#### **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 1529 West Sequim Bay Road Sequim, WA 98382 PM: Jill Brandenberger (360) 681-4564

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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

							O.	1113. μg/L		
Sample ID -		Fraction			Collection					
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Date	Hg	As	Ag	Al	Cd
				Instrument:		CVAF	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory	chieved Detection	n Limite (Free	hwatar)	mstrument.		0.0001	0.03	0.002	0.3	0.004
-	eporting Limit (N		iiwatci)			0.0001	0.03	0.002	1.0	0.004
TTESHWATEI N	eporting Limit (1	VIDL 3.16)				0.0003	0.1	0.000	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 1	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
00 000			Posite_equal_time	511. 10	, -, -,	2.0001.70	0.02 0	0.00 <b>=</b> 0	0.0	0.00. 0

## 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 -		Fraction					CITIES ME		CVAF Batch	ICP-MS Batch
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	ID	ID
			•							
				Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
Laboratory A	chieved Detection	on Limits (Fres	hwater)		0.08	0.007	0.002	0.05		
•	eporting Limit (I	*	··		0.3	0.02	0.006	0.2		
<u>SW08</u>										
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
<u>Equipment l</u>										
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

## BATTELLE MARINE SCIENCE LABORATORIES 1529 West Sequim Bay Road

Sequim, Washington 98382-9099

360/681-4564

#### 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 Blan</b>	<u>nks</u>								
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

#### 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 -		Fraction											ICP-MS
Metals	Station Code	(Total/Diss)	Sample Type	MSL Code	As	$\mathbf{A}\mathbf{g}$	Al	Cd	Cr	Cu	Pb	Zn	Batch ID
				Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	_
Laboratory A	chieved Detection	on Limits (Fre	shwater)		0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater R	eporting Limit (I	MDL* 3.18)			0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	
METHOD B	<u>BLANKS</u>	TD (E)	F 1	TDM DI 1 D1		0.000 ***		0.004.77	0.00.77		0.000 ***		121011 (100
MB-1 MB-2		TME TME	Freshwater Freshwater	TRM Blank R1 TRM Blank R2	0.03 U 0.03 U	0.002 U 0.002 U	0.3 U 0.3 U	0.004 U 0.004 U	0.08 U 0.08 U	0.007 U 0.007 U	0.002 U 0.002 U	0.05 U 0.05 U	121911-6100 121911-6100
MB-2		IME	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
LABORATO	ORY CONTROL	L SAMPLES											
Spiking Leve					2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
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		TRM LCS R2	2.02	1.93	2.16	2.04	2.00	1.97	2.05	2.01	121911-6100
				ent Recovery, LCS	101%	97%	113%	101%	103%	100%	103%	102%	
			Perc	ent Recovery, LCS	101%	97%	108%	102%	100%	99%	103%	101%	
MATRIX SI	PIKE RESULTS	<u>S</u>											
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	
				cent Recovery, MS	106%	87%	102%	102%	105%	96%	104%	102%	
			Perce	nt Recovery, MSD	105%	89%	100%	103%	99%	99%	100%	102%	
				RPD	0.5%	2.8%	1.4%	1.0%	5.9%	3.6%	3.4%	0.0%	
REPLICATI	E 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
			• •	Mean	0.957	0.0196	299	0.161	3.18	14.9	3.88	139	
				RPD	2.0%	6.1%	4.4%	3.1%	4.7%	2.0%	0.0%	2.2%	
	) REFERENCE			TDM 1640 D1 10	267	6.20	57.5	22.0	20.0	00.4	20.2	57.4	121011 (100
SRM 1640-1		TME TME	Freshwater	TRM 1640 R1 10x	26.7	6.38	57.5 50.7	23.0	38.8	88.4	28.3	57.4 57.2	121911-6100
SRM 1640-2		IME	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	26.7	7.62	52.0	22.8	38.6	85.2	27.9	53.2	
				PD	0.1%	16.3%	10.6%	0.9%	1%	3.8%	1.5%	7.9%	
				PD	1.4%	16.7%	14.8%	3.1%	2%	0.9%	0.4%	7.5%	

#### 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

		Fraction				
Sample ID - Metals	Station Code	(Total/Diss)	Sample Type	MSL Code	Hg	CVAF Batch ID
				Instrument:	CVAF	
Laboratory Achieved					0.0001	
Reporting Limit (MD	DL* 3.18)				0.0003	
METHOD BLANKS	S					
MB-1	5	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
LABORATORY CO	ONTROL SAMPLE	S				
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
				ent Recovery, LCS 1	103%	
			Perce	ent Recovery, LCS 2	103%	
SW08-0014	PSNS015	DME	Composite_equal_time	3174*80	0.00325	122011HGA
MS1	PSNS015	DME	Composite_equal_time		0.0140	122011HGA
MSD1	PSNS015	DME	Composite_equal_time		0.0151	122011HGA
				Spiking Level, MS	0.0110	
				Spiking Level, MSD	0.0113	
			Pe	rcent Recovery, MS	98%	
			Pero	cent Recovery, MSD	105%	
				RPD	7.0%	
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		0.0345	122011HGA
				Spiking Level, MS	0.0271	
				Spiking Level, MSD	0.0274	
				rcent Recovery, MS	99%	
			Pero	cent Recovery, MSD	100%	
				RPD	1.3%	
REPLICATE PREC		TD 45		2154450	0.0266	122011117
SW08-0013	PSNS015	TME	Composite_equal_time		0.0266	122011HGA
DUP	PSNS015	TME	Composite_equal_time		0.0210	122011HGA
				Mean	0.0238	
STANDARD REFE	RENCE MATERIA	L		RPD	24%	
SRM 1641 (1)		TME	Freshwater	1641d 121911	1601	122011HGA
				Certified Value	1590	
				range	±18	
	SRM 1641 (1)	)		PD	1%	

#### 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 ≤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 inidicates 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 SW08

**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 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.

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 & 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:

Sample Receipt Dates: EB:11/03/2011

SW08: 11/23/11

**Cooler temp.** on arrival All coolers were at 4.0±2°C

Collection dates Various see table

CVAF analysis dates (Hg) 12/20/11

TRM Prep/Freshwater Analysis

by ICP-MS

(As, Ag, Al, Cd, Cr, Cu, Pb, Zn)

12/19/11

#### 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**

#### **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 ≤20% PD
- \* Precision result outside OC criterion of <30%
- B Analyte detected in the method blank > RL and sample concentration < 10 times detected blank value
- Exceeds data quality objective but meets contingency criterion
- b Result is reagent blank corrected using the batch specific blank (BMRB)

#### 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.

#### 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 1640 for all other metals. The differences were within the QC acceptance criterion of  $\leq 20\%$ .

#### **REFERENCE:**

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.

	Project:	of _ N4523A10MP000 PSNSNon-dry Do					172	9.02		(e)ei		₹@Y£	(2/ <u>153</u>		! ! !	1529 Wes Laborator Attention:	ciences Lab st Sequim E y: Battelle Jill Brand	Bay Road MSL			
updates	Julio Julio	Station ID	Daterrano	Matrix	Hardness	TOC	000	TSS	TME/DME		Tatal mately	. 3	,		No. contain	Sample Type (Grab vs. Comp)	Storm#	Notes / Comp. Cond. (µS/cm) and Turb. (NTU) Readings			
- 0051	SW08 / 0001	PSNS 015	11/22/11 (0932)				_			X						Grab	ያ	61.6 us/cm 9.63 N			
	SW08-0002	PSNS 115.1	11/22/11 (0850)			_	_	_		X			$\sqcup \bot$			Grab	<u>3</u>	98.9 US/cm 8.60 MT			
-0053	Sw08 - 0003	PSNS084.1	11/22/11 (0906)	Water		_	_	_		ΧL		1			2	Grab	3	98.6 us/cm, 3.12 MT	u		
- 0053	5w08 - 0004	PS NS 124	11/22/11 (0930)			_		$\dashv$		×	-	1				Grab		42.8 us/cm, 506 NTU			
- 0056	Sw08-0005	PS NS 124.1	11/22/11 (0948)	water		_	_	_		×		4			2	Grab	8	6.09 us/cm ,559 NTL	•		
	5000-80mc	PSNS126	11/22/11 (1000)	water			_			X	_	-		43		Crab	g	534 MS/cm, 6.51 WT			
	5w08 -0007	PSNSO15	11/22/11 (0938)		×	X	X.[	X,	ᄊ		_					Comp	8	182 us/cm, 16 NT	ч		
	SW08-0008	PSNS084-1	11/22/11 (0936)	Water	×	X	X	X]	X		<b>—</b> —		$\sqcup$		_	Comp	8	270 US/cm II NTU			
	SW08-0009	PSHS 115.1	11/22/11 (0936)	Water	χ	X	X	Х.,	X	_ .		1				Comp	8	1692 MS/cm, 4 NTU			
	5008 -0010	PSNS 124	11/22/11 (0934)	water	X	X	Х	X	ΧĮ			<u> </u>			Ш	Comp	8	651 us/cm, 10 NTU			
	SW08 -0011	PSNS 124.1	11/22/11 (0933)	Water	X	X	X.	X	XΙ		_		$\sqcup$		Ц	Comp	8	·			
	SW08-0012			Water	X	X	X	X	X.	$\dashv$	٠,	1.			Ц	Comp	8				
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	Relinquished by:	n	11/22/11	1820		Hec	eiv	ed b	)y:			Z	est :	>   <u> </u>   <u> </u>	<u>,</u>	Chinman	Containe Method:		/		
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O Turbidty measurements conducted mat Navy SW Lab w/ Hach 2100P kenchtop meter

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

Station Log

				Station Log	OT	Dogo of
Sample Collect		Johnst	un Malles	PSNS Project ENVVE	S1	Page of
Sampling Tean	n	Cochh	art	Ambient Monitoring		11/22/2011
Organization	¥					FCSW 2011_11-22
Use pre-assigned id			nm			
StationID	Time Arrive Date/Time	Time Leave Date/Time	Station Type	LAT	LONG	Remarks/ Comments
PSW5015	0820	0432	SW	sampled for TPH	FL Cord, Sal	SWO8-0001 A TWO bottles
						SWO8-0001B Sound party
PSN 5 115,1	0841	0858	SW	TPH, FC, Cad	IT TWb	5408-00ZA
				, ,	,	5W08-00ZB
15N50841	0900	0906	SW	TPH, FC, Cond/T	Turb	5408-0034
						5008-003B
P5NS124	0916	0930	Siv	TPH FC, Lond	T. Turb	5W03-004A
	1.0					3W08-004B
PSN3124.1	0938	0948	sw	TPH, FC, Cond	IT Tarb	5W08-005A
						5W08-005B
PSN9 126	0950	1000	SW	TPIT, FC & FLPUP,	CondIT. Turb	5W08-006A
131.7100						5W08-006B
			<u> </u>	<u> </u>		

**Battelle** SAMPLE CHAIN OF CUSTODY FORM Date: 11/22/2011 Marine Sciences Laboratory SW = Stormwater 1529 West Sequim Bay Road Page: 1 of 1 Laboratory: Battelle MSL Project No.: 54220 Attention: Jill Brandenberger Project: Non-dry Dock Stormwater SW08 Phone: (360) 681-4564 Analyze parameters per QAP/FSP TME/DME Hardness containers DME TOC 200 TSS TPH Sample Type (grab Collection ĝ Date/Time vs. Comp) Storm# Lab Code Sample Label Station ID Matrix SW08-0013 PSNS015 11/22/11 0938 SW 1 SW08 3174\*79 x comp SW 3174\*80 SW08 SW08-0014 **PSNS015** 11/22/11 0938 1 х comp SW SW08 3174\*81 SW08-0015 PSNS084.1 11/22/11 0936 1 comp х SW08-0016 PSNS084.1 11/22/11 0936 SW 1 SW08 3174\*82 Х comp 3174\*83 SW08-0017 PSNS115.1 11/22/11 0936 SW 1 **SW08** x comp SW08-0018 PSNS115.1 11/22/11 0936 SW **SW08** 3174\*84 х 1 comp SW SW08-0019 **PSNS124** 11/22/11 0934 1 **SW08** 3174\*85 comp SW08-0020 PSNS124 11/22/11 0934 SW 1 **SW08** 3174\*86 х comp SW 3174\*87 SW08-0021 PSNS124.1 11/22/11 0933 1 **SW08** comp SW **SW08** 3174\*88 SW08-0022 PSNS124.1 11/22/11 0933 lχ 1 comp SW08-0023 **PSNS126** 11/22/11 0927 SW 1 **SW08** 3174\*89 comp SW08-0024 **PSNS126** 11/22/11 0927 SW **SW08** 3174\*90 lx comp --end--Total # of Containers Received by: Relinquished by: 11/23/11 Mus 1140. Shipment Method: Retained at Battelle  $\smile$ Signature Time Signature C. Susum KED Sample Disposition: Printed Name Printed Name Company Distribution: Relinquished by: Received by: 1) PNNL Signature Date Time Signature

Printed Name

Printed Name

Company

SAMPLE CHAIN	OF CUSTODY F	ORM														Battelle		
Date	: 11/28/2011															Marine Scien	ices Labora	itory
Page	: 1 of 3		SW = Stor	mwa	ater											1529 West S		
Project No.:				1												Laboratory:		
Project	: Non-dry Dock S	tormwater SW08															ill Brandenl	
	· *			An	alyz	e p	ага	met	ers	per	QA	P/F	SP					60) 681-4564
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1 9/3/	49	Collection		-				⊢								Type (grab		
Sample Label	Station ID	Date/Time	Matrix												2	vs. Comp)	Storm#	Lab Code
SW08 000/ \0051		11/22/11 0938	SW							X					1	comp	SW08	
SW08 0002 052		11/22/11 0936	SW							X					1	comp	SW08	
SW08 0003 005		11/22/11 0936	SW							X					1	comp	SW08	
SW08-0004 0054		11/22/11 0934	SW							X					1	comp	SW08	
SW08 0005 005		11/22/11 0933	SW		,					X		П			1	comp	SW08	
SW08 0006 005		11/22/11 0927	SW							Х		П			1	comp	SW08	
SW08-0027	PSNS015	11/22/11 0938	SW	Х									T		1	comp	SW08	SW08-0007
SW08-0028	PSNS015	11/22/11 0938	SW		Х									$\top$	1	comp	SW08	SW08-0007
SW08-0029	PSNS015	11/22/11 0938	SW			Х								$\neg$	1	comp	SW08	SW08-0007
SW08-0030	PSNS015	11/22/11 0938	SW				Х								1	comp	SW08	SW08-0007
SW08-0031	PSNS084.1	11/22/11 0936	SW	х											1	comp	SW08	SW08-0008
SW08-0032	PSNS084.1	11/22/11 0936	SW		Х										1	comp	SW08	SW08-0008
SW08-0033	PSNS084.1	11/22/11 0936	SW			х									1	comp	SW08	SW08-0008
SW08-0034	PSNS084.1	11/22/11 0936	SW				Х								1	comp	SW08	SW08-0008
Relinquished by:		11/28/1.	<i>_</i>		Re	ceiv	ed	by:								Total # of Co	ntainers	
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5.6	Printed Name	Company	· coey					Prin	ted I	Nam	е					Sample Disp	osition:	
Relinquished by:					Re	ceiv	ed)	by:				-		_		Distribution:		
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#### SAMPLE CHAIN OF CUSTODY FORM **Battelle** Date: 11/28/2011 Marine Sciences Laboratory Page: 2 of 3 SW = Stormwater 1529 West Sequim Bay Road Project No.: 54220 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW08 Attention: Jill Brandenberger Analyze parameters per QAP/FSP Phone: (360) 681-4564 TME/DME containers Hardness DOC DME TPH **T**0C Sample Collection Type (grab 9 Sample Label Station ID Date/Time Matrix vs. Comp) Lab Code Storm# SW08-0035 PSNS115.1 11/22/11 0936 х SW 1 SW08 SW08-0009 comp SW08-0036 PSNS115.1 SW 11/22/11 0936 Х 1 **SW08** SW08-0009 comp SW08-0037 PSNS115.1 11/22/11 0936 SW 1 SW08-0009 SW08 comp SW08-0038 PSNS115.1 11/22/11 0936 SW SW08-0009 Х 1 **SW08** comp SW08-0039 PSNS124 SW 11/22/11 0934 Х 1 **SW08** SW08-0010 comp PSNS124 SW08-0040 11/22/11 0934 SW lχ 1 **SW08** SW08-0010 comp SW08-0041 **PSNS124** 11/22/11 0934 SW x 1 SW08 SW08-0010 comp SW08-0042 PSNS124 SW 11/22/11 0934 х 1 **SW08** SW08-0010 comp SW08-0043 PSNS124.1 11/22/11 0933 SW х 1 **SW08** SW08-0011 comp SW08-0044 PSNS124.1 11/22/11 0933 SW SW08 Х 1 SW08-0011 comp SW08-0045 PSNS124.1 11/22/11 0933 SW SW08 SW08-0011 comp

SW08-0046	PSNS124.1	11/22/11 0933	SW				Х		Ī				1	comp	SW08	SW08-0011
SW08-0047	PSNS126	11/22/11 0927	SW	х									1	_ comp	SW08	SW08-0012
SW08-0048	PSNS126	11/22/11 0927	SW		Х			7					1	comp	SW08	SW08-0012
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	Signature	Date	Time				S	ignat	ure				-	2) CAS		
	Printed Name	Company					F	rintec	l Nam	 ne						

#### SAMPLE CHAIN OF CUSTODY FORM **Battelle** Date: 11/28/2011 Marine Sciences Laboratory Page: 3 of 3 SW = Stormwater 1529 West Sequim Bay Road Project No.: 54220 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW08 Attention: Jill Brandenberger Analyze parameters per QAP/FSP Phone: (360) 681-4564 TME/DME No. containers Hardness DME TOC DOC TPH Sample Collection Type (grab Sample Label Station ID Date/Time Matrix vs. Comp) Storm# Lab Code SW08-0049 11/22/11 0927 **PSNS126** SW lх 1 SW08 SW08-0012 comp SW08-0050 PSNS126 11/22/11 0927 SW 1 х **SW08** SW08-0012 comp -end--Relinquished by: Received by: Total # of Containers 11/28/11 1500 Shipment Method: SUSUCIO Date Signature Fedex to CAS MSU Printed Name Company Sample Disposition: Printed Name Relinguished by: Received by: Distribution: 1) PNNL Signature Date Time 2) CAS Signature Printed Name Company Printed Name





**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

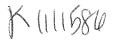
PH: (360) 681-4565

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 #: 374 Sample No(s): 79 -92 90 Batch: SW08	
	Project Name: 2011 Storm Warter Project Manager: TMB	
	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:	
	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)	n ]/
	Custody seal present Seal intact? YES NO	וויע
1	Cooler temperature (acceptable range: 4±2°C or solids:frozen)	
32	(if multiple coolers, note temp. of each)  3.//16,007 °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? (Metalo portion; Samples were Split for all param. On	رهر)
	Sample condition(s): Acceptable Other (explain): 5WOF-011 only he one bay of Tel	3/
	Container type: Tellan Poly Glass Cap. Vial Other:	
	Notes:	
	11/ 1. 12-	
	Completed By: Date/Time:	٠
=	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: (2 0.2% HNO3 Notes: Optima Lot# (2/10/0	
	0.5% HCl (Hg samples) Notes: Lot#	
	Refrigerate Freeze SED Notes: Motella acrahan 1423/11; CAS paran Stored in Wellen	
	Other Notes:	-5-
	Completed By: 11/23/11	
	CA	

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



Battelle

#### SAMPLE CHAIN OF CUSTODY FORM

Date: 11/28/2011 Marine Sciences Laboratory Page: 1 of 3 SW = Stormwater 1529 West Sequim Bay Road Project No.: 54220 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW08 Attention: Jill Brandenberger Analyze parameters per QAP/FSP Phone: (360) 681-4564 TME/DME containers Hardness DOC DME 70C TSS TPH T Sample Collection Type (grab Š. Sample Label Station ID Date/Time Matrix vs. Comp) Storm# Lab Code SW08-0001 PSNS015 11/22/11 0938 SW X SW08 comp SW08-0002 PSNS084.1 11/22/11 0936 SW X SW08 comp SW08-0003 PSNS115.1 11/22/11 0936 SW Χ comp **SW08** SW08-0004 PSNS124 SW 11/22/11 0934 Χ **SW08** comp SW08-0005 PSNS124.1 11/22/11 0933 SW X SW08 comp SW08-0006 **PSNS126** 11/22/11 0927 SW Χ **SW08** comp SW08-0027 PSNS015 11/22/11 0938 SW comp **SW08** SW08-0007 SW08-0028 **PSNS015** 11/22/11 0938 SW х **SW08** SW08-0007 comp SW08-0029 PSNS015 11/22/11 0938 SW Х **SW08** SW08-0007 comp SW08-0030 **PSNS015** 11/22/11 0938 SW Х SW08 SW08-0007 comp SW08-0031 PSNS084.1 11/22/11 0936 SW Х SW08 SW08-0008 comp SW08-0032 PSNS084.1 11/22/11 0936 SW Х **SW08** SW08-0008 comp SW08-0033 PSNS084.1 11/22/11 0936 SW **SW08** SW08-0008 comp SW08-0034 PSNS084.1 11/22/11 0936 SW SW08 comp SW08-0008 Relinquished by: W Received by: Total # of Containers /28/n 1500 susu Shipment Method: Signature Time Date Fedex to CAS Signature C.SUSUCE SOUDLF MSL to Feder Printed Name Company Sample Disposition: Printed Name Relinquished by: Received by: Distribution: 1) PNNL Signature Date Time 2) CAS Signature

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

Printed Name

Printed Name

Company

K1111686

**Battelle** 

Marine Sciences Laboratory

#### SAMPLE CHAIN OF CUSTODY FORM

Page: 2 of 3

Date: 11/28/2011

1529 West Sequim Bay Road Project No.: 54220 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW08 Jill Brandenberger Attention: Phone: (360) 681-4564 Analyze parameters per QAP/FSP TME/DME Hardness containers DOC DME TOC TSS TPH Sample Collection Type (grab Š Sample Label Station ID Date/Time Matrix vs. Comp) Storm# Lab Code SW08-0035 PSNS115.1 11/22/11 0936 SW 1 **SW08** SW08-0009 comp SW08-0036 11/22/11 0936 SW PSNS115.1 1 Х **SW08** SW08-0009 comp SW08-0037 11/22/11 0936 SW PSNS115.1 1 **SW08** SW08-0009 Х comp 11/22/11 0936 SW08-0038 PSNS115.1 SW 1 **SW08** SW08-0009 Χ comp SW08-0039 PSNS124 11/22/11 0934 SW Х 1 **SW08** SW08-0010 comp SW08-0040 PSNS124 11/22/11 0934 SW Х 1 comp **SW08** SW08-0010 SW08-0041 PSNS124 11/22/11 0934 SW 1 SW08 SW08-0010 Х comp SW08-0042 PSNS124 11/22/11 0934 SW 1 **SW08** SW08-0010 Χ comp SW08-0043 SW PSNS124.1 11/22/11 0933 1 **SW08** comp SW08-0011 SW08-0044 PSNS124.1 11/22/11 0933 SW х 1 **SW08** SW08-0011 comp SW08-0045 SW PSNS124.1 11/22/11 0933 1 **SW08** SW08-0011 Χ comp SW08-0046 PSNS124.1 SW 11/22/11 0933 Х 1 **SW08** SW08-0011 comp SW08-0047 PSNS126 11/22/11 0927 SW 1 comp **SW08** SW08-0012 SW08-0048 **PSNS126** 11/22/11 0927 SW SW08 SW08-0012 comp

SW = Stormwater

11/28/11	1500	Received by:	Total # of Containers Shipment Method:
Date MSC	Time	Sugnature 6930	Fedex to CAS
Company	· .	Printed Name	Sample Disposition:
	-	Received by:	Distribution:
			1) PNNL
Date	Time	Signature	2) CAS
Company		Printed Name	
	Date Company  Date	Date Time Company  Date Time	Date Time Signature System Company Printed Name Received by:  Date Time Signature Signature Signature



#### Battelle SAMPLE CHAIN OF CUSTODY FORM Date: 11/28/2011 Marine Sciences Laboratory Page: 3 of 3 SW = Stormwater 1529 West Sequim Bay Road Project No.: 54220 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW08 Attention: Jill Brandenberger Analyze parameters per QAP/FSP Phone: (360) 681-4564 TME/DME No. containers Hardness DOC TSS DME TPH 200 Sample Collection Type (grab Sample Label Station ID Date/Time vs. Comp) Matrix Storm# Lab Code SW08-0049 PSNS126 11/22/11 0927 SW 1 SW08 SW08-0012 comp SW08-0050 PSNS126 SW 11/22/11 0927 SW08-0012 **SW08** comp -end--Relinquished by: Received by: Total # of Containers 11/28/11 1500 Shipment Method: 1. SUSUCIO Date Fedex to CAS Time Signature MSU SNOLF Printed Name Sample Disposition: Company Printed Name Relinquished by: Received by: Distribution: 1) PNNL Signature Date Time 2) CAS Signature

Printed Name

Printed Name

Company

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

PC W

Client / Project: Battelle	Service Request K11 1684	
Received: 11 29/11 Opened: 11 79/11	By:	2
1. Samples were received via? Mail Fed Ex	PS DHL PDX Courier Hand Delivered	
2. Samples were received in: (circle) Cooler Be	x Envelope OtherNA	
3. Were <u>custody seals</u> 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 Thermometer Composition of the state of the s	Tracking Number   NA   Fi	led
the state of the s	rap Gel Packs) Wet Ice Sleeves Other	
8. Were custody papers properly filled out (ink, signed, etc	<u> </u>	N
9. Did all bottles arrive in good condition (unbroken)? <i>Inc.</i>		N
10. Were all sample labels complete (i.e analysis, preservation).	Mail	N M
<ul><li>Did all sample labels and tags agree with custody paper.</li><li>Were appropriate bottles/containers and volumes receive</li></ul>		
13. Were the pH-preserved bottles (see SMO GEN SOP) received		N N
14. Were VOA vials received without headspace? <i>Indicate</i>		N
15. Was C12/Res negative?	NA Y	N
Sample ID on Bottle Samp	e ID on COC Identified by:	
Bottle Count Out of Sample ID Bottle Type Temp		ime
	Proce proce pri reagent added reamber initials i	IIIIC
Notes, Discrepancies, & Resolutions:	Samples (not one).	· · · · · · · · · · · · · · · · · · ·
FUCA & POITES JOT IFIL	Samples (not one).	
	, id	





## **SAMPLE LOGIN**

Project Manager: Brandenberger

Date Received: 11/3/2011

Batch: 8

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
SW08-001	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

	SAMPLE CHAIN Date: Page:	of <u>1</u> N4523A10MP000 PSNSNon-dry Do	_ 034 Amend.1			.\p	લ્કામ્ <sub>ર</sub> ્		7 <b>5</b> 1( <b>3</b> )	ကမ		012				Laboratory Attention:	iences Lab t Sequim B y: Battelle Jill Brand	Bay Road MSL
74-		Station ID	Collection Date/Time	Matrix	Hardness	тос	DOC	TSS	TME/ <del>DME</del>	ТРН	Turbidity				No containers	Sample Type (Grab vs. Comp)	Storm#	Notes / Comp. Cond. Reading μS/cm
	5W08-001	115.1 EB	10/31/11 @ 0155	water	<u> </u>		-		X			-	_	+	1	,		
74	-002		11/11/11/2 03 Zo	water				-	K		H	$\dashv$	-	+	++			
75	-004	OIS EB	11/11/11/11/11/11		-				×		$\vdash$	$\dashv$	$\dashv$	+	ti			
77	~005	126 EB	الاعادام الاعادا						V			_			1			
178	-006	1241 EB	11/2/11 @ 1215						¥						١			
	<u></u> <del>- 007</del>	EB	11/2/11 @ 1330	1						X					Z			ship to CAS
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		Printed Name	Company								Name	_			_	Sample Di	isposition:	
	Relinquished by:					Re	ceiv	/ed								Distributio		
																1) PNNL	-TME	
		Sigṇature	Date	Time					Sigr	natui	re					2) CAS ~ 3) TAI	- TPH	
		Printed Name	Company						Prin	ted I	Name	е				1		

Central File #:	Sample No(s):		Batch:
Project Name: 2011 Sto1	mocto	Project	Manager: Imps
TO BE COMPLETED BY PROJ	ECT MANAGER (prior to arri	val when possible)	
	ker-pI	WP#	
Yes No		1 Mar de Arine -	
Navy-type Pro	ject (requires high-level sample	e tracking procedures)	
USDA Sample	s (see Compliance Agreement C	hecklist) PM Verificat	ion:
ł			
Filter Samples	s: <i>Amount:</i> En	tire sample H	laif of sample
<u> </u>	mple(s) - samples will be weighe		
	mpie(s) - samples will be weight	a and placed in diffalow re	mp Treezer (Login Lub)
Special instru	ctions: <u>splits</u>	amples  No HNO 3  Il information	
Sample Preservation Instr	uctions: $0.2^{\circ}$	10 HNO 3	
*	*See LIMS for archive/dispose	al information**	
TO BE COMPLETED UPON	SAMPLE ARRIVAL/LOG-1	:N	
	ite in Appropriate Box	<del>_</del>	
		alintact? YES NO	
			46
	temperature (acceptable range		4.5 /,5 °c
(if m	ultiple coolers, note temp. of e	ach)	3.8, 4.7 °C
	t Manager notified of any custo nment/Remedy:	ody/login discrepancies (co	oler temp, sponsor codes, etc)
Were	<u>all</u> chain of custody forms signe	ed and dated?	
Were:	samples filtered at MSL?		
Sample condition(s):	Acceptable 0	ther (explain):	
cample condition(s).	Cooping	itel fexbiani.	<u> </u>
Container type:	Teflon Poly Glass (	ap. Vial Other:	
••			
Notes:	· · · · · · · · · · · · · · · · · · ·		
1	4 -		11/2/
Completed By: 1000	u_	Date/Time:_	u/3/11 1900
CAMPLE PRECEDIATION			
SAMPLE PRESERVATION			. •
Sample(s) were present	eved prior to arrival at MSL (no	ted on CoC / Sample / per	PM Instruction )
Random pH checked for	or ~10% of samples (use dip pap	per) Sample IDs:	
Complete pH check re	quired for project (use pH met	er and record on pH Recor	d form)
Sample(s) were presen	ved at MSL		
Type: (C) 0.2% HN03	Notes:	6ptime	LOT# 1210040
0.5% HCl (Hg	samples) Notes:	·	Lot#
Refrigerate/F	reeze Notes:		
Other	Notes:		
Completed By:		Date/Time:	11/4/11 11:00 AN
Storage Shel	fi 1 D		
=, -, ago ono			

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

SAMPLE CHAIN Date Page Project No. Project	ORM formwater SW08	SW = Stormwater							Marine Sciences Laboratory 1529 West Sequim Bay Road Laboratory: Battelle MSL Attention: Jill Brandenberger Phone: (360) 681-4564									
Sample Label SW08-007	Station ID EB	Collection Date/Time 11/02/11 1330	<b>Matrix</b> SW	Hardness	TOC	DOC	TSS	TME/DME	DME	X TPH				] :	∾ No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
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A CONTRACTOR OF THE CONTRACTOR					V	$\mathcal{X}$	A	7		$\Rightarrow$		17 K				3) TAI		
	Printed Name	Company			L			Prin	ted I	Nam	e							
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Client / Project	. \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	F. 00.			•		ervatio		11 /	001/	)		
		ace	11/5	/,,	D		Service I	Request K		0,8,90	<i></i>		<u>,</u>
eceived:	(0)///	_ Opened:		<u>//</u>	В	у:	1	_ Unloade	:d:	0//	By:_		<del>/</del>
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	dy seals on coole		NA	Y (	N	. •		any and wh					
If present, v	vere custody seal	ls intact?		Y	N	If	present,	were they s	signed ar	nd dated?	.2	Y	N
Cooler Temp °C	Temp Blank °C	Thermoi ID		Co	ooler/CO ID	C NA			Trackin	g Number		NA	Filed
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Packing ma	terial used. In	serts Bag	ggies (Bu	ıbble W	rap G	el Packs	Wet I	ce Sleeve	es Othe	er Ston	m X	lass	ما
. Were custoo	dy papers proper	ly filled ou	t (ink, sign	ned, etc.	)?					-	NA	$\widehat{Y}$	) N
Did all bottl	es arrive in good	l condition	(unbroker	n)? Ind	icate in	the table	e below.				NA	Y	<b>У</b> и
). Were all sa	mple labels com	plete (i.e aı	nalysis, pr	eservati	on, etc.)	?					NA	Y	И
l. Did all sam	ple labels and ta	gs agree w	ith custody	y papers	? Indic	ate majo	or discrep	ancies in t	he table	on page 2.	NA	E	$\supset$ N
2. Were appro	priate bottles/co	ntainers an	d volumes	receive	ed for th	e tests in	ndicated?				NA	Y	N
3. Were the pl	H-preserved bott	les (see SM	O GEN SO	P) recei	ved at tl	ne appro	priate pH	? Indicate	in the to	ble below	(NA	) Y	N
4. Were VOA	vials received v	vithout hea	dspace? In	ndicate	in the ta	ble belo	w,				NA	Y	N
5. Was C12/R	tes negative?											Z4	
											NA	ツ Y	N
											NA	ソ Y	N
Samp	ole ID on Bottle			Samp	le ID on	coc				Identified by	NA	JY	N
Samp	le ID on Bottle			Samp	le ID on	COC				Identified by:	NA	<i>у</i> ч	N
Samp	ole ID on Bottle			Samp	le ID on	COC				Identified by:	NA:	Э Y	N
Samp	ale ID on Bottle			Samp	le ID on	COC						<i>y</i> Y	N
	ole ID on Bottle		e Count le Type	Out of			H R	eagent	Volume added	Identified by:	ot	) Y	N
				Out of	Head-		iH R	eagent		Reagent L	ot		
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				Out of	Head-		iH R	eagent		Reagent L	ot		
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Sar		Bott		Out of	Head-		BH R	eagent		Reagent L	ot		
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Sar	mple ID	Bott		Out of	Head-		H R	eagent		Reagent L	ot		
Sar	mple ID	Bott		Out of	Head-		H R	eagent		Reagent L	ot		

Client: Project:

Battelle

Non-dry Dock Stormwater SW08

Service Request No.: Date Received:

K1111586 11/29/11

Sample Matrix:

Water

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

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

Units: mg/L

Analysis Method:

SM 2340 C

Units: mg/L Basis: NA

#### Hardness, Total as CaCO3

					Dilution	Date	Date	
Sample Name	Lab Code	Result Q	MRL	MDL	Factor	Extracted	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	I	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	8.0	1	NA	12/1/11 03:30	

 $\label{lem:lims} $$\lim Reps\Analytical Report.rpt$ 

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

Units: mg/L Basis: NA

Lab Code:

K1111586-007

SW08-0027DUP

				Sample		te Sample 6-007DUP6		RPD
Analyte Name	Method	MRL	MDL	Result	Result	Average	RPD	Limit
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.

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Form 3B

SuperSet Reference:

11-0000196120 rev 00

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

Spike

% Rec

Analyte Name

Hardness, Total as CaCO3

Method

Amount % Rec Result

Limits

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.

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\\Inflow2\Starlims\LimsReps\LabControlSample.rpt

Form 3C

SuperSet Reference:

11-0000196120 rev 00

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 Collected:** 11/22/11 **Date Received:** 11/29/11

Units: mg/L Basis: NA

Analysis Method:

SM 2540 D

#### 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		l	NA	11/29/11 16:10	NATIONAL PROPERTY OF THE PARTY
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	

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** 

**MDL** 

Sample Name: Lab Code:

Batch QC

K1110647-039

Units: mg/L

Basis: NA

Batch QCDUP

**Duplicate Sample** 

**RPD** K1110647-039DUP1 Sample **RPD** Limit Result Average Result

Analyte Name Solids, Total Suspended (TSS)

SM 2540 D

Method

**MRL** 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.

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Form 3B

SuperSet Reference:

11-0000196120 rev 00

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

Spike

% Rec Limits

**Analyte Name** 

Method

Result

Amount % Rec

Solids, Total Suspended (TSS)

SM 2540 D

242

101 240

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.

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Form 3C

SuperSet Reference:

11-0000196120 rev 00

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

Units: mg/L Basis: NA

Analysis Method:

SM 5310 C

Carbon, Dissolved Organic (DOC)

Sample Name	Lab Code	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
	K1111586-009	3.39	0.50	0,07	1	NA	11/30/11 13:44	
SW08-0029	K1111586-013	2.27	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0033	K1111586-017	1.28	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0037	K1111586-021	1.34	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0041	K1111586-025	1.43	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0045	K1111586-029	2.52	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0049	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 Method Blank	K1111586-MB3	ND U	0.50	0.07	1	NA	12/2/11 15:04	

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: Lab Code:

SW08-0029

K1111586-009

Units: mg/L Basis: NA

SW08-0029DUP

Duplicate Sample

				Sample	mple K1111586-009DUP8			RPD
Analyte Name	Method	MRL	MDL	Result	Result	Average	RPD	Limit
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.

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Form 3B

SuperSet Reference:

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: Lab Code:

SW08-0033 K1111586-013 Units: mg/L Basis: NA

SW08-0033DUP

**Duplicate Sample** 

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

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 3B

SuperSet Reference:

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: Lab Code:

SW08-0037 K1111586-017 Units: mg/L

Basis: NA

SW08-0037DUP

Dunlicata Samule

				Sample	Sample K1111586-017DUP12				
Analyte Name	Method	MRL	MDL	Result	Result	Average	RPD	Limit	
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.

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Form 3B

SuperSet Reference:

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: Lab Code:

SW08-0041

Units: mg/L Basis: NA

K1111586-021

SW08-0041DUP

**Duplicate Sample** 

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

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 3B

SuperSet Reference:

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: Lab Code:

SW08-0045

K1111586-025

Units: mg/L

Basis: NA

SW08-0045DUP

**Duplicate Sample** 

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

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 3B

SuperSet Reference:

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

SW08-0049DUP

**Duplicate Sample** 

Sample K1111586-029DUP18 RPD
Result Result Average RPD Limit

Analyte Name
Carbon, Dissolved Organic (DOC)

SM 5310 C

Method

0.50 0.07

MRL

MDL

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.

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Form 3B

SuperSet Reference:

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: Lab Code:

SW08-0029 K1111586-009 Units: mg/L Basis: NA

Analytical Method: SM 5310 C

SW08-0029MS Matrix Spike

K1111586-009MS4

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

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

SuperSet Reference:

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

SM 5310 C

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

Spike

% Rec

Method

Carbon, Dissolved Organic (DOC)

Amount % Rec Result

Limits

Analyte Name

26.3

101 26.0

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:

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

Sample Matrix:

Analyte Name

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

Method

Result

Spike Amount % Rec % Rec Limits

Carbon, Dissolved Organic (DOC)

SM 5310 C

25.9

99 26.0

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:

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

Spike

% Rec

**Analyte Name** 

Method

Result

Amount % Rec

Limits

Carbon, Dissolved Organic (DOC)

SM 5310 C

24.8

96 26.0

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:

QA/QC Report

Client: Project: Battelle Marine Sciences Lab

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
CCVI	271463	KQ1113136-24	11/30/11 13:44	25.0	23.4	94	90 - 110
CCV1	271463	KQ1113136-25	11/30/11 13:44	25.0	23.6	94	90 - 110
CCV2	271463	KQ1113136-26	11/30/11 13:44	25.0	23.4	93	90 - 110
CCV3	271463	KQ1113136-27	11/30/11 13:44	25.0	23.1	93	90 - 110
CCV4	271833	KQ1113210-07	12/2/11 15:04	25.0	23.7	95	90 - 110
CCV5	271833	KQ1113210-08	12/2/11 15:04	25.0	23.4	94	90 - 110

QA/QC Report

Client: Project: Battelle Marine Sciences Lab

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	
				0.07	0.50	0.21 J	WEEKEN COMMUNICATION OF THE PROPERTY OF THE PR
CCB1	271463	KQ1113136 <b>-</b> 28	11/30/11 13:44			ND U	
CCB2	271463	KQ1113136-29	11/30/11 13:44	0.07	0.50		
CCB3	271463	KQ1113136-30	11/30/11 13:44	0.07	0,50	ND U	
	271463	KQ1113136-31	11/30/11 13:44	0.07	0.50	ND U	
CCB4		~	12/2/11 15:04	0.07	0.50	ND U	
CCB5	271833	KQ1113210-09		-,-	0.50	ND U	
CCB6	271833	KQ1113210-10	12/2/11 15:04	0.07	0,50	ND C	

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

Units: mg/L Basis: NA

**Analysis Method:** 

SM 5310 C

Carbon, Total Organic

Sample Name	Lab Code	Result Q	MRL	MDL	Dilution Factor		Date Analyzed	Note
SW08-0028	K1111586-008	3.34	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0028 SW08-0032	K1111586-012	2.48	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0032 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	
SW08-0040 SW08-0044	K1111586-024	1.47	0.50	0.07	1	NA	11/30/11 13:44	
SW08-0044 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	

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: Lab Code: SW08-0028 K1111586-008 Units: mg/L Basis: NA

SW08-0028DUP

**Duplicate Sample** 

				Sample K1111586-008DUP7					
Analyte Name	Method	MRL	MDL	Result	Result	Average	RPD	Limit	
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.

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Form 3B

SuperSet Reference:

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

Method

SM 5310 C

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: Lab Code:

**Analyte Name** 

Carbon, Total Organic

SW08-0032 K1111586-012 Units: mg/L Basis: NA

MRL

0.50

MDL

0.07

SW08-0032DUP

**Duplicate Sample RPD** K1111586-012DUP9 Sample RPD Limit Result Average Result 33 2.41 2.33 2.48

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 3B

SuperSet Reference:

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: Lab Code:

SW08-0036 K1111586-016

Units: mg/L Basis: NA

SW08-0036DUP

Bunlicate Sample

		-016DUP11						
Analyte Name	Method	MRL	MDL	Result	Result	Average	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.

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Form 3B

SuperSet Reference:

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: Lab Code:

SW08-0040

Units: mg/L Basis: NA

K1111586-020

SW08-0040DUP

**Dunlicate Sample** 

				Sample	K1111586-020DUP13			RPD
Analyte Name	Method	MRL	MDL	Result	Result	Average	RPD	Limit
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.

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Form 3B

SuperSet Reference:

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: Lab Code:

SW08-0044 K1111586-024 Units: mg/L Basis: NA

SW08-0044DUP

**Duplicate Sample** 

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

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 3B

SuperSet Reference:

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: Lab Code:

SW08-0048

Units: mg/L

K1111586-028

Basis: NA

SW08-0048DUP

**Duplicate Sample** 

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

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 12/13/11 14:20

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Form 3B

SuperSet Reference:

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: Lab Code: SW08-0028 K1111586-008 Units: mg/L Basis: NA

Analytical Method: SM 5310 C

SW08-0028MS

Matrix Spike K1111586-008MS3

Analyte Name Sample Result Result Amount % 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

SuperSet Reference:

QA/QC Report

Lab Control Sample Summary **General Chemistry Parameters** 

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

Sample Matrix:

Water

Service Request: K1111586

Date Analyzed: 11/30/11

Units: mg/L Basis: NA

Lab Control Sample

K1111586-LCS1

Spike

% Rec Limits

**Analyte Name** 

Method

Amount % Rec Result

Carbon. Total Organic

SM 5310 C

25.9

99 26.0

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.

Printed 12/13/11 14:20

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Form 3C

SuperSet Reference:

QA/QC Report

Client: Project: Battelle Marine Sciences Lab

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
CCVI	271464	KO1113138-13	11/30/11 13:44	25.0	23.4	94	90 - 110
CCV1	271464	KQ1113138-14	11/30/11 13:44	25.0	23.4	93	90 - 110
CCV2	271464	KQ1113138-15	11/30/11 13:44	25.0	23.1	93	90 - 110
CCV3	271464	KQ1113138-16	11/30/11 13:44	25.0	23.3	93	90 - 110

QA/QC Report

Client: Project: Battelle Marine Sciences Lab

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	n plant Noosenska keleksis on ole kiloleksis
CCB1	271464	KQ1113138-17	11/30/11 13:44	0.07	0.50	0.21 J	
CCB1	271464	KQ1113138-18	11/30/11 13:44	0.07	0.50	ND U	
CCB2	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: Project:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW08/54220

Service Request:

K1111586

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

		Date	Date
Sample Name	Lab Code	Collected	Received
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:

Name:

Title:

Cover Page - Organic

SuperSet Reference:

Page

RR136486

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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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

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

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

Comments:

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Form 1A - Organic

SuperSet Reference: RR13648

Page RR136486 1 of 1

Analytical Results

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

**67** J

200 J

Sample Matrix:

Water

Service Request: K1111586

**Date Collected:** 11/22/2011

**Date Received:** 11/29/2011

# Diesel and Residual Range Organics

Sample Name:

**Analyte Name** 

SW08-0052

Lab Code:

K1111586-002

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

KWG1112166

KWG1112166

Analysis Method:

Diesel Range Organics (DRO)

Residual Range Organics (RRO)

NWTPH-Dx

			Dilution	Date	Date	Extraction	
Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note

1

1

11/30/11

11/30/11

12/01/11

12/01/11

12

21

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

270

540

Comments:

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Form 1A - Organic

SuperSet Reference:

RR136486

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Analytical Results

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

290 J

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

Units: ug/L Basis: NA

Level: Low

KWG1112166

**Analysis Method:** 

Residual Range Organics (RRO)

NWTPH-Dx

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	<b>120</b> J	270	12	1	11/30/11	12/01/11	KWG1112166	

20

11/30/11

12/01/11

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	

530

Comments:

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SuperSet Reference: RR136486

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** NWTPH-Dx

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

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Form 1A - Organic

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SuperSet Reference:

RR136486

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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

Units: ug/L Basis: NA

Extraction Method: Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

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	Personal National Assessment Street
Residual Range Organics (RRO)	280 J	520	20	1	11/30/11	12/01/11	KWG1112166	

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

Comments:

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Form 1A - Organic

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SuperSet Reference:

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

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

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Form 1A - Organic

SuperSet Reference:

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RR136486

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: Lab Code:

Method Blank

KWG1112166-3

Units: ug/L

**Extraction Method:** 

Method

Basis: NA

**Analysis Method:** 

NWTPH-Dx

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	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:

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Form 1A - Organic

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SuperSet Reference: RR136486

QA/QC Report

**Client:** 

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

Sample Matrix:

Water

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

**Extraction Method: Analysis Method:** 

Method

NWTPH-Dx

Service Request: K1111586

Units: PERCENT

Level: Low

Sample Name	Lab Code	Sur1	Sur2
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 (%)

Surl = o-Terphenyl50-150 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.

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Form 2A - Organic

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SuperSet Reference:

RR136486

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

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

Sample Name:

SW08-0056

Lab Code:

K1111586-006

Basis: NA

**Extraction Method:** 

Method

Level: Low

Units: ug/L

Analysis Method:

NWTPH-Dx

Extraction Lot: KWG1112166

			Sample	SW08-00 KWG11 Duplicate	12166-1	Relative Percent	RPD Limit
Analyte Name	MRL	MDL	Result	Result	Average	Difference	
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.

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Form 3B - Organic

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SuperSet Reference: RR136486

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

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 Snike

	Lab Control Spike			%Rec			
Analyte Name	Result	Expected	%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.

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Form 3C - Organic

Page

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SuperSet Reference:

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: Lab Code:

Method Blank

KWG1112166-3

**Instrument ID:** GC21

File ID: J:\GC21\DATA\120111B\1201F015.D

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** NWTPH-Dx Extraction Lot: KWG1112166

This Method Blank applies to the following analyses:

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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

Form 4A - Organic

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: 20:11

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

Sample Name:

Lab Control Sample

Lab Code:

KWG1112166-2

Instrument ID: GC21

File ID: J:\GC21\DATA\120111B\1201F013.D

**Extraction Method: Analysis Method:** 

Method

NWTPH-Dx

Level: Low

Extraction Lot: KWG1112166

This Lab Control Sample applies to the following analyses:

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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

RR136486

SuperSet Reference:

QA/QC Results

Client:

Н

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: **Instrument ID:** 

CAL10701

GC21

J:\GC21\DATA\071111B-NW\0711F059.D

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
В	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		

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)				5 5 6			1			1			:	i	,
				F E			Н	50	699	I	200	712	J	500	777
	K	2000	797	L	5000	768	М	20000	802	N	50000	809	!		
Residual Range Organics (RRO)				В	50	588	C	200	510	D	500	513	Е	2000	500
	F	5000	545	1			1 1 1 1			\$ c			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
o-Terphenyl		,								:			1		
				G	1.0	988	Н	2.5	1000	I	10	998	J	25	1040
	K	100	1100	L	250	1020									
n-Triacontane					· · · · · · · · · · · · · · · · · · ·		1								
				G	1.0	803	Н	2.5	840	I	10	840	J	25	875
	K	100	936	L .	250	872	1			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			!		

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

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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

		Calibration Evaluation						
Analyte Name	Compound Type	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.

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Form 6A - Organic

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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: **Analysis Method:** 

External Standard

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) Residual Range Organics (RRO)	1000	990	767	761	-1	NA	± 15 %	AverageRF
	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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SuperSet Reference: RR136486

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: **Analysis Method:** 

External Standard

NWTPH-Dx

Calibration Date: 07/12/2011

Calibration ID: CAL10701

Analysis Lot: KWG1112511

Units: ppm

File ID:

J:\GC21\DATA\120111B\1201F007.D

J:\GC21\DATA\120111B\1201F009.D

Column ID: ZB-1

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

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

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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: Analysis Method:** 

External Standard

NWTPH-Dx

Calibration Date: 07/12/2011

Calibration ID: CAL10701

Analysis Lot: KWG1112511

Units: ppm

File ID:

J:\GC21\DATA\120111B\1201F035.D

J:\GC21\DATA\120111B\1201F037.D

Column ID: ZB-1

			Average	CCV				
Analyte Name	Expected	Result	RF	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	$\pm$ 15 %	AverageRF
o-Terphenyl	50	53	1030	1080	5	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	56	861	957	11	NA	$\pm$ 15 %	AverageRF

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

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Form 7 - Organic

Page

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Client:

Battelle

Service Request No.:

K1110840

Project:

Non-dry Dock Stormwater SW08

Date Received:

11/5/11

Sample Matrix:

Water

#### **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\_\_/

Analytical Results

Client:

Battelle Marine Sciences Lab

Project: Sample Matrix: Non-dry Dock Stormwater SW08/54220

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

Units: ug/L Basis: NA

Extraction Method: Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

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:

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Merged

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SuperSet Reference:

RR135503

Analytical Results

Client:

Battelle Marine Sciences Lab

Project: Sample Matrix: Non-dry Dock Stormwater SW08/54220

Water

Service Request: K1110840

Date Collected: NA Date Received: NA

Diesel and Residual Range Organics

Sample Name:

Method Blank

Lab Code:

KWG1111409-5

Units: ug/L Basis: NA

**Extraction Method:** 

Method

**Analysis Method:** 

NWTPH-Dx

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:

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Merged

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

Units: PERCENT

**Analysis Method:** 

NWTPH-Dx

Level: Low

Lab Code	<u>Sur1</u>	Sur2
K1110642-001	80	77
K1110811-003	117	112
K1110840-001	90	88
KWG1111409-3	95	92
KWG1111409-5	106	103
KWG1111409-1	123	121
KWG1111409-2	116	114
KWG1111409-4	121	119
	K1110811-003 K1110840-001 KWG1111409-3 KWG1111409-5 KWG1111409-1 KWG1111409-2	K1110642-001 80 K1110811-003 117 K1110840-001 90 KWG1111409-3 95 KWG1111409-5 106 KWG1111409-1 123 KWG1111409-2 116

Surrogate Recovery Control Limits (%)

50-150 Sur1 = o-Terphenyl50-150 Sur2 = n-Triacontane

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

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

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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

Basis: NA

**Extraction Method:** 

Method

Level: Low

Units: ug/L

**Analysis Method:** 

NWTPH-Dx

Extraction Lot: KWG1111409

Batch QCMS

Batch QCDMS

KWG1111409-1

KWG1111409-2

	Sample	Matrix Spike			Duplic	ate Matrix S	%Rec		RPD	
Analyte Name	Result	Result	Expected	%Rec	Result	Expected	%Rec	Limits	RPD	Limit
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.

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Page

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SuperSet Reference: RR135503

QA/QC Report

**Client:** 

Battelle Marine Sciences Lab

**MRL** 

260

520

MDL

12

20

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

Result

ND

ND

Sample Name:

**Analyte Name** 

Diesel Range Organics (DRO)

Residual Range Organics (RRO)

Batch QC

Lab Code:

K1110642-001

Units: ug/L Basis: NA

Level: Low

**Extraction Method: Analysis Method:** 

Method NWTPH-Dx

Extraction Lot: KWG1111409

NC

30

Batch QCDUP

26

KWG1111409-3 Relative **Duplicate Sample** Percent **RPD** Limit Difference Result Average ND 30 ND

NC

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 3B - Organic

Page

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QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW08/54220

Sample Matrix:

Service Request: K1110840

Date Extracted: 11/08/2011

**Date Analyzed:** 11/10/2011

Lab Control Spike Summary Diesel and Residual Range Organics

a/m

Extraction Method: Method

**Analysis Method:** 

NWTPH-Dx

Units: ug/L

Basis: NA

Level: Low

Extraction Lot: KWG1111409

Lab Control Sample KWG1111409-4

Lab Control Spike

				%Kec	
Analyte Name	Result	Expected	%Rec	Limits	
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.

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SuperSet Reference:

RR135503

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:

**Extraction Method:** 

**Analysis Method:** 

Lab Code:

Method Blank

KWG1111409-5

**Instrument ID:** GC21

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

Method

NWTPH-Dx

Level: Low

Extraction Lot: KWG1111409

This Method Blank applies to the following analyses:

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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

SuperSet Reference:

Page

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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 Code:

Lab Control Sample

KWG1111409-4

**Instrument ID:** GC21

File ID: J:\GC21\DATA\110911F\1109F038.D

**Extraction Method: Analysis Method:** 

Method

NWTPH-Dx

Level: Low

Extraction Lot: KWG1111409

This Lab Control Sample applies to the following analyses:

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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\111111F\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

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RR135503

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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

Column: ZB-1

**Instrument ID:** 

GC21

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\071111F\0711F036.D	I	J:\GC21\DATA\071111F\0711F060.D
В	J:\GC21\DATA\071111F\0711F038.D	J	J:\GC21\DATA\071111F\0711F062.D
C	J:\GC21\DATA\071111F\0711F040.D	K	J:\GC21\DATA\071111F\0711F064.D
D	J:\GC21\DATA\071111F\0711F042.D	$\mathbf{L}$	J:\GC21\DATA\071111F\0711F066.D
Е	J:\GC21\DATA\071111F\0711F044.D	M	J:\GC21\DATA\071111F\0711F068.D
F	J:\GC21\DATA\071111F\0711F046.D	N	J:\GC21\DATA\071111F\0711F070.D
G	I:\GC21\DATA\071111F\0711F056 D		

J:\GC21\DATA\071111F\0711F056.D J:\GC21\DATA\071111F\0711F058.D Η

Analyta Nama	Level ID	Amt	RF	Level ID	Amt	RF	Leve	l Amt	RF	Leve ID	l Amt	RF	Level ID	Amt	RF
Analyte Name		Aint	- Kr		Amı	N.F.		Amt	IXI		Ame	IXI.			IXI <sup>5</sup>
Diesel Range Organics (DRO)				1											
				G	20	779	Н	50	795	I	200	747	J	500	809
	K	2000	847	L	5000	869	M	20000	863	N	50000	907	1 .		
Residual Range Organics (RRO)				В	50	627	С	200	597	D	500	551	E	2000	588
	F	5000	645	1			!			1					
													1		
o-Terphenyl										1			: :		
				G	1.0	1040	H	2.5	1100	I	10	1040	J	25	1090
	K	100	1150	L	250	1150							4		
n-Triacontane							1								
				G	1.0	894	Н	2.5	932	I	10	878	J	25	939
	K.	100	972	L	250	976	3 2 3			!			!		

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

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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

GC21

**Instrument ID:** 

Column: ZB-1

			Calibratio	n Evaluati	ion	
Analyte Name	Compound Type	Fit Type	Eval.	Eval. Result	Q	Control Criteria
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.

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Form 6A - Organic

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Analytical Chemistry Data Package, SW08, November 2011

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: **Analysis Method:** 

External Standard

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

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Form 6B - Organic

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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

File ID:

J:\GC21\DATA\110911F\1109F032.D

J:\GC21\DATA\110911F\1109F034.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	827	926	12	NA	$\pm$ 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.

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Form 7 - Organic

Page

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SuperSet Reference: RR135503

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

File ID:

J:\GC21\DATA\110911F\1109F062.D

J:\GC21\DATA\110911F\1109F064.D

Column ID: ZB-1

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

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

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Page 1 of 1

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

File ID:

J:\GC21\DATA\111111F\1111F008.D

J:\GC21\DATA\111111F\1111F010.D

Column ID: ZB-1

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

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

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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

File ID:

 $J: \label{eq:conditional} J: \label{eq:con$ 

J:\GC21\DATA\11111F\1111F036.D

Column ID: ZB-1

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	$\pm$ 15 %	AverageRF
o-Terphenyl	50	55	1100	1200	9	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	56	932	1040	11	NA	± 15 %	AverageRF

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

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Form 7 - Organic

SuperSet Reference:

RR135503

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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

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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

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Form 8 - Organic

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SuperSet Reference:

RR135503

QA/QC Results

**Client:** 

Battelle Marine Sciences Lab

Project: Sample Matrix: Non-dry Dock Stormwater SW08/54220

Water

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

**Extraction Method: Analysis Method:** 

Method

NWTPH-Dx

Extraction Lot: KWG1111409

Level: Low

Service Request: K1110840

Date Extracted: 11/08/2011

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	lmL	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

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Form 9 - Organic

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# **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

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# 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

							•	7111100 Mg/2		
Sample ID -		Fraction			Collection					
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Date	Hg	As	Ag	Al	Cd
-										
				Instrument:		CVAF	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory A	chieved Detectio	n Limits (Fres	hwater)			0.0001	0.03	0.002	0.3	0.004
Freshwater R	eporting Limit (N	MDL* 3.18)				0.0003	0.1	0.006	1.0	0.01
CIVOO										
<u>SW09</u> SW09-0041	PSNS084.1	TME	Composite_equal_time	3174*91	01/21/12	0.00455	0.768	0.0134	436	0.255
SW09-0041 SW09-0042	PSNS084.1	DME	Composite_equal_time	3174*91	01/21/12	0.00433	0.768	0.0134 0.002 U	20.9	0.233
SW09-0042	PSNS115.1	TME	Composite_equal_time	3174*93	01/21/12	0.00124	1.80	0.106	394	0.112
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

						•	πillo. μg/L			
Sample ID -		Fraction							CVAF Batch	ICP-MS Batch
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	ID	ID
•										_
				Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
Laboratory A	chieved Detection	n Limits (Fres	hwater)		0.08	0.007	0.002	0.05		
Freshwater R	Reporting Limit (N	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

			Callaction	Amalysis	Amalrosia					Detection	Reporting
Station Code	Sample ID	Type Name	Collection Date	Analysis Date	Analysis Method	Component	Units	Resul	t	Limit	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	SW09-0039 SW09-0038	Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.41	=	0.07	0.50
PSNS015	SW09-0037	Composite_equal_time	01/21/2012	01/24/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	24.8	=	0.07	2.0
PSNS015	SW09-0040	Composite_equal_time	01/21/2012	01/26/2012	SM 2540 C 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 ug/L	650	=, O		480
PSNS084.1	SW09-003	Composite_equal_time	01/20/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.00	-, O =	0.07	0.50
PSNS084.1	SW09-0013	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	SW09-0014 SW09-0013	Composite_equal_time	01/21/2012	01/24/2012	SM 2340 C	Hardness, Total as CaCO3	mg/L	16.8	=	0.07	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 ug/L	630	=, O		480
PSNS115.1	SW09-0019	Composite_equal_time	01/20/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	0.98	_, O =	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 ug/L	210	=, J	22	580
PSNS126Dup		Composite_equal_time	01/20/2012	01/24/2012	SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.09	_, <b>3</b> =	0.07	0.50
PSNS126Dup		Composite_equal_time	01/21/2012	01/24/2012	SM 5310 C	Carbon, Total Organic	mg/L	1.22	=	0.07	0.50
PSNS126Dup		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		Composite_equal_time	01/21/2012	01/26/2012	SM 2540 D	Solids, Total Suspended (TSS)	mg/L mg/L	10.0	=	5.0	5.0
15115120Dup	51107 0032	composite_equal_time	01/21/2012	01/20/2012	5111 23TO D	sonas, rom suspended (199)	mg/L	10.0	_	5.0	5.0

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

Sample ID -		Fraction											ICP-MS
Metals	Station Code	(Total/Diss)	Sample Type	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	Batch ID
				Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
Laboratory Ac	chieved Detection	on Limits (Fre	shwater)		0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Freshwater Re	eporting Limit (1	MDL* 3.18)			0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	
METHOD DI	LANUZC												
METHOD BI MB-1	LANKS	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
WID-1		TNIL	Tieshwater	TRIVI DIGIIK KT	0.03 0	0.002 0	0.422 3	0.004 0	0.00 C	0.007 C	0.002 0	0.0043 3	020212-0100
LABORATO	RY CONTRO	L SAMPLES											
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	1.96	1.94	2.45	2.01	1.91	1.98	1.95	1.94	020212-6100
			Pero	cent Recovery, LCS	98%	97%	101%	101%	96%	99%	98%	94%	
	IKE 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	
				rcent Recovery, MS	106%	86%	96%	103%	105%	94%	102%	103%	
			Perc	ent Recovery, MSD	104%	87%	97%	102%	102%	92%	101%	100%	
				RPD	1.9%	0.6%	0.2%	1.5%	2.9%	2.2%	1.0%	2.6%	
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
			• •	Mean	0.733	0.0221	1100	0.083	3.16	9.74	9.47	68.7	
				RPD	2.3%	52.2% *	5.5%	3.1%	2.5%	0.1%	0.1%	1.3%	
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 PSNS015	DME	Composite_equal_time	3174*104 3174*104r2	0.503	0.002 U	33.3 32.6	0.0354	1.70	2.80	0.393	37.7	020212-6100
DUF	FSNSUIS	DME	Composite_equal_time	Mean	0.513	0.002 U NA	33.0	0.0334	1.74	2.80	0.390	37.8	020212-0100
				RPD	2.0%	NA NA	2.1%	8.6%	4.6%	0.0%	0.390 <b>1.5%</b>	0.3%	
				KrD	2.0%	NA	2.170	0.070	4.070	0.076	1.5%	0.576	
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	26.67	7.62	52.0	22.8	38.6	85.2	27.9	53.2	
				PD	1.8%	16.7%	7.7%	1.8%	2%	1.6%	0.7%	5.6%	

#### 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   Crotal/Diss)   Sample Type   MSL Code   High   CVAF   Ratch ID			Fraction				
Laboratory Achieved Detection Limits   Reporting Limit (MDL* 3.18)   Composite_equal_time   Spiking Level, MSD   PSNS124   TME   Composite_equal_time   Spiking Level, MSD   PSNS015   PSNS015   TME   Composite_equal_time   Spiking Level, MSD   P	Sample ID - Metals	Station Code	(Total/Diss)	Sample Type			CVAF Batch ID
METHOD BLANKS   TME	T. 1	D			Instrument:		
METHOD BLANKS							
MB-1	Reporting Limit (ML	)L" 3.16)				0.0003	
MB-1	METHOD BLANKS	S					
MB-2         TME         Freshwater         MB2_012912         0.0001 U         0.13012HGA           LABIORATORY CONTROL SAMPLES           Spiking Level         TME         Freshwater         OPR 012912 runl         0.00495         0.13012HGA           LCS (1)         TME         Freshwater         OPR 012912 runl         0.00495         013012HGA           LCS (2)         TME         Freshwater         OPR 012912 runl         0.00493         013012HGA           LCS (2)         TME         Freshwater         OPR 012912 runl         0.00493         013012HGA           LCS (2)         TME         Freshwater         OPR 012912 runl         0.00493         013012HGA           LCS (2)         TME         TME         Freshwater         Blank012912         000196         013012HGA           LCS (2)         PSNS084.1         DME         Composite_equal_time         3174*92         000124         013012HGA           MS1         PSNS084.1         DME         Composite_equal_time         3174*92         MSD         0.0127         013012HGA           MSD1         PSNS084.1         DME         Composite_equal_time         3174*92 MSD         0.0127         013012HGA           MS2         PSNS124         T		·	TME	Freshwater	MB1_012912	0.000102 J	013012HGA
Spiking Level   CS (1)	MB-2		TME	Freshwater		0.0001 U	013012HGA
Spiking Level   CS (1)	MB-3		TME	Freshwater	MB3_012912	0.0001 U	013012HGA
Spiking Level   CS (1)			~				
TME		ONTROL SAMPLES	<u>S</u>			0.00406	
CS (2)			TME	Frachwater	ODD 012012 mm1		012012UCA
Composite_equal_time   Spiking_Level, MSD   MSD2   PSNS124   TME   Composite_equal_time   Spiking_Level, MSD   MSD2   PSNS124   TME   Composite_equal_time   Spiking_Level, MSD   MSD2   PSNS124   TME   Composite_equal_time   Spiking_Level, MSD   MSD2   MSD3							
SW09-0042							
SW09-0042	LCS Dialik (1)		TNIE				013012HGA
SW09-0042							
MS1				reice	iit Recovery, LCS 2	93 70	
MS1	SW09-0042	PSNS084.1	DME	Composite_equal_time	3174*92	0.00124	013012HGA
MSD1	MS1	PSNS084.1	DME		3174*92 MS	0.0123	013012HGA
Spiking Level, MSD   0.0116   Spiking Level, MSD   0.0116   Percent Recovery, MSD   99%   Percent Recovery, MSD   PSN   Percent Recovery, MSD   PSN   Percent Recovery, MSD   PSN   PErcent Recovery, MSD   PErcent R	MSD1	PSNS084.1	DME		3174*92 MSD	0.0127	013012HGA
Spiking Level, MSD   97%					Spiking Level, MS	0.0114	
Note						0.0116	
Note						97%	
SW09-0051						99%	
MS2         PSNS124         TME         Composite_equal_time of the posite_equal_time of the posite_equal_time of the property of the posite_equal_time of the property of the posite_equal_time of the property of the pro					RPD	1.8%	
MS2         PSNS124         TME         Composite_equal_time of the posite_equal_time of the posite_equal_time of the property of the posite_equal_time of the property of the posite_equal_time of the property of the pro	SW09-0051	PSNS124	TME	Composite equal time	3174*101	0.00727	013012HGA
MSD2							
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Percent Recovery, MS   102%   Percent Recovery, MS   102%   Percent Recovery, MSD   Percent Recovery percent Report Percent							
Percett Recovery, MSD   102%   RPD   0.4%							
RPD   0.4%					• .		
Name						0.49/-	
SW09-0053	DEDITION TE DDEC	NICION			KI D	<b>0.4</b> /0	
DUP       PSNS015       TME       Composite_equal_time       3174*103r2       0.0239       013012HGA         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       9%         STANDARD REFERENCE MATERIAL         SRM 1641 (1)       TME       Freshwater       1641d 012912       1627         Certified Value range       ±18			TME	Composite equal time	2174*102	0.0261	012012UCA
Mean   0.0250   NPD   9%							
SW09-0054	DOI	15115015	TNIL	Composite_equal_time			01301211GA
SW09-0054       PSNS015       DME       Composite_equal_time       3174*104       0.00180       013012HGA         DUP       PSNS015       TME       Composite_equal_time       3174*104r2       0.00164       013012HGA         RPD       9%         STANDARD REFERENCE MATERIAL         SRM 1641 (1)       TME       Freshwater       1641d 012912       1627         Certified Value range       1590         range       ±18							
DUP         PSNS015         TME         Composite_equal_time         3174*104r2         0.00164         013012HGA           Mean         0.00172           RPD         9%           STANDARD REFERENCE MATERIAL         TME         Freshwater         1641d 012912         1627           SRM 1641 (1)         Certified Value range         1590 range         ±18					KPD	970	
DUP         PSNS015         TME         Composite_equal_time         3174*104r2         0.00164         013012HGA           Mean         0.00172           RPD         9%           STANDARD REFERENCE MATERIAL         TME         Freshwater         1641d 012912         1627           SRM 1641 (1)         Certified Value range         1590 range         ±18	SW09-0054	PSNS015	DME	Composite equal time	3174*104	0.00180	013012HGA
Mean   0.00172   RPD   9%						0.00164	
STANDARD REFERENCE MATERIAL   SRM 1641 (1)   TME   Freshwater   1641d 012912   1627				1 – 1 –			
SRM 1641 (1)  TME Freshwater 1641d 012912 1627  Certified Value range ±18							
Certified Value 1590 range ±18	STANDARD REFE	RENCE MATERIA	<u>L</u>				
range ±18	SRM 1641 (1)		TME	Freshwater	1641d 012912	1627	
					<b>Certified Value</b>	1590	
SRM 1641 (1) PD 2%					range	±18	
		SRM 1641 (1)			PD	2%	

#### 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

#### **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 ≤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 inidicates 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.  $500~\text{mL}~0.45\mu\text{m}$  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:

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

OA/OC 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**

#### **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 ≤20% PD
- \* Precision result outside OC criterion of <30%
- B Analyte detected in the method blank > RL and sample concentration < 10 times detected blank value
- 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. 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  $\pm 30\%$  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%).

# 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 1640 for all other metals. The

differences were within the QC acceptance criterion of ≤20%.

#### **REFERENCE:**

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: 1/2//2012

Page:

N4523A10MP00034 Amend.1 Project No.: PSNSNon-dry Dock SW 2010 Project:

#### **Battelle**

Marine Sciences Laboratory 1529 West Sequim Bay Road Laboratory: Battelle MSL Attention: Jill Brandenberger

Project:	PSNSNOII-dry Doc			Sales (A) Art	An	alyz	ер	arai	mete	ers	óer i	QAF	/FSF			Phone: (36		64
Sample Label		1/21/2012  Collection  Date/Time  10 23	Matrix ちい	★ Hardness		X	X	X		Turbidity				→ No. containers	Sample Type (Grab vs. Comp)	Storm#	Cond. (µS Turb. Read	Comp. 6/cm) and (NTU) lings 2.3
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O Turbidity measured at Navy Stormwater Lab during comp'ing session

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**Battelle** Date: 1/1/2112 1/21/12 Marine Sciences Laboratory 1529 West Sequim Bay Road SW = Stormwater Page: 1 of 1 Laboratory: Battelle MSL Project No.: 54220 Jill Brandenberger Attention: Project: Non-dry Dock Stormwater SW09 Phone: (360) 681-4564 Analyze parameters per QAP/FSP TME/DME containers Hardness DME TOC DOC TSS Sample Type (grab Collection Š vs. Comp) Date/Time Storm# Lab Code Station ID Matrix Sample Label SW09 3174\*91 SW09-0041 PSNS084.1 1/21/2012 1023 SW Х comp SW09 3174\*92 SW SW09-0042 PSNS084.1 1/21/2012 1023 х comp SW09 SW 3174\*93 SW09-0043 PSNS115.1 1/21/2012 0949 comp Х SW09-0044 PSNS115.1 SW 1 SW09 3174\*94 1/21/2012 0949 comp SW09 3174\*95 SW SW09-0045 PSNS124.1 1/21/2012 0127 Х comp SW09 3174\*96 SW SW09-0046 PSNS124.1 1/21/2012 0127 х comp 3174\*97 SW09 SW09-0047 1/21/2012 1158 SW х 1 **PSNS126** comp SW 1 SW09 3174\*98 PSNS126 1/21/2012 1158 SW09-0048 comp Х SW09 3174\*99 SW 1 SW09-0049 PSNS126Dup 1/21/2012 1158 Х comp SW 1 SW09 3174\*100 SW09-0050 PSNS126Dup 1/21/2012 1158 comp 3174\*101 SW09-0051 PSNS124 SW 1 SW09 1/21/2012 0905 х comp SW09 3174\*102 SW09-0052 1 PSNS124 1/21/2012 0905 SW comp х 1/21/2012 0957 SW SW09 3174\*103 PSNS015 SW09-0053 х comp PSNS015 SW amoo SW09 3174\*104 SW09-0054 1/21/2012 0957 Total # of Containers Received by: Relinquished by: NK 1/21/12 monne Shipment Method: 2205 Retained at Battelle Date Time Signature Signature Sample Disposition: Printed Name Company Printed Name Distribution: Relinquished by: Received by: 1) PNNL Signature Signature Date Time Printed Name Printed Name Company





**SAMPLE LOGIN** 

Project Manager: Brandenberger Date Received: 1/21/2012

Batch: 10

Login Designee: Brandenberger

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

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

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

SOP#: MSL-A-001 Page 1 of 1

LOG-IN CHECKLIST SH	509		Ret	ference SOP#	MSL-A-001
Central File #: 3174 Project Name: Non Dry Da		91-104 WU 9	Batch: Project Manager:		) (ZMa
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Special instructi	ons: <, ,	olit per Ga	PP		
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were sar	nples filtered at MS	L/ ************************************		,	
Sample condition(s):	Acceptable	Other (explai	n):		
Container type:	Teflon Poly 6	lass) Cap. Vial	Other:		
Notes:		No. of the second secon	The same of the sa		<u> </u>
Notes.					
Completed By: Amm	n		Date/Time: 1/21	/12 22	05
SAMPLE PRESERVATION	e e e				
Sample(s) were preserve	ed prior to árrival at	MSL (noted on CoC	/ Sample / per PM Instr	uction)	
Random pH checked for	~10% of samples (us	e dip paper)	Sample IDs:		• .
Complete pH check requi	•		rd on pH Record form)	· · · · · · · · · · · · · · · · · · ·	
Sample(s) were preserve	1	•		·	
Type: 0.2% HN03	No.	tes: TME/OI	ne	Lot# 12	1020
Q.5% HCl (Hg sa	mples) No	tes:		Lot#	
/ Refrigerate/Fre	•		TOCIDOL/Hard	ness 1TI	PH
Other		<u> </u>			,
flo a			1/2-	112 (1)	

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

SAMPLE CHAIN	OF CUSTODY FO	RM													В	attelle		
	1/1/2112 /21/12														Μ	larine Scien	ces Laborat	ory
	1 of 3		SW = Stori	nwa	ter											529 West Se		
Project No.:				l												aboratory: [		
	Non-dry Dock Sto	ormwater SW09													A		ill Brandenb	
,	,			An	alyz	е ра	arar	net	ers	per	QA	P/F	SP_				Phone: (36	0) 681-4564
			-													1		
		Collection		Hardness	TOC	DOC	TSS	TME/DME	DME	TPH				containers	1 1	Sample ype (grab		
Sample Label	Station ID	Date/Time	Matrix						1	1				Z	2   v	/s. Comp)	Storm#	Lab Code
SW09-001	PSNS126	1/20/2012 1700	SW							Х				1		grab	SW09	
SW09-002	PSNS124.1	1/20/2012 1715	SW	1						Х				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	1	grab	SW09	
SW09-005	PSNS015	1/20/2012 1800	SW							X				1	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	Х												comp	SW09	SW09-007
SW09-0014	PSNS084.1	1/21/2012 1023	SW		Х			L							1	comp	SW09	SW09-007
SW09-0015	PSNS084.1	1/21/2012 1023	SW	]		Х									1	comp	SW09	SW09-007
SW09-0016	PSNS084.1	1/21/2012 1023					Х					<u> </u>			1	comp	SW09	SW09-007
SW09-0017	PSNS115.1	1/21/2012 0949	SW	Х					$oldsymbol{ol}}}}}}}}}}}}}}}}}$		<u> </u>		<u> </u>	_	1	comp	SW09	SW09-008
SW09-0018	PSNS115.1	1/21/2012 0949	SW		Х	L	<u> </u>		╧			<u> </u>			1	comp	SW09	SW09-008
SW09-0019	PSNS115.1	1/21/2012 0949	SW		L.	x								—	1	comp	SW09	SW09-008
SW09-0020	PSNS115.1	1/21/2012 0949	SW			L.	X			<u> </u>	İ.,	<u> </u>			1	comp	SW09	SW09-008
Relinquished by	<u> </u>	1/1/			Re	cei	ved	by:								otal # of Co		
	Mes	P3/20/2 1	3:10.		<u> _</u>											Shipment Me		
1	Signature 7- Juny Lavo	Date Dattell	Time					Sig	gnatu	ıre						edex to CA		
	Printed Name	Company						Pri	inted	Nan	ne _					Sample Disp	osition:	
Relinquished by:					Re	cei	ved	by:	•						- 1	Distribution:  1) PNNL		
	Signature	Date	Time	Signature							. •			2) CAS				
	Drinted Name	Company			Printed Name											-		

#### **Battelle** SAMPLE CHAIN OF CUSTODY FORM, Date: 1/1/2112 /2/1 3/ Marine Sciences Laboratory Page: 2 of 3 1529 West Sequim Bay Road SW = Stormwater Project No.: 54220 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW09 Attention: Jill Brandenberger Analyze parameters per QAP/FSP Phone: (360) 681-4564 Hardness TME/DME containers DME DOC TSS TPH Sample Collection Type (grab Š. Sample Label Station ID Date/Time Matrix vs. Comp) Storm# Lab Code SW09-0021 PSNS124.1 1/21/2012 0127 SW Х 1 SW09 SW09-009 comp SW09-0022 1/21/2012 0127 PSNS124.1 SW 1 x SW09 SW09-009 comp SW09-0023 1/21/2012 0127 PSNS124.1 SW x 1 SW09 SW09-009 comp SW09-0024 PSNS124.1 1/21/2012 0127 SW SW09 Х 1 SW09-009 comp SW09-0025 PSNS126 1/21/2012 1158 SW 1 SW09 SW09-010 Х comp SW09-0026 PSNS126 1/21/2012 1158 SW x 1 SW09 SW09-010 comp SW09-0027 PSNS126 1/21/2012 1158 SW х 1 SW09 SW09-010 comp SW09-0028 PSNS126 1/21/2012 1158 SW Х SW09 comp SW09-010 SW09-0029 PSNS126Dup 1/21/2012 1158 SW 1 SW09 SW09-011 Х comp SW09-0030 PSNS126Dup 1/21/2012 1158 SW SW09 X 1 comp SW09-011 SW09-0031 1/21/2012 1158 PSNS126Dup SW 1 SW09 X comp SW09-011 SW09-0032 PSNS126Dup 1/21/2012 1158 SW Х 1 SW09 SW09-011 comp SW09-0033 PSNS124 1/21/2012 0905 SW X 1 SW09 SW09-012 comp SW09-0034 PSNS124 1/21/2012 0905 SW SW09 comp SW09-012 Total # of Containers Relinguished by: Received by: Shipment Method: Date Fedex to CAS Signature Jum Euo Time Signature Battelle Printed Name Sample Disposition: Company Printed Name Relinguished by: Received by: Distribution: 1) PNNL Signature Date Time 2) CAS Signature

Printed Name

Company

Printed Name

SAMPLE CHAIN	OF CUSTODY FO	RM													Battelle		
Date:	1/1/2112 /21/2 &														Marine Scier	ices Labora	tory
Page:			SW = Stori	mwa	ater										1529 West S		
Project No.:															Laboratory:		
Project:	Non-dry Dock Sto	ormwater SW09													Attention:	lill Brandent	
1 Toject.	Horrary Book on	51,71W G. G. T. T. T.		An	alyz	e pa	arar	nete	ers	per	QAI	P/FS	SP			Phone: (36	60) 681-4564
					Ť												
		Collection		Hardness	TOC	DOC	TSS	TME/DME	DME	ТРН				containers			
Sample Label	Station ID	Date/Time	Matrix	İ										S	vs. Comp)	Storm#	Lab Code
SW09-0035	PSNS124	1/21/2012 0905	SW			х								1	comp	SW09	SW09-012
SW09-0036	PSNS124	1/21/2012 0905	SW				Х							1	comp	SW09	SW09-012
SW09-0037	PSNS015	1/21/2012 0957	SW	Х			l								comp	SW09	SW09-013
SW09-0038	PSNS015	1/21/2012 0957	SW		х										comp	SW09	SW09-013
SW09-0039	PSNS015	1/21/2012 0957	SW			Х									comp	SW09	SW09-013
SW09-0040	PSNS015	1/21/2012 0957	SW				Х								comp	SW09	SW09-013
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Relinquished by:					Re	ecei	ved	by:							Distribution: 1) PNNL		
	Signature	Date	Time					Sig	natu	ire					2) CAS		
-	Brintod Name	Company			1			Pri	nted	Nan	ne						



SAMPLE CHAIN	OF CUSTODY FO	ORM														Battelle		
Date:	: 1/1/2112															Marine Scien	ices Labora	tory
Page:	1 of 3		SW = Stor	mwa	ater											1529 West S	equim Bay	Road
Project No.:																Laboratory:		
Project:	Non-dry Dock St	ormwater SW09														Attention: J	ill Brandenl	
			·	An	alyz	e p	arar	nete	ers p	oer,	QAI	2/F	SP_				Phone: (36	60) 681 <b>-4564</b>
				S				Ш					l		S	·		
				Hardness	0	O	S	TME/DME	Ш	$\pm$					containers			
				<u>ā</u>	700	DOC	TSS	E/I	DME	TPH					<u>a</u>			
		0.11		무	<u> </u>			$\sum_{i=1}^{n}$	-						Ö	Sample		
0	01.41.10	Collection		1					İ				ĺ		No.	Type (grab		
Sample Label	Station ID	Date/Time	Matrix	-		ļ		_								vs. Comp)	Storm#	Lab Code
SW09-001 SW09-002	PSNS126	1/20/2012 1700		↓	ļ			_		X					1	grab	SW09	
01100 002	PSNS124.1	1/20/2012 1715	SW	—	<u> </u>					X				-	1	grab	SW09	<u> </u>
SW09-003	PSNS124	1/20/2012 1730	SW							Х					1	grab	SW09	
SW09-004	PSNS084.1	1/20/2012 1745	SW	<u> </u>						X			-		1	grab	SW09	
SW09-005	PSNS015	1/20/2012 1800	SW	<del> </del>		ļ				Х					1	grab	SW09	
SW09-006	PSNS115.1	1/20/2012 1827	SW	1	<u> </u>	ļ	ļ			Χ					1	grab	SW09	
SW09-0013 SW09-0014	PSNS084.1	1/21/2012 1023	SW	X		ļ									1	comp	SW09	SW09-007
	PSNS084.1	1/21/2012 1023	SW		X	ļ									1	comp	SW09	SW09-007
SW09-0015	PSNS084.1	1/21/2012 1023	SW		<u> </u>	Х									1	comp	SW09	SW09-007
SW09-0016	PSNS084.1	1/21/2012 1023	SW	<u> </u>			X								1	comp	SW09	SW09-007
SW09-0017	PSNS115.1	1/21/2012 0949	SW	X		ļ	<u> </u>								1	comp	SW09	SW09-008
SW09-0018	PSNS115.1	1/21/2012 0949	SW	<u> </u>	X	ļ							_	- 1	1	comp	SW09	SW09-008
SW09-0019	PSNS115.1	1/21/2012 0949	SW	<u> </u>	ļ	Х	<u> </u>								1	comp	SW09	SW09-008
SW09-0020	PSNS115.1	1/21/2012 0949	SW			<u> </u>	X	$oxed{oxed}$			1	, 1	, ,	Ш	1	comp	SW09	SW09-008
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	lee	,	3:10						4/1	<u>U</u>	<u> </u>	/	<u> </u>			Shipment Me		
	Signature - Juny Karo	Battelll	Time				-(	Sigr	ature	W.	9//		DH			Fedex to CA	S	
	Printed Name	Company						Prin	ted N	lame	9					Sample Disp	osition;	
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	***															1) PNNL		
	Signature	Date	Time					Sign	nature	€						2) CAS		
	Printed Name	Company						Prin	ted N	lame	9							



#### SAMPLE CHAIN OF CUSTODY FORM

Date: 1/1/2112

Battelle

Marine Sciences Laboratory

Page:	2 of 3		SW = Stor	mwa	ater											1529 West S	equim Bay	Road
Project No.:	54220															Laboratory:	Battelle MS	L
Project	Non-dry Dock Sto	ormwater SW09		1												Attention: J	lill Brandent	perger
	• • • • • • • • • • • • • • • • • • • •			An	alyz	ze p	araı	mete	ers	per	QA	P/F	SP				Phone: (36	60) 681-4564
		Collection		Hardness	TOC	DOC	TSS	TME/DME	DME	ТРН					. containers	Sample Type (grab		
Sample Label	Station ID	Date/Time	Matrix												Š	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		Х										1	comp	SW09	SW09-009
SW09-0023	PSNS124.1	1/21/2012 0127	SW			Х									1	comp	SW09	SW09-009
SW09-0024	PSNS124.1	1/21/2012 0127	SW				Х								1	comp	SW09	SW09-009
SW09-0025	PSNS126	1/21/2012 1158	SW	Х											1	comp	SW09	SW09-010
SW09-0026	PSNS126	1/21/2012 1158	SW		Х										1	comp	SW09	SW09-010
SW09-0027	PSNS126	1/21/2012 1158	SW			Х									1	comp	\$₩09	SW09-010
SW09-0028	PSNS126	1/21/2012 1158	SW				Х								1	comp	SW09	SW09-010
SW09-0029	PSNS126Dup	1/21/2012 1158	SW	Х											1	comp	SW09	SW09-011
SW09-0030	PSNS126Dup	1/21/2012 1158	SW	T	Х										1	comp	SW09	SW09-011
SW09-0031	PSNS126Dup	1/21/2012 1158	SW	Τ		Х									1	comp	SW09	SW09-011
SW09-0032	PSNS126Dup	1/21/2012 1158	SW				Х								1	comp	SW09	SW09-011
SW09-0033	PSNS124	1/21/2012 0905	SW	Х											1	comp	SW09	SW09-012
SW09-0034	PSNS124	1/21/2012 0905	SW		Х				ň	Λ		7	,		1	comp	SW09	SW09-012
Relinquished by:	Signature Juny Euro	bate Battelle	Time		Re	ceiv	/ed	1/1	M atur	e ,	10	1/24	1/12	M		Total # of Co Shipment Me Fedex to CAS	thod:	
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Delinental	Printed Name	Company							ted I	Name	е					Sample Dispo	osition:	
Relinquished by:	0.				Re 	ceiv	/ed									Distribution: 1) PNNL		
	Signature	Date	Time					Sigr	natur	e .						2) CAS		
	Printed Name	Company						Prin	ted I	Name	е							

Date Page Project No.:	OF CUSTODY FO 1/1/2112 3 of 3 54220 Non-dry Dock Sto	:	SW = Stor				araı	mete	ers	per	QAI	P/F\$	SP.			Battelle Marine Scien 1529 West S Laboratory: Attention: J	nces Labora Sequim Bay Battelle MS Jill Brandenl	Road L
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	ТРН					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW09-0035	PSNS124	1/21/2012 0905	SW			Х									1	comp	SW09	SW09-012
SW09-0036	PSNS124	1/21/2012 0905	SW				Х								1	comp	SW09	SW09-012
SW09-0037	PSNS015	1/21/2012 0957	SW	Х												comp	SW09	SW09-013
SW09-0038	PSNS015	1/21/2012 0957	SW		Х											comp	SW09	SW09-013
SW09-0039	PSNS015	1/21/2012 0957	SW			Х										comp	SW09	SW09-013
SW09-0040	PSNS015	1/21/2012 0957	SW				Х									comp	SW09	SW09-013
end															-			
										ń	11			,				
Relinquished by:	Signature Jum Fuv	Date Battelll	Time	-	Re	ceiv	ed .	Sign	4	MI.		1/2	04//	126		Total # of Co Shipment Me Fedex to CAS	ethod: S	
Relinquished by:	Printed Name	Company			Re	ceiv	ed.	Print by:	ted f	vame	<del>.</del>	:				Sample Disposition:  1) PNNL	OSILION:	
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	Printed Name	Company						Print	ted 1	Name	9					and the same same same same same same same sam		

Columbia Analytical Services, Inc.  Cooler Receipt and Preservation Form  Client / Project:	gent i
Received: 194/12 Opened: 194/12 By: 11 Unloaded: 194/12 By: 11	
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 <u>custody seals</u> 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   Thermometer   Cooler/COC     Tracking Number   NA   File	đ
7. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves Wet Ice Packs  8. Were custody papers properly filled out (ink, signed, etc.)?  9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below.  10. Were all sample labels complete (i.e analysis, preservation, etc.)?  11. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA  12. Were appropriate bottles/containers and volumes received for the tests indicated?  13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below  14. Were VOA vials received without headspace? Indicate in the table below.  15. Was C12/Res negative?  Sample ID on Bottle  Sample ID on COC  Identified by:	
Sample ID Bottle Count Bottle Type Temp space Broke pH Reagent added Number Initials Tim	ne
Notes, Discrepancies, & Resolutions:	

Page\_\_\_\_of\_\_

Client:

Battelle

**Project:** Non-dry Dock Stormwater SW09

Service Request No.:
Date Received:

K1200620 1/24/12

Sample Matrix:

Water

#### 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

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

**Date Collected:** 01/21/12

Service Request: K1200620

**Date Received:** 01/24/12

Sample Matrix: **Analysis Method:** 

Water SM 2340 C

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	

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1200620

Project

Non-dry Dock Stormwater SW09/54220

**Date Collected:** 

01/21/12

Sample Matrix:

Water

Date Received:

01/24/12

Replicate Sample Summary

Hardness, Total EDTA Titration, 20th ed

Sample Name:

Analyte Name

Hardness, Total as CaCO3

SW09-0013

Units:

Date Analyzed: 01/27/12

mg/L

Lab Code:

K1200620-007

Basis:

NA

**Duplicate Sample** 

K1200620-

Analysis Sample 007**DUP2**0 **RPD** Method Result MRI Limit MDI Result **RPD Average** SM 2340 C 2.0 0.8 16.8 16.0 16.4 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.

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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Sample Matrix:

Water

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

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

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

Sample Matrix:

Analysis Method:

Water

SM 2540 D

**Date Collected:** 01/21/12 Date Received: 01/24/12

Service Request: K1200620

Units: mg/L

Basis: NA

Solids, Total Suspended (TSS)

Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	O
K1200620-010	17.0	5.0	M4	1	01/26/12 12:05	
K1200620-014	25.0	5.0	•	1	01/26/12 12:05	
K1200620-018	12.5	5.0	.=	1	01/26/12 12:05	
K1200620-022	5.0	5.0	-	1	01/26/12 12:05	
K1200620-026	10,0	5,0	-	1	01/26/12 12:05	
K1200620-030	9.0	5.0	-	1	01/26/12 12:05	
K1200620-034	36.0	5.0	-	1	01/26/12 12:05	
K1200620-MB1	ND U	5.0	_	1	01/26/12 12:05	
K1200620-MB2	ND U	5.0	-	1	01/26/12 12:05	
	K1200620-010 K1200620-014 K1200620-018 K1200620-022 K1200620-026 K1200620-030 K1200620-034 K1200620-MB1	K1200620-010       17.0         K1200620-014       25.0         K1200620-018       12.5         K1200620-022       5.0         K1200620-026       10.0         K1200620-030       9.0         K1200620-034       36.0         K1200620-MB1       ND	K1200620-010       17.0       5.0         K1200620-014       25.0       5.0         K1200620-018       12.5       5.0         K1200620-022       5.0       5.0         K1200620-026       10.0       5.0         K1200620-030       9.0       5.0         K1200620-034       36.0       5.0         K1200620-MB1       ND       U       5.0	K1200620-010       17.0       5.0       -         K1200620-014       25.0       5.0       -         K1200620-018       12.5       5.0       -         K1200620-022       5.0       5.0       -         K1200620-026       10.0       5.0       -         K1200620-030       9.0       5.0       -         K1200620-034       36.0       5.0       -         K1200620-MB1       ND       U       5.0       -	K1200620-010       17.0       5.0       -       1         K1200620-014       25.0       5.0       -       1         K1200620-018       12.5       5.0       -       1         K1200620-022       5.0       5.0       -       1         K1200620-026       10.0       5.0       -       1         K1200620-030       9.0       5.0       -       1         K1200620-034       36.0       5.0       -       1         K1200620-MB1       ND       U       5.0       -       1	Lab Code         Result         MRL         MDL         Dil.         Analyzed           K1200620-010         17.0         5.0         -         1         01/26/12 12:05           K1200620-014         25.0         5.0         -         1         01/26/12 12:05           K1200620-018         12.5         5.0         -         1         01/26/12 12:05           K1200620-022         5.0         5.0         -         1         01/26/12 12:05           K1200620-026         10.0         5.0         -         1         01/26/12 12:05           K1200620-030         9.0         5.0         -         1         01/26/12 12:05           K1200620-034         36.0         5.0         -         1         01/26/12 12:05           K1200620-MB1         ND         U         5.0         -         1         01/26/12 12:05

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1200620

Project

Non-dry Dock Stormwater SW09/54220

**Date Collected:** 

NA

Sample Matrix:

Water

Date Received: NA

mg/L

Analysis Method:

SM 2540 D

Units: Basis: NA

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

		Sample						RPD	Date
Sample Name:	Lab Code:	MRL	MDL	Result	<b>Duplicate Result</b>	Average	RPD	Limit	Analyzed
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

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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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Sample Matrix:

Water

**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

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

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

Date Collected: 01/21/12

Service Request: K1200620

Sample Matrix:

Date Received: 01/24/12

Analysis Method:

Water

SM 5310 C

Units: mg/L

Basis: NA

### Carbon, Dissolved Organic (DOC)

						Date	
Sample Name	Lab Code	Result	MRL	MDL	Dil.	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	

#### Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Saccine Prairie Scien

Service Request: K1200620

Project

Non-dry Dock Stormwater SW09/54220

Date Collected: 01/21/12

Sample Matrix:

Water

Date Received:

01/24/12

Analysis Method:

SM 5310 C

Units: mg/L Basis: NA

# Duplicate Sample Summary Carbon, Dissolved Organic (DOC)

				Sample				RPD	Date
Sample Name:	Lab Code:	MRL	MDL	Result	<b>Duplicate Result</b>	Average	RPD	Limit	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

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: Project:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW09/54220

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

Sample Matrix:

Water

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

		A 12			
Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	1.00	26.8	25.0	103	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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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

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

Sample Matrix:

Water

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

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

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1200620

Project:

Non-dry Dock Stormwater SW09/54220

# Continuing Calibration Verification (CCV) Summary

Carbon, Dissolved Organic (DOC)

Analysis Method:

SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCVI	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

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QA/QC Report

Client:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Project:

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

Analysis Method:

SM 5310 C

Units: mg/L

	Analysis		Date					
	Lot	Lab Code	Analyzed	MRL	MDL	Result	Q	
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	Ü	
CCB4	277500	KQ1200715-10	01/24/12 16:21	0.50	0.07	ND	Ū	

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12-0000201085 rev 00 Superset Reference:

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Analysis Method:

Non-dry Dock Stormwater SW09/54220

Sample Matrix:

Water

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	

#### Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Sample Matrix:

Water

**Date Collected:** 01/21/12

Date Received: 01/24/12

Analysis Method:

SM 5310 C

Units: mg/L

Basis: NA

## **Duplicate Sample Summary** Carbon, Total Organic

				Sample				RPD	Date
Sample Name:	Lab Code:	MRL	MDL	Result	<b>Duplicate Result</b>	Average	RPD	Limit	Analyzed
SW09-0014	K1200620-008DUP21	0,50	0.07	1.23	1.23	1.23	< [	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

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

Service Request: K1200620

Project:

Non-dry Dock Stormwater SW09/54220

Date Collected: N/A

Sample Matrix:

Water

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

Matrix Spike

**Duplicate Matrix Spike** 

K1200252-012MS1

K1200252-012DMS1

	Sample		Spike			Spike		% Rec		RPD
Analyte Name	Result	Result	Amount	% Rec	Result	Amount	% Rec	Limits	RPD	Limit
Carbon, Total Organic	0.13	25.4	25:0	101	24.9	25.0	99	60-134	2	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.

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Now part of the ALS Group

QA/QC Report

Client: Project:

Battelle Marine Sciences Lab

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

Sample Spike % Rec **RPD Analyte Name** Result Amount Result % Rec Limits Limit Carbon, Total Organic 0.20 25.9 25.0 103 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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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1200620

Project:

Non-dry Dock Stormwater SW09/54220

Date Collected: N/A

Sample Matrix:

Water

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

	Sample		Spike		% R	dec RPD
Analyte Name	Result	Result	Amount	% Rec	Lim	its Limit
Carbon Total Organic	5	508	500	101	60-1	34

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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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1200620

Project:

Non-dry Dock Stormwater SW09/54220

Date Collected: N/A

Sample Matrix:

Water

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

	Sample		Spike	Sec	% Rec	RPD
Analyte Name	Result	Result	Amount	% Rec	Limits	Limit
Carbon, Total Organic	0.93	26.1	25.0	101	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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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Date Analyzed: 01/24/12

Sample Matrix:

Water

**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

Spike Spike % Rec Analyte Name Amount Result % Rec Amount Result % Rec Limits **RPD** Limit **RPD** Carbon, Total Organic 22.3 22.7 98 21.9 22.7 96 87-112 20

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QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Sample Matrix:

Water

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

		Spike		% Rec
Analyte Name	Result	Amount	% Rec	Limits
Carbon, Total Organic	22.1	22.7	. 97	87-112

Now part of the ALS Group

QA/QC Report

Client: Project:

Battelle Marine Sciences Lab

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
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

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QA/QC Report

Client: Project:

Battelle Marine Sciences Lab

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

	Analysis		Date					
	Lot	Lab Code	Analyzed	MRL	MDL	Result	$\mathbf{Q}^{\perp}$	
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	

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Now part of the ALS Group

Client: Project:

Battelle Marine Sciences Lab

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
•			01/24/2012
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:

Title:

.

Page 1 of

Date:

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

Analysis Method:

NWTPH-Dx

te Extraction

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:

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Form 1A - Organic

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Merged

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

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

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Merged

Form 1A - Organic

SuperSet Reference:

1 of 1

RR138050

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

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

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

Comments:

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SuperSet Reference:

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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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO) Residual Range Organics (RRO)	210 J 630 O	240 480	11 19	1	01/31/12 01/31/12	02/02/12 02/02/12	KWG1201126 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:

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SuperSet Reference:

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

Units: ug/L Basis: NA

Level: Low

Analysis	Methoa:	NW	IPH-DX	

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:

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Form 1A - Organic

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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

Method

**Extraction Method: Analysis Method:** 

NWTPH-Dx

Units: ug/L

Basis: NA

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Diesel Range Organics (DRO)	65 J	240	11	1	01/31/12	02/02/12	KWG1201126	
Residual Range Organics (RRO)	<b>210</b> 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:

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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

. NA

Date Received: NA

## Diesel and Residual Range Organics

Sample Name:

Method Blank

Lab Code:

KWG1201126-3

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

Analysis Method:

NWTPH-Dx

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)	<b>25</b> 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:

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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

Units: PERCENT

Level: Low

NWTPH-Dx **Analysis Method:** 

Sample Name	Lab Code	Sur1	Sur2
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 (%)

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

Results flagged with an asterisk (\*) indicate values outside control criteria. Results flagged with a pound (#) indicate the control criteria is not applicable.

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SuperSet Reference:

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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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

Extraction Lot: KWG1201126

			Sample	SW09-00 KWG120 <b>Duplicate</b>	1126-1	Relative Percent Difference	RPD Limit
Analyte Name	MRL	MDL	Result	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.

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Form 3B - Organic

SuperSet Reference:

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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 %Rec Limits %Rec **Analyte Name** Result Expected 1540 1600 96 46-140 Diesel Range Organics (DRO) 45-159 Residual Range Organics (RRO) 700 800 87

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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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:

Lab Code:

Method Blank

KWG1201126-3

**Instrument ID:** GC21

File ID: J:\GC21\DATA\020112B-NW\0201F033.D

**Extraction Method: Analysis Method:** 

Method

NWTPH-Dx

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

SuperSet Reference:

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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: 03:12

## Lab Control Sample Summary Diesel and Residual Range Organics

Sample Name:

Lab Code:

Lab Control Sample

KWG1201126-2

Instrument ID: GC21

File ID: J:\GC21\DATA\020112B-NW\0201F031.D

Extraction Method: Analysis Method:

Method

NWTPH-Dx

Level: Low

Extraction Lot: KWG1201126

This Lab Control Sample applies to the following analyses:

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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

Now part of the ALS Group

QA/QC Results

Client: Project: Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW09/54220

Service Request: K1200620

Calibration Date: 07/12/2011

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

Calibration ID: Instrument ID:

CAL10701

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
В	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	$\mathbf{L}^{-1}$	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	1-\GC21\DATA\071111B NW\0711F057 D		

G	J:\GC21\DA1A\U/1111B-NW\U/111\03/.D
H	J:\GC21\DATA\071111B-NW\0711F059.D

	Level			Level			Leve			Leve			Level		70. FT
Analyte Name	ID	Amt	$\mathbf{RF}$	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF
Diesel Range Organics (DRO)							1								
				1			Н	50	699	I	200	712	J	500	777
	K	2000	797	L	5000	768	M	20000	802	N	50000	809			
Residual Range Organics (RRO)				В	50	588	C	200	510	D	500	513	Е	2000	500
	F	5000	545				8 8 8 8 8						3 1 1 1 1 1 2 4		
o-Terphenyl		<del></del>		G	1.0	988	Н	2.5	1000	I	10	998	J	25	1040
	K	100	1100	Ĺ	250	1020				1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4			i .		
n-Triacontane		***************************************				000	7.7	2.5	0.40	T	10	840	J	25	875
				G	1.0	803	Н	2.5	840	1	10	840	, ,	23	013
	K	100	936	L	250	872							i.		

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

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Form 6A - Organic

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Now part of the ALS Group

QA/QC Results

**Client:** Project: Battelle Marine Sciences Lab

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	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.

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Form 6A - Organic

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Now part of the ALS Group

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: **Analysis Method:** 

External Standard

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

SuperSet Reference:

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Now part of the ALS Group

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: **Analysis Method:** 

External Standard

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	$\pm$ 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.

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SuperSet Reference:

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Now part of the ALS Group

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: **Analysis Method:** 

External Standard

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

			Average	CCV				
Analyte Name	Expected	Result	RF	RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	980	767	753	-2	NA	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	970	531	514	-3	NA	$\pm$ 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.

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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

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u:\Stealth\Crystal.rpt\Form8.rpt Chemistry Data Package, Non-Dry Dock Stormwater Event 09, January 2012

Now part of the ALS Group

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: Analysis Method:** 

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

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Form 9 - Organic

SuperSet Reference:

1 of 1 Page RR138050

Chemistry Data Package, Non-Dry Dock Stormwater Event 09, January 2012

## **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

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Non-Dry Dock Stormwater SW10 February 29, 2012 SW11 March 15, 2012 Chemical Analyses

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							Ul	N115: μg/L		
Sample ID -		Fraction			Collection					
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Date	Hg	As	Ag	Al	Cd
				Instrument:		CVAF	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory A	Achieved Detection Limits	s (Freshwater)				0.0001	0.03	0.002	0.3	0.004
Freshwater R	Reporting Limit (MDL* 3	.18)				0.0003	0.1	0.006	1.0	0.01
SW10										
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
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							N115: μg/L			
Sample ID -		Fraction							CVAF Batch	ICP-MS Batch
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	ID	ID
•										_
				Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
Laboratory A	chieved Detection Limits	s (Freshwater)			0.08	0.007	0.002	0.05		
Freshwater R	eporting 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		032612-6100

							•	DIVIID. µg/L		
Sample ID -		Fraction			Collection					
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Date	Hg	As	Ag	Al	Cd
-										
				Instrument:		CVAF	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory Ac	chieved Detection Lim	its (Freshwater)				0.0001	0.03	0.002	0.3	0.004
Freshwater Re	eporting Limit (MDL*	3.18)				0.0003	0.1	0.006	1.0	0.01
	ì	•								
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

360/681-4564

							TITO. μg/L	•	
Sample ID -		Fraction							CVAF Batch ICP-MS Batch
Metals	Station Code	(Total/Diss)	Type Name	MSL Code	Cr	Cu	Pb	Zn	ID ID
•									
				Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
Laboratory A	chieved Detection Lim	its (Freshwater)	)		0.08	0.007	0.002	0.05	1
Freshwater R	eporting 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

		Collection	Analysis					Detection	Reporting
Station Code	Type Name	Date	Date	Analysis Method	Component	Units	Result	Limit	Limit
SW10									_
PSNS124.1	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	280 =,H	11	250
PSNS124.1	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	650 =,O	19	500
PSNS126	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	87 =,J	12	270
PSNS126	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	270 =,J	20	530
PSNS126 Dup	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	73 =,J	11	250
PSNS126 Dup	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	260 = J	19	500
PSNS124	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	85 =,J	12	260
PSNS124	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	180 =,J	20	520
PSNS 115.1	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	72 =,J	11	250
PSNS 115.1	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	170 =,J	19	500
PSNS084.1	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	200 = J	12	260
PSNS084.1	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	720 =,O	20	520
PSNS015	Grab	02/29/2012		2 NWTPH-Dx	Diesel Range Organics (DRO)	ug/L	89 =,J	12	270
PSNS015	Grab	02/29/2012	03/09/201	2 NWTPH-Dx	Residual Range Organics (RRO)	ug/L	230 = J	20	530
PSNS015	Composite_equal_time	02/29/2012	03/09/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	30.0 =	0.8	2.0
PSNS015	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Total Organic	mg/L	2.71 =	0.07	0.50
PSNS015	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	2.30 =	0.07	0.50
PSNS015	Composite_equal_time	02/29/2012	03/06/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	13.0 =	5.0	5.0
PSNS084.1	Composite_equal_time	02/29/2012	03/09/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	21.2 =	0.8	2.0
PSNS084.1	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Total Organic	mg/L	2.21 =	0.07	0.50
PSNS084.1	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.85 =	0.07	0.50
PSNS084.1	Composite_equal_time	02/29/2012	03/06/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	6.0 =	5.0	5.0
PSNS126	Composite_equal_time	02/29/2012	03/09/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	44.8 =	0.8	2.0
PSNS126	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Total Organic	mg/L	17.7 =	0.07	0.50
PSNS126	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	15.7 =	0.07	0.50
PSNS126	Composite_equal_time	02/29/2012	03/06/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	9.5 =	5.0	5.0
PSNS126DUP	Composite_equal_time	02/29/2012	03/09/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	45.6 =	0.8	2.0
PSNS126DUP	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Total Organic	mg/L	18.3 =	0.07	0.50
PSNS126DUP	Composite_equal_time	02/29/2012	03/05/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	16.1 =	0.07	0.50
PSNS126DUP	Composite_equal_time	02/29/2012	03/06/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	10.5 =	5.0	5.0
PSNS124	Composite_equal_time	02/28/2012	03/09/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	109 =	0.8	2.0
PSNS124	Composite_equal_time	02/28/2012	03/05/201	2 SM 5310 C	Carbon, Total Organic	mg/L	33.9 =	0.07	0.50
PSNS124	Composite_equal_time	02/28/2012	03/05/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	31.5 =	0.07	0.50
PSNS124	Composite_equal_time	02/28/2012	03/06/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	48.0 =	5.0	5.0
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## *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 An	nalysis Method	Component	Units	Result	Detection Limit	Reporting Limit
PSNS115.1	Composite_equal_time	02/29/2012	03/09/2012 SM		Hardness, Total as CaCO3	mg/L	50.0 =	0.8	2.0
PSNS115.1	Composite_equal_time	02/29/2012	03/05/2012 SM		Carbon, Total Organic	mg/L	2.86 =	0.07	0.50
PSNS115.1	Composite_equal_time	02/29/2012	03/05/2012 SM		Carbon, Dissolved Organic (DOC)	mg/L	2.30 =	0.07	0.50
PSNS115.1	Composite_equal_time	02/29/2012	03/06/2012 SM		Solids, Total Suspended (TSS)	mg/L	ND ND	5.0	5.0
PSNS124.1	Composite_equal_time	02/28/2012	03/09/2012 SM		Hardness, Total as CaCO3	mg/L	90.0 =	0.8	2.0
PSNS124.1	Composite_equal_time	02/28/2012	03/05/2012 SM	A 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		Carbon, Dissolved Organic (DOC)	mg/L	2.77 =	0.07	0.50
PSNS124.1	Composite_equal_time	02/28/2012	03/06/2012 SM	M 2540 D	Solids, Total Suspended (TSS)	mg/L	8.0 =	5.0	5.0
<u>SW11</u>									
PSNS015	Grab	03/14/2012	03/22/2012 NV		Diesel Range Organics (DRO)	ug/L	110 = J	12	270
PSNS015	Grab	03/14/2012	03/22/2012 NV	WTPH-Dx	Residual Range Organics (RRO)	ug/L	330 = J	20	530
PSNS84.1	Grab	03/14/2012	03/22/2012 NV		Diesel Range Organics (DRO)	ug/L	130 =,J	12	270
PSNS84.1	Grab	03/14/2012	03/22/2012 NV	WTPH-Dx	Residual Range Organics (RRO)	ug/L	250 = J	20	530
PSNS126	Grab	03/15/2012	03/22/2012 NV	WTPH-Dx	Diesel Range Organics (DRO)	ug/L	190 =,J	13	290
PSNS126	Grab	03/15/2012	03/22/2012 NV	WTPH-Dx	Residual Range Organics (RRO)	ug/L	780 = Z	22	570
PSNS115.1	Grab	03/15/2012	03/22/2012 NV	WTPH-Dx	Diesel Range Organics (DRO)	ug/L	110 = J	12	270
PSNS115.1	Grab	03/15/2012	03/22/2012 NV		Residual Range Organics (RRO)	ug/L	330 = J	21	540
PSNS124	Grab	03/15/2012	03/22/2012 NV		Diesel Range Organics (DRO)	ug/L	390 = H	12	270
PSNS124	Grab	03/15/2012	03/22/2012 NV		Residual Range Organics (RRO)	ug/L	1100 = , O	20	530
PSNS124DUP	Grab	03/15/2012	03/23/2012 NV	WTPH-Dx	Diesel Range Organics (DRO)	ug/L	570 = H	12	280
PSNS124DUP	Grab	03/15/2012	03/23/2012 NV	WTPH-Dx	Residual Range Organics (RRO)	ug/L	2500 = ,0	21	550
PSNS124.1	Grab	03/15/2012	03/23/2012 NV		Diesel Range Organics (DRO)	ug/L	600 = H	12	280
PSNS124.1	Grab	03/15/2012	03/23/2012 NV	WTPH-Dx	Residual Range Organics (RRO)	ug/L	2600 = , O	21	550
PSNS124.1DUP	Grab	03/15/2012	03/22/2012 NV	WTPH-Dx	Diesel Range Organics (DRO)	ug/L	350 = H	13	280
PSNS124.1DUP	Grab	03/15/2012	03/22/2012 NV	WTPH-Dx	Residual Range Organics (RRO)	ug/L	1000 = 0	22	560
PSNS015	Composite_equal_time	03/15/2012	03/28/2012 SM	И 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	И 5310 C	Carbon, Total Organic	mg/L	1.62 =	0.07	0.50
PSNS015	Composite_equal_time	03/15/2012	03/21/2012 SM	И 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	M 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		Hardness, Total as CaCO3	mg/L	20.4 =	0.8	2.0
PSNS015DUP	Composite_equal_time	03/15/2012	03/29/2012 SM	И 5310 C	Carbon, Total Organic	mg/L	1.82 =	0.07	0.50
PSNS015DUP	Composite_equal_time	03/15/2012	03/21/2012 SM	И 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	A 2540 D	Solids, Total Suspended (TSS)	mg/L	44.0 =	5.0	5.0

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
PSNS84.1	Composite_equal_time	03/15/2012	03/28/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	20.0 =	0.8	2.0
PSNS84.1	Composite_equal_time	03/15/2012	03/29/201	2 SM 5310 C	Carbon, Total Organic	mg/L	1.26 =	0.07	0.50
PSNS84.1	Composite_equal_time	03/15/2012	03/21/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.84 =	0.07	0.50
PSNS84.1	Composite_equal_time	03/15/2012	03/21/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	19.5 =	5.0	5.0
PSNS115.1	Composite_equal_time	03/15/2012	03/28/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	30.8 =	0.8	2.0
PSNS115.1	Composite_equal_time	03/15/2012	03/29/201	2 SM 5310 C	Carbon, Total Organic	mg/L	1.28 =	0.07	0.50
PSNS115.1	Composite_equal_time	03/15/2012	03/21/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.26 =	0.07	0.50
PSNS115.1	Composite_equal_time	03/15/2012	03/21/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	20.5 =	5.0	5.0
PSNS126	Composite_equal_time	03/15/2012	03/28/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	30.0 =	0.8	2.0
PSNS126	Composite_equal_time	03/15/2012	03/29/201	2 SM 5310 C	Carbon, Total Organic	mg/L	3.75 =	0.07	0.50
PSNS126	Composite_equal_time	03/15/2012	03/21/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	4.22 =	0.07	0.50
PSNS126	Composite_equal_time	03/15/2012	03/21/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	16.0 =	5.0	5.0
PSNS124.1	Composite_equal_time	03/15/2012	03/28/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	22.0 =	0.8	2.0
PSNS124.1	Composite_equal_time	03/15/2012	03/29/201	2 SM 5310 C	Carbon, Total Organic	mg/L	1.71 =	0.07	0.50
PSNS124.1	Composite_equal_time	03/15/2012	03/21/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.56 =	0.07	0.50
PSNS124.1	Composite_equal_time	03/15/2012	03/21/201	2 SM 2540 D	Solids, Total Suspended (TSS)	mg/L	20.5 =	5.0	5.0
PSNS124	Composite_equal_time	03/15/2012	03/28/201	2 SM 2340 C	Hardness, Total as CaCO3	mg/L	50.0 =	0.8	2.0
PSNS124	Composite_equal_time	03/15/2012	03/29/201	2 SM 5310 C	Carbon, Total Organic	mg/L	1.93 =	0.07	0.50
PSNS124	Composite_equal_time	03/15/2012	03/21/201	2 SM 5310 C	Carbon, Dissolved Organic (DOC)	mg/L	1.20 =	0.07	0.50
PSNS124	Composite_equal_time	03/15/2012	03/21/201	2 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
	1 2	(100001		Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
I aboratory A	chieved Detection	Limits (Fresh	nwater)	This is the cit.	0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
Laboratory Achieved Detection Limits (Freshwater) Freshwater Reporting Limit (MDL* 3.18)					0.03	0.002	1.0	0.004	0.3	0.007	0.002	0.03	
		DE 3.10)			0.1	0.000	1.0	0.01	0.5	0.02	0.000	0.2	
<u>METHOD B</u> MB-1	LANKS	TME	F	TDM Dlank D1	0.02.11	0.002 U	0.2.11	0.004.11	0.161 J	0.007.11	0.002.11	0.05.11	022612 610
мв-1 МВ-2		TME	Freshwater	TRM Blank R1	0.03 U 0.03 U		0.3 U 0.3 U	0.004 U 0.004 U		0.007 U 0.007 U	0.002 U 0.002 U	0.05 U	032612-610
MB-2		IME	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	032612-610
LABORATO	ORY CONTROL	SAMPLES											
Spiking Leve	l				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	032612-610
			P	ercent Recovery, LCS	98%	96%	95%	100%	101%	95%	100%	97%	
Spiking Leve	1				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	032612-610
				ercent Recovery, LCS	98%	98%	101%	99%	107%	98%	99%	97%	
MATRIX SE	PIKE RESULTS												
SW10-048	PSNS126	DME	Composite equal tim	e 3174-110	6.34	0.128	17.0	0.194	0.951	23.6	0.327	61.0	032612-610
MS	PSNS126	DME	Composite_equal_tim		8.37	2.09	72.1	2.22	3.01	75.1	2.46	112	032612-610
MSD	PSNS126	DME	Composite_equal_tim		8.53	2.12	71.5	2.29	3.08	75.1	2.47	113	032612-610
				Spiking Level	2	2	50	2	2	50	2	50	
				Percent Recovery, MS	102%	105%	110%	101%	103%	103%	107%	102%	
			Pe	ercent 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%	
CXXXII 0.45	POLICO LEDITO	D) (E)		2174 122	0.200	0.00226 1	45.4	0.00.50	0.000	2.11	0.045	25.5	000610 610
SW11-047	PSNS015DUP	DME	Composite_equal_tim		0.380	0.00336 J	47.4	0.0258	0.899	3.11	0.845	35.7	032612-610
MS	PSNS015DUP	DME	Composite_equal_tim		2.39	1.95	96.3	2.05	2.90	5.04	2.87	82.8	032612-610
MSD	PSNS015DUP	DME	Composite_equal_tim		2.30	1.89	97.7	1.97	2.87	4.86	2.83	84.5	032612-610
			Spiking Level		2	2	50	2	2	2	2	50	
	Percent Recovery, MS		101% 96%	98% 95%	98%	101% 97%	100% 99%	97% 88%	101% 99%	94% 98%			
			r	ercent Recovery, MSD RPD	96% 4.6%	3.1%	101% 2.8%	4.0%	99% 1.5%	88% 9.8%	2.0%	98% 3.5%	
REPLICATI	E PRECISION			KI D	4.0 /0	3.1 /0	2.0 /0	4.0 /0	1.5 /0	<b>9.0</b> /0	2.0 /0	3.3 /0	
SW10-043	PSNS015	TME	Composite_equal_tim	e 3174-105 R1	0.615	0.0173	443	0.207	1.92	8.71	8.40	74.8	032612-610
DUP	PSNS015	TME	Composite equal tim		0.601	0.0162	426	0.211	1.84	8.42	8.13	72.3	032612-610
			F	Mean	0.608	0.0168	435	0.209	1.88	8.57	8.27	73.6	032612-610
				RPD	2.3%	6.6%	3.9%	1.9%	4.3%	3.4%	3.3%	3.4%	
OXXXII 0 10	payras : :	m (=		2151 152	0.00=	0.0102		0.1-1					000000
SW11-048	PSNS84.1	TME	Composite_equal_tim		0.985	0.0183	230	0.171	1.88	17.3	5.18	135	032612-610
DUP	PSNS84.1	TME	Composite_equal_tim		1.01	0.0198	231	0.166	1.86	17.3	5.18	134	032612-610
				Mean	0.998	0.0191	231	0.169	1.87	17.3	5.18	135	032612-610
STANDADD	REFERENCE N	/ATEDIAI	Sogwator	RPD	2.5%	7.9%	0.4%	3.0%	1.1%	0.0%	0.0%	0.7%	
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	032612-610
SRM 1640a-2		TME	Freshwater	TRM 1640a 10x R1	7.49	7.34	53.0	3.69	41.4	81.3	11.4	53.1	032612-610
10 104 2	=		110311114101										002012 010
				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%	

Sample ID - Metals	Station Code	Fraction (Total/Diss)	Sample Type	MSL Code	Hg	CVAF Batch ID
				Instrument:	CVAF	•
Laboratory Achieved Reporting Limit (MD					0.0001 0.0003	
METHOD BLANKS	8	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 CO	ONTROL SAMPLES	<u>s</u>				
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
			Perce Perce	nt Recovery, LCS 1 nt Recovery, LCS 2	105% 104%	
Cuiling I and				• •	0.00406	
Spiking Level LCS (1)		TME	Freshwater	OPR 040212 run1	0.00496 0.00504	040312HGA
LCS (1) LCS (2)		TME	Freshwater	OPR 040212 run2	0.00304	040312HGA
LCS Blank (1)		TME	Freshwater	Blank 040212	0.0001 U	040312HGA
200 2141111 (1)		11,12		nt Recovery, LCS 1	102%	0.001211011
				nt 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	
				rcent Recovery, MS ent Recovery, MSD	101% 106%	
			1010	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	
				rcent Recovery, MS	102%	
			Perc	ent Recovery, MSD	106%	
MC1	DGNG127	TEN ATE	Comments 1 di	RPD	3.8%	0.40212146.4
MS1 MSD1	PSNS126 PSNS126	TME TME	Composite_equal_time Composite equal time	3174-127 MS	0.0344 0.0390	040312HGA 040312HGA
SW11-052	PSNS126 PSNS126	TME	Composite_equal_time Composite equal time	3174-127 MSD 3174-127	0.0390	040312HGA 040312HGA
D W 11-032	1 5115120	I IVII.	composite_equal_time	Spiking Level, MS	0.0128	07031211UA
				Spiking Level, MSD	0.0238	
				rcent Recovery, MS	92%	
				ent Recovery, MSD	111%	
				RPD	18.9%	

Sample ID - Metals   Station Code   Total/Diss   Sample Type   MSL. Code   Hg   CVAF Batch ID			Fraction				
Laboratory Achieved Detection Limits Reporting Limit (MDL* 3.18)   0.0003   0.00003   0.000003   0.000003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.000003   0.000003   0.000003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.00003   0.000003   0.000003   0.00003	Sample ID - Metals	Station Code	(Total/Diss)	Sample Type			CVAF Batch ID
NS2					Instrument:		
MS2							
MSD2	Reporting Limit (MD	L* 3.18)				0.0003	
MSD2							
SW11-055							
Spiking Level, MS   0.0149   0.0145   Percent Recovery, MS   97%   Percent Recovery, MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recovery MS   Percent Recover							
Spiking Level, MSD   0.0145   97%   Percent Recovery, MS   97%   Percent Recovery, MS   97%   Percent Recovery, MS   105%   Percent Recovery, MSD   105%	SW11-055	PSNS124.1	DME	Composite_equal_time			040312HGA
Percent Recovery, MSD   105%							
REPLICATE PRECISION   SW10-043   PSNS015   TME   Composite_equal_time   3174-105 R1   0.0119   032912HGA							
RPD   7.3%   FREPLICATE PRECISION   SW10-043   PSNS015   TME   Composite_equal_time   3174-105 R1   0.0119   032912HGA   0.0124   0.0136							
Note				Perc	ent Recovery, MSD	105%	
SW10-043					RPD	7.3%	
SW10-043	DEDI ICATE DDEC	TISION					
DUP         PSNS015         TME         Composite_equal_time and proposite_equal_time and propos			TMF	Composite equal time	3174-105 R1	0.0119	032912HGA
Name							
SW10-043	DOI	1 5145015	TIVIL	composite_equal_time			03271211071
SW10-043							
DUP       PSNS015       TME       Composite_equal_time Mean Mean RPD       3174-105 R2re Mean 0.0131 RPD       0.0148 0.0131 RPD       0.0131 0.0131 RPD         SW11-048       PSNS84.1       TME       Composite_equal_time Composite_equal_time PSNS84.1       3174-123 0.00400 040312HGA 040312HGA 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 0.0040					M D	20 / 0	
DUP       PSNS015       TME       Composite_equal_time Mean Mean RPD       3174-105 R2re Mean 0.0131 RPD       0.0148 0.0131 RPD       0.0131 0.0131 RPD         SW11-048       PSNS84.1       TME       Composite_equal_time Composite_equal_time PSNS84.1       3174-123 0.00400 040312HGA 040312HGA 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 040312HGA 0.00408 0.0040	SW10-043	PSNS015	TME	Composite equal time	3174-105 R1re	0.0115	032912HGA
Nean   0.0131   RPD   25%							
SW11-048	201	15115010	11,12	composite_equal_time			052) 1211011
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           Mean         0.00408           RPD         4%           STANDARD REFERENCE MATERIAL           SRM 1641 (1)         TME         Freshwater         1641d 032812         1637         032912HGA           SRM 1641 (1)         TME         Freshwater         1641d 040212         1550         040312HGA           Certified Value range         ±18           SRM 1641 (1)         PD         3%							
DUP         PSNS84.1         TME         Composite_equal_time         3174-123r2         0.00416         040312HGA           Mean         0.00408           RPD         4%           STANDARD REFERENCE MATERIAL         TME         Freshwater         1641d 032812         1637         032912HGA           SRM 1641 (1)         TME         Freshwater         1641d 040212         1550         040312HGA           Certified Value range         ±18           SRM 1641 (1)         PD         3%						20,0	
DUP         PSNS84.1         TME         Composite_equal_time         3174-123r2         0.00416         040312HGA           Mean         0.00408           RPD         4%           STANDARD REFERENCE MATERIAL         TME         Freshwater         1641d 032812         1637         032912HGA           SRM 1641 (1)         TME         Freshwater         1641d 040212         1550         040312HGA           Certified Value range         ±18           SRM 1641 (1)         PD         3%	SW11-048	PSNS84.1	TME	Composite equal time	3174-123	0.00400	040312HGA
Mean   0.00408   RPD   4%	DUP				3174-123r2	0.00416	040312HGA
STANDARD REFERENCE MATERIAL           SRM 1641 (1)         TME         Freshwater         1641d 032812         1637         032912HGA           SRM 1641 (1)         TME         Freshwater         1641d 040212         1550         040312HGA           Certified Value range         ±18           SRM 1641 (1)         PD         3%					Mean	0.00408	
STANDARD REFERENCE MATERIAL           SRM 1641 (1)         TME         Freshwater         1641d 032812         1637         032912HGA           SRM 1641 (1)         TME         Freshwater         1641d 040212         1550         040312HGA           Certified Value range         ±18           SRM 1641 (1)         PD         3%					RPD	4%	
SRM 1641 (1)         TME         Freshwater         1641d 032812         1637         032912HGA           SRM 1641 (1)         TME         Freshwater         1641d 040212         1550         040312HGA           Certified Value range         ±18           SRM 1641 (1)         PD         3%	STANDARD REFE	RENCE MATERIAI					
SRM 1641 (1)  TME Freshwater 1641d 040212 1550 040312HGA  Certified Value range ±18 SRM 1641 (1) PD 3%				Freshwater	1641d 032812	1637	032912HGA
range ±18 SRM 1641 (1) PD 3%	SRM 1641 (1)		TME	Freshwater	1641d 040212	1550	040312HGA
range ±18 SRM 1641 (1) PD 3%					Certified Value	1590	
SRM 1641 (1) PD 3%							
		SRM 1641 (1)					

#### 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

#### **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 ≤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 inidicates 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 pertroleum 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

**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),

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 (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.

## **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
- 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 OC criterion of <30%
- B Analyte detected in the method blank > RL and sample concentration < 10 times detected blank value
- Reported result exceeds linear range; use with caution
- 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 ≤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.

**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 O	OF CUSTODY FOR	RM													Battelle				
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	Page:	of 2 1														1529 Wes	st Sequim B	Bay Road		
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		PSNSNon-dry Doo														Attention:				
		•				An	alyz	e pa	aran	nete	rs pe	r QA	P/FS	SP.			Phone: (36	60) 681-4:	564	•
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Signature on Branchen Scient Phine

Printed Name

O Turbidity measured in SW Lab W/ Hach 2100P meter

CardnoTEC

2 Very low Sample voi. >2000 ml

Printed Name

B Extremely low Sample Vol Stormwater Events 10 and 11

#### Battelle SAMPLE CHAIN OF CUSTODY FORM Marine Sciences Laboratory Date: 3/1/2012 1529 West Sequim Bay Road SW = Stormwater Page: 1 of 1 Laboratory: Battelle MSL Project No.: 54220 Attention: Jill Brandenberger Project: Non-dry Dock Stormwater SW10 Phone: (360) 681-4564 Analyze parameters per QAP/FSP TME/DME containers Hardness DME DOC TSS **T0C** Sample Type (grab Collection ģ vs. Comp) Lab Code Storm# Date/Time Matrix Station ID Sample Label SW10 3174\*105 1 x comp 02/29/12 1327 SW SW10-043 PSNS015 SW10 3174\*106 1 02/29/12 1327 **PSNS015** SW lχ comp SW10-044 SW10 3174\*107 SW x 1 comp PSNS084.1 02/29/12 1336 SW10-045 SW 1 SW10 3174\*108 02/29/12 1336 amoo x SW10-046 PSNS084.1 SW10 3174\*109 SW х 1 comp SW10-047 **PSNS126** 02/29/12 1237 SW10 3174\*110 SW 1 02/29/12 1237 x comp SW10-048 **PSNS126** 3174\*111 SW10 SW x 1 comp 02/29/12 1237 PSNS126DUP SW10-049 SW10 3174\*112 SW 1 comp 02/29/12 1237 SW10-050 PSNS126DUP x 3174\*113 SW10 SW 1 02/28/12 1851 х comp SW10-051 PSNS124 3174\*114 SW10 PSNS124 SW 1 comp SW10-052 02/28/12 1851 Х SW 1 SW10 3174\*115 х SW10-053 02/29/12 1340 comp PSNS115.1 SW10 3174\*116 SW 1 comp SW10-054 PSNS115.1 02/29/12 1340 х 3174\*117 SW10 SW 1 SW10-055 PSNS124.1 02/28/12 2026 х comp 3174\*118 SW10 SW SW10-056 PSNS124.1 02/28/12 2026 comp Total # of Containers Received by: Relinquished by: Shipment Method: looo Retained at PNNL Date Time Signature Signature PNNL Jon Brandengerger Sample Disposition: Printed Name Printed Name Company Distribution: Received by: Relinquished by: 1) PNNL Date Time Signature Signature

Printed Name

Company

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

SOP#: MSL-A-001

Central File #: 3174 Sample No(s): 105-118 Batch: 11
Project Name: SW10 Project Manager: 7MB
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: 5pit
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±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 <u>all</u> chain of custody forms signed and dated?
Were samples filtered at MSL?
Sample condition(s): Other (explain):
Container type: Teflan Poly, Glass Cap. Vial Other:
Notes:
Completed By: //n 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
Date: 12/10.
1 ot#
- Kerrigerator resta
Completed By: Malla (h. Date/Time: 3/1/12 1+;50
Storage Shelf: K-4-D

SAMPLE CHAIN	OF CUSTODY FO	ORM													Battelle		
Date:	3/1/2012														Marine Scier	nces Labora	tory
	1 of 3		SW = Storr	nwa	ater										1529 West S	Sequim Bay	Road
Project No.:				1											Laboratory:	Battelle MS	L
	Non-dry Dock St	ormwater SW10													Attention: .	Jill Brandent	perger
	•			An	alyz	ze pa	ara	met	ers	per	QΑ	P/F	SP			Phone: (36	60) 681-4564
													il				
Sample I abel	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH				No containers	I I VDE (GIAD	Storm#	Lab Code
Sample Label SW10-001	PSNS124.1	02/29/12 1535	SW		-	$\vdash$	_	┢	$\vdash$	X	-	-	$\vdash$	2		SW10	Lab Code
SW10-001	PSNS124.1	02/29/12 1558	SW	$\vdash$	┢		$\vdash$	+	╁	x		<del> </del>	$\vdash$	1 2		SW10	
SW10-002 SW10-003	PSNS126 Dup	02/29/12 1538	SW	-	┢		-	╁	┢	x	-	<del> </del>	$\vdash$	1 2		SW10	
SW10-003	PSNS124	02/29/12 1618	SW	-	╁	<u> </u>	$\vdash$	1	╫┈	x	-	$\vdash$	$\vdash$	1 2		SW10	
SW10-004	PSNS 115.1	02/29/12 1640	SW	$\vdash$	┢	1	H	-	┢	x	╂	┢	╁─┼	1 2		SW10	
SW10-005	PSNS084.1	02/29/12 1658	SW	-				$\vdash$	╁	X	$\vdash$	-	$\vdash$	1 2		SW10	
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SW10-007	PSNS015	02/29/12 1327	SW	x	一	<del>                                     </del>	H	+-	$\vdash$		┢	$\vdash$	$\vdash$	$\frac{1}{1}$		SW10	
SW10-015	PSNS015	02/29/12 1327	SW	Ĥ	x	+	┢	1	┢	╁	<u> </u>			+i		SW10	
SW10-010	PSNS015	02/29/12 1327	SW	$\vdash$	Ĥ	x	┢	╁	┢				$\vdash$	<del>-   i</del>		SW10	
SW10-018	PSNS015	02/29/12 1327	SW	╁	t	<del> ``</del>	×			T	┢			$-\frac{1}{1}$	<del></del>	SW10	
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SW10-020	PSNS084.1	02/29/12 1336	SW	Ť.	l <sub>x</sub>	+-	t	╁┈	╁			$\vdash$		1		SW10	
SW10-021	PSNS084.1	02/29/12 1336	SW	$t^-$	Ĥ	x		T		T	†			1		SW10	
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C. Sushu	Signature	Date Batalense	Time						natu	re					Fedex to CA	s	
	Printed Name	Company						Prin	nted	Nam	ne				Sample Disp	osition:	
Relinquished by:					Re	eceiv	ved	by:							Distribution: 1) PNNL		
	Signature	Date	Time					Sig	natu	re	-				2) CAS		
	Printed Name	Company						Pri	nted	Nan	ne				1		

2 Coolers

SAMPLE CHAIN	OF CUSTODY FO	RM														Battelle		
	3/1/2012															Marine Scien		•
	2 of 3		SW = Storr	nwa	ter											1529 West S	equim Bay l	Road <sub>.</sub>
Project No.:				1											l	Laboratory: I		
	Non-dry Dock Sto	rmwater SW10															ill Brandent	
•				An	alyz	e pa	arar	nete	ers	per	QAI	P/FS	SP.				Phone: (36	60) 681-4564
		Collection		Hardness	TOC	DOC	TSS	TME/DME	DME	ТРН					No. comainers	Sample Type (grab	Stownt	Lab Code
Sample Label	Station ID	Date/Time	Matrix	_	ļ							-	-		<u>=</u>   1	vs. Comp)	Storm# SW10	Lab Code
SW10-022	PSNS084.1	02/29/12 1336	SW	<u> </u>			Х							<del>-</del>	┧		SW10	
SW10-023	PSNS126	02/29/12 1237	SW	X								-	-+	—	┧	comp	SW10	
SW10-024	PSNS126	02/29/12 1237	SW	⊢	х										1	comp	SW10	
SW10-025	PSNS126	02/29/12 1237	SW	-		Х							-		_	comp	SW10	
SW10-026	PSNS126	02/29/12 1237	SW	-			Х					$\dashv$		-	1	comp	SW10	
SW10-027	PSNS126DUP	02/29/12 1237	SW	×	ļ.,.						$\vdash$		$\dashv$		1	comp	SW10	
SW10-028	PSNS126DUP	02/29/12 1237	SW	_	X							$\vdash$	-		1	comp	SW10	
SW10-029	PSNS126DUP	02/29/12 1237	SW	<u> </u>		Х							-+	-	1	comp	SW10	
SW10-030	PSNS126DUP	02/29/12 1237	SW	_	-	_	X	<u> </u>	_				$\dashv$		1	comp	SW10	
SW10-031	PSNS124	02/28/12 1851	SW	×	_	_						$\vdash$	+	-	1	comp	SW10	
SW10-032	PSNS124	02/28/12 1851	SW	<u> </u>	х	<u> </u>	_		<u> </u>						1	comp	SW10	
SW10-033	PSNS124	02/28/12 1851	SW	↓_	<u> </u>	X	<u> </u>		<u> </u>	_		$\vdash$		-+	1	comp		
SW10-034	PSNS124	02/28/12 1851	SW		ļ	_	X			_	_			<del>-</del> +	1	comp	SW10 SW10	
SW10-035	PSNS115.1	02/29/12 1340	SW	X	_	L_	L.,	<u> </u>							1	comp		
Relinquished by:		3121			Re	cei	<u>/ed</u>		<b>7</b> -							Total # of Co		
- Con	<del></del> .	3/21/2	<u>150</u> 0						DĘ.							Shipment Me Fedex to CA		
(.505	Signature	Date Battale	Time					Sigi	natu	re 								
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Relinquished by:					Re	ceiv	/ed	by:								Distribution:		
					<u> </u>											1) PNNL		
	Signature	Date	Time					Sig	natu	re						2) CAS		
	Printed Name	Company						Prir	nted	Nam	ie							

SAMPLE CHAIN	OF CUSTODY FO	RM	••													Battelle		
	3/1/2012															Marine Scien	ces Labora	tory
Page:			SW = Storn	nwa	iter											1529 West Se		
Project No.:																Laboratory: [		
	Non-dry Dock Sto	ormwater SW10													Ī		ill Brandent	
, 10,000.	11011 011 011			An	alyz	е ра	arar	nete	ers	per	QΑ	P/F	SP				Phone: (36	60) 681-4564
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				<u>,,</u>				111							s			
				Hardness		0		TME/DME	111	_					containers			
				ιğ	T0C	DOC	TSS	Z/D	DME	TPH					<u></u>			
				ā	-		_	ME		-					5	Sample		
		Collection		-				_							. 1	Type (grab		
Sample Label	Station ID	Date/Time	Matrix											:	2	vs. Comp)	Storm#	Lab Code
SW10-036	PSNS115.1	02/29/12 1340	SW		Х										1	comp	SW10	
SW10-037	PSNS115.1	02/29/12 1340	SW			Χ								_	<u>1</u>	comp	SW10	
SW10-038	PSNS115.1	02/29/12 1340	SW				Χ								1	comp	SW10	
SW10-039	PSNS124.1	02/28/12 2026	SW	Х						<u> </u>					1	comp	SW10	
SW10-040	PSNS124.1	02/28/12 2026	SW		Х					L.					1	comp	SW10	
SW10-041	PSNS124.1	02/28/12 2026	SW			Χ		<u> </u>	<u> </u>	L	<u> </u>				1	comp	SW10	
SW10-042	PSNS124.1	02/28/12 2026	SW				Х		<u>L</u>		L			_	1	comp	SW10	
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		<u></u>			<u> </u>	<u> </u>		<u> </u>	<u> </u>	1	<u> </u>	<u> </u>				Total # of Co	ntainere	<u> </u>
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Ch		3/2/12			-		-0	- 7							_	Fedex to CA	_	
C. SUSL	Signature	Battello _	Time					Sig	natu	ire					(	Iredex to CA	9)	
<u>C. 2081</u>					-			D-:-	-44	Man		-			_	Sample Disp	osition.	
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	D. L. I.M.	Common			-			Dri	nted	Nan	ne					<u> </u>		
	Printed Name	Company						1,118	iteu	11011						<u> </u>		

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#### SAMPLE CHAIN OF CUSTODY FORM

Date: 3/1/2012

Project No : 54220 SW = Stormwater

**Battelle** 

Marine Sciences Laboratory
1529 West Sequim Bay Road

Project No																Laboratory:	Battelle MS	_
Project:	: Non-dry Dock Sto	rmwater SW10														Attention: .	Jill Brandent	•
	<b></b>			An	alyz	ze p	ara	met	ers	per	QA	P/F	SP				Phone: (36	60) 681-4564
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	1		T	<u> </u>	<u> </u>	<del> </del>	X		<del>                                     </del>			2	grab	SW10	<u> Lub oouo</u>
SW10-002	PSNS126	02/29/12 1558	SW	1	<b></b>	$I^-$				Х					2	grab	SW10	
SW10-003	PSNS126 Dup	02/29/12 1600	SW							X				一十	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	Х											1	comp	SW10	
SW10-016	PSNS015	02/29/12 1327	SW		Х										1	comp	SW10	
SW10-017	PSNS015	02/29/12 1327	SW			х									1	comp	SW10	
SW10-018	PSNS015	02/29/12 1327	SW				Х								1	comp	SW10	
SW10-019	PSNS084.1	02/29/12 1336	SW	х											1	comp	SW10	
SW10-020	PSNS084.1	02/29/12 1336	SW		х										1	comp	SW10	
SW10-021	PSNS084.1	02/29/12 1336	SW			Х					·				1	comp	SW10	
Relinquished by:	35 35 40	3/21/2	1500		Re	ceiv	∕ed ~C	by:	y							Total # of Co Shipment Me		
C. Susha	Signature	Date Sattelle Ma	Time		٠			Sigr	natur	e						Fedex to CA	S	
	Printed Name	Company						Prin	ted I	Nam	e					Sample Disp	osition:	
Relinquished by:					Re	ceiv	red		<u></u>	alan and a state of the state o	ando Molesson (					Distribution: 1) PNNL		
	Signature	Date	Time		r	)r<	كريد	Sigr		e つい	~	3		12	_	2) CAS		
	Printed Name	Company						Prin	ted I	Nam	е		91	نه ک	- 1			

2 Coolers

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#### SAMPLE CHAIN OF CUSTODY FORM

Date: 3/1/2012

Page: 2 of 3

SW = Stormwater

Battelle

Marine Sciences Laboratory
1529 West Seguim Bay Road

	. 2013		200 = 200	rrnw:	ater											1529 West S	, ,	
Project No.																Laboratory:	Battelle MS	L
Project	: Non-dry Dock Sto	ormwater SW10															Iill Branden	Ų.
		<u>.</u>		An	alyz	ze p	ara	met	ers	per	QA	P/F	SP				Phone: (36	60) 681-4564
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	HdL					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-022	PSNS084.1	02/29/12 1336	SW		1		X								1	comp	SW10	
SW10-023	PSNS126	02/29/12 1237	SW	Х											1	comp	SW10	
SW10-024	PSNS126	02/29/12 1237	SW		Х										1	comp	SW10	
SW10-025	PSNS126	02/29/12 1237	SW			Х									1	comp	SW10	
SW10-026	PSNS126	02/29/12 1237	SW		<u> </u>		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			Х									1	comp	SW10	
SW10-030	PSNS126DUP	02/29/12 1237	SW				Х								1	comp	SW10	
SW10-031	PSNS124	02/28/12 1851	SW	Х											1	comp	SW10	
SW10-032	PSNS124	02/28/12 1851	SW		Х										1	comp	SW10	
SW10-033	PSNS124	02/28/12 1851	SW			Х									1	comp	SW10	
SW10-034	PSNS124	02/28/12 1851	SW				Х								1	comp	SW10	
SW10-035	PSNS115.1	02/29/12 1340	SW	X											1	comp	SW10	
Relinquished by:					Re	ceiv	/ed		1000		····					Total # of Co	ntainers	
CAL	- CANADA CONTRACTOR CO	3/2/12	<u>1500</u> 0				4	- 6	Do	Ç.						Shipment Me	thod:	
0.506	Signaturo	Date Eastwee	Time					Sigr	natur	е				(	·	Fedex to CAS	3	
	Printed Name	Company						Prin	ted N	Nam	e.					Sample Dispo	osition:	
Relinquished by:					Re	ceiv	red		<u> </u>	$\overline{A}$	, e residente de la constitución de la constitución de la constitución de la constitución de la constitución d					Distribution: 1) PNNL		, .
	Signature	Date	Time		Ϋ́.	bri	O Al	Sign	natur Ub		)	in the second		3-1		2) CAS		
	Printed Name	Company					-	Prin	ted N	Nam	e							

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	OF CUSTODY FO	ORM	Fy													Battelle	r	
Page Project No.		0)440	SW = Stor	mwa 	ater											Marine Scier 1529 West S Laboratory:	equim Bay Battelle MS	Road L
Project	: Non-dry Dock St	ormwater SVV10		An	aly:	ze p	araı	met	ers	per	QΑ	P/F	SP			Attention: J	lill Brandent Phone: (36	perger 60) 681-4564
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	TPH				1	No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW10-036	PSNS115.1	02/29/12 1340	SW	$\vdash$	X	-	-	<u> </u>	-		$\vdash$	-	$\vdash$		<u>-</u> 1	comp	SW10	Lab Code
SW10-037	PSNS115.1	02/29/12 1340	SW			X						$t^-$	T		<u>.</u>	comp	SW10	
SW10-038	PSNS115.1	02/29/12 1340	SW	1		<u> </u>	X			<del> </del>	<del> </del>	T	+		1	comp	SW10	
SW10-039	PSNS124.1	02/28/12 2026	SW	X	<b> </b>				<del>                                     </del>		T	1	T		1	comp	SW10	
SW10-040	PSNS124.1	02/28/12 2026	SW	1	X								T		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				Х								1	comp	SW10	
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	Printed Name	Company						Prin	ted I	Nam	e					Sample Dispo	osition:	
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	Signature	Date	Time		0	ru	zl	Sign	natur 101	<b>(</b> /)		3	30			2) CAS		
	Printed Name	Company						Prin	ted I	Nam	e		070	10	Ī			

Printed Name

Company

Printed Name

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

PC AA

Client / Project: <u>Valtell</u>	<u>L</u>				Serv	rice Request	K12	1959	and and another the second	
Received: 3 3 1 Z	Opened: 3								3y:	man.
<ol> <li>Samples were received via?</li> <li>Samples were received in: (circle)</li> <li>Were <u>custody seals</u> on coolers'         If present, were custody seals in     </li> </ol>	Mail Fed Cooler NA	Ex	UPS ox N	DH Enve	L I lope yes, ho	Other ow many and verent, were they	vhere?	and Delivered	<i>NA</i>	N
Cooler Temp Temp °C Blank °C 4.7 2 1 3.3 1.0	Thermometer ID 302	C	iooler/C	OC N			Trackin	g Number	NA T	Filed  Y  X
7. Packing material: Inserts B 8. Were custody papers properly 9. Did all bottles arrive in good co 10. Were all sample labels comple 11. Did all sample labels and tags 12. Were appropriate bottles/conta 13. Were the pH-preserved bottles 14. Were VOA vials received with	filled out (ink, si ondition (unbrokete (i.e analysis, pagree with custo ainers and volumes (see SMO GEN S	gned, etc en)? In preservat dy paper es receiv (OP) rece	c.)?  dicate in the control of the c	in the to c.)? licate m the test	able bed ajor di s indica propriat	screpancies in		on page 2.	NA CY NA CY NA CY NA CY NA CY NA CY NA CY	N N N N N N N N N
5. Was C12/Res negative?  Sample ID on Bottle		Sam	ole ID o	n COC		antigetti, shake as the ap		Identified by:	¥A Y	N
Sample ID	Bottle Count Bottle Type		Head- space	Broke	рН	Reagent	Volume added	Reagent Lot Number	Initials	Time
		3								
Notes, Discrepancies, & Resolu	utions:		:							<u>.                                    </u>

Date: _Febr	aury 29, 2011	1 2/2/2	112									Battelle	
COC Number	1 er: 253 552 1781	1 317	46									1529 West 9	nces Laboratory Sequim Bay Road
												Sequim, Wa	shington 98382
Project No.:	USGS D6M11				E	VEN	T: We	et W	eathe	er Samp	oling		Battelle MSL
Project Nam	e: Mercury Burd	en on Organisms			ļ					•			1529 W. Sequim Bay Road
					ł							1	Sequim, WA 98382
Project Mana Phone: (360	ager: Jill Brander	nberger										Attention:	ill Brandenberger
FIIONE. (300	0) 001-3008			· <del>  · · · · · · ·</del>	L		Test	ing [	<sup>o</sup> arar	neters		,	Observations, Instructions
Lab. Use only: Lab ID	Sample ID	Sample Lable	Collection Date/Time	Matrix	Motals (The)	TOC					No. of containers		
SWID-IDL	3174.119	Anderson Creek	Feb 29, 2011 1201		X		-	╁╌	++		2		Comments
102	1 120	Gorst Creek	Feb 29, 2011 1200	1	1	H	-	+	$\vdash$	++	2	Blank 12072370	Samples of Opportunity
000000000 0000000000000000000000000000	M 121	Anderson Creek	Feb 29, 2011 1345			Ш		+-			2	12072370	collected for TSS
104	1 /22	Annapolis Creek	Feb 29, 2011 1500		H	Н	+	1	$\vdash$		2	12072430	Check Blank for suitability of bottle type
SW10-105	3174. 123	Blackjack Creek	Feb 29, 2011 1645		女	4	+	+-	$\vdash$	<del>- - -</del>	_	12072520	
					_	_	12/2	† -		<del>- - -</del>	3		
				1			7417	†-	$\vdash$		12		124
				<del>                                     </del>	$\dashv$	- 1	+			++	+-		NOTE: Samples are for
					_	-	_	$\vdash$		++-	+		Metals : TOC per
					$\neg$	$\dashv$	+		╌┼	++	╅		PM 8 3/2/12
				1	1	_	$\dashv$	$\vdash$	-+	+	+		9212
					$\neg$	_	+	+	+	+	+		
					Ť	+	+-		-	++	+		TOC Split taken enou
					_	+	+-	$\vdash$	-	<del></del>	╂╾╂		
2.50.1		4			$\dashv$	十	_	$\vdash$	-		+		
Relinquished	by:////////////////////////////////////		Stilien	1:4	7	Rec	eived	by:		<del></del>		Total # of Con	tainers : Cooler
.*			<u> </u>	49		3	20	ځد	4/2	1_		Shipment Met	Triple Bagged Over Ice in Cooler
ANT	howy is p	Signature U 4005W	Date U(S)S	Time	-				ature	_		Shinmont Mot	20 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
		Printed Name			-	ML	FM			W C	3/02	/12 /100	1
Relinquished	by:		Company		4	Rec	منيمط		ed Na	me		Sample Dispos	sition:
						100	eived	υy.				Distribution:	Abolatan
	:	Signature	Date	Time	ŀ			Sian	ature			i) ∠ copies to 2) 1 copy to p	the Laboratory roject manager
	<del></del>							ə." 				3) Return con	oject manager opleted original to
		Printed Name	Company					Print	ed Na	me	$\neg \neg$		ne Sciences I aboratory

**Battelle** 

SAMPLE CHAIN OF CUSTODY FORM

# 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.]

			Sample		
Study Site Name	Field Identifier	USGS Site identifier	date	Latitude	Longitude
	Stream Sites				
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 05/15/08	473125.4	1224059.7
Blackjack Creek at mouth at Port Orchard, WA	Blackjack	12072510	05/07/08 05/14/08	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
	Storm Water Sit	es			
Drainage outfall at navy city recycle near Gorst, WA PSNSO15 Storm vault A42 PIPE 4 NR BREMERTON WA	Navy City	473144122415401	01/07/09	473144.9	1224153.8
PSNS124 Storm vault I/55-9 NR BREMERTON WA	PSNS 015 PSNS 124	473329122390304 473336122374701	01/07/09 01/07/09	473333.9 473340.3	1223747.8 1223748.2
PSNS124.1 Storm vault J/56-1 NR BREMERTON WA Storm outfall at sheridan Rd. near Bremerton, WA	PSNS 124.1 Sheridan Road	473336122374401 473510122384701	01/07/09 01/08/09	473339.9 473510	1223744.7 1223847
Stormwater outfall at Port Orchard boat ramp PSNS 015-2253	PO boat ramp PSNS 015-2253*	473225122382801 473322122390201	01/08/09	473222.9	1223828.7
* PSNS 015-2253 is not the NDDES site for the DSNS 045 at			12/29/09 03/31/10	473322.6	1223902.9

<sup>\*</sup> PSNS 015-2253 is not the NPDES site for the PSNS-015 storm drain, 2253 is the label of the manhole vault.



**Battelle** The Business of Innovation

**SAMPLE LOGIN** 

Project Manager: Brandenberger

Date Received: 3/2/2012

Batch: 12

Login Designee: McGahan

Marine Sciences Laboratory 1529 West Sequim Bay Road Sequim, Washington 98382

PH: (360) 681-4565

Proiect:	<b>Envvest</b>	<b>SW10</b>
----------	----------------	-------------

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



SOP#: MSL-A-001

Central File #: 3/74 Sample No(s): //	7-123	Batch:	12
Project Name: SWID EXUVESA		Project Manager:	Brondonbergo
TO BE COMPLETED BY PROJECT MANAGER (prior to a	prival when pos	sible)	
Matrix:	. WP#		-
Yes No Navy-type Project (requires high-level sam	onla trackina pro	vedurest	
		PM Verification:	
USDA Samples (see Compliance Agreemen	it Checkiisi)	rw verification.	
	<u> </u>	Half of sar	
Filter Samples: Amount:	Entire sample	<del></del>	
Freeze dry sample(s) - samples will be weight	gnea and placea	in all alow temp is eeze	, (cognicae)
Special instructions:			
Sample Preservation Instructions:  **See LIMS for archive/disp	osal information	1**	
TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG	<u>9-IN</u>		
Yes No N/A Indicate in Appropriate Box			
Custody seal present	Seal intact?	YES NO	
Cooler temperature (acceptable ra		olids:frozen)	<u>S. / °c</u>
(if multiple coolers, note temp. o			
Project Manager notified of any cu  Comment/Remedy:	ıstody/login disc	crepancies (cooler temp	, sponsor codes, etc)
Were all chain of custody forms si	igned and dated:	· · · · · ·	Au d
Were samples filtered at MSL?	•		
			, , , , , , , , , , , , , , , , , , ,
Sample condition(s):	Other (explain	):	
Container type: Teflan Poly Glass	Cap. Vial	Other:	
Notes: 500 me poly - Pick Sampes	Bla	we= 250 ml	- Poly 3-3/2h
		03/02	100 400
Completed By: Wohn	-	Date/Time: 702	1/2 1100
SAMPLE PRESERVATION			
Sample(s) were preserved prior to arrival at MSL	(noted on CoC /	Sample / per PM Instru	uction)
		•	·
Random pH checked for ~10% of samples (use dip		Sample IDs:	
Complete pH check required for project (use pH n	neter and recor	d on pH Record form)	
C Sample(s) were preserved at MSL			
Type: C: 0.2% HNO3 Notes:	ep-	tima_	Lot# /2//020
0.5% HCl (Hg samples) Notes:			Lot#
Refrigerate/Freeze Notes:			
Other Notes:	DAC +	o dup for 6	8
10.11		2/5	10 16124
Completed By:	-	Date/Time: 3/3	71213.30
Storage Shelf: K-4-X	V	· · ·	

	OF CUSTODY FO	RM														Bat	ttelle	•			
Date: 3 /14 /	12															Mar	ine S	cienc	es Lal	poratory	
Page:l		- <b>-</b>														152	9 We	st Se	quim E	Bay Road	
Project No.:	N4523A10MP000															Lab	orato	ry: B	attelle	MSL	
Project:	PSNSNon-dry Do	ck SW 2010														Atte	ntion			denberger	
		<del> </del>			Ar	aly	ze p	ara	mel	ers	per	QA	P/F	SP				Pho	ne: (3	60) 681-4564	
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME		Turbidity					- No. containers	Ty (G V Co	mple /pe rab /s. mp)		orm#	Notes / Comp. Cond. (µS/cm) and Turb. (NTU) Readings	
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Battelle

	SAMPLE CHAIN Date: 315 12 Page: 1 Project No.: Project:	of CUSTODY FO of / N4523A10MP000 PSNSNon-dry Do	 034 Amend.1			An	alyz	<b>(e. p</b>	arai	met	ers	per	QAI	2/JFS	P	1529 We	ciences Lab st Sequim B ry: Battelle : Jill Brand	Bay Road MSL
5N11	Sample Label Swi1 - 6001 Swi1 - 012	Station ID PSNS 015	Collection Date/Time 3   5   2   60	Matrix Sい Sい	× ≺ Hardness	X	× × poc	X	イン TME/DME	ТРН	Turbidity (4)	<b>&gt;</b>			No. containers	Comp)	Storm#	Notes / Comp. Cond. (µS/cm) and Turb. (NTU) Readings
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013	SW114016/	PS-NS 1241	3/15/12 1658		X	X	X	X	X						1	comp	50011	190/4
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Analytical Chemistry Data Package, Non-Dry Dock Stormwater Events 10 and 11

<b>SAMPLE CHAIN</b>	OF CUSTODY FO	RM														Battelle		
Date	: 3/16/2012															Marine Scien	ces Labora	tory
Page	: 1 of 1		SW = Storr	nwa	ater											1529 West S	equim Bay	Road
	: 54220 / 62375															Laboratory:		
Project	: Non-dry Dock Sto	ormwater SW11														Attention: .	lill Brandent	
				An	alyz	ера	arar	net	ers	per.	QΑ	P/F	SP				Phone: (36	0) 681-4564
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SW11-044	PSNS015	3/15/12 1601	SW					Х							1	comp	SW11	3174*119
SW11-045	PSNS015	3/15/12 1601	SW						х						1	comp	SW11	3174*120
SW11-046	PSNS015DUP	3/15/12 1601	SW					Х							1	comp	SW11	3174*121
SW11-047	PSNS015DUP	3/15/12 1601	SW						х						1	comp	SW11	3174*122
SW11-048	PSNS84.1	3/15/12 1656	SW					Х							1	comp	SW11	3174*123
SW11-049	PSNS84.1	3/15/12 1656	SW						х						1	comp	SW11	3174*124
SW11-050	PSNS115.1	3/15/12 1558	SW					х							1	comp	SW11	3174*125
SW11-051	PSNS115.1	3/15/12 1558	SW						Х						1	comp	SW11	3174*126
SW11-052	PSNS126	3/15/12 1529	SW					Х							1	comp	SW11	3174*127
SW11-053	PSNS126	3/15/12 1529	SW						Х						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						Х						1	comp	SW11	3174*132
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	Printed Name	Company						Prin	ted I	Namo	e					Sample Disp	osition:	
Relinquished by:					Re	ceiv	ed l	by:								Distribution: 1) PNNL		
	Signature	Date	Time					Sigr	natur	e				<u></u>				
	Printed Name	Company						Prin	ted t	Vamo	a.							





**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)

Spor	nsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
SW	11-044	PSNS015	3174*119	Water	Prep Lab	Total Metals	03/15/12
SW.	11-045	PSNS015	3174*120	Water	Prep Lab	Dissolved Metals	03/15/12
SW.	11-046	PSNS015DUP	3174*121	Water	Prep Lab	Total Metals	03/15/12
SW.	11-047	PSNS015DUP	3174*122	Water	Prep Lab	Dissolved Metals	03/15/12
SW <sup>2</sup>	11-048	PSNS84.1	3174*123	Water	Prep Lab	Total Metals	03/15/12
SW <sup>2</sup>	11-049	PSNS84.1	3174*124	Water	Prep Lab	Dissolved Metals	03/15/12
SW	11-050	PSNS115.1	3174*125	Water	Prep Lab	Total Metals	03/15/12
SW	11-051	PSNS115.1	3174*126	Water	Prep Lab	Dissolved Metals	03/15/12
SW <sup>2</sup>	11-052	PSNS126	3174*127	Water	Prep Lab	Total Metals	03/15/12
SW	11-053	PSNS126	3174*128	Water	Prep Lab	Dissolved Metals	03/15/12
SW <sup>2</sup>	11-054	PSNS124.1	3174*129	Water	Prep Lab	Total Metals	03/15/12
SW	11-055	PSNS124.1	3174*130	Water	Prep Lab	Dissolved Metals	03/15/12
SW	11-056	PSNS124	3174*131	Water	Prep Lab	Total Metals	03/15/12
SW <sup>2</sup>	11-057	PSNS124	3174*132	Water	Prep Lab	Dissolved Metals	03/15/12

SOP#: MSL-A-001

LOG-IN CHECKLIST		Re	ference SOP# MSL-A-001	
Central File #: 3174 Sample No(s): \\	7-132	Batch	: 12	
Project Name: ENVEST SWII		Project Manager	: JMB	
TO BE COMPLETED BY PROJECT MANAGER (prior	to arrival when possi	ble)		
Matrix: Water	WP#			
I	al comple teacking proc	edunes)		
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CODA Samples (see compliance Agre	emeni checkiisi)	,,, ,c,,,,cario		
Filter Samples: Amount:	Entire sample	Half of sa	nple	
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1 · · · · · · · · · · · · · · · · · · ·	/disposal information*			
TO BE COMPLETED UPON SAMPLE ARRIVAL	/LOG-IN			
		Ha	ind delivered	
	Seal intact?	YES NO		
Central File #: 2114 Sample No(s): 147 137 Batch: 12 Project Name: CONNEST SWII Project Manager: TIMB.  TO BE COMPLETED BY PROJECT MANAGER (prior to arrival a when possible)  Matrix: Watta WP#  Yes No Navy-type Project (requires high-level sample tracking procedures)  USDA Samples (see Compliance Agreement Checklist)  Filter Samples: Amounit: Entire sample Holf of sample  Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)  Special instructions:  Sample Preservation Instructions:  "See LIMS for archive/disposal information**  TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN  VS No N/A Indicate in Appropriate Box  Custody seal present Seal intact? YES NO  Cooler temperature (acceptable range: 422°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? AS Notes.  Were all chain of custody forms signed and dated?  Were samples filtered at MSL? AS Notes.  Completed By:  Date/Time: 31WW2  Lost# 21102  Complete pH checked for -10% of samples (use dip paper)  Sample(s) were preserved prior to arrival at MSL (noted on Coc / Sample / per PM Instruction)  Sample(s) were preserved at MSL  Type: 0.2% HNO3  Notes: Watch  Refrigerate/Freeze  Notes:  Other  Completed By:  Date/Time: 31WW2  MSD  Notes:  Date/Time: 31WW2  MSD  Notes:  Date/Time: 31WW2  MSD		>4c ·c		
Central File # 3/14 Sample No(s): 19 137 Batch: 12 Project Name: 500055 SW) Project Manager: 5 TO BE COMPLETED BY PROJECT MANASER (prior to arrival when possible)  Matrix: 102te, 1924  Ves No Navy-type Project (requires high-level sample tracking procedures)  USDA Samples (see Compliance Agreement Checklist)  Filter Samples: Annount: Entire sample Half of sample  Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)  Special instructions:  "See LIMS for archive/disposal information"*  TO BE COMPLETED UPON SAMPLE ARRIVAL/OG-IN  Yes No N/A Indicate in Appropriate Box  We No N/A Indicate in Appropriate Box  Gooder temperature (acceptable range: 412°C or solidis:frozen)  (if multiple coolers, note temp. of each)  Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes Comment/Remedy:  Were all chain of custody forms signed and dated?  Were samples filtered at MSL? AS 9 Oct.  Sample condition(s):  Enther (emploin):  Container type:  Completed By:  Date/Time: 311412  Completed By:  Date/Time: 314412  Completed By:  Date/Time: 314412  Complete 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 (s) were preserved at MSL  Complete pH checked for ~10% of samples (use dip paper)  Sample (s) were preserved at MSL  Oction Project (use pH meter and record on pH Record form)  Sample(s) were preserved at MSL  Oction Project (use pH meter and record on pH Record form)  Sample(s) were preserved at MSL  Oction Project (use pH meter and record on pH Record form)  Sample(s) were preserved at MSL  Oction Project (use pH meter and record on pH Record form)  Sample(s) were preserved at MSL  Oction Project (use pH meter and record on pH Record form)  Sample(s) were preserved at MSL  Oction Project (use pH meter and record on pH Record form)			*c	
Project Manager notified of a	Antral File #: 314 Sample No(s): 197 Batch: 12			
	Sample No(s): 19 Project Manager: 12 Project Name: 2005 SWII Project Name: 2005 SWII Project Manager: 19 Project Manager: 2005 SWII Project Manager: 2005 SWII Project Manager: 2005 SWII Project Manager: 2005 SWII Project Manager: 2005 SWII Project Manager: 2005 SWII Project Manager: 2005 SWII Project Manager: 2005 Swii Project (requires high-level sample tracking procedures)    Word Navy-type Project (requires high-level sample tracking procedures)   USDA Samples (see Compliance Agreement Checklist) PM Verification:   Filter Samples:			
Comment/Remedy:	Project Manager:   Project Man			
	Sample No(s): 19			
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Were all chain of custody form  Were samples filtered at MSI	Project Manager: The project Manager: The project Manager: The project Manager: The project Manager: The project Manager: Matrix: Natrix:			
Were all chain of custody for Were samples filtered at MSI  Sample condition(s):	? AS notc.? Other (explain):			
Were all chain of custody form  Were samples filtered at MSI  Sample condition(s):  Container type:  Testor Poly 6	? AS notc.? Other (explain):			
Project Name: CONCEST MANAGER (prior to arrival when possible)  Matrix: Jacata WPH  Matrix: Jacata WPH  Ves No Navy-type Project (requires high-level sample tracking procedures)  USDA Samples (see Compliance Agreement Checklist)  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:  "See LIMS for archive/disposal information"  TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN  Yes No N/A Indicate in Appropriate Box  (if multiple coolers, note temp. of each)  Cooler temperature (acceptable range: 422°C or solids: frozen)  (if multiple coolers, note temp. of each)  Project Manager notified of any custody/login discrepancies (cooler temp. sponsor codes, e. Comment/Remedy:  Were all chain of custody forms signed and dated?  Were all chain of custody forms signed and dated?  Were samples filtered at MSL? AS (104c.)  Sample condition(s):  Container type:  Notes:  Completed By:  Date/Time: 31UU2  Ocomplete pH checked for ~10% of samples (use dip paper)  Sample (s) were preserved at MSL  Complete pH check required for project (use pH meter and record on pH Record form)  Sample(s) were preserved at MSL  Type:  O.2% HNO3  Notes:  Refrigerate/Freeze  Notes:  Other  Notes:  Other  Notes:  Other  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  Date/Time: 31UU2  Notes:  N				
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SAMPLE CHAIN	OF CUSTODY FOI	RM							•							Battelle		
Date:	3/16/2012															Marine Scien	ices Labora	tory
Page:	1 of 1		SW = Storr	nwa	ater											1529 West S		
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Project:	Non-dry Dock Stor	rmwater SW11															lill Brandent	
				An	alyz	e p	ara	met	ers	per	QA	P/F	<u>SP</u>				Phone: (36	60) 681-4564
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SW11-004	PSNS115.1	3/15/12 1605	SW		oxdot	$oldsymbol{ol}}}}}}}}}}}}}}}}}}$		<u> </u>		Х					2	grab	SW11	
SW11-005	PSNS124	3/15/12 1626	SW	igstyle igstyle	$oxed{igspace}$	<u> </u>	辶	匚		X	Ш			_	2	grab	SW11	
SW11-006	PSNS124DUP	3/15/12 1630	SW		$oxed{oxed}$		<u> </u>	L		Х	Ш		$\sqcup$		2	grab	SW11	
SW11-007	PSNS124.1	3/15/12 1658	SW	$oldsymbol{ol}}}}}}}}}}}}}}}}}$			$oldsymbol{ol}}}}}}}}}}}}}}}}}}$	<u> </u>		Х	Ш			_	2	grab	SW11	
SW11-008	PSNS124.1DUP	3/15/12 1705	SW		辶		<u> </u>	<u> </u>		Х		$oxed{oxed}$	$\sqcup$		2	grab	SW11	
			ļ <u>.</u>		<u> </u>		<u> </u>	<u> </u>			$\square$	Ш						
				$oldsymbol{ol}}}}}}}}}}}}}}}}}}$	<u> </u>	<u> </u>	丄	<u> </u>			Ш		$\sqcup$		_			
				$oldsymbol{ol}}}}}}}}}}}}}}}}}$	<u> </u>	<u> </u>		<u> </u>		L		Ш						
X/					<u> </u>		<u> </u>	_										
OS				$oldsymbol{ol}}}}}}}}}}}}}}}}}}$														
					<u> </u>	<u></u>		<u> </u>		<u> </u>								
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Min															_	Shipment Me		
C. Susue	Signature	Date MSU	Time					Sig	natui	re				(		Fedex to CA	s)	
	Printed Name	Company						Prir	nted I	Nam	ie					Sample Disp	osition:	
Relinquished by:					Re	cei	ved	by:					-			Distribution:		
	Signature	Date	Time		-				natur							1) PNNL 2) CAS		
					_													
	Printed Name	Company						Prir	nted l	Nam	e					l		

#### **Battelle** SAMPLE CHAIN OF CUSTODY FORM Date: 3/16/2012 Marine Sciences Laboratory Page: 2 of 2 SW = Stormwater 1529 West Sequim Bay Road Project No.: 54220 / 62375 Laboratory: Battelle MSL Project: Non-dry Dock Stormwater SW11 Attention: Jill Brandenberger Phone: (360) 681-4564 Analyze parameters per QAP/FSP TME/DME Hardness containers DME 70C 200 TSS 표 Sample Type (grab Collection ĝ Sample Label Station ID Date/Time vs. Comp) Matrix Storm# Lab Code SW11-030 PSNS115.1 3/15/12 1558 SW X 1 SW11 comp SW11-031 PSNS115.1 3/15/12 1558 SW X 1 **SW11** comp SW11-032 PSNS126 SW 3/15/12 1529 Х 1 SW11 comp SW11-033 **PSNS126** 3/15/12 1529 SW Х 1 SW11 comp SW11-034 **PSNS126** 3/15/12 1529 SW 1 **SW11** comp SW11-035 **PSNS126** 3/15/12 1529 SW X **SW11** 1 comp SW11-036 PSNS124.1 3/15/12 1658 SW Х 1 SW11 comp SW11-037 PSNS124.1 3/15/12 1658 SW X 1 **SW11** comp PSNS124.1 SW SW11-038 3/15/12 1658 X 1 **SW11** comp SW11-039 PSNS124.1 SW 3/15/12 1658 X 1 SW11 comp SW11-040 **PSNS124** 3/15/12 1400 SW X 1 SW11 comp SW11-041 PSNS124 3/15/12 1400 SW Χ 1 **SW11** comp SW11-042 SW **PSNS124** 3/15/12 1400 X 1 SW11 comp SW11-043 3/15/12 1400 PSNS124 SW X **SW11** comp Relinguished by: Received by: Total # of Containers Shipment Method: Signature Time Fedex to CAS Date Signature Sample Disposition: Printed Name Company Printed Name Relinquished by: Received by: Distribution: 1) PNNL 2) CAS Signature Date Time Signature

Printed Name

Company

Printed Name

## **SAMPLE CHAIN OF CUSTODY FORM**

Date: 3/16/2012

Page: 1 of 2 SW = Stormwater

## **Battelle**

Marine Sciences Laboratory 1529 West Sequim Bay Road

	: 54220 / 62375															Laboratory:		
Project	: Non-dry Dock Sto	ormwater SW11														Attention: .	Iill Branden	
				An	alyz	e p	ara	met	ers	per	QA	P/F	SP.				Phone: (36	60) 681-4564
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	ТРН					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			Х									1	comp	SW11	
SW11-019	PSNS015	3/15/12 1601	SW	1			X								1	comp	SW11	
SW11-020	PSNS015DUP	3/15/12 1601	SW	X											1	comp	SW11	-
SW11-021	PSNS015DUP	3/15/12 1601	SW		Х									$\Box$	1	comp	SW11	
SW11-022	PSNS015DUP	3/15/12 1601	SW			Χ								一	1	comp	SW11	
SW11-023	PSNS015DUP	3/15/12 1601	SW				X								1	comp	SW11	
SW11-024	PSNS84.1	3/15/12 1656	SW	Х											1	comp	SW11	
SW11-025	PSNS84.1	3/15/12 1656	SW		Χ										1	comp	SW11	
SW11-026	PSNS84.1	3/15/12 1656	SW	Ī		Х									1	comp	SW11	
SW11-027	PSNS84.1	3/15/12 1656	SW				X							$\Box$	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		Х			-							1	comp	SW11	
Relinquished by:		-			Re	ceiv	ed	by:								Total # of Co	ntainers	
																Shipment Me	ethod:	
	Signature	Date	Time					Sigr	natur	е						Fedex to CA	S	
	Printed Name	Company						Prin	ted N	Name	9					Sample Disp	osition:	
Relinquished by:					Re	ceiv	ed/	by:								Distribution:		
																1) PNNL		
	Signature	Date	Time					Sign	natur	е						2) CAS		
	Printed Name	Company						Prin	ted N	Namo	 e					<del></del>		

Page: Project No.:	3/16/2012		SW = Storn	nwa 	iter										Battelle Marine Scier 1529 West S Laboratory: Attention:	equim Bay	Road L
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Ana	alyz	ze pa	arar	met	ers	per	QAI	P/FS	SP.		,		60) 681-4564
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC			TME/DME		ТРН				No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW11-001	PSNS015	3/14/12 1420	sw					<b></b>	<b> </b>	X		$\neg$	$\neg$	2	grab	SW11	Transition
SW11-002	PSNS84.1	3/14/12 1455	SW							X				2	grab	SW11	
SW11-003	PSNS126	3/15/12 1542	SW							X				2	grab	SW11	
SW11-004	PSNS115.1	3/15/12 1605	SW							X				2	grab	SW11	
SW11-005	PSNS124	3/15/12 1626	SW							Х				2	grab	SW11	
SW11-006	PSNS124DUP	3/15/12 1630	SW							X				2	grab	SW11	
SW11-007	PSNS124.1	3/15/12 1658	SW						T	Х				2	grab	SW11	
SW11-008	PSNS124.1DUP	3/15/12 1705	SW						T	X				2	grab	SW11	
<u> </u>																	
US																	
<b>"</b>																	
Relinquished by:		21. 1.	(200)		Re	ceiv	/ed	by:				, mg	7-12	315	Total # of Co		
Min		3/11/12	1500			1		1		4	500	01	114		Shipment Mc		
C. Sosue	Signature	Date MSU	Time		b	ra	d:	Sig	natui <u>O İ I</u>	re' ∩		125	Соци		Fedex to CA	s)	
	Printed Name	Company						Prir	nted I	Nam	ie			91	Sample Disp	osition:	
Relinquished by:	-				Re	ceiv	/ed	by:							Distribution: 1) PNNL		
	Signature	Date	Time					Sig	natur	e					2) CAS		

Printed Name

Company

Printed Name

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

PC AA

Client / Project: <u>Pattelle</u> 1	Marine S	Ciena	Δ	Serv	vice Request <b>I</b>	(12 <u>0</u>	2461		
Received: 3-17-12 Op	ened: 3.17.	12	Ву:		ar .			By: <u></u>	71
<ol> <li>Samples were received via?</li> <li>Samples were received in: (circle</li> <li>Were <u>custody seals</u> on coolers?</li> </ol>	Cooter	UPS Box	Enve	lope	Other			5	<sup>7</sup> A
If present, were custody seals into	act? Y	N		If pre	sent, were they	signed an	d dated?		Y N
Cooler Temp Ti		and the contract of the contra							
		:	(14)			Tracking	) Number: visar	30 - 28 - 1 N IN F	X
7. Packing material: (nserts Bag	ggies Bubble Wr	ap Gel P	gcks	Wett	ce Dry Ice	Sleeves	A		
8. Were custody papers properly fil	led out (ink, signed	l, etc.)?						NA C	y) N
9. Did all bottles arrive in good con	dition (unbroken)?	Indicate	in the t	able be	low.			NA (	N (Y
•	7								N N
		•			•	the table (	on page 2.	NA C	y) N
• • •								-	y) N
					te pH? <i>Indicat</i>	e in the ta	ble below (	-	
14. Were VOA vials received without	ut headspace? <i>Indi</i>	icate in the	table b	elow.				Aller C	
15. Was C12/Res negative?								NA)	Y N
Sample ID on Bottle		Sample ID o	n COC				Identified by:		
Sample ID			Broke	рН	Reagent	Volume added	Reagent Lot Number	Initial	s Time
			· ·						
Notes, Discrepancies, & Resoluti	ons:								
	***************************************							ä	
	ed: 3.1712 Opened: 3.7712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT Unloaded: 3.1712 By: BT UNLOADED: A UNLOADED: BDX Envelope Other NA Fleed Unloaded: 4.7								
		<del></del>			×				



	OF CUSTODY FO	PRM														Battelle		
	: 3/19/2012															Marine Sciences Laboratory		
	: 1 of 2		SW = Stor	ormwater										1529 West Sequim Bay Road				
	: 54220 / 62375 : Non-dry Dock Sto	ormunator CVVII 1														Laboratory:		
Project	. Non-dry Dock Sit	imwater Swiii		l <sub>n</sub>	alv.	* o . n.	050	m - t	0.50	505	<b>Ω</b> Λ	. ח / ר	.CD			Attention: .	Jill Branden	
		T .	1	AII	aiy z	ze pa	arai	T	T	per	T	T	JP T				Phone: (36	60) 681-4564 r
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	НДТ					No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW11-016	PSNS015	3/15/12 1601	SW	X				t			<b>†</b>				<u>-</u>	comp	SW11	
SW11-017	PSNS015	3/15/12 1601	SW		Х										1	comp	SW11	
SW11-018	PSNS015	3/15/12 1601	SW			Х						T			1	comp	SW11	
SW11-019	PSNS015	3/15/12 1601	SW	T			Χ		<u> </u>		1	1			1	comp	SW11	
SW11-020	PSNS015DUP	3/15/12 1601	SW	X								<b>1</b>			1	comp	SW11	
SW11-021	PSNS015DUP	3/15/12 1601	SW		Х										1	comp	SW11	
SW11-022	PSNS015DUP	3/15/12 1601	SW			X									1	comp	SW11	
SW11-023	PSNS015DUP	3/15/12 1601	SW				Χ								1	comp	SW11	
SW11-024	PSNS84.1	3/15/12 1656	SW	Х							1				1	comp	SW11	
SW11-025	PSNS84.1	3/15/12 1656	SW		Χ										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				Χ								1	comp	SW11	
SW11-028	PSNS115.1	3/15/12 1558	SW	Х											1	comp	SW11	
SW11-029	PSNS115.1	3/15/12 1558	SW		Χ		-								1	comp	SW11	
Relinguished by:	and the state of t	7/ /			Re	ceiv	ed	bу:	•				· · · · · · · · · · · · · · · · · · ·			Total # of Co	ntainers	
//mm	Charged the color of the color	3/19/12	134/		A CONTRACT	TA	ZL	<u> </u>								Shipment Me	ethod:	
(	Signature	Date	Time		Sec.			Sigr	natur	e	1	1				Fedex to CA		
JMB	rundenserger	PNNL				Two.	a Zum	E		3	121	1/17	-0	920	)			
	Printed Name	Company						Prin	ted I	Nam	e	/				Sample Disp	osition:	
Relinquished by:					Re	ceiv	ed	by:								Distribution:		
																1) PNNL		
	Signature	Date	Time					Sigr	natur	е						2) CAS		
	Printed Name	Company						Prin	ted I	Nam	е					***************************************		

K1202609

SAMPLE CHAIN C		RM													Battelle		
	3/19/2012														Marine Scien	ices Labora	tory
Page:			SW = Stor	mwa	ater										1529 West S	equim Bay	Road
	54220 / 62375														Laboratory:		
Project:	Non-dry Dock Sto	rmwater SVV11													Attention: J	ill Brandenl	
ļ		•		An	alyz	e pa	araı	mete	ers	per	QAI	P/FSP	.,			Phone: (36	60) 681-4564
				1								1					
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	DME	HdT			1 1	No. containers	Sample Type (grab vs. Comp)	Storm#	Lab Code
SW11-030	PSNS115.1	3/15/12 1558	SW			Χ								1	comp	SW11	
SW11-031	PSNS115.1	3/15/12 1558	SW				Χ							1	comp	SW11	
SW11-032	PSNS126	3/15/12 1529	SW	Х										1	comp	SW11	
SW11-033	PSNS126	3/15/12 1529	SW		Χ									1	comp	SW11	
SW11-034	PSNS126	3/15/12 1529	SW			Χ								1	comp	SW11	
SW11-035	PSNS126	3/15/12 1529	SW				Χ							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		Χ									1	comp	SW11	
SW11-038	PSNS124.1	3/15/12 1658	SW			Χ						-		1	comp	SW11	
SW11-039	PSNS124.1	3/15/12 1658	SW				Χ							1	comp	SW11	
SW11-040	PSNS124	3/15/12 1400	SW	Х										1	comp	SW11	
SW11-041	PSNS124	3/15/12 1400	SW		X									1	comp	SW11	
SW11-042	PSNS124	3/15/12 1400	SW			Χ								1	comp	SW11	
SW11-043	PSNS124	3/15/12 1400	SW				Χ							1	comp	SW11	
Relinquished by:	3/1	9/12 134	/		Red	ceiv	ed	by:)							Total # of Containers Shipment Method:		
	Signature	Date	Time		(	-	Jo G	Sign	atur			****			Fedex to CAS		
Till Brande		PNNL			3	200	ZF	- Olgi	3/2	20/	12	092	10	1	1 6467 10 0710	5	
	Printed Name	Company						Prin	7			<u> </u>		-	Sample Dispo	nsition.	
Relinquished by:					Red	ceiv								$\dashv$	Distribution:	3010011.	
								<i>y</i> .							1) PNNL		
	Signature	Date	Time		*			Sign	atur	е					2) CAS		
				1													

#### Columbia Analytical Services, Inc. Cooler Receipt and Preservation Form Client / Project: Service Request K12 Received: 3 Unloaded: 3 Samples were received via? Maik Fed Ex **UPS** DHLPDX Courier Hand Delivered Samples were received in: (circle) Cooler Box Envelope Other NA Were custody seals on coolers? NA If yes, how many and where? If present, were custody seals intact? If present, were they signed and dated? Y N Cooler/COC Cooler Thermometer Temp Temp °C Blank %C NA **Tracking Number** ID NA Filed Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Were custody papers properly filled out (ink, signed, etc.)? NA N Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA N 10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA N 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* N Were appropriate bottles/containers and volumes received for the tests indicated? NA N 13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA N 14. Were VOA vials received without headspace? Indicate in the table below. NÁ N 15. Was C12/Res negative? NA N Sample ID on Bottle Sample ID on COC Identified by:

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

Notes, Discrepancies	, & Resolutions:_			
				V
				1

Page\_\_\_\_of\_\_\_

Client: Project:

Battelle

Non-dry Dock Stormwater SW10

Service Request No.: Date Received:

K1201959

Sample Matrix:

Water

#### **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 House Holm Date 3-19-12

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Analysis Method:

Non-dry Dock Stormwater SW10/54220

Sample Matrix:

Water

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 CaCO3

						Date	
Sample Name	Lab Code	Result	MRL	MDL	Dil.	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	8.0	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	8.0	1	03/09/12 10:00	

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

**Project** 

Service Request:

K1201959

Non-dry Dock Stormwater SW10/54220

Date Collected:

02/29/12

Sample Matrix:

Water

Date Received:

03/03/12

Date Analyzed:

03/09/12

**Replicate Sample Summary** 

**General Chemistry Parameters** 

Sample Name:

SW10-015

mg/L Units:

Lab Code:

K1201959-008

Basis: NA

**Duplicate** Sample

K1201959-

**Analysis** 

Sample

008DUP6

Result

Method

MRL MDL 2.0

Result Average

**RPD** Limit RPD

Analyte Name Hardness. Total as CaCO3

SM 2340 C

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

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW10/54220

Service Request: K1201959

Sample Matrix:

Water

Date Analyzed: 03/09/12

**Lab Control Sample Summary** Hardness, Total as CaCO3

**Analysis Method:** 

SM 2340 C

Units: mg/L

Basis: NA

Analysis Lot: 282981

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample Lab Control Sample	K1201959-LCS2	89.2	86.3	103	90-116
	K1201959-LCS3	88.0	86.3	102	90-116

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project: Sample Matrix:

Analysis Method:

Non-dry Dock Stormwater SW10/54220

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Water SM 2540 D aryucar Report

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	

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW10/54220

Service Request:

K1201959

Project

**Date Collected:** 

NA

Sample Matrix:

Water

**Date Received:** 

NA

Date Analyzed: 03/06/12

**Replicate Sample Summary** 

**General Chemistry Parameters** 

Sample Name:

Batch QC

Units:

mg/L NA

Lab Code:

K1201908-001

**Duplicate** 

Basis:

Sample

K1201908-

001DUP5

**RPD** 

Analyte Name

Analysis Method

MRL

Sample Result

Result

**RPD** Average

Limit

Solids, Total Suspended (TSS)

SM 2540 D

10

MDL

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.

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Superset Reference: 12-0000204887 rev 00

Analytical Chemistry Data Package, Non-Dry Dock Stormwater 2 vents 10 and 11

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW10/54220

Service Request: K1201959

Sample Matrix:

Water

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

 Sample Name
 Lab Code
 Result
 Amount
 % Rec
 Limits

 Lab Control Sample
 K1201959-LCS2
 300
 305
 98
 85-111

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project: Sample Matrix:

**Analysis Method:** 

Non-dry Dock Stormwater SW10/54220

Water

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	
CW10 020	K 1201050 022	16.1	0.50	0.07	1	03/05/12 17:05	

SW10-029 0.50 0.07 03/05/12 17:05 K1201959-022 16.1 03/05/12 17:05 0.07 1 0.50 SW10-033 K1201959-026 31.5 0.50 0.07 1 03/05/12 17:05 2,30 SW10-037 K1201959-030 0.07 1 03/05/12 17:05 0.50 SW10-041 K1201959-034 2.77 03/05/12 17:05 K1201959-MB1 ND U 0.50 0.07 1 Method Blank 03/05/12 17:05 0.50 0.071 Method Blank K1201959-MB2 ND U

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

**Project** 

Service Request: K1201959

Non-dry Dock Stormwater SW10/54220

**Date Collected:** 

02/28/12 - 02/29/12

Sample Matrix:

Water

Date Received:

03/03/12

Analysis Method:

SM 5310 C

Units: mg/L

NA Basis:

## **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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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 Anai

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

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	2.30	25.4	25.0	92	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.

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW10/54220

Sample Matrix:

Water

Date Analyzed: 03/05/12

Service Request: K1201959

**Duplicate Lab Control Sample Summary** 

**General Chemistry Parameters** 

Analysis Method:

SM 5310 C

Units: mg/L

Basis: NA

Analysis Lot: 282378

Lab Control Sample K1201959-LCS1

**Duplicate Lab Control Sample** K1201959-DLCS1

		Spike			Spike		% Rec		RPD
Analyte Name	Result	Amount	% Rec	Result	Amount	% Rec	Limits	RPD	Limit
Carbon, Dissolved Organic (DOC)	20.6	22,7	91	20.4	22.7	90	87-112	1	33

Now part of the ALS Group

QA/QC Report

Client: Project:

Battelle Marine Sciences Lab

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
CCVI	282378	KQ1202328-18	03/05/12 17:05	25.0	24.5	98	90-110
CCV1	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

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW10/54220

Service Request: K1201959

Project:

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

**Analysis Method:** 

SM 5310 C

Units: mg/L

	Analysis		Date				
	Lot	Lab Code	Analyzed	MRL	MDL	Result	Q
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

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12-0000204887 rev 00

Superset Reference:

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	

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project

Non-dry Dock Stormwater SW10/54220

Service Request:

Date Collected:

K1201959 02/28/12 - 02/29/12

Sample Matrix:

Water

Date Received:

03/03/12

Analysis Method:

SM 5310 C

Units: mg

Units: mg/L
Basis: NA

Duplicate Sample Summary Carbon, Total Organic

				Sample	Duplicate			RPD	Date
Sample Name:	Lab Code:	MRL	MDL	Result	Result	Average	RPD	Limit	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

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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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

cted: 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

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.71	27.0	25.0	97	60-134

Results flagged with an asterisk (  $\star$  ) 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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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW10/54220

Date Analyzed: 03/05/12

Service Request: K1201959

Sample Matrix:

Water

Lab Control Sample Summary Carbon, Total Organic

Analysis Method:

SM 5310 C

Units: mg/L

Basis: NA

Analysis Lot: 282377

 Sample Name
 Lab Code
 Result
 Amount
 % Rec
 Limits

 Lab Control Sample
 K1201959-LCS2
 20.5
 22.7
 90
 87-112

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Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1201959

Project:

Non-dry Dock Stormwater SW10/54220

# Continuing Calibration Verification (CCV) Summary

## Carbon, Total Organic

**Analysis Method:** 

SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCVI	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

Printed 3/12/2012 2:21:57 PM

Now part of the ALS Group

QA/QC Report

Client: Project:

Battelle Marine Sciences Lab

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

	Analysis		Date				
	Lot	Lab Code	Analyzed	MRL	MDL	Result	Q
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

Printed 3/12/2012 2:21:57 PM

12-0000204887 rev 00

Superset Reference:

Now part of the ALS Group

Client: Project: Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW10/54220

**Service Request:** 

K1201959

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

		Date	Date
Sample Name	Lab Code	Collected	Received
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:

3/6N

Name:

Title:\_

Page

1 of I

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:

SW10-001

Lab Code:

K1201959-001

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	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 n-Triacontane	97 103	50-150 50-150	03/09/12 03/09/12	Acceptable Acceptable		

Comments:

Printed: 03/14/2012 14:36:51

Form 1A - Organic

SuperSet Reference: RR139274

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	<b>87</b> Ј	270	12	1	03/08/12	03/09/12	KWG1202421	
Residual Range Organics (RRO)	<b>270</b> Ј	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:

Printed: 03/14/2012 14:36:54

Merged

Form 1A - Organic

1 of 1

SuperSet Reference:

RR139274

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:

**Extraction Method:** 

Analysis Method:

SW10-003

Lab Code:

K1201959-003

NWTPH-Dx

Method

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:

Printed: 03/14/2012 14:36:57

Merged

Form 1A - Organic

SuperSet Reference:

RR139274

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO) Residual Range Organics (RRO)	85 J 180 J	260 520	12 20	1	03/08/12 03/08/12	03/09/12 03/09/12	KWG1202421 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:

Printed: 03/14/2012 14:37:00

Form 1A - Organic

Page 1 of 1 SuperSet Reference:

Merged  $u:\Stealth\Crystal.rpt\Form1mNew.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater Events 10 and 11

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:

SW10-005

Lab Code:

K1201959-005

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Analysis Method:

Level: Low

NWTPH-Dx

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO) Residual Range Organics (RRO)	72 J 170 J	250 500	11 19	1	03/08/12 03/08/12	03/09/12 03/09/12	KWG1202421 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:

Printed: 03/14/2012 14:37:03

Form 1A - Organic

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) Residual Range Organics (RRO)	200 J 720 O	260 520	12 20	1	03/08/12 03/08/12	03/09/12 03/09/12	KWG1202421 KWG1202421	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
o-Terphenyl n-Triacontane	92 98	50-150 50-150	03/09/12 03/09/12	Acceptable Acceptable	

Comments:

Printed: 03/14/2012 14:37:06

Form 1A - Organic

SuperSet Reference:

RR139274

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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

Units: ug/L Basis: NA

Level: Low

**Extraction Method: Analysis Method:** 

Method

NWTPH-Dx

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:

Printed: 03/14/2012 14:37:13

Form 1A - Organic

Page RR139274 SuperSet Reference:

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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: Lab Code:

Method Blank

KWG1202421-4

**Extraction Method:** 

Method

Units: ug/L Basis: NA

Level: Low

**Analysis Method:** NWTPH-Dx

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:

Printed: 03/14/2012 14:37:16

Merged

Form 1A - Organic

Page

SuperSet Reference: RR139274

u:\Stealth\Crystal.rpt\Form1mNew.rpt Analytical Chemistry Data Package, Non-Dry Dock Stormwater Events 10 and 11

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW10/54220

**Sample Matrix:** 

Water

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

**Extraction Method:** 

Method

Analysis Method:

NWTPH-Dx

Service Request: K1201959

Level: Low

Units: PERCENT

Sample Name	Lab Code	Sur1	Sur2
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 (%)

50-150 Sur1 = o-Terphenyl50-150 Sur2 = n-Triacontane

Results flagged with an asterisk (\*) indicate values outside control criteria. Results flagged with a pound (#) indicate the control criteria is not applicable.

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Form 2A - Organic

1 of

SuperSet Reference:

RR139274

 $u:\Stealth\Crystal.rpt\Form2.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater 25ents 10 and 11

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

Result

280

650

MDL

12

20

MRL

260

520

Sample Name:

Analyte Name

Diesel Range Organics (DRO)

Residual Range Organics (RRO)

SW10-001

Lab Code:

K1201959-001

Method

**Extraction Method:** 

**Analysis Method:** 

NWTPH-Dx

Units: ug/L

Basis: NA

Level: Low

Extraction Lot: KWG1202421

SW10-001DUP

650

Relative KWG1202421-1 Percent **RPD** Limit **Duplicate Sample** Difference Result Average 1 # 30 280 280 1 # 30 650

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 3B - Organic

SuperSet Reference:

Page 1 of

RR139274 Page 75 of 131

u:\Stealth\Crystal.rpt\Form3DUP.rpt Analytical Chemistry Data Package, Non-Dry Dock Stormwater Fents 10 and 11

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

SW10-002DUP

			Sample L Result	KWG120 Duplicate	02421-2	Relative Percent Difference	RPD Limit
Analyte Name	MRL	MRL MDL		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.

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Form 3B - Organic

SuperSet Reference: RR139274

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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 %Rec Limits %Rec Result Expected **Analyte Name** 46-140 Diesel Range Organics (DRO) 1690 1600 106 45-159 800 96 Residual Range Organics (RRO) 770

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 - Organic

RR139274

SuperSet Reference:

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Page

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:

**Extraction Method:** 

Analysis Method:

Method Blank

Lab Code:

KWG1202421-4

NWTPH-Dx

Method

Instrument ID: GC21

File ID: J:\GC21\DATA\030812B-NW\0308F047.D

Level: Low

Extraction Lot: KWG1202421

This Method Blank applies to the following analyses:

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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
SW10-001 SW10-001DUP	KWG1202421-1	J:\GC21\DATA\030812B-NW\0308F079.D	03/09/12	07:13
SW10-001	K1201959-006	J:\GC21\DATA\030812B-NW\0308F083.D	03/09/12	07:57

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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:

**Extraction Method:** 

Analysis Method:

Lab Control Sample

Lab Code:

KWG1202421-3

Instrument ID: GC21

File ID: J:\GC21\DATA\030812B-NW\0308F045.D

Level: Low

Extraction Lot: KWG1202421

This Lab Control Sample applies to the following analyses:

Method

NWTPH-Dx

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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
SW10-002D01	K1201959-003	J:\GC21\DATA\030812B-NW\0308F057.D	03/09/12	03:12
SW10-003	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
SW10-007	K1201959-001	J:\GC21\DATA\030812B-NW\0308F077.D	03/09/12	06:52
SW10-001 DUP	KWG1202421-1	J:\GC21\DATA\030812B-NW\0308F079.D	03/09/12	07:13
SW10-001D01	K1201959-006	J:\GC21\DATA\030812B-NW\0308F083.D	03/09/12	07:57

Now part of the ALS Group

QA/QC Results

Client: Project: Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW10/54220

Service Request: K1201959

Calibration Date: 07/12/2011

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

Calibration ID: Instrument ID: CAL10701

GC21

Column: ZB-1

Level ID	File ID	Level ID	File ID
Α	J:\GC21\DATA\071111B-NW\0711F037.D	J	J:\GC21\DATA\071111B-NW\0711F063.D
B	J:\GC21\DATA\071111B-NW\0711F039.D	K	J:\GC21\DATA\071111B-NW\0711F065.D
Č	J:\GC21\DATA\071111B-NW\0711F041.D	L	J:\GC21\DATA\071111B-NW\0711F067.D
D .	J:\GC21\DATA\071111B-NW\0711F043.D	M	J:\GC21\DATA\071111B-NW\0711F069.D
E	J:\GC21\DATA\071111B-NW\0711F045.D	N	J:\GC21\DATA\071111B-NW\0711F071.D
F	J:\GC21\DATA\071111B-NW\0711F047.D	I	J:\GC21\DATA\071111B-NW\0711F061.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)	K	2000	797	L	5000	768	H M	50 20000	699 802	I N	200 50000	712 809	J	500	777
Residual Range Organics (RRO)	F	5000	545	В	50	588	С	200	510	D	500	513	Е	2000	500
o-Terphenyl	K	100	1100	G L	1.0 250	988 1020	Н	2.5	1000	I	10	998	J	25	1040
n-Triacontane	K	100	936	G L	1.0 250	803 872	Н	2.5	840	I	10	840	J	25	875

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

Now part of the ALS Group

QA/QC Results

Client: Project: Battelle Marine Sciences Lab

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

			Calibratio				
Analyte Name	Compound Type	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.

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Form 6A - Organic

SuperSet Reference: RR139274

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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: Analysis Method:

External Standard

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

SuperSet Reference: RR139274

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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: Analysis Method:

External Standard

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\0308F039.D

J:\GC21\DATA\030812B-NW\0308F041.D

		_	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Analyte Name	Expected	Result	Kr	KI	761)	/01/111	Cincina	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.

Form 7 - Organic

Page 1 of 1

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: Analysis Method:

External Standard

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	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	960	531	510	-4	NA	$\pm$ 15 %	AverageRF
o-Terphenyl	50	54	1030	1100	7	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	54	861	931	8	NA	± 15 %	AverageRF

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

1 of 1 Page

Now part of the ALS Group

QA/QC Results

Client:

- Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW10/54220 **Project:** 

Service Request: K1201959

**Date Analyzed:** 03/09/2012

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

Calibration Type: Analysis Method:

External Standard

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	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	980	531	519	-2	NA	$\pm$ 15 %	AverageRF
o-Terphenyl	50	52	1030	1070	4	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	54	861	928	8	NA	± 15 %	AverageRF

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

Printed: 3/14/2012 14:38:02

Form 7 - Organic

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SuperSet Reference:

RR139274

 $u:\Stealth\Crystal.rpt\Form7.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater & ent 10 and 11

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Client:

Battelle

Service Request No.:

K1202461

Project:

Non-dry Dock Stormwater SW11

Date Received:

3/17/12

Sample Matrix:

Water

#### **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 Haward Holius Date 4112

Now part of the ALS Group

Client: Project:

Battelle Marine Sciences Lab

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

Date: March 30,2

Name:

Title

Page

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

Method

Units: ug/L Basis: NA

Level: Low

**Extraction Method:** 

NWTPH-Dx **Analysis Method:** 

Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Diesel Range Organics (DRO)	110 J	270	12	1	03/19/12	03/22/12	KWG1202820	
Residual Range Organics (RRO)	<b>33</b> 0 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:

Printed: 03/30/2012 12:04:00

Form 1A - Organic

SuperSet Reference:

RR139853

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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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Analysis Method:

NWTPH-Dx

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 n-Triacontane	82 88	50-150 50-150	03/22/12 03/22/12	Acceptable Acceptable	

Comments:

Printed: 03/30/2012 12:04:03

Form 1A - Organic

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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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

**Analysis Method:** 

NWTPH-Dx

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:

Printed: 03/30/2012 12:04:06

Form 1A - Organic

1 of 1

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

**Analysis Method:** 

NWTPH-Dx

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO) Residual Range Organics (RRO)	110 J 330 J	270 540	12 21	1 1	03/19/12 03/19/12	03/22/12 03/22/12	KWG1202820 KWG1202820	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Ferphenyl	70	50-150	03/22/12	Acceptable
Friacontane	76	50-150	03/22/12	Acceptable

Comments:

Printed: 03/30/2012 12:04:09

Form 1A - Organic

1 of 1

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

Units: ug/L

Basis: NA

**Extraction Method:** 

Method

Level: Low

Analysis Method:

NWTPH-Dx

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	
n-Terphenyl	78	50-150	03/22/12	Acceptable	
n-Triacontane	84	50-150	03/22/12	Acceptable	

Comments:

Printed: 03/30/2012 12:04:12

Form 1A - Organic

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Merged

SuperSet Reference:

RR139853

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

Units: ug/L Basis: NA

**Extraction Method:** 

Method

Level: Low

Analysis Method:

NWTPH-Dx

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	
Ferphenyl	76	50-150	03/23/12	Acceptable	
Friacontane	84	50-150	03/23/12	Acceptable	

Comments:

Printed: 03/30/2012 12:04:15

Form 1A - Organic

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SuperSet Reference:

RR139853

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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

Units: ug/L

Basis: NA

**Extraction Method:** 

Method

Level: Low

NWTPH-Dx **Analysis Method:** 

Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
600 H <b>2600</b> O	280 550	12 21	1 1	03/19/12 03/19/12	03/23/12 03/23/12	KWG1202820 KWG1202820	
_	600 H	600 H 280	600 H 280 12	Result Q         MRL         MDL         Factor           600 H         280         12         1	Result Q         MRL         MDL         Factor         Extracted           600 H         280         12         1         03/19/12	Result Q         MRL         MDL         Factor         Extracted         Analyzed           600 H         280         12         1         03/19/12         03/23/12	600 H 280 12 1 03/19/12 03/23/12 KWG1202820

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
-Terphenyl	81	50-150	03/23/12	Acceptable
-Triacontane	89	50-150	03/23/12	Acceptable

Comments:

Printed: 03/30/2012 12:04:18

Form 1A - Organic

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SuperSet Reference:

RR139853

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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

Units: ug/L

**Extraction Method:** 

Method

Basis: NA

Level: Low

Analysis Method:

NWTPH-Dx

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:

Printed: 03/30/2012 12:04:21

Form 1A - Organic

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Merged

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

Units: ug/L Basis: NA

Level: Low

**Analysis Method:** 

NWTPH-Dx

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)	<b>25</b> 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:

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Form 1A - Organic

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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

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

**Extraction Method:** 

Method

Analysis Method:

NWTPH-Dx

Service Request: K1202461

Units: PERCENT

Level: Low

Sample Name	Lab Code	Sur1	Sur2
Sample Name	<u>Lab Couc</u>	Dull	<u> </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 (%)

50-150 Surl = o-Terphenyl50-150 Sur2 = n-Triacontane

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

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

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Form 2A - Organic

Page

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SuperSet Reference: RR139853

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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

			Sample IDL Result	Batch ( KWG12 <b>Duplicat</b> e	02820-1	Relative Percent Difference	RPD Limit
Analyte Name	MRL	MDL		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.

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Form 3B - Organic

SuperSet Reference:

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RR139853

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Analytical Chemistry Data Package, Non-Dry Dock Stormwater 23 and 11

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:

**Extraction Method:** 

Analysis Method:

SW11-001

Lab Code:

K1202461-001

Method NWTPH-Dx

Basis: NA

Units: ug/L

Level: Low

Extraction Lot: KWG1202820

SW11-001DUP

			Sample	KWG120 Duplicate		Relative Percent Difference	RPD Limit
Analyte Name	MRL M	MDL	Result	Result	Average		
Diesel Range Organics (DRO) Residual Range Organics (RRO)	270 530	12 20	110 330	120 260	110 290	10 # 25 #	30 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.

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Form 3B - Organic

SuperSet Reference:

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RR139853

 $u:\Stealth\Crystal.rpt\Form3DUP.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater Events 10 and 11

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

Lab Control Sample KWG1202820-3

Lab Control Spike %Rec Limits %Rec Result Expected **Analyte Name** 104 46-140 Diesel Range Organics (DRO) 3320 3200 45-159 1600 95 Residual Range Organics (RRO) 1520

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 - Organic

SuperSet Reference:

RR139853

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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:

**Extraction Method:** 

**Analysis Method:** 

Method Blank

Lab Code:

NWTPH-Dx

Method

KWG1202820-4

Instrument ID: GC21

File ID: J:\GC21\DATA\032112B\0321F015.D

Level: Low

Extraction Lot: KWG1202820

This Method Blank applies to the following analyses:

			Date	1 ime
Sample Name	Lab Code	File ID	Analyzed	Analyzed
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

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Printed: 03/30/2012 12:04:50

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:

**Extraction Method:** 

**Analysis Method:** 

Lab Control Sample

Lab Code:

KWG1202820-3

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:

Method

NWTPH-Dx

			Date	Time
Sample Name	Lab Code	File ID	Analyzed	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

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Form 4B - Organic

SuperSet Reference:

RR139853

 $u:\Stealth\Crystal.rpt\Form4LCS.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater 27ents 10 and 11

Now part of the ALS Group

QA/QC Results

Client:

Η

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW11/54220 / 62375 Project:

Service Request: K1202461 Calibration Date: 07/12/2011

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

Calibration ID:

CAL10701

J:\GC21\DATA\071111B-NW\0711F059.D

**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
В	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	I:\GC21\DATA\071111B-NW\0711F057.D		

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

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

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Form 6A - Organic

SuperSet Reference: RR139853

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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

						Calibration Evaluation						
Analyte Name	Compound Type	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.

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Form 6A - Organic

SuperSet Reference:

RR139853

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 $u:\Stealth\Crystal.rpt\Form6iNew.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater 20 and 11

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

Calibration ID: CAL10701

Analysis Method:

NWTPH-Dx

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

SuperSet Reference:

1 of 1

Printed: 3/30/2012 12:05:04

Form 6B - Organic

RR139853

 $u:\Stealth\Crystal.rpt\Form6SS.rpt$ Analytical Chemistry Data Package, Non-Dry Dock Stormwater Pents 10 and 11

Now part of the ALS Group

QA/QC Results

Client: Project: Battelle Marine Sciences Lab

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: Analysis Method:

External Standard

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	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	950	531	505	-5	NA.	$\pm$ 15 %	AverageRF
o-Terphenyl	50	51	1030	1040	1	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	52	861	889	3	NA	± 15 %	AverageRF

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

Form 7 - Organic

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Printed: 3/30/2012 12:05:07  $u:\Stealth\Crystal.rpt\Form7.rpt$ 

Analytical Chemistry Data Package, Non-Dry Dock Stormwater 2 vents 10 and 11

SuperSet Reference: RR139853

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Now part of the ALS Group

QA/QC Results

Client:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW11/54220 / 62375 Project:

Service Request: K1202461

**Date Analyzed:** 03/22/2012

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

Calibration Type: **Analysis Method:** 

External Standard

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	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	950	531	503	-5	NA	$\pm$ 15 %	AverageRF
o-Terphenyl	50	50	1030	1040	1	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	53	861	905	5	NA	± 15 %	AverageRF

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

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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: **Analysis Method:** 

External Standard

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	% <b>D</b> rift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	783	2	NA	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	960	531	509	-4	NA	$\pm$ 15 %	AverageRF
o-Terphenyl	50	50	1030	1040	1	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	53	861	909	6	NA	± 15 %	AverageRF

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

1 of 1

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: **Analysis Method:** 

External Standard

NWTPH-Dx

Calibration Date: 07/12/2011

Calibration ID: CAL10701

Analysis Lot: KWG1203223

Units: ppm Column ID: ZB-1

File ID:

n-Triacontane

J:\GC21\DATA\032112B\0321F071.D

50

52

J:\GC21\DATA\032112B\0321F073.D

CCV Average **Curve Fit** RF RF %D %Drift Criteria Expected Result **Analyte Name** ± 15 % AverageRF NA 1000 767 772 1 Diesel Range Organics (DRO) 1000 AverageRF  $\pm$  15 % 526 -1 NA Residual Range Organics (RRO) 1000 990 531 1020 0 NA  $\pm$  15 % AverageRF 1030 50 50 o-Terphenyl ± 15 % AverageRF 899 4 NA 861

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

Form 7 - Organic

SuperSet Reference:

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Now part of the ALS Group

QA/QC Results

Client:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW11/54220 / 62375 Project:

Service Request: K1202461

**Date Analyzed:** 03/23/2012

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

Calibration Type: **Analysis Method:** 

External Standard

NWTPH-Dx

Calibration Date: 07/12/2011

Calibration ID: CAL10701

Analysis Lot: KWG1202964

Column ID: ZB-1

Units: ppm

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	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	970	531	515	-3	NA	± 15 %	AverageRF
o-Terphenyl	50	49	1030	1010	-1	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	52	861	896	4	NA	$\pm$ 15 %	AverageRF

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

Printed: 3/30/2012 12:05:19

Form 7 - Organic

SuperSet Reference:

RR139853

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1 of 1

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

NWTPH-Dx **Analysis Method:** 

Calibration Date: 07/12/2011

Calibration ID: CAL10701

Analysis Lot: KWG1202964

Units: ppm

File ID:

J:\GC21\DATA\032212B\0322F051.D

J:\GC21\DATA\032212B\0322F053.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	767	789	3	NA	$\pm$ 15 %	AverageRF
Residual Range Organics (RRO)	1000	940	531	501	<b>-</b> 6	NA	$\pm$ 15 %	AverageRF
o-Terphenyl	50	51	1030	1040	1	NA	$\pm$ 15 %	AverageRF
n-Triacontane	50	53	861	911	6	NA	± 15 %	AverageRF

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

Printed: 3/30/2012 12:05:22

 $u:\Stealth\Crystal.rpt\Form7.rpt$ 

Form 7 - Organic

SuperSet Reference:

1 of 1

RR139853

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Analytical Chemistry Data Package, Non-Dry Dock Stormwater 26ents 10 and 11

Client:BattelleService Request No.:K1202509Project:Non-dry Dock Stormwater SW11Date Received:3/20/12

Sample Matrix: Water

#### **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 Howard Holmo Date 4-2-12

#### Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Sample Matrix:

**Analysis Method:** 

Non-dry Dock Stormwater SW11/54220/62375

Date Collected: 03/15/12

Service Request: K1202509

Water

SM 2340 C

Date Received: 03/20/12

Units: mg/L

Basis: NA

## Hardness, Total as CaCO3

						Date	
Sample Name	Lab Code	Result	MRL	MDL	Dil.	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	I	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	

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

K1202509 Service Request:

Project

Non-dry Dock Stormwater SW11/54220/62375

Date Collected:

03/15/12

Sample Matrix:

Water

Date Received:

03/20/12

**Replicate Sample Summary** 

03/28/12 Date Analyzed:

**General Chemistry Parameters** 

Sample Name:

SW11-032

**Units:** mg/L

Lab Code:

K1202509-017

Basis: NA

**Duplicate** 

Sample

K1202509-

Analysis

Sample

017DUP10

Analyte Name

Result

Result

Average

RPD Limit 20

Hardness, Total as CaCO3

Method SM 2340 C MRL 2.0

MDL 0.8

30.0

30.4

30.2

**RPD** 

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 3/28/2012 3:33:22 PM

Superset Reference: 12-0000206369 rev 00

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 Date Analyzed: 03/28/12

Sample Matrix:

Water

Lab Control Sample Summary Hardness, Total as CaCO3

**Analysis Method:** 

SM 2340 C

Units: mg/L

Basis: NA

Analysis Lot: 285179

% Rec Spike Limits Amount % Rec Lab Code Result Sample Name 90-116 105 90.8 86.3 K1202509-LCS1 Lab Control Sample

Superset Reference: 12-0000206369 rev 00 Printed 3/28/2012 3:33:22 PM

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Sample Matrix:

Analysis Method:

Non-dry Dock Stormwater SW11/54220/62375

Water

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)

						Date	
Sample Name	Lab Code	Result	MRL	MDL	Dil.	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	

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1202509

Project

Non-dry Dock Stormwater SW11/54220/62375

**Date Collected:** 

Date Analyzed: 03/21/12

NA

Sample Matrix:

Water

**Date Received:** 

NA

Replicate Sample Summary

**General Chemistry Parameters** 

Sample Name:

Batch QC

Units:

mg/L

Lab Code:

K1202546-001

**Duplicate** 

Basis: NA

Sample

K1202546-Sample 001DUP23 Analysis Result Result Method

Analyte Name

SM 2540 D

MDL MRL

16.5

ND

Average NC

RPD NC

Limit

**RPD** 

Solids, Total Suspended (TSS)

5.0

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.

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Project:

Non-dry Dock Stormwater SW11/54220/62375

Date Analyzed: 03/21/12

Service Request: K1202509

Sample Matrix:

Water

Lab Control Sample Summary

Solids, Total Suspended (TSS)

**Analysis Method:** 

SM 2540 D

Units: mg/L

Basis: NA

Analysis Lot: 284358

Sample NameLab CodeResultAmount% RecLimitsLab Control SampleK1202509-LCS13003059885-111

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project: Non-di Sample Matrix: Water

Non-dry Dock Stormwater SW11/54220/62375

D

**Service Request:** K1202509 **Date Collected:** 03/15/12

~ .

Date Received: 03/20/12

Analysis Method:

SM 5310 C

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	11	03/29/12 23:00	
SW11-037	K1202509-022	1.71	0.50	0.07	I	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	

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW11/54220/62375

Service Request: K1202509

**Date Collected:** 03/15/12

Sample Matrix:

Analysis Method:

Project

Water

Date Received: 03/20/12

SM 5310 C

mg/L Units: NA

Basis:

## **Duplicate Sample Summary** Carbon, Total Organic

				Sample	Duplicate			RPD	Date
Sample Name:	Lab Code:	LOQ	MDL	Result	Result	Average	RPD	Limit	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

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.

Superset Reference: 12-0000206369 rev 00 Printed 3/30/2012 3:03:57 PM

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1202509

Project:

Non-dry Dock Stormwater SW11/54220/62375

**Date Collected:** 03/15/12

Sample Matrix:

Water

Date Received: 03/20/12

Date Analyzed: 03/29/12

Matrix Spike Summary Carbon, Total Organic

Sample Name:

SW11-017

Lab Code:

K1202509-002

Units: mg/L Basis: NA

Analysis Method:

SM 5310 C

Matrix Spike K1202509-002MS1

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.62	26.8	25.0	101	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.

Printed 3/30/2012 3/03/57 PM Superset Reference: 12-0000206369 rev 00

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

Date Analyzed: 03/21/12

Sample Matrix:

Water

Lab Control Sample Summary Carbon, Total Organic

**Analysis Method:** 

SM 5310 C

Units: mg/L

Basis: NA

Analysis Lot: 284408

			Spike		% Rec
Sample Name	Lab Code	Result	Amount	% Rec	<u>Limits</u>
Lab Control Sample	K1202509-LCS1	18.9	22.7	83 *	87-112
Lab Control Sample	K1202509-LCS2	22.3	22.7	98	87-112

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 Date Analyzed: 03/29/12

Sample Matrix:

Water

Lab Control Sample Summary Carbon, Total Organic

Analysis Method:

SM 5310 C

Units: mg/L

Basis: NA

Analysis Lot: 285428

 Sample Name
 Lab Code
 Result
 Amount
 % Rec
 Limits

 Lab Control Sample
 K1202509-LCS3
 22.5
 22.7
 99
 87-112

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1202509

Project:

Non-dry Dock Stormwater SW11/54220/62375

## Continuing Calibration Verification (CCV) Summary

## Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCVI	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	KO1202921-27	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

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1202509

Project:

Non-dry Dock Stormwater SW11/54220/62375

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

Analysis Method:

SM 5310 C

Units: mg/L

	Analysis		Date				
	Lot	Lab Code	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

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12-0000206369 rev 00 Superset Reference:

Now part of the ALS Group

Analytical Report

Client:

Battelle Marine Sciences Lab

Project:

Sample Matrix:

**Analysis Method:** 

Water

SM 5310 C

Non-dry Dock Stormwater SW11/54220/62375

Service Request: K1202509 **Date Collected:** 03/15/12

Date Received: 03/20/12

Units: mg/L Basis: NA

Carbon, Dissolved Organic (DOC)

						Date	
Sample Name	Lab Code	Result	MRL	MDL	Dil.	Analyzed	<u>Q</u>
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	l	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	

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client: Battelle Marine Sciences Lab

Non-dry Dock Stormwater SW11/54220/62375

Date Collected: 03/15/12

Service Request: K1202509

Sample Matrix:

**Analysis Method:** 

Project

Water

Date Received: 03/20/12

water

SM 5310 C

Units: mg/L Basis: NA

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

				Sample	Duplicate			RPD	Date
Sample Name:	Lab Code:	MRL	MDL	Result	Result	Average	RPD	Limit	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
<del></del>	K1202509-015DUP9	0.50	0.07	1.26	1.21	1.24	4	10	03/21/12
SW11-030	K1202509-019DUP12	0.50	0.07	4.22	4.32	4.27	2	10	03/21/12
SW11-034	K1202509-023DUP14	0.50	0.07	1.56	1.51	1.53	3	10	03/21/12
SW11-038	K1202509-023D0114		0.07	1.20	1.24	1.22	3	10	03/21/12
SW11-042	K1202309-02/DOF10	0.50	0.07	1,20	1.2	- · <del></del>			

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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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 Date Collected: 03/15/12

Sample Matrix:

Water

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

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Dissolved Organic (DOC)	1.57	26.2	25.0	98	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.

Superset Reference: 12-0000206369 rev 00 Printed 3/28/2012 3:33:22 PM

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 Date Analyzed: 03/21/12

Sample Matrix:

Water

Lab Control Sample Summary Carbon, Dissolved Organic (DOC)

**Analysis Method:** 

SM 5310 C

Units: mg/L

Basis: NA

Analysis Lot: 284409

 Sample Name
 Lab Code
 Result
 Amount
 % Rec
 Limits

 Lab Control Sample
 K1202509-LCS1
 22.4
 22.7
 99
 87-112

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1202509

Project:

Non-dry Dock Stormwater SW11/54220/62375

# 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
CCVI	284409	KQ1202922-11	03/21/12 19:09	25.0	24.7	99	90-110
CCV2	284409	KQ1202922-11 KQ1202922-12	03/21/12 19:09	25.0	24.4	98	90-110
CCV3	284409	KQ1202922-12 KQ1202922-13	03/21/12 19:09	25.0	24.5	98	90-110
CCV3	284409	KQ1202922-14	03/21/12 19:09	25.0	24.6	99	90-110

Superset Reference: 12-0000206369 rev 00

Now part of the ALS Group

QA/QC Report

Client:

Battelle Marine Sciences Lab

Service Request: K1202509

Project:

Non-dry Dock Stormwater SW11/54220/62375

# Continuing Calibration Blank (CCB) Summary

Carbon, Dissolved Organic (DOC)

**Analysis Method:** 

SM 5310 C

Units: mg/L

	Analysis		Date		**D*	Dogule	0
	Lot	Lab Code	Analyzed	MRL	MDL	Result	<u> </u>
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
	284409	KQ1202922-17	03/21/12 19:09	0.50	0.07	0.09	J
CCB3	<del>-</del> '	`	03/21/12 19:09	0.50	0.07	ND	U
CCB4	284409	KQ1202922-18	03/21/12 19.09	0.50	0.07		_

Printed 3/28/2012 3:33:22 PM

12-0000206369 rev 00 Superset Reference:

# **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	
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Sample Custody Information Chain of Custody Form Laboratory Sample Log-In Form Log-In Checklist	30

Analytical raw data available upon request

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 -		Fraction				Collection	Used in					
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	Date	Comp	Conductivity	Turbidity	TSS	OC	$\mathbf{OC}$
<u>,                                      </u>									Probe		HTCO	HTCO
					Instrument:			Probe (μS/cm)	(NTU)	mg/L	(mg/L)	$(\mu M)$
Laboratory A	Achieved Detection	Limits (Seawa	ter)							0.49	0.030	2.5
•	porting Limit (MD)	*	,								0.095	8.0
	Achieved Detection		vater)							0.49	0.030	2.5
Freshwater R	Reporting Limit (M	DL* 3.18)	•								0.095	8.0
CIVIA												
<u>SW12</u> SW12-001	PSNS015-1	T-4-1		Euroberrateur	2174 122	04/20/12	<b>V</b>	1200	42	41.8		
SW12-001 SW12-001	PSNS015-1 PSNS015-1	Total Diss	composite_time composite_time	Freshwater Freshwater	3174-133 3174-134	04/20/12	Y 	1200	42	41.8	4.01	334
SW12-001 SW12-002	PSNS015-1 PSNS015-2	Total	composite_time	Freshwater	3174-134	04/20/12	 Y	 70	25	23.3	4.01	334
SW12-002 SW12-002	PSNS015-2 PSNS015-2	Diss	composite_time	Freshwater	3174-135	04/20/12	1 	70 	23 	23.3 	3.47	289
SW12-002 SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-130	04/20/12	Y	42	16	14.6	J.47 	209
SW12-003	PSNS015-3	Diss	composite_time	Freshwater	3174-137	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	3.71	307 L
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		317 L
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	3.22	
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	3.27	
SW12-010	PSNS015-10	Diss	composite_time	Seawater	3174-151	04/20/12					3.12	260
SW12-010	PSNS015-11	Total	composite_time	Seawater	3174-153	04/20/12	N	40100	6	6.57	5.12	
SW12-011	PSNS015-11	Diss	composite_time	Seawater	3174-154	04/20/12					1.87	155
SW12-011 SW12-012	PSNS015-11 PSNS015-12	Total	composite_time	Seawater	3174-154	04/20/12	N	42350	4	4.14	1.07	133
SW12-012	PSNS015-12	Diss	composite_time	Seawater	3174-156	04/20/12		42330			1.36	113
SW12-012 SW12-013	PSNS015-12 PSNS015-13	Total	composite_time	Seawater	3174-150	04/20/12	N	15750	8	1.90	1.30	
SW12-013 SW12-013	PSNS015-13 PSNS015-13	Diss	composite_time	Seawater	3174-137	04/20/12		13730	o 	1.90	2.96	247
SW12-013 SW12-014	PSNS015-13	Total	composite_time	Freshwater	3174-158	04/20/12	Y	1065	10	2.95	2.90	247 
SW12-014 SW12-014	PSNS015-14	Diss	composite_time	Freshwater	3174-139	04/20/12		1005		2.93	3.14	262
3 W 12-U14	F3N3U13-14	DISS	composite_time	riesiiwater	31/4-100	04/20/12					5.14	202

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## Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water UNITS: µg/L

0 1 TF		T		1				JN115: μg/L		
Sample ID -		Fraction	m		) (C) (C) (C)					<b>6.1</b>
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	Hg	As	Ag	Al	Cd
					Instrument:	CVAF	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory A	chieved Detection	Limits (Seawat	er)			0.0001	NA	0.0042	2.14	0.00110
Seawater Rep	orting Limit (MDI	L* 3.18)				0.00032	NA	0.013	6.8	0.0035
Laboratory A	chieved Detection	Limits (Freshw	rater)			0.0001	0.03	0.002	0.3	0.004
Freshwater R	eporting Limit (M)	DL* 3.18)				0.0003	0.1	0.006	1.0	0.01
SW12										
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 -		Fraction						•	
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	Cr	Cu	Pb	Zn
					Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory A	chieved Detection	Limits (Seawa	iter)			0.0293	0.0351	0.0019	0.0263
Seawater Rep	orting Limit (MD)	L* 3.18)				0.093	0.11	0.0060	0.084
Laboratory A	chieved Detection	Limits (Freshy	water)			0.08	0.007	0.002	0.05
Freshwater R	eporting Limit (M	DL* 3.18)				0.3	0.02	0.006	0.2
CW12									
<u>SW12</u> SW12-001	PSNS015-1	Total	composite_time	Freshwater	3174-133	2.69	17.4	14.4	76.2
SW12-001 SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-133	0.949	7.43	0.872	43.7
SW12-001 SW12-002	PSNS015-1 PSNS015-2	Total	composite_time	Freshwater	3174-134	1.61	12.3	9.77	62.6
SW12-002 SW12-002	PSNS015-2	Diss	composite_time	Freshwater	3174-135	0.746	6.02	1.18	34.2
SW12-002	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
SW12-009 SW12-010	PSNS015-10	Total	composite_time	Seawater	3174-151	1.40 1.37 b	8.95 b	6.43 b	92.0 b
SW12-010 SW12-010	PSNS015-10	Diss	composite_time	Seawater	3174-151	0.698 b	4.49 b	1.49 b	71.0 b
SW12-010 SW12-011	PSNS015-10	Total	•	Seawater	3174-152	0.420 b	3.49 b	2.70 b	71.0 b
			composite_time				1.68 b	0.470 b	65.1 b
SW12-011	PSNS015-11	Diss	composite_time	Seawater	3174-154	0.119 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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# Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water

Sample ID -		Fraction				CVAF Batch	ICP-MS Batch	TSS	
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	ID	ID	Nucleopore	HTCO
			••	•		•		•	
					Instrument:				
Laboratory A	chieved Detection	Limits (Seawate	-r)						
•	orting Limit (MDI	*	<i>5</i> 1)						
	chieved Detection		ater)						
•	eporting Limit (MI	,	ater)						
1 Testiwater Re	cporting Limit (wir	JL 3.10)			l				
<b>SW12</b>									
SW12-001	PSNS015-1	Total	composite_time	Freshwater	3174-133	060612HGA	061112-6100	042712TSS	
SW12-001	PSNS015-1	Diss	composite_time	Freshwater	3174-134		061112-6100		DOC061912
SW12-002	PSNS015-2	Total	composite_time	Freshwater	3174-135		061112-6100	042712TSS	
SW12-002	PSNS015-2	Diss	composite_time	Freshwater	3174-136		061112-6100		DOC061912
SW12-003	PSNS015-3	Total	composite_time	Freshwater	3174-137		061112-6100	042712TSS	
SW12-003	PSNS015-3	Diss	composite_time	Freshwater	3174-138		061112-6100		DOC061512
SW12-004	PSNS015-4	Total	composite_time	Freshwater	3174-139		061112-6100	042712TSS	
SW12-004	PSNS015-4	Diss	composite_time	Freshwater	3174-140		061112-6100		DOC061512
SW12-005	PSNS015-5	Total	composite_time	Freshwater	3174-141		061112-6100	042712TSS	
SW12-005	PSNS015-5	Diss	composite_time	Freshwater	3174-142		061112-6100		DOC061612
SW12-006	PSNS015-6	Total	composite_time	Freshwater	3174-143		061112-6100	042712TSS	
SW12-006	PSNS015-6	Diss	composite_time	Freshwater	3174-144		061112-6100		DOC061512
SW12-007	PSNS015-7	Total	composite_time	Freshwater	3174-145		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		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		061112-6100	042712TSS	
SW12-014	PSNS015-14	Diss	composite_time	Freshwater	3174-160	061212HGA	061112-6100		DOC061512

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# Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water

Sample ID -		Fraction				Collection	Used in					
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	Date	Comp	Conductivity	Turbidity	TSS	OC	OC
									Probe		HTCO	HTCO
					Instrument:			Probe (µS/cm)	(NTU)	mg/L	(mg/L)	$(\mu M)$
Laboratory A	chieved Detection	Limits (Seawa	ater)							0.49	0.030	2.5
Seawater Rep	oorting Limit (MDL	L* 3.18)									0.095	8.0
Laboratory A	chieved Detection	Limits (Fresh	water)							0.49	0.030	2.5
Freshwater R	eporting Limit (MI	DL* 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

							,	ntiio. μg/L		
Sample ID -		Fraction								
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	Hg	As	Ag	Al	Cd
					Instrument:	CVAF	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory A	Achieved Detection I	Limits (Seaw	ater)			0.0001	NA	0.0042	2.14	0.00110
Seawater Re	porting Limit (MDL	* 3.18)				0.00032	NA	0.013	6.8	0.0035
Laboratory A	Achieved Detection I	Limits (Fresh	water)			0.0001	0.03	0.002	0.3	0.004
Freshwater I	Reporting Limit (MD	DL* 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

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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) Metals in Water UNITS: ug/L

							·	//N115: μg/L	
Sample ID -		Fraction							_
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	Cr	Cu	Pb	Zn
					Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Laboratory A	Achieved Detection	Limits (Seaw	rater)			0.0293	0.0351	0.0019	0.0263
Seawater Re	porting Limit (MDL	L* 3.18)				0.093	0.11	0.0060	0.084
Laboratory A	Achieved Detection	Limits (Fresh	iwater)			0.08	0.007	0.002	0.05
Freshwater I	Reporting Limit (MI	DL* 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

PNNL Data Package - ENVVEST SW12

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 -		Fraction				CVAF Batch	ICP-MS Batch	TSS	
Metals	Station Code	Total/Diss	Type Name	Matrix	MSL Code	ID	ID	Nucleopore	HTCO
<u> </u>									
					Instrument:				
Laboratory A	chieved Detection	Limits (Seawa	ater)						
Seawater Rep	porting Limit (MDI	<b>*</b> 3.18)							
Laboratory A	chieved Detection	Limits (Fresh	water)						
Freshwater R	Reporting Limit (MI	DL* 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

PNNL Data Package - ENVVEST SW12 Page 10 of 34

#### Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water UNITS: µg/L

Sample ID -		Fraction												ICP-MS
Metals	Station Code	(Total/Diss)	Sample Type	Matrix	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	Batch ID
					Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
•	chieved Detection		iwater)			NA	0.0042	2.14	0.00110	0.0293	0.0351	0.0019	0.0263	
	orting Limit (M					NA	0.013	6.8	0.0035	0.093	0.11	0.0060	0.084	
	chieved Detection		shwater)			0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
	eporting Limit (1	MDL* 3.18)				0.1	0.006	1.0	0.01	0.3	0.02	0.006	0.2	
METHOD BI	LANKS													
MB-1		Total			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
MEAN REAG	GENT BLANK			Seawater	BMRB_062712	NA	0.0001 U	0.507 U	0.00005 U	0.0423 J	0.0408 J	0.00174 U	0.0940	
LAROPATO	RY CONTRO	I CAMDIFC												
Spiking Level		L SAIVII LES				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
200 1		10111			cent Recovery, LCS	99%	100%	101%	97%	102%	104%	100%	97%	001112 0100
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
					cent Recovery, LCS	94%	98%	104%	97%	106%	101%	100%	97%	
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
LCSD		Total		Seawater	SB LCSD	NA	1.85	2.29 b	1.97 b	2.17 b	2.20 b	2.04 b	1.96 b	062712-6100
				Per	cent Recovery, LCS	NA	87%	92%	91%	97%	91%	96%	85%	
				Perce	ent Recovery, LCSD	NA	92%	102%	96%	102%	98%	102%	88%	
					RPD	NA	6.1%	10.8%	5.4%	5.0%	7.4%	5.6%	4.1%	
MATRIX SP	IKE RESULTS	<u>S</u>												
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	
					rcent Recovery, MS	101%	91%	111%	96%	102%	103%	106%	101%	
				Pero	cent Recovery, MSD RPD	102% 1.5%	91% 0.0%	113% 1.8%	96% 0.5%	104% 1.5%	103% 0.5%	105% 0.9%	103% 2.0%	
					KID	1.3 /0	0.0 76	1.0 70	0.5 /6	1.5 /0	0.5 /0	0.976	2.0 /0	
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	
				Pe	rcent Recovery, MS	94%	NA	91%	98%	97%	100%	101%	98%	
				Pero	cent Recovery, MSD	95%	NA	107%	98%	97%	101%	102%	98%	
					RPD	1.0%	NA	16%	0.8%	0.1%	1.0%	1.0%	0.0%	

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#### Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water UNITS: µg/L

Sample ID -		Fraction												ICP-MS
Metals	Station Code	(Total/Diss)	Sample Type	Matrix	MSL Code	As	Ag	Al	Cd	Cr	Cu	Pb	Zn	Batch ID
					Instrument:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	
	Achieved Detection		awater)			NA	0.0042	2.14	0.00110	0.0293	0.0351	0.0019	0.0263	
	porting Limit (MD					NA	0.013	6.8	0.0035	0.093	0.11	0.0060	0.084	
•	Achieved Detection	,	eshwater)			0.03	0.002	0.3	0.004	0.08	0.007	0.002	0.05	
-	Reporting Limit (M					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	
					rcent Recovery, MS	94%	95%	90%	95%	94%	93%	100%	96%	
				Pero	ent Recovery, MSD RPD	96% 2.6%	97% 1.6%	80% 12%	97% 2.6%	96% 2.1%	97% 3.7%	99% 1.0%	96% 0.0%	
					KI D	2.0 /0	1.070	12/0	2.0 /0	2.1 /0	3.7 70	1.0 / 0	0.0 / 0	
REPLICAT	E PRECISION													
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%	
	D REFERENCE I		<u>L</u>											
SRM 1640a-		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	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
					<b>Certified Value</b>	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%	
CELAND A DE	D DEEEDENGE													
STANDARL SRM CASS-:	<u>D REFERENCE I</u>	<u>VIATERIAI</u> Total	L, Seawater	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
SKWI CASS	.5	Total		Seawater										002/12-0100
					Certified Value	NA	NC	NC	0.0215	0.106	0.38	0.011	0.719	
					PD	NA			10%	<b>51%</b> 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 NA	NC 		1%	11%	3%	26% c	3%	
					ΓD	11/1			1 /0	11/0	3 /0	20 /0 0	3/0	

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#### Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water UNITS: µg/L

Metals	Station Code	Fraction (Total/Diss)	Sample Type	Matrix	MSL Code	Hg	CVAF Batch ID
				•	Instrument:	CVAF	
Laboratory Achiev		imits				0.0001	
Reporting Limit (1	MDL* 3.18)					0.0003	
MERIOD DI AN	TTT CI						
METHOD BLAN MB-1	NKS	Total		Emaghyyatan	Method Blank1	0.0001 U	060612HGA
MB-2		Total		Freshwater	Method Blank2	0.0001 U	060612HGA
MB-3		Total			Method Blank3	0.0001 U	060612HGA
MID-3		Total		riesiiwatei	Method Blanks	0.0001 0	000012HGA
MB-1		Total		Freshwater	Method Blank1	0.0001 U	061212HGA
MB-2		Total		Freshwater	Method Blank2	0.0001 U	061212HGA
MB-3		Total		Freshwater		0.0001 U	061212HGA
						***************************************	
LABORATORY	CONTROL SA	<b>AMPLES</b>					
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			BLANK 060512	0.000129 J	060612HGA
					ent Recovery, LCS 1	102%	
				Perce	ent Recovery, LCS 2	105%	
C-:1-: I1						0.00407	
Spiking Level		Total		Emaghyyatan	OPR 061112 run1	0.00496 0.00524	061212HGA
LCS (1)		Total Total			OPR 061112 run1 OPR 061112 run2	0.00524	061212HGA 061212HGA
LCS (2) LCS Blank (1)		Total			BLANK 061112	0.00313 0.0001 U	061212HGA
LCS Dialik (1)		Total			ent Recovery, LCS 1	106%	001212HGA
					ent Recovery, LCS 2	103%	
				10100	in Recovery, 1205 2	100 / 0	
MATRIX SPIKE	<u> </u>						
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	
				Pe	rcent Recovery, MS	98%	
				Pero	cent 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
2 = 002			F		Spiking Level, MS	0.0279	***************************************
					Spiking Level, MSD	0.0288	
					rcent Recovery, MS	114%	
					cent Recovery, MSD	106%	
					RPD	7.5%	
MC1	DCNICO15 14	Т-4-1	aamer: t '	Da1 (			06121211614
	PSNS015-14	Total	composite_time	Freshwater	3174-159 MS	0.0235	061212HGA
	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, MSD	0.0103	
					Spiking Level, MSD rcent Recovery, MS	0.0107 <b>92%</b>	
					cent Recovery, MSD	92% 97%	
				1 610	- '		
					RPD	4.9%	

#### Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) Metals in Water UNITS: µg/L

Sample ID -		Fraction					
Metals	Station Code	(Total/Diss)	Sample Type	Matrix	MSL Code	Hg	CVAF Batch ID
					Instrument:	CVAF	
	hieved Detection Li	imits				0.0001	
Reporting Lim	it (MDL* 3.18)					0.0003	
3.503	D011001# 0010D				24-14-27-5	0.0=40	0.410.1077.01
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	
					rcent Recovery, MS	96%	
				Pero	ent Recovery, MSD	108%	
					RPD	11.9%	
REPLICATE	PRECISION						
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
Der	15115015	10111	composite_time	1 Testivatei	Mean	0.0398	00001211011
					RPD	1%	
					M D	170	
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
			· · · · · · · · · · · · · · · · · · ·		Mean	0.267	
					RPD	2%	
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
			. –		Mean	0.266	
					RPD	4%	
STANDARD	REFERENCE MA	TERIAL					
SRM 1641 (1)		Total		Freshwater	1641d 060512	1638	060612HGA
SRM 1641 (1)		Total		Freshwater	1641d 061112	1681	061212HGA
					Certified Value	1590	
						±18	
	SRM 1641 (1)				range PD	±18 3%	
	SRM 1641 (1) SRM 1641 (2)				PD PD	5% 6%	
	SKW 1041 (2)				ru	U 70	

# Non-Dry Dock Stormwater ENVVEST 2011-12\_SW12 (Bonus Storm) QC Sample Results for TOC/DOC by HTCO

	Fraction			TOC/DOC	TOC/DOC	
Sample ID - Metals Station	n Code (Total/Diss)	Matrix	MSL Code	mg/L	μМ	Batch ID
Laboratory Achieved Detec	tion Limits (Seawater)			0.030	2.5	
Seawater Reporting Limit (	MDL* 3.18)			0.095	8.0	
			Instrument:	НТСО	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 Inter	·laboratory Sample²					
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-			PD	3.4%	3.4%	
CALIBRATION DECLI	<b>P</b> C					
CALIBRATION RESULT	<u>18</u>		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/C			% RECOVERY	105%		
ICV/C			% RECOVERY	107%		
ICV/C			% RECOVERY	98%		
ICV/C			% RECOVERY	102% 97%		
ICV/C			% RECOVERY			
ICV/C			% RECOVERY	98%		
ICV/C			% RECOVERY	98%		
ICV/C			% RECOVERY	98%		
ICV/C	CCV-9		% RECOVERY	105%		

# 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
Sample ID - Metals	Station Code	(Total/DISS)	ivialitx	MSL Code	133	Uillts	Datell ID
				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 C	CONTROL SA	MPLES					
LCS-1		Total	Freshwater	LCS042712r1	34.8	mg/L	042712TSS
LCS-2		Total	Freshwater	LCS042712r2	38.4	mg/L	042712TSS
				TRUE VALUE		mg/L	
	LCS-1			% RECOVERY			
	LCS-2			% RECOVERY	96%		

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

#### **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 ≤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

PNNL Data Package - ENVVEST SW12 Page 17 of 34

**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 dicrete 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  $0.45\mu m$  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  $4.0\pm2^{\circ}C$ .

The following lists information on sample receipt and processing activities:

Sample Receipt Dates:SW12: 04/20/12Cooler temp. on arrivalAll coolers were at  $4.0\pm2^{\circ}$ CCollection dates04/19/12 and 04/20/12

TSS analysis dates 04/27/12

**DOC analysis dates** 06/15/12, 06/16/12, 06/19/12, 06/20/12

**CVAF analysis dates** (Hg) 06/06/12 and 06/12/12

TRM Prep/Freshwater Analysis by ICP-MS 06/11/12

(As, Ag, Al, Cd, Cr, Cu, Pb, Zn)

Fe/Pd Prep/seawater Analysis by ICP-MS 06/26-27/12

(Ag, Al, Cd, Cr, Cu, Pb, Zn)

#### **QA/QC DATA QUALITY OBJECTIVES:**

#### **FRESHWATER**

		r.	<u>KESHWAIEK</u>	L		
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	НТСО	NA	≤20%	≤30%	0.03 mg/L	0.095 mg/L

SEAWATER	(only if different th	an freshwater)
DEAWALEN	While it dilletell th	an neshwater

Analyte	Analytical Method for Seawater	MS Range of Recovery	SRM Percent Difference	Replicate Precision	Method Detection Limits	Reporting Limits
	Seawatei	Recovery	Difference		<u>Limits</u> (μg/L)	<u>(μg/L)</u>
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*,

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
- Analyte detected above the MDL, but less than the RL
- N Spiked sample recovery outside QC criterion of 70-130%
- Accuracy result outside OC criterion of <20% PD
- Precision result outside QC criterion of <30%
- Analyte detected in the method blank > RL and sample concentration < 10 times detected blank value
- Reported result exceeds linear range; use with caution
- 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

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 <a href="http://yyy.rsmas.miami.edu/groups/biogeochem/CRM.html">http://yyy.rsmas.miami.edu/groups/biogeochem/CRM.html</a>. The average of the reference value range was used to calculate the PD for each replicate. The PD ranged from 1-3.4%.

**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;  $\mu$ L/L) and mean particle size ( $\mu$ 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  $\mu$ m (silt/clay), 63-234  $\mu$ m (very fine and fine sand), and 234-386  $\mu$ m (medium sand).

These *in-situ* measurements were then plotted again 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 (~1-2 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 storms drain sediment collected at PSNS015 and several other outfalls in both the CIA and NBK portions of PSNS.

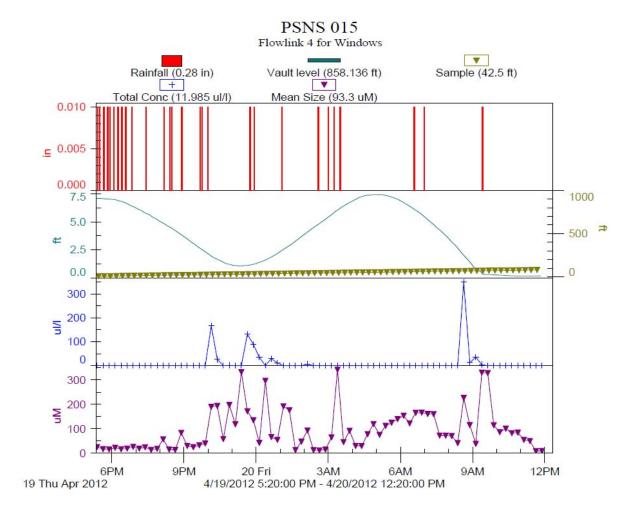


Figure 1. From top to bottom, graphs of the precipitation (inches), water level in the pipe (ft.), total concentration of particles as measured by the Laser In-Situ Scattering and Transmissometry (LISST;  $\mu L/L$ ) and mean particle size ( $\mu m$ ) of the stormwater during the SW12 event.

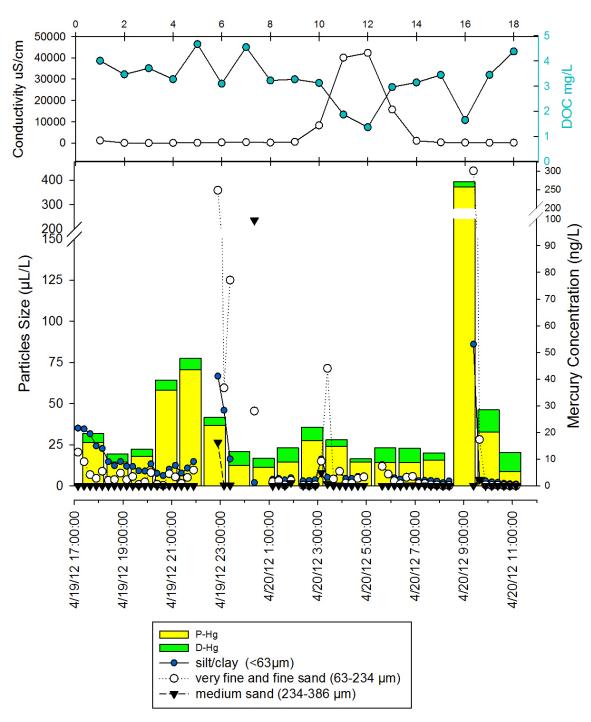


Figure 2. The top graph is the conductivity and dissolved organic carbon (DOC) during the storm event starting April 19, 2012. The bottom graph includes the concentrations of particulate mercury (P-Hg), dissolved Hg (D-Hg), silt/clay, fine sand, and medium sand. The top of the bar presents total recoverable Hg.

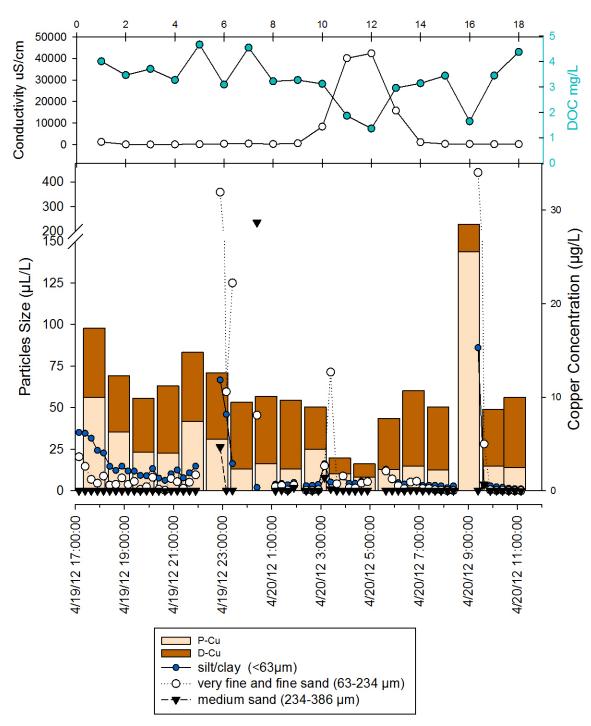


Figure 3. The top graph is the conductivity and dissolved organic carbon (DOC) during the storm event starting April 19, 2012. The bottom graph includes the concentrations of particulate copper (P-Cu), dissolved Cu (D-Cu), silt/clay, fine sand, and medium sand. The top of the bar presents total recoverable Cu.

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 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	<b>Bottle Type</b>	Volume (mL)	#
Wedge Bottle	Total and Dissolved	Teflon	250mL (half filtered at lab	48 (24 field
	Metals		for dissolved)	& 24 lab)

<sup>&</sup>lt;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.

Non-Dry Dock Stormwater SW12

Wedge Bottle	TSS	LDPE	500mL	24
Wedge Bottle	DOC	Glass	125mL (filtered in field)	24
	Collected at M	ISL from Comp	osite Sample	
Comp	Total and Dissolved	Teflon	500mL (half filtered at lab	2
	Metals		for dissolved)	
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.

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SAMPLE CHAIN	<b>OF CUSTODY FO</b>	RM													Battelle		
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	: 54220 / 62375 : Non-dry Dock Sto	rmwater SW12													Laboratory: I Attention: J		
Project	. Non-dry Dock Oto	illiwater Ovv 12		Ana	alyze	e pa	ram	ete	rs p	er Q/	AP/FS	P		ľ			60) 681-4564
3174 DIS Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	тос	200	TSS	L L	TME/DME				No containers		Sample Type (grab vs. Comp)	Storm#	Notes/Comments
SW12-014 458		4/20/12 103		-			χΪ	- 1	$\mathbb{T}^{1}$	-		1	3	_	comp	SW12	
SW12-014 736	PSAIS 015 - 14	1120112.105				$\frac{}{Y}$	$\frac{1}{v}$	$\dashv$	×		++	+	3	-	1	SW12	
SW12-015 10 166	PSNS015-15	1	SW			-	X	-	<i>X</i>		+	+	-	+			
SW12-016104162			SW			χ	Ϋ́	+	X		++	+	3	_		SW12	Debris, organic B Detritu
SW12-017 1949	PSNSOIS-17		SW			Y	V L		Ϋ́		++-	4	3	_	_/_	SW12	Small amount of Detritu
SW12-018 16 Put			SW			<u> </u>	¥.		γ		4-4	$\perp$	_[3	3		SW12	
SW12-019	PSNS015	4/13/12	SKIN						ᄾ		1_	_		<u> </u>	grab	SW12	Vault sediment
SW12-020 20 5	PSNS015	4/20112 103	7 sw			χ	시		X					<u> </u>	Carp	SW12	sterm comp
SW12-021	\		sw													SW12	
SW12-022	\		sw													SW12	
SW12-023			sw													SW12	
SW12-024			sw											Т		SW12	
SW12-025			sw									T		T		SW12	
3,7,12,020	50V07-00	6 8 4/23/12												1			
Relinquished by:		1/20/12	1750		Red	eiv	ed b	y:		4/1	20/12	_ 1	837	١,	Total # of Co Shipment Me	ntainers	
Jn Br	Signature A ~ l ( ~ b l/( ) ? V	Date	Time			•	<u>سما</u> اکان	<b>~</b> .	ature		13C		000	<b>-</b>	Hand Deliver	red to MSL	
	Printed Name	Company							ed Na	me					Sample Disp	osition:	
Relinquished by:					Red	ceiv	ed b	y:		··- ·-					Distribution: 1) PNNL		
	Signature	Date	Time				•	Signa	ature					_ : 	2) CAS		
	Printed Name	Company						Drint	ted Na	·ma				Ī			



Battelle
The Business of Innovation

**SAMPLE LOGIN** 

Project Manager: Brandenberger Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick

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

Project: ENVVEST Non-Dry Dock Storm Water - SW12

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

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PNNL Data Package - ENVVEST SW12 Page 30 of 34



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**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

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Marine Sciences Laboratory 1529 West Sequim Bay Road Sequim, Washington 98382

PH: (360) 681-4565

# **SAMPLE LOGIN**

Project Manager: Brandenberger Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick

Project: ENVVEST Non-Dry Dock Storm Water - SW12

CID	Cita Danasisti	D-Malla Cada	B.C A	Chamara I anadias	Danis da I Danis da I	Collection
Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	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

SOP#: MSL-A-001 Page 3 of 4

PNNL Data Package - ENVVEST SW12 Page 32 of 34

# **SAMPLE LOGIN**

Project Manager: Brandenberger Date Received: 4/20/2012

Batch: 13

Login Designee: Suslick





Marine Sciences Laboratory 1529 West Sequim Bay Road Sequim, Washington 98382

PH: (360) 681-4565

Project: ENVVEST Non-Dry Dock Storm Water - SW12

Project.	LIAAAFSI IAOII-		om water	- 34412			Collection
Sponsor ID	Site Description	Battelle Code		Matrix	Storage Location	Requested Parameters	Date
			Updated Code -	should reflec	ct the dissolved portion	of the sample (CS, 8/2/12)	
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

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PNNL Data Package - ENVVEST SW12 Page 33 of 34

LOG-IN CHECKLIST Reference SOP# MSL-A-001
Central File #: 3/74 Sample No(s): 133-170 Batch: 13
Project Name: Project Manager: TMB
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:
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)  Cooler temperature (acceptable range: 4±2°C or solids:frozen)
Custody seal present Seal intact? YES NO Wards
Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc)  Comment/Remedy:
Were <u>all</u> chain of custody forms signed and dated?
Were samples filtered at MSL? (AS hotel M (02)
Sample condition(s):  Acceptable Other (explain):
Sample condition(s).
Container type: Pelly Glass Cap. Vial Other:
Notes:
Completed By: 1800 Date/Time: 4/20/12 800
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: O.2% HNO3 Notes: Other Lot# 12(1090)
0.5% HCl (Hg samples) Notes: Lot#
Refrigerate/Freeze Notes:
Other Notes:
4/2/0-1827
Completed By: Date/Time: 1701/12 18 80
Storage Shelt: 1405 - Waven Gold
Battelle Marine Sciences Labs, 1529 West Sequim Bay Rd, Sequim, Washington 98362 PH: (360) 681-4565