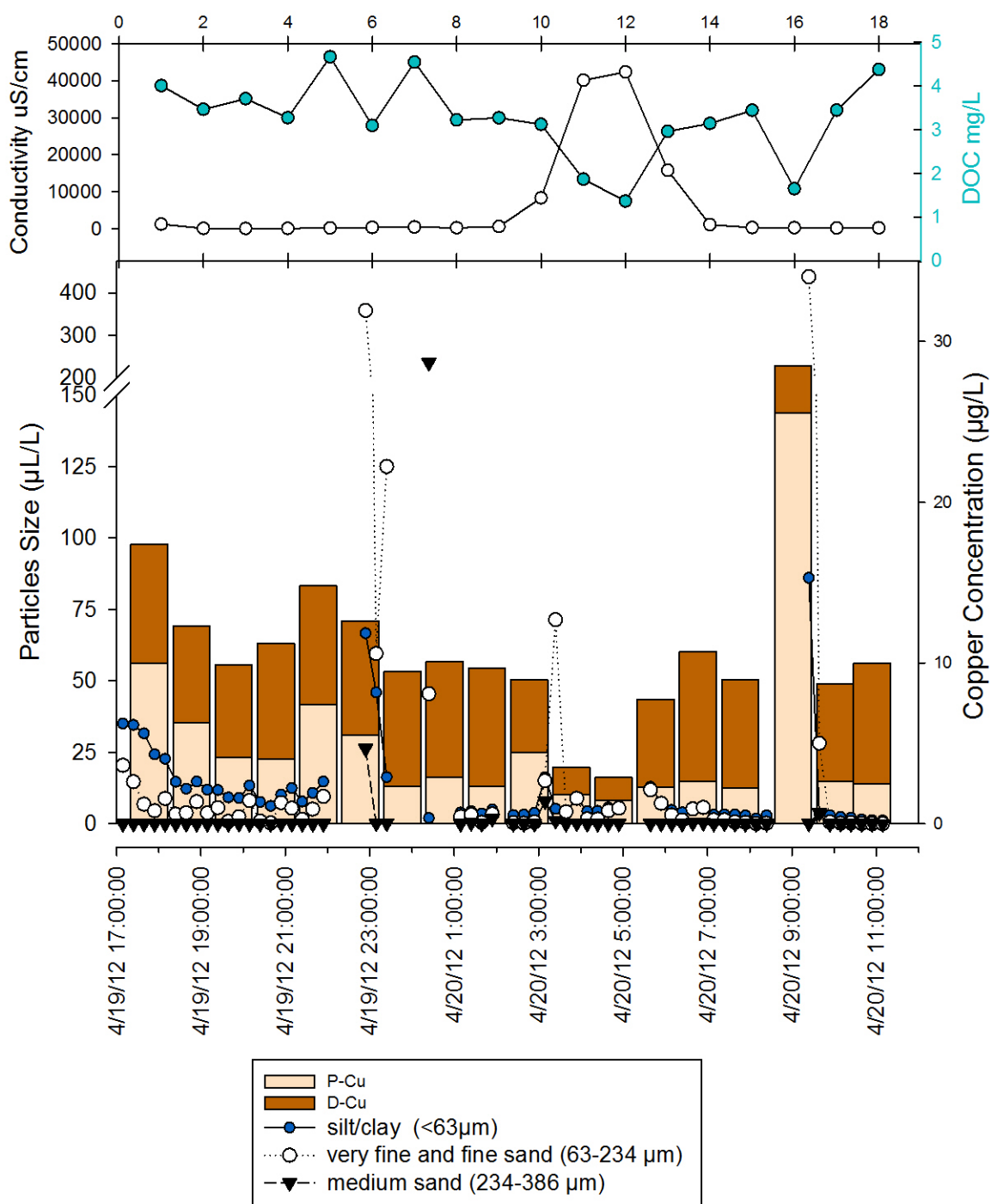


Figure 3. The top graph is the conductivity and dissolved organic carbon (DOC) during the storm event starting April 19, 2012. The bottom graph includes the concentrations of particulate copper (P-Cu), dissolved Cu (D-Cu), silt/clay, fine sand, and medium sand. The top of the bar presents total recoverable Cu.

# QA/QC NARRATIVE

PNNL Project No. 54220

**AMENDMENT TO PERFORMANCE WORK STATEMENT  
TASK 2 OF THE ENVVEST WATERSHED SCALE STUDY  
AMENDMENT 7 TITLE: PHASE II NON-DRY DOCK STORMWATER MONITORING FOR  
PSNS&IMF, BREMERTON, WA  
ADDENDUM A  
DATE: 3/22/12**

## 1. INTRODUCTION

This addendum modifies the existing Phase II Non-Dry Dock Stormwater Monitoring project by adding a bonus stormwater sample collected from PSNS015 outfall. This does not add funding to the existing project, but supplements the scope. The funding for the supplemental scope will be provided from two areas within the scoped work: 1) cost savings from the field collection tasks and 2) the reduced number of sediment samples available for collection within the storm drains. Specific tasking for the collection and analyses of the bonus storm sample are provided below.

## 2. SPECIFIC TASKS

The storm targeting, qualification criteria, collection methods, and retrieval procedures will remain consistent with the 2012 Project Work Plan and Phase II statement of work. One stormwater sample will be collected from PSNS015 prior to May 1, 2012. If a storm meeting the desired qualifications does not occur prior to this date, then the supplemental sampling will be canceled. This provides sufficient time for the chemical analyses, demobilization, and annual report production to occur within FY12.

### 2.1 Task 1: Field Collection and Processing

The collection protocol will follow the existing statement of work and 2012 project work plan (PWP), but only one storm will be collected at PSNS015 during or immediately following periods of higher high tide (if possible) and no grab samples are planned. The 24 wedge bottles will be deployed as detailed in the PWP and retrieved after collection of a storm anticipated to yield > 1 inch of rain in a 24 hour period. The 24 wedge bottles will be taken to the stormwater lab and aliquots removed from each wedge bottle as listed in Table 1. After removal of the aliquot, the procedure for compositing will remain consistent with the PWP (e.g. conductivity & turbidity analyses to determine samples included in the composite).

The composite sample will be created in a pre-cleaned glass jar as detailed in the PWP and delivered to PNNL. The composite will be aliquoted at MSL for a subset of the parameters as detailed in Table 1. All other sampling procedures for telemetry<sup>1</sup> and data processing will remain the same as described in the PWP.

Table 1. Bonus PSNS015 Analytical Parameter List for both Wedge Bottles and Composite.

Sample Type	Parameter	Bottle Type	Volume (mL)	#
Wedge Bottle	Total and Dissolved Metals	Teflon	250mL (half filtered at lab for dissolved)	48 (24 field & 24 lab)

<sup>1</sup> If possible, a laser in situ scattering transmissometry (LISST) sensor capable of measuring the size-dependent settling velocity distribution of suspended particles will be added to the in situ sensors at PSNS015 for this storm event.

## QA/QC NARRATIVE

Wedge Bottle	TSS	LDPE	500mL	24
Wedge Bottle	DOC	Glass	125mL (filtered in field)	24
<b>Collected at MSL from Composite Sample</b>				
Comp	Total and Dissolved Metals	Teflon	500mL (half filtered at lab for dissolved)	2
Comp	TSS	LDPE	500mL	1
Comp	DOC	Glass	125mL	1

## 2.2 Task 2: Reports

A storm event (STE) report and chemistry report will be provided for the bonus storm. The data will be incorporated into the annual report and other deliverables as appropriate.

# **SAMPLE CHAIN OF CUSTODY FORM**

Date:

Page: Page 1 of 2

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW12

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

3174  
Diss

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TPH	TME/DME	DME	No. containers	Sample Type (grab vs. Comp)	Storm#	Notes/Comments
133 SW12-001 134	PSNSOIS - 1	4/20/12 1034	SW			X	X	X	X		3	comp	SW12	
135 SW12-002 136	PSNSOIS - 2		SW			X	X		V		3		SW12	
137 SW12-003 138	PSNSOIS - 3		SW			X	X		X		3		SW12	Amphiodie
139 SW12-004 140	PSNSOIS - 4		SW			X	X		X		3		SW12	
141 SW12-005 142	PSNSOIS - 5		SW			X	X		X		3		SW12	Debris; organic & detritus
143 SW12-006 144	PSNSOIS - 6		SW			X	X		X		3		SW12	Debris; organic (soil/grass)
145 SW12-007 146	PSNSOIS - 7		SW			X	X		X		3		SW12	
147 SW12-008 148	PSNSOIS - 8		SW			X	X		X		3		SW12	
149 SW12-009 148	PSNSOIS - 9		SW			X	X		X		3		SW12	
151 SW12-010 150	PSNSOIS - 10		SW			X	X		X		3		SW12	Amphiodie
153 SW12-011 152	PSNSOIS - 11		SW			X	V		X		3		SW12	
155 SW12-012 156	PSNSOIS - 12		SW			X	V		X		3		SW12	
157 SW12-013 158	PSNSOIS - 13		SW			X	X		X		3		SW12	Amphiodie

Relinquished by:

Signature: *[Signature]* Date: 4/20/12 Time: 1750  
Printed Name: Jim Brandenberger Company: PNNL

Received by:

Signature: *[Signature]* Date: 4/20/12 Time: 1830  
Printed Name: C. Sushan Company: MSL

Total # of Containers

Shipment Method:  
Hand Delivered to MSL

Relinquished by:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Printed Name: \_\_\_\_\_ Company: \_\_\_\_\_

Received by:

Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_

Sample Disposition:

Distribution:  
1) PNNL  
2) CAS

Signature: *[Signature]* Date: 4/20/12

# **SAMPLE CHAIN OF CUSTODY FORM**

Date:

Page: Page of 2

Project No.: 54220 / 62375

Project: Non-dry Dock Stormwater SW12

SW = Stormwater

## **Battelle**

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TPH	TME/DME	DME	No. containers	Sample Type (grab vs. Comp)	Storm#	Notes/Comments
3174														
159 SW12-014	PSNSO15-14	4/20/12 1037	SW			X	X		X		3	comp	SW12	
161 SW12-015	PSNSO15-15		SW			X	X		X		3		SW12	
163 SW12-016	PSNSO15-16		SW			X	X		X		3		SW12	Debris, organic & Detritus
165 SW12-017	PSNSO15-17		SW			X	X		X		3		SW12	Small amount of Detritus
167 SW12-018	PSNSO15-18		SW			X	X		X		3		SW12	
3259-7 SW12-019	PSNSO15	4/13/12	SW						X		1	grab	SW12	vault sediment
169 SW12-020	PSNSO15	4/20/12 1037	SW			X	X		X		3	comp	SW12	storm comp
SW12-021			SW										SW12	
SW12-022			SW										SW12	
SW12-023			SW										SW12	
SW12-024			SW										SW12	
SW12-025			SW										SW12	
SQV07-006 8 4/23/12														
Relinquished by: <u>Jm Brandenberger</u> 4/20/12 1750				Received by: <u>C. Susun</u> 4/20/12 1830				Total # of Containers						
Signature: <u>Jm Brandenberger</u> Date: <u>4/20/12</u> Time: <u>1750</u>				Signature: <u>C. Susun</u>				Shipment Method:						
Printed Name: <u>Jm Brandenberger</u> Company: <u>PNNL</u>				Printed Name: <u>C. Susun</u>				Hand Delivered to MSL						
Relinquished by:				Received by:				Sample Disposition:						
Signature: _____ Date: _____ Time: _____				Signature: _____				Distribution:						
Printed Name: _____ Company: _____				Printed Name: _____				1) PNNL						
								2) CAS						

\* 8 4/20/12

# SAMPLE LOGIN

Project Manager: Brandenberger

Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick

Project: **ENVVEST Non-Dry Dock Storm Water - SW12**

Pacific Northwest  
NATIONAL LABORATORY

**Battelle**  
The Business of Innovation

Marine Sciences Laboratory

1529 West Sequim Bay Road

Sequim, Washington 98382

PH: (360) 681-4565

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW12-001	PSNS015-1	3174-133	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-001	PSNS015-1	3174-134	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-002	PSNS015-2	3174-135	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-002	PSNS015-2	3174-136	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-003	PSNS015-3	3174-137	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-003	PSNS015-3	3174-138	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-004	PSNS015-4	3174-139	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-004	PSNS015-4	3174-140	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-005	PSNS015-5	3174-141	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-005	PSNS015-5	3174-142	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-006	PSNS015-6	3174-143	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-006	PSNS015-6	3174-144	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-007	PSNS015-7	3174-145	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-007	PSNS015-7	3174-146	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-008	PSNS015-8	3174-147	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-008	PSNS015-8	3174-148	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-009	PSNS015-9	3174-149	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-009	PSNS015-9	3174-150	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-010	PSNS015-10	3174-151	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-010	PSNS015-10	3174-152	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12



# SAMPLE LOGIN

Project Manager: Brandenberger

Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick

Project: **ENVVEST Non-Dry Dock Storm Water - SW12**



Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, Washington 98382  
PH: (360) 681-4565

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW12-011	PSNS015-11	3174-153	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-011	PSNS015-11	3174-154	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-012	PSNS015-12	3174-155	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-012	PSNS015-12	3174-156	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-013	PSNS015-13	3174-157	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-013	PSNS015-13	3174-158	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-014	PSNS015-14	3174-159	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-014	PSNS015-14	3174-160	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-015	PSNS015-15	3174-161	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-015	PSNS015-15	3174-162	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-016	PSNS015-16	3174-163	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-016	PSNS015-16	3174-164	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-017	PSNS015-17	3174-165	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-017	PSNS015-17	3174-166	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-018	PSNS015-18	3174-167	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-018	PSNS015-18	3174-168	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-020	PSNS015-COMP	3174-169	WAT	Prep Lab, K-1-B/C	Total Metals	04/20/12
SW12-020	PSNS015-COMP	3174-170	WAT	Prep Lab, K-1-B/C	Dissolved Metals	04/20/12
SW12-019	VAULT Sediment - see CF#3259		SED	Walkin Freezer	Metals	04/13/12

## SAMPLE LOGIN

Project Manager: Brandenberger

Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick

Project: **ENVVEST Non-Dry Dock Storm Water - SW12**

Pacific Northwest  
NATIONAL LABORATORY

Battelle  
The Business of Innovation

Marine Sciences Laboratory

1529 West Sequim Bay Road

Sequim, Washington 98382

PH: (360) 681-4565

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW12-001	PSNS015-1	3174-133	WAT	Walkin cold room	TSS	04/20/12
SW12-002	PSNS015-2	3174-135	WAT	Walkin cold room	TSS	04/20/12
SW12-003	PSNS015-3	3174-137	WAT	Walkin cold room	TSS	04/20/12
SW12-004	PSNS015-4	3174-139	WAT	Walkin cold room	TSS	04/20/12
SW12-005	PSNS015-5	3174-141	WAT	Walkin cold room	TSS	04/20/12
SW12-006	PSNS015-6	3174-143	WAT	Walkin cold room	TSS	04/20/12
SW12-007	PSNS015-7	3174-145	WAT	Walkin cold room	TSS	04/20/12
SW12-008	PSNS015-8	3174-147	WAT	Walkin cold room	TSS	04/20/12
SW12-009	PSNS015-9	3174-149	WAT	Walkin cold room	TSS	04/20/12
SW12-010	PSNS015-10	3174-151	WAT	Walkin cold room	TSS	04/20/12
SW12-011	PSNS015-11	3174-153	WAT	Walkin cold room	TSS	04/20/12
SW12-012	PSNS015-12	3174-155	WAT	Walkin cold room	TSS	04/20/12
SW12-013	PSNS015-13	3174-157	WAT	Walkin cold room	TSS	04/20/12
SW12-014	PSNS015-14	3174-159	WAT	Walkin cold room	TSS	04/20/12
SW12-015	PSNS015-15	3174-161	WAT	Walkin cold room	TSS	04/20/12
SW12-016	PSNS015-16	3174-163	WAT	Walkin cold room	TSS	04/20/12
SW12-017	PSNS015-17	3174-165	WAT	Walkin cold room	TSS	04/20/12
SW12-018	PSNS015-18	3174-167	WAT	Walkin cold room	TSS	04/20/12
SW12-020	PSNS015-COMP	3174-169	WAT	Walkin cold room	TSS	04/20/12

# **SAMPLE LOGIN**

Project Manager: Brandenberger

Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick

Project: **ENVVEST Non-Dry Dock Storm Water - SW12**



Marine Sciences Laboratory  
1529 West Sequim Bay Road  
Sequim, Washington 98382  
PH: (360) 681-4565

Sponsor ID	Site Description	Battelle Code		Matrix	Storage Location	Requested Parameters	Collection Date
<i>Updated Code - should reflect the dissolved portion of the sample (CS, 8/2/12)</i>							
SW12-001	PSNS015-1	3174-133	3174-134	WAT	Walkin Freezer	DOC	04/20/12
SW12-002	PSNS015-2	3174-135	3174-136	WAT	Walkin Freezer	DOC	04/20/12
SW12-003	PSNS015-3	3174-137	3174-138	WAT	Walkin Freezer	DOC	04/20/12
SW12-004	PSNS015-4	3174-139	3174-140	WAT	Walkin Freezer	DOC	04/20/12
SW12-005	PSNS015-5	3174-141	3174-142	WAT	Walkin Freezer	DOC	04/20/12
SW12-006	PSNS015-6	3174-143	3174-144	WAT	Walkin Freezer	DOC	04/20/12
SW12-007	PSNS015-7	3174-145	3174-146	WAT	Walkin Freezer	DOC	04/20/12
SW12-008	PSNS015-8	3174-147	3174-148	WAT	Walkin Freezer	DOC	04/20/12
SW12-009	PSNS015-9	3174-149	3174-150	WAT	Walkin Freezer	DOC	04/20/12
SW12-010	PSNS015-10	3174-151	3174-152	WAT	Walkin Freezer	DOC	04/20/12
SW12-011	PSNS015-11	3174-153	3174-154	WAT	Walkin Freezer	DOC	04/20/12
SW12-012	PSNS015-12	3174-155	3174-156	WAT	Walkin Freezer	DOC	04/20/12
SW12-013	PSNS015-13	3174-157	3174-158	WAT	Walkin Freezer	DOC	04/20/12
SW12-014	PSNS015-14	3174-159	3174-160	WAT	Walkin Freezer	DOC	04/20/12
SW12-015	PSNS015-15	3174-161	3174-162	WAT	Walkin Freezer	DOC	04/20/12
SW12-016	PSNS015-16	3174-163	3174-164	WAT	Walkin Freezer	DOC	04/20/12
SW12-017	PSNS015-17	3174-165	3174-166	WAT	Walkin Freezer	DOC	04/20/12
SW12-018	PSNS015-18	3174-167	3174-168	WAT	Walkin Freezer	DOC	04/20/12
SW12-020	PSNS015-COMP	3174-169	3174-170	WAT	Walkin Freezer	DOC	04/20/12

## LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 3174 Sample No(s): 133-170 Batch: 13  
Project Name: SW12 Project Manager: JMB

## TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: _____		WP# _____
Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Navy-type Project (requires high-level sample tracking procedures)
<input type="checkbox"/>	<input type="checkbox"/>	USDA Samples (see Compliance Agreement Checklist)
		PM Verification:
<input type="checkbox"/>	<input type="checkbox"/>	Filter Samples: <u>Amount:</u> <u>Entire sample</u> <u>Half of sample</u>
<input type="checkbox"/>	<input type="checkbox"/>	Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)
<input type="checkbox"/>	<input type="checkbox"/>	Special instructions: _____
Sample Preservation Instructions: _____		
**See LIMS for archive/disposal information**		

## TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes	No	N/A	Indicate in Appropriate Box
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Custody seal present
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cooler temperature (acceptable range: $4 \pm 2^\circ\text{C}$ or solids:frozen) (if multiple coolers, note temp. of each)
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc) Comment/Remedy: _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Were <u>all</u> chain of custody forms signed and dated?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Were samples filtered at MSL? <u>(as noted in log)</u>
Sample condition(s):		<u>Acceptable</u> Other (explain): _____	
Container type:		<u>Teflon</u> <u>Poly</u> <u>Glass</u> Cap. Vial Other: _____	
Notes: _____			

Hand delivered  
 $4 \pm 2^\circ$   
°C  
°C

Completed By: JMB Date/Time: 4/20/12 1800

## SAMPLE PRESERVATION

<input type="checkbox"/>	Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)
<input type="checkbox"/>	Random pH checked for ~10% of samples (use dip paper)
<input type="checkbox"/>	Complete pH check required for project (use pH meter and record on pH Record form)
<input type="checkbox"/>	Sample(s) were preserved at MSL
Type:	<input checked="" type="checkbox"/> 0.2% HNO <sub>3</sub> Notes: <u>Optima</u> Lot# <u>1211090</u>
	<input type="checkbox"/> 0.5% HCl (Hg samples) Notes: _____ Lot# _____
	<input checked="" type="checkbox"/> Refrigerate/Freeze Notes: _____
	<input type="checkbox"/> Other Notes: _____

Completed By: JMB Date/Time: 4/20/12 1830

Storage Shelf: Met-Lab 231, TSS-Warmin Cooler  
DOE Warmin freezer