

Appendix B: Laboratory QA/QC Results and Discussion

QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance and quality control (QA/QC) measures are built into the CCWTMP and Salts TMDL programs to assure that collected data are credible. Two types of quality controls were conducted. Field quality controls (to test for field contamination and precision) were conducted by the field crews and include: equipment blanks, field blanks, and field duplicates and laboratory quality controls (to test for laboratory contamination and precision) were conducted by the labs and include: method blanks, blank spikes, blank spike duplicates, lab duplicates, matrix spikes, matrix spike duplicates, laboratory control samples, and surrogates (organics only). Equipment blanks only apply to the shovels used in sediment sample collection. For the Salts TMDL program, blind standards were also submitted to the labs for further accuracy checks. All field protocols for the collection of clean samples were followed according to the QAPPs. The following section lists the quality control failures that occurred during the 2010-2011 monitoring year (Jan 2011 to July 2011 for Salts) and any associated qualifiers and comments.

Blank Contamination (CCWTMP & Salts TMDL)

Overall there was very little blank contamination detected during this third year of monitoring. Most of the field blank hits were found in the metals and the few others were nutrients and one Pyrethroid. There were again no equipment blank hits for the third year. Of the lab blank hits; there was one for each 4,4'-DDE, DOC, and Total Phosphorous. The others were all metals. For Salts, the blank hits were evenly distributed over the constituents and across events. Most of the field blank hits and blind blank hits were just over the RL limits and of the 15 blind blank hits, 4 were early on in the lab selection process and were from the non-selected lab. Details of all the blank hits are reported below in Table 1. The following lists a basic summary of the blank contamination results:

- Field Blanks – 648 analyzed – 39 detections above the RL (6%)
- Equipment Blanks – 36 analyzed – 0 detections above RL
- Laboratory Blanks – 1576 analyzed – 8 detections above RL (0.5%)
- Field Blanks (Salts) – 65 analyzed – 12 detections above the RL (18%)
- Blind Blanks (Salts) – 49 analyzed – 15 detections above RL (31%)
- Laboratory Blanks (Salts) – 62 analyzed – 0 detections above RL

Precision (CCWTMP & Salts TMDL)

The purpose of analyzing duplicates is to demonstrate precision of sample collection, preparation, and analytical methods. The relative percent difference (RPD) is reported for field duplicates, lab duplicates, blank spike duplicates, laboratory control spike (LCS) duplicates, and matrix spike duplicates. QA failures for precision are noted when the RPD between a sample and its duplicate are greater than the acceptance value. The following list summarizes the precision analysis results with details included in Table 2:

- Field Duplicates – 914 analyzed – 29 failed RPD (3.2%)
- Laboratory Duplicates – 385 analyzed – 15 failed RPD (3.9%)
- Blank Spike/LCS Duplicates – 1075 analyzed – 8 failed RPD (1.4%)

- Matrix Spike Duplicates – 447 analyzed – 7 failed RPD (1.6%)
- Field Duplicates (Salts) – 68 analyzed – 2 failed RPD (2.9%)
- Laboratory Duplicates (Salts) – 62 analyzed – 1 failed RPD (1.6%)
- Blank Spike/LCS Duplicates (Salts) – 45 analyzed – 0 failed RPD
- Matrix Spike Duplicates (Salts) – 52 analyzed – 0 failed RPD

Accuracy (CCWTMP)

Percent recoveries of blank spike samples (BS), laboratory control spike samples (LCS), and matrix spike samples (MS) check the accuracy of lab reported sample concentrations. For the BS and LCS that fell outside the acceptable range, 2 were in metals and 2 in the nutrients, then rest were all in the pesticides. For the matrix spike samples that fell outside the acceptable range, 27 were from the first event of the year in our sediment samples, all from the pesticides. Of the remaining ones, 26 were from water samples from pesticides, metals, and Total Phosphorus and 5 were from the pesticides in tissue samples. Table 3 summarizes the QA/QC sample results for accuracy that did not meet percent recovery objectives. The following lists the results of the accuracy analysis results:

- Blank Spike/LCS Samples – 2208 Analyzed – 37 fell outside the range (1.7%)
- Matrix Spike Samples – 902 Analyzed – 54 fell outside the range (6.0%)

Accuracy (Salts TMDL)

For Salts, we submitted blind known concentrations to the labs for analysis. These blind standards should fall within the same range as a blank spike. Of the 100 blind analysis submitted, not one fell outside the range. Also, there was no BS or LCS that fell outside the acceptable range and only 6 matrix spikes, all for Sulfate, which fell outside the range. Table 3 summarizes the QA/QC sample results for accuracy that did not meet percent recovery objectives. The following lists the results of the accuracy analysis results:

- Blank Spike/LCS Samples – 91 Analyzed – 0 fell outside the range
- Matrix Spike Samples – 104 Analyzed – 6 fell outside the range (5.8%)
- Blind Standards – 100 Analyzed – 0 fell outside the range

Table 1. Blank Contamination Observed

Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Equipment Blank	Program Qualifier	Comments
General Water Quality								
Dissolved Organic Carbon (mg/L)	Water	23	K1012576	6.05			U	Associated environmental samples less than 10 times the blank concentration are qualified
Dissolved Organic Carbon (mg/L)	Water	24	K1014283		4.44		U	Associated environmental samples less than 10 times the blank concentration are qualified
Dissolved Organic Carbon (mg/L)	Water	25	K1101035	1.5			U	Associated environmental samples less than 10 times the blank concentration are qualified
Dissolved Organic Carbon (mg/L)	Water	27	K1104399	2.41			U	Associated environmental samples less than 10 times the blank concentration are qualified
Nutrients								
Total Phosphorus as P (mg/L)	Water	23	K1012713	0.03			U	Associated environmental samples less than 10 times the blank concentration are qualified
Total Kjeldahl Nitrogen (mg/L)	Water	24	K1014278	0.51			U	Associated environmental samples less than 10 times the blank concentration are qualified
Total Phosphorus as P (mg/L)	Water	24	K1014283		9.49		U	Associated environmental samples less than 10 times the blank concentration are qualified
Total Kjeldahl Nitrogen (mg/L)	Water	26	K1102532	0.54			U	Associated environmental samples less than 10 times the blank concentration are qualified
Total Kjeldahl Nitrogen (mg/L)	Water	26	K1102532	0.86			U	Associated environmental samples less than 10 times the blank concentration are qualified

Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Equipment Blank	Program Qualifier	Comments
OC Pesticides								
DDE(p,p') (ug/L)	Water	24	O-1055W		0.34		U	Associated environmental samples less than 10 times the blank concentration are qualified
Bifenthrin (ug/L)	Water	25	O-1057W	0.0026			U	Associated environmental samples less than 10 times the blank concentration are qualified
PCBs								
None								
OP Pesticides								
None								
Triazine Pesticides								
None								
Pyrethroid Pesticides								
None								
Metals & Selenium								
Total Zinc (ug/L)	Water	22	C0H1113		0.85			
Dissolved Zinc (ug/L)	Water	22	C0H2412	2.31			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Zinc (ug/L)	Water	22	C0H2413	0.57			MS>UL, EST MS/MSD	Matrix Spike Recovery above upper limit, Estimated due to MS/MSD RPD failure.
Dissolved Nickel (ug/L)	Water	22	C0H2707	0.30	0.30		U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Nickel (ug/L)	Water	22	C0H2708	0.30	0.30		U	Associated environmental samples less than 5 times the blank concentration are qualified

Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Equipment Blank	Program Qualifier	Comments
Dissolved Zinc (ug/L)	Water	22	C0H2704	4.13	3.62		U, BS>UL	Associated environmental samples less than 5 times the blank concentration are qualified; Blank Spike Recovery above upper limit.
Total Zinc (ug/L)	Water	22	C0H2705	3.30	3.53		U	Associated environmental samples less than 5 times the blank concentration are qualified
Dissolved Nickel (ug/L)	Water	23	E-2013	0.07			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Nickel (ug/L)	Water	23	E-2013	0.05				
Dissolved Copper (ug/L)	Water	23	E-2013	0.09			U, FD RPD	Associated environmental samples less than 5 times the blank concentration are qualified; Estimated due to field duplicate failed the RPD objective.
Total Copper (ug/L)	Water	23	E-2013	0.11			U	Associated environmental samples less than 5 times the blank concentration are qualified
Dissolved Zinc (ug/L)	Water	23	E-2013	1.74			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Zinc (ug/L)	Water	23	E-2013	1.10			U	Associated environmental samples less than 5 times the blank concentration are qualified
Dissolved Zinc (ug/L)	Water	23	E-2008	2.20			U	Associated environmental samples less than 5 times the blank concentration are qualified
Dissolved Zinc (ug/L)	Water	24	E-2012W	1.41			U	Associated environmental samples less than 5 times the blank concentration are qualified
Dissolved Zinc (ug/L)	Water	25	E-2020W	2.59			U	Associated environmental samples less than 5 times the blank concentration are qualified

Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Equipment Blank	Program Qualifier	Comments
Total Copper (ug/L)	Water	25	E-2021W	4.02			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Nickel (ug/L)	Water	25	E-2021W	2.85			U, FD RPD	Associated environmental samples less than 5 times the blank concentration are qualified; Estimated due to field duplicate failed the RPD objective.
Total Selenium (ug/L)	Water	25	E-2021W	18.24				
Dissolved Zinc (ug/L)	Water	25	E-2021W	0.78			U, FD RPD	Associated environmental samples less than 5 times the blank concentration are qualified; Estimated due to field duplicate failed the RPD objective.
Dissolved Zinc (ug/L)	Water	26	E-2029W	0.85			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Copper (ug/L)	Water	26	E-2029W	0.27				
Dissolved Copper (ug/L)	Water	27	E-2070W	0.43			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Copper (ug/L)	Water	27	E-2070W	0.40				
Total Nickel (ug/L)	Water	27	E-2070W	0.23				
Dissolved Zinc (ug/L)	Water	27	E-2070W	0.94			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Copper (ug/L)	Water	27	E-2073W	0.07			U	Associated environmental samples less than 5 times the blank concentration are qualified
Dissolved Copper (ug/L)	Water	27	E-2073W	0.04			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Nickel (ug/L)	Water	27	E-2073W	0.08				
Dissolved Nickel (ug/L)	Water	27	E-2073W	0.05				

Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Equipment Blank	Program Qualifier	Comments
Dissolved Zinc (ug/L)	Water	27	E-2073W	0.74			U	Associated environmental samples less than 5 times the blank concentration are qualified
Total Zinc (ug/L)	Water	27	E-2073W	1.31			U	Associated environmental samples less than 5 times the blank concentration are qualified
Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Blind Blank	Program Qualifier	Comments
Salts								
Sulfate (mg/L)	Water	1	C-1127	0.169				
Total Dissolved Solids (mg/L)	Water	1	C-1033			28		
Total Dissolved Solids (mg/L)	Water	3	C-1052			29.3		
Total Dissolved Solids (mg/L)	Water	4	C-2023	52		52		
Total Dissolved Solids (mg/L)	Water	5	C-2063	8				
Sulfate (mg/L)	Water	5	C-2043	0.198		0.219		
Chloride (mg/L)	Water	5	C-2043			0.052		
Boron (ug/L)	Water	6	E-2057	92.8			U	U - Upper Limit of analyte due to Field blank hits and the environmental < 5x the blank hit.
Sulfate (mg/L)	Water	9	C-2138	0.16		0.17		
Chloride (mg/L)	Water	9	C-2138	0.05		0.06		
Boron (ug/L)	Water	9	E-2071	7.1				
Sulfate (mg/L)	Water	10	C-2139	0.16				
Chloride (mg/L)	Water	10	C-2139	0.08				
Sulfate (mg/L)	Water	12	C-3085			0.27		
Sulfate (mg/L)	Water	13	C-3091			0.23		

Constituent	Matrix	Event	Lab Batch	Field Blank	Method Blank	Blind Blank	Program Qualifier	Comments
Chloride (mg/L)	Water	13	C-3091			0.07		
Chloride (mg/L)	Water	14	C-3079	0.06		0.06		
Sulfate (mg/L)	Water	14	C-3079	0.2				
Sulfate (mg/L)	Water	15	C-4031			0.23		
Sulfate (mg/L)	Water	16	C-4032			0.2		
Chloride (mg/L)	Water	16	C-4032			0.06		

Table 2. Precision QA/QC Issues

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
General Water Quality										
Total Suspended Solids (mg/L)	Water	22	C0H1101	LabQA		67				
Total Suspended Solids (mg/L)	Water	22	C0H3003	01_BPT_6		46				
Total Suspended Solids (mg/L)	Water	23	C-1026	01_SG_74		42			LD RPD	Estimate due to LD failure
Dissolved Organic Carbon (mg/L)	Water	24	230486W	01_RR_BR		115			U, LD RPD	Upper limit, Estimate due to LD failure
Total Suspended Solids (mg/L)	Water	25	C-1142W	01_BPT_15		36				
Dissolved Organic Carbon (mg/L)	Water	25	K110103 5W	01_BPT_15		40			U, FD RPD	Upper limit, Estimate due to FD failure
Total Suspended Solids (mg/L)	Water	26	C-2060W	10_GATE		38			FD RPD	Estimate due to LD failure
Total Suspended Solids (mg/L)	Water	27	C-2126W	04D_VENTRA		73			LD RPD	Estimate due to LD failure

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
Total Suspended Solids (mg/L)	Water	27	C-2127W	07_HITCH	108				FD RPD	Estimate due to FD failure
Total Suspended Solids (mg/L)	Water	27	C-2144W	01_BPT_3	38					
Nutrients										
Total Kjeldahl Nitrogen (mg/L)	Water	25	236133W	04_WOOD	74			37	EST MS/MSD, FD RPD	Estimate Matrix Spike/Matrix Spike Dup failure, FD RPD failure
Ammonia as N (mg/L)	Water	26	C-2097W	10_GATE	118				FD RPD	Estimate due to FD failure
OC Pesticides										
Endrin Aldehyde (ng/g)	Water	22	C0I2015	BlankSpike			74			
4,4'-DDT (ng/g)	Tissue	22	C0I2015	07_HITCH		35				
4,4'-DDE (ng/g)	Tissue	22	C0I2015	07_HITCH		79			LD RPD	Estimate due to LD failure
Endosulfan II (ug/L)	Water	22	C0H0602	LabQA				53		
4,4'-DDT (ng/g dw)	Sediment	22	C0I1001	02_PCH				71		
Dieldrin (ng/g)	Tissue	22	C0I2015	07_HITCH				52	MS<LL, EST MS/MSD	Matrix Spike Lower limit failure, Estimate Matrix Spike/Matrix Spike Dup failure
4,4'-DDE (ug/L)	Water	23	O-1032	01T_ODD2_DCH	38				FD RPD	Estimate due to FD failure
Endosulfan II (ug/L)	Water	24	O-1038W	13_SB_HILL				56	EST MS/MSD	Estimate Matrix Spike/Matrix Spike Dup failure
Endosulfan Sulfate (ug/L)	Water	25	O-1057W	BlankSpike			38			
4,4'-DDT (ng/g)	Water	25	O-1057W	04_WOOD	61					
4,4'-DDE (ng/g)	Water	25	O-1057W	04_WOOD	34				FD RPD	Estimate due to FD failure
PCBs										
None										

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
OP Pesticides										
Diazinon (ng/g ww)	Water	22	C0I1001	BlankSpike			42			
Diazinon (ug/L)	Water	27	W1E0345	10D_HILL			99			
Triazine Pesticides										
Simazine (ug/L)	Water	22	C0H2001	07_HITCH	35				BS<LL, FD RPD	Blank Spike Lower limit failure, Estimate due to FD failure
Simazine (ug/L)	Water	22	C0H2001	10_GATE	42				BS<LL, FD RPD	Blank Spike Lower limit failure, Estimate due to FD failure
Prometryn (ug/L)	Water	27	W1E0345	10D_HILL			104			
Simazine (ug/L)	Water	27	W1E0345	10D_HILL			93			
Pyrethroid Pesticides										
Bifenthrin (ug/L)	Water	24	O-1055W	04_WOOD	68				H, FD RPD	Holdtime exceeded, Estimate due to FD failure
Cypermethrin (ug/L)	Water	24	O-1060W	04_WOOD	127				H, FD RPD	Holdtime exceeded, Estimate due to FD failure
Deltamethrin (ug/L)	Water	27	O-1120W	BlankSpike			84			
Deltamethrin (ug/L)	Water	27	W1E0495	10D_HILL			34			
Metals and Selenium										
Dissolved Zinc (ug/L)	Water	22	C0H2412	01T_ODD2_DCH		38			LD RPD, U	Upper limit, Estimate due to LD failure
Total Zinc (ug/L)	Water	22	C0H2413	01T_ODD2_DCH		61		31	LD RPD, MS>UL, EST MS/MSD	LD Failure, MS Upper Limit exceeded, Estimate Matrix Spike/Matrix Spike Dup failure
Dissolved Zinc (ug/L)	Water	22	C0H2412	LabQA		38			LD RPD, U	Upper limit, Estimate due to LD failure

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
Dissolved Mercury (ug/L)	Water	22	C0H2302	03_UNIV	39					
Total Mercury (ug/L)	Water	22	C0H3109	01_BPT_6	49				U	Upper limit
Dissolved Copper (ug/L)	Water	22	C0H2707	01_BPT_6	78				FD RPD	Estimate due to FD failure
Total Copper (ug/L)	Water	22	C0H2708	01_BPT_6	35				FD RPD	Estimate due to FD failure
Dissolved Zinc (ug/L)	Water	22	C0H2704	01_BPT_6	107				U, BS>UL, FD RPD	Upper Limit, BS Upper Limit exceeded, Estimate due to FD failure
Total Zinc (ug/L)	Water	22	C0H2705	01_BPT_6	100				U, FD RPD	Upper Limit, Estimate due to FD failure
Dissolved Copper (ug/L)	Water	23	E-2013	01_BPT_14	45				FD RPD	Estimate due to FD failure
Total Mercury (ug/L)	Water	25	M-1068W	03_UNIV		32			LD RPD, U	Upper Limit, Estimate due to LD failure
Total Selenium (ug/L)	Water	25	E-2020W	9AD_CAMA		33				
Dissolved Mercury (ug/L)	Water	25	M-1068W	04_WOOD	40				U	Upper Limit
Total Nickel (ug/L)	Water	25	E-2021W	01_BPT_15	80				U, FD RPD	Upper Limit, Estimate due to FD failure
Total Zinc (ug/L)	Water	25	E-2021W	01_BPT_15	152				FD RPD	Estimate due to FD failure
Dissolved Zinc (ug/L)	Water	25	E-2021W	01_BPT_15	130				FD RPD	Estimate due to FD failure
Total Mercury (ug/L)	Water	26	M-1083W	01T_ODD2_DCH				46	MS>UL, EST MS/MSD	MS Upper Limit exceeded, Estimate due to MS/MSD failure
Total Selenium (ug/L)	Water	27	E-2070W	01T_ODD2_DCH		33			LD RPD, FD RPD	Estimate due to FD failure and LD failure
Dissolved Mercury (ug/L)	Water	27	M-1085W	01_BPT_14		45			FD RPD	Estimate due to FD failure
Total Mercury (ug/L)	Water	27	M-1085W	01_BPT_14		56				

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
Dissolved Selenium (ug/L)	Water	27	E-2073W	01_BPT_14		85			LD RPD	Estimate due to LD failure
Dissolved Mercury (ug/L)	Water	27	M-1085W	03_UNIV	120				FD RPD	Estimate due to FD failure
Total Selenium (ug/L)	Water	27	E-2070W	03_UNIV	37				LD RPD, FD RPD	Estimate due to FD failure and LD failure
Total Selenium (ug/L)	Water	27	E-2073W	01_BPT_3	67				FD RPD	Estimate due to FD failure
Salts										
Sulfate (mg/L)	Water	3	C-2003	04D_Ventura		44			LD RPD	Estimate due to LD failure
Chloride (mg/L)	Water	6	C-2090	03_UNIV	40				FD RPD	Estimate due to FD failure
Sulfate (mg/L)	Water	6	C-2090	03_UNIV	40				FD RPD	Estimate due to FD failure

BS/BSD = Blank Spike / Blank Spike Duplicate
MS/MSD = Matrix Spike / Matrix Spike Duplicate
RPD = Relative Percent Difference

Table 3. Accuracy QA/QC Issues (CCWTMP)

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
General Water Quality									
None									
Nutrients									
OrthoPhosphate as P (mg/L)	Water	24	C-1093W	101	99	124	126		
Total Phosphorus as P (mg/L)	Water	27	C-3031W	154	123	113	118		
OC Pesticides									

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
2,4'-DDT (ug/L)	Water	22	C0H0602	23	24	123	122	M1	Recovery of the MS/MSD compound was out of control due to matrix interference.
4,4'-DDD (ug/L)	Water	22	C0H0602	146	149	117	121	M1	Recovery of the MS/MSD compound was out of control due to matrix interference.
Endrin Ketone (ug/L)	Water	22	C0H0602	39	38	112	118	M1	Recovery of the MS/MSD compound was out of control due to matrix interference.
2,4'-DDD (ug/L)	Water	22	C0H0602	128	148	97	100	M1	Recovery of the MS/MSD compound was out of control due to matrix interference.
2,4'-DDT (ug/L)	Water	22	C0H1801	X	X	133	133	L-1	The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
Endosulfan Sulfate (ug/L)	Water	22	C0H2001	147	135	124	128	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
2,4'-DDT (ug/L)	Water	22	C0H3103	X	X	141	141		
HCH, delta (ng/g dw)	Sediment	22	C0H2501	124	133	110	136	M1, L-1	Recovery of the MS/MSD compound was out of control due to matrix interference. The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
Chlordane, gamma- (ng/n dw)	Sediment	22	C0I1001	109	115	123	103	L-1	The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
4,4'-DDD (ng/g dw)	Sediment	22	C0H2501	160	170	127	125	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BS Rec.	Program Qualifier	Comments
Endosulfan Sulfate (ng/g dw)	Sediment	22	C0H2501	121	125	111	121	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
HCH, delta (ng/g dw)	Sediment	22	C0I1001	140	141	147	128	M1, L-1	Recovery of the MS/MSD compound was out of control due to matrix interference. The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
Endrin Aldehyde (ng/g dw)	Sediment	22	C0I1001	118	132	130	166	L-1	The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
4,4'-DDD (ng/g dw)	Sediment	22	C0I1001	151	165	121	121	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
4,4'-DDT (ng/g dw)	Sediment	22	C0I1001	13	6	134	134	M4, J	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification. Detected but below the RL, Estimated.
Endosulfan Sulfate (ng/g dw)	Sediment	22	C0I1001	129	115	108	106	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
Endosulfan II (ng/g dw)	Sediment	22	C0I1001	131	119	122	122	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
2,4'-DDD (ng/g dw)	Sediment	22	C0I1001	123	141	126	107	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
2,4'-DDT (ng/g dw)	Sediment	22	C0I1001	43	35	X	X		
Endosulfan I (ng/g)	Tissue	22	C0I2015	54	46	34	26		
4,4'-DDE (ng/g)	Tissue	22	C0I2015	32	-7	104	105		
4,4'-DDE (ng/g)	Tissue	22	C0I2015	-913	-943	111	X		
Dieldrin (ng/g)	Tissue	22	C0I2015	77	44	83	106		
Endrin (ug/L)	Water	24	O-1060W	X	X	53	49	H	Sample analyzed past the recommended holding time.
Endrin Ketone (ug/L)	Water	24	O-1038W	110	96	128	114		
4,4'-DDT (ug/L)	Water	24	O-1038W	125	123	132	122		
PCBs									
None									
OP Pesticides									
Chlorpyrifos (ug/L)	Water	22	W0H0360	X	X	56	47	BS-03	Recovery in the BS/LCS was outside the control; however the results were accepted based on another BS/LCS or MS/MSD that met the control.
Malathion (ug/L)	Water	22	C0H0602	127	144	106	106	M1	Recovery of the MS/MSD compound was out of control due to matrix interference.

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
Malathion (ug/L)	Water	22	C0H2001	150	131	122	108	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Diazinon (ng/g dw)	Sediment	22	C0H2501	138	143	11	9	M1, L-2, J	Recovery of the MS/MSD compound was out of control due to matrix interference. The LCS/LCSD recovery was below the acceptance limit – Biased low. Detected but below the RL, Estimated.
Diazinon (ng/g dw)	Sediment	22	C0I0701	95	94	0	0	L-1, L-2, M1	The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected. The LCS/LCSD recovery was below the acceptance limit – Biased low. Recovery of the MS/MSD compound was out of control due to matrix interference.
Diazinon (ng/g dw)	Sediment	22	C0I1001	114	113	11	17	L-2, J	The LCS/LCSD recovery was below the acceptance limit – Biased low. Detected but below the RL, Estimated.
Malathion (ng/g dw)	Sediment	22	C0I1001	168	159	101	113	M1	Recovery of the MS/MSD compound was out of control due to matrix interference.
Triazine Pesticides									
Atrazine (ug/L)	Water	22	C0H1801	X	X	124	124	L-1	The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
Simazine (ug/L)	Water	22	C0H1801	X	X	127	131	L-1	The LCS/LCS duplicate compound recovery was above the acceptance limits and the corresponding samples were not detected.
Atrazine (ug/L)	Water	22	C0H2001	107	98	94	69	L-3	LCS/LCSD beyond the normal 3 StdDev acceptance limits, but still within the 4 StdDev limit.

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
Simazine (ug/L)	Water	22	C0H2001	110	95	85	65	L-3	LCS/LCSD beyond the normal 3 StdDev exceptance limits, but still within the 4 StdDev limit.
Simazine (ug/L)	Water	24	O-1038W	X	X	150	156		
Prometryn (ug/L)	Water	27	W1E0345	X	X	81	257	BS-03	Recovery in the BS/LCS was outside the control; however the results were accepted based on another BS/LCS or MS/MSD that met the control.
Simazine (ug/L)	Water	27	W1E0345	X	X	78	213	BS-03	Recovery in the BS/LCS was outside the control; however the results were accepted based on another BS/LCS or MS/MSD that met the control.
Pyrethroid Pesticides									
Bifenthrin (ug/L)	Water	22	C0H0602	162	156	109	114	QM-05	MS/MSD was outside acceptance limits due to matrix interference, however the LCS/LCSD was within acceptance limits and data was accepted.
Permethrin (ug/L)	Water	22	C0H0602	184	169	112	112	QM-05	MS/MSD was outside acceptance limits due to matrix interference, however the LCS/LCSD was within acceptance limits and data was accepted.
Bifenthrin (ug/L)	Water	22	C0H2001	86	87	66	64	L-3	LCS/LCSD beyond the normal 3 StdDev exceptance limits, but still within the 4 StdDev limit.
Bifenthrin (ng/g dw)	Sediment	22	C0H2501	152	137	92	99	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
Cypermethrin (ng/g dw)	Sediment	22	C0H2501	139	117	85	98	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Permethrin (ng/g dw)	Sediment	22	C0H2501	165	134	96	112	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Bifenthrin (ng/g dw)	Sediment	22	C0I1001	216	229	113	120	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Permethrin (ng/g dw)	Sediment	22	C0I1001	147	153	83	102	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Permethrin (ug/L)	Water	25	W1B0589	88	96	58	X	BS-03	Recovery in the BS/LCS was outside the control; however the results were accepted based on another BS/LCS or MS/MSD that met the control.
Metals and Selenium									
Dissolved Selenium (ug/L)	Water	22	C0H2412	129	130	104	104	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.

Constituent	Matrix	Event	Lab Batch	MS Rec.	MSD Rec.	LCS/BS Rec.	LCSD/BSD Rec.	Program Qualifier	Comments
Total Selenium (ug/L)	Water	22	C0H2413	129	132	101	99	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Total Zinc (ug/L)	Water	22	C0H2413	102	140	105	104	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Dissolved Zinc (ug/L)	Water	22	C0H2704	101	93	128	122		
Dissolved Selenium (ug/L)	Water	22	C0H2707	84	83	68	75	L-3	LCS/LCSD beyond the normal 3 StdDev exceptance limits, but still within the 4 StdDev limit.
Total Selenium (ug/L)	Water	22	C0H2708	81	73	83	83	M4	Spike or surrogate compound recovery was out of control due to matrix interference. Associated method blank spike or surrogate compound was in control and therefore sample data was reported without clarification.
Total Mercury (ug/L)	Water	26	M-1083W	167	105	111	109		
Dissolved Selenium (ug/L)	Water	27	E-2070W	136	120	X	X		
Salts									
Sulfate (mg/L)	Water	2	C-1046	47	55	107	114	M	Recovery of the MS/MSD compound was out of control due to matrix interference.
Sulfate (mg/L)	Water	3	C-2003	144	144	116	116	M	Recovery of the MS/MSD compound was out of control due to matrix interference.
Sulfate (mg/L)	Water	6	C-2090	59	58	92	90	M	Recovery of the MS/MSD compound was out of control due to matrix interference.

MS = Matrix Spike

MSD = Matrix Spike Duplicate
LCS = Lab Control Spike
LCSD = Lab Control Spike Duplicate
Rec. = Recovery