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U.S. Army Corps of Engineers

New England District
Concord, Massachusetts

QUALITY ASSURANCE PROJECT PLAN

Volume III
Appendices B, C, D

8 January 1999 (DCN: GEP2-123098-AAET)

Revised May 2003 (DCN: GE-022803-ABLZ)

Environmental Remediation Contract
General Electric (GE)/Housatonic River Project
Pittsfield, Massachusetts

Contract No. DACW33-00-D-0006

03P-1194-4A

WESTON SOLUTIONS

QUALITY ASSURANCE PROJECT PLAN, FINAL (REVISED 2003)

ENVIRONMENTAL REMEDIATION CONTRACT GENERAL ELECTRIC (GE) HOUSATONIC RIVER PROJECT PITTSFIELD, MASSACHUSETTS

Volume III—Appendices B, C, and D

8 January1999 (DCN: GEP2-123098-AAET)
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Contract No. DACW33-00-D-0006

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APPENDIX B.1

ELECTRONIC DATA DELIVERABLES

B. DATA EVALUATION DELIVERABLES

B.1 ELECTRONIC DATA DELIVERABLE PRINTOUT

The Electronic Data Deliverable (EDD) printout consists of a spreadsheet report organized by laboratory sample ID. The printout contains all fields within the EDD. The data evaluator/ chemist will perform a cursory comparison of the electronic data to the hardcopy deliverables. Any discrepancies are to be conveyed to the laboratory for resubmittal, and documented in the analytical batch file. See Exhibit B.1-1.

EXHIBIT B.1-1 ELECTRONIC DATA DELIVERABLE PRINTOUT

Batch	LSmp ID	FSmp ID	Mtx	Anl Mth	Smp t	Caption	Res typ	Result	Units	Flag	Dil ty	Dil F	Prep Bch	Col	Prep	Anlysis	Per Sol
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1254	FR	120	ug/Kg	P	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1260	FR	180	ug/Kg		03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	1,2,4-Trichlorobenzene	FR	7.9	ug/Kg	U	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1016	FR	40.0	ug/Kg	U	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1221	FR	40.0	ug/Kg	U	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1232	FR	40.0	ug/Kg	U	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1242	FR	40.0	ug/Kg	U	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Aroclor-1248	FR	40.0	ug/Kg	U	03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	PCB, Total	FR	300	ug/Kg		03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Tetrachloro-m-xylene	UR	17.0	ug/Kg		03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Tetrachloro-m-xylene	US	105	%REC		03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Decachlorobiphenyl	UR	18.0	ug/Kg		03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366978	091898IZ03	S	SW8082A	F	Decachlorobiphenyl	US	111	%REC		03	2.0	PBLKJ3	09/18/1998	09/24/1998	09/26/1998	84.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1254	FR	1200	ug/Kg	P	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1260	FR	1900	ug/Kg		09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	1,2,4-Trichlorobenzene	FR	44.0	ug/Kg	U	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1016	FR	220	ug/Kg	U	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1221	FR	220	ug/Kg	U	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1232	FR	220	ug/Kg	U	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1242	FR	220	ug/Kg	U	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Aroclor-1248	FR	220	ug/Kg	U	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	PCB, Total	FR	3100	ug/Kg		09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Tetrachloro-m-xylene	UR	11.0	ug/Kg	J	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Tetrachloro-m-xylene	US	61	%REC	J	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Decachlorobiphenyl	UR	11.0	ug/Kg	J	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366996	092198IZ09	S	SW8082A	F	Decachlorobiphenyl	US	62	%REC	J	09	10.0	PBLKJ7	09/21/1998	09/24/1998	09/26/1998	76.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1254	FR	600	ug/Kg		03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1260	FR	940	ug/Kg		03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	1,2,4-Trichlorobenzene	FR	20.0	ug/Kg	U	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1016	FR	100	ug/Kg	U	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1221	FR	100	ug/Kg	U	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1232	FR	100	ug/Kg	U	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1242	FR	100	ug/Kg	U	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Aroclor-1248	FR	100	ug/Kg	U	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	PCB, Total	FR	1500	ug/Kg		03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0

Batch	LSmp ID	FSmp ID	Mtx	Anl Mth	Smp t	Caption	Res typ	Result	Units	Flag	Dil ty	Dil F	Prep Bch	Col	Prep	Anlysis	Per Sol
PT066	366997	092198IZ13	S	SW8082A	F	Tetrachloro-m-xylene	UR	10.0	ug/Kg	J	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Tetrachloro-m-xylene	US	65	%REC	J	03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Decachlorobiphenyl	UR	11.0	ug/Kg		03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366997	092198IZ13	S	SW8082A	F	Decachlorobiphenyl	US	69	%REC		03	5.0	PBLK7J	09/21/1998	09/24/1998	09/27/1998	83.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1254	FR	9800	ug/Kg		03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1260	FR	10000	ug/Kg		03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	1,2,4-Trichlorobenzene	FR	18000	ug/Kg	EP	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1016	FR	1200	ug/Kg	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1221	FR	1200	ug/Kg	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1232	FR	1200	ug/Kg	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1242	FR	1200	ug/Kg	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1248	FR	1200	ug/Kg	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	PCB, Total	FR	20000	ug/Kg		03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Tetrachloro-m-xylene	UR	3.5	ug/Kg	J	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Tetrachloro-m-xylene	US	18	%REC	J	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Decachlorobiphenyl	UR	120	ug/Kg	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Decachlorobiphenyl	US	0	%REC	U	03	50.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1254	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1260	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	1,2,4-Trichlorobenzene	FR	350000	ug/Kg	D	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1016	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1221	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1232	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1242	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Aroclor-1248	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	PCB, Total	FR	120000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Tetrachloro-m-xylene	UR	12000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Tetrachloro-m-xylene	US	0	%REC	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Decachlorobiphenyl	UR	12000	ug/Kg	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	366998	092198IZ23	S	SW8082A	F	Decachlorobiphenyl	US	0	%REC	U	01	5000.0	PBLKJ7	09/21/1998	09/24/1998	09/27/1998	69.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1254	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1260	FR	160	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1260	FS	94	%REC		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	1,2,4-Trichlorobenzene	FR	15.0	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	1,2,4-Trichlorobenzene	FS	115	%REC		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0

Batch	LSmp ID	FSmp ID	Mtx	Anl Mth	Smp t	Caption	Res typ	Result	Units	Flag	Dil ty	Dil F	Prep Bch	Col	Prep	Anlysis	Per Sol
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1016	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1221	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1232	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1242	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Aroclor-1248	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	PCB, Total	FR	180	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Tetrachloro-m-xylene	UR	16.0	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Tetrachloro-m-xylene	US	117	%REC		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Decachlorobiphenyl	UR	15.0	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J3LCS	J3LCS	S	SW8082A	KN	Decachlorobiphenyl	US	115	%REC		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1254	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1260	FR	150	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1260	FS	88	%REC		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	1,2,4-Trichlorobenzene	FR	14.0	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	1,2,4-Trichlorobenzene	FS	108	%REC		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1016	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1221	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1232	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1242	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Aroclor-1248	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	PCB, Total	FR	150	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Tetrachloro-m-xylene	UR	14.0	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Tetrachloro-m-xylene	US	105	%REC		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Decachlorobiphenyl	UR	14.0	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	J7LCS	J7LCS	S	SW8082A	KN	Decachlorobiphenyl	US	109	%REC		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1254	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1260	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	1,2,4-Trichlorobenzene	FR	3.3	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1016	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1221	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1232	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1242	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Aroclor-1248	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	PCB, Total	FR	17.0	ug/Kg	U	00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Tetrachloro-m-xylene	UR	14.0	ug/Kg		00	01	PBLK7J		09/24/1998	09/27/1998	100.0

Batch	LSmp ID	FSmp ID	Mtx	Anl Mth	Smp t	Caption	Res typ	Result	Units	Flag	Dil ty	Dil F	Prep Bch	Col	Prep	Anlysis	Per Sol
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Tetrachloro-m-xylene	US	104	%REC		00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Decachlorobiphenyl	UR	14.0	ug/Kg		00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLK7J	PBLK7J	S	SW8082A	MB	Decachlorobiphenyl	US	108	%REC		00	01	PBLK7J		09/24/1998	09/27/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1254	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1260	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	1,2,4-Trichlorobenzene	FR	3.3	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1016	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1221	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1232	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1242	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Aroclor-1248	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	PCB, Total	FR	17.0	ug/Kg	U	00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Tetrachloro-m-xylene	UR	15.0	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Tetrachloro-m-xylene	US	114	%REC		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Decachlorobiphenyl	UR	15.0	ug/Kg		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ3	PBLKJ3	S	SW8082A	MB	Decachlorobiphenyl	US	114	%REC		00	01	PBLKJ3		09/24/1998	09/25/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1254	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1260	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	1,2,4-Trichlorobenzene	FR	3.3	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1016	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1221	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1232	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1242	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Aroclor-1248	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	PCB, Total	FR	17.0	ug/Kg	U	00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Tetrachloro-m-xylene	UR	14.0	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Tetrachloro-m-xylene	US	105	%REC		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Decachlorobiphenyl	UR	15.0	ug/Kg		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0
PT066	PBLKJ7	PBLKJ7	S	SW8082A	MB	Decachlorobiphenyl	US	114	%REC		00	01	PBLKJ7		09/24/1998	09/26/1998	100.0

APPENDIX B.2

TECHNICAL DATA MANAGEMENT SYSTEM (TDMS) EVALUATION REPORTS

B.2 TECHNICAL DATA MANAGEMENT SYSTEM (TDMS) EVALUATION REPORTS

The following reports represent the paper audit trail to document electronic evaluation qualifier assignments. The analytical batch is an example batch and a few Quality Control (QC) items were intentionally changed to be out of criteria.

B.2.1 Electronic Evaluation Programs and Descriptions

This sheet is the key to the QC parameter descriptions that go with the programs listed in the Evaluation Flag Detail Report. If and when these program names change, a new Electronic Evaluation Programs and Descriptions Sheet will be included in the evaluation deliverable. See Exhibit B.2-1.

B.2.2 Evaluation Flag Detail Report

This report lists and is sorted by Lab Sample ID, evaluation phase program, dilution (or multiple analysis) code, matrix, method, analyte name, original lab flag with the flag calculated in this phase, original lab result with the adjusted result (the result is only changed when a blank evaluation raises a detection below reporting limit up to the reporting limit), the overall evaluation flag, and parameter ID and sub ID (the electronic system code assignment for the analyte).

The information presented on this report and the Evaluation Log Report are similar to Validation Worksheet information. See Exhibit B.2-2.

B.2.3 Evaluation Log Report

This information goes with the Evaluation Flag Detail Report. A brief description is given about the flag assignment and the information is sorted by each QC parameter that was out of criteria. See Exhibit B.2-3.

B.2.4 Chain of Custody Summary Report

The chain of custody information is presented with some additional information (e.g., field type, collection type, depths, etc.). See Exhibit B.2-4.

B.2.5 Field Blank Report

Associated field blanks (2=equipment blank, 3=trip blank) are listed per sample per method. Field sample qualification based on field blank contamination might not be used on this project. See Exhibit B.2-5.

B.2.6 Evaluated Flag Report

This report shows the final evaluation qualifier assignment. If additional flag assignments or changes are made following review by a data evaluator/chemist, then this report is reprinted and represents the final evaluation qualifiers. There will be handwritten notes on the original evaluation reports explaining additional flag assignments or changes. See Exhibit B.2-6.

EXHIBIT B.2-1 ELECTRONIC EVALUATION PROGRAMS AND DESCRIPTIONS

Electronic Evaluation Programs and Descriptions

Evaluation Phase Number	Evaluation Phase Program	Evaluation Phase Description
1	EVAL0016.EXE	Holding Time
2	EVAL0002.EXE	Surrogate
3	EVAL0003.EXE	Method Blank
4	EVAL0013.EXE	Field Blank
5	EVAL0019.EXE	MS/D
7	EVAL0008.EXE	LCS
9	EVAL0020.EXE	Field Duplicate
10	EVAL0011.EXE	Percent Solids
11	SETFLG02.EXE	Set Flags

EXHIBIT B.2-2 EVALUATION FLAG DETAIL REPORT

Evaluated Flag Report
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010 SAP ID: 0001

15:49:52
09/02/1998

Lab ID	Dil. Code	Matrix	Method	Caption/Analyte	Lab Result	Lab Flag	Eval Result	Eval Flag	Param ID	Sub
70	02	S	SW8082B	AROCLOR-1254	570			J-	4059	*
70	02	S	SW8082B	AROCLOR-1260	4500			J-	4058	*
70	02	S	SW8082B	1,2,4-TRICHLOROBENZENE	98.0	U		UJ	686	*
70	02	S	SW8082B	AROCLOR-1248	510	U		UJ	4073	*
71	03	S	SW8082B	AROCLOR-1260	91000			J	4058	*
71	03	S	SW8082B	AROCLOR-1248	12000	U			4073	*
71	03	S	SW8082B	AROCLOR-1254	15000			J	4059	*
71	03	S	SW8082B	1,2,4-TRICHLOROBENZENE	2300	U			686	*
72	04	S	SW8082B	1,2,4-TRICHLOROBENZENE	36.0	U		UJ	686	*
72	04	S	SW8082B	AROCLOR-1260	1600			J	4058	*
72	04	S	SW8082B	AROCLOR-1254	270			J	4059	*
72	04	S	SW8082B	AROCLOR-1248	180	U		UJ	4073	*
73	05	S	SW8082B	AROCLOR-1248	190	U			4073	*
73	05	S	SW8082B	AROCLOR-1254	280				4059	*
73	05	S	SW8082B	AROCLOR-1260	2100				4058	*
73	05	S	SW8082B	1,2,4-TRICHLOROBENZENE	20		37.0	U	686	*
74	06	S	SW8082B	1,2,4-TRICHLOROBENZENE	20		210	U	686	*
74	06	S	SW8082B	AROCLOR-1260	9200			J	4058	*
74	06	S	SW8082B	AROCLOR-1254	1100	U		UJ	4059	*
74	06	S	SW8082B	AROCLOR-1248	1100	U		UJ	4073	*

Evaluation Flag Detail Report
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010 SAP ID: 0001

15:49:42
09/02/1998

Eval. Phase Lab ID	Dil. Code	Matrix	Method	Caption/Analyte	Lab Flag Calc Flag	Lab Result Eval Result	Eval Flag	Param ID Sub ID
70	02	S	SW8082B	1,2,4-TRICHLOROBENZENE	U	98.0	UJ	686
EVAL0016					UJ			*
70	02	S	SW8082B	AROCLOR-1248	U	510	UJ	4073
EVAL0016					UJ			*
70	02	S	SW8082B	AROCLOR-1254		570	J-	4059
EVAL0016					J-			*
70	02	S	SW8082B	AROCLOR-1260		4500	J-	4058
EVAL0016					J-			*
71	03	S	SW8082B	AROCLOR-1254		15000	J	4059
EVAL0002					J			*
71	03	S	SW8082B	AROCLOR-1260		91000	J	4058
EVAL0002					J			*
72	04	S	SW8082B	1,2,4-TRICHLOROBENZENE	U	36.0	UJ	686
EVAL0002					UJ			*
72	04	S	SW8082B	AROCLOR-1248	U	180	UJ	4073
EVAL0002					UJ			*
72	04	S	SW8082B	AROCLOR-1254		270	J	4059
EVAL0002					J	-		*
72	04	S	SW8082B	AROCLOR-1260		1600	J	4058
EVAL0002					J			*
73	05	S	SW8082B	1,2,4-TRICHLOROBENZENE		20	U	686
EVAL0003					U	37.0		*
74	06	S	SW8082B	1,2,4-TRICHLOROBENZENE		20	U	686
EVAL0002					J	210		*
74	06	S	SW8082B	1,2,4-TRICHLOROBENZENE		20	U	686
EVAL0003					U	210		*
74	06	S	SW8082B	1,2,4-TRICHLOROBENZENE		20	U	686
EVAL0016					J-	210		*
74	06	S	SW8082B	AROCLOR-1248	U	1100	UJ	4073
EVAL0016					UJ			*
74	06	S	SW8082B	AROCLOR-1254	U	1100	UJ	4059
EVAL0016					UJ			*
74	06	S	SW8082B	AROCLOR-1260		9200	J	4058
EVAL0002					J			*
74	06	S	SW8082B	AROCLOR-1260		9200	J	4058
EVAL0016					J-			*

EXHIBIT B.2-3 EVALUATION LOG REPORT

Evaluation Log Report
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010 SAP ID: 0001

15:49:34
09/02/1998

Delivery Group: PT002TST	**C-Of-C Item:**001	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 70		[1] Criteria: 14	EVAL0016
Field Sample ID: 02		[2] Elapsed: 20	4059
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: AROCLOR-1254			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**001	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 70		[1] Criteria: 14	EVAL0016
Field Sample ID: 02		[2] Elapsed: 20	4058
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: AROCLOR-1260			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**001	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 70		[1] Criteria: 14	EVAL0016
Field Sample ID: 02		[2] Elapsed: 20	686
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: 1,2,4-TRICHLOROBENZENE			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**001	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 70		[1] Criteria: 14	EVAL0016
Field Sample ID: 02		[2] Elapsed: 20	4073
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: AROCLOR-1248			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**005	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 74		[1] Criteria: 14	EVAL0016
Field Sample ID: 06		[2] Elapsed: 20	686
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: 1,2,4-TRICHLOROBENZENE			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**005	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 74		[1] Criteria: 14	EVAL0016
Field Sample ID: 06		[2] Elapsed: 20	4058
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: AROCLOR-1260			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**005	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 74		[1] Criteria: 14	EVAL0016
Field Sample ID: 06		[2] Elapsed: 20	4059
Method: SW8082B		[3]	3000
Matrix: S **Sub ID:** *		[4]	
Caption: AROCLOR-1254			
Error: Hold Time Exceeded Between Start and Prep			

Evaluation Log Report
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010 SAP ID: 0001

15:49:34
09/02/1998

Delivery Group: PT002TST	**C-Of-C Item:**005	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 74		**[1]** Criteria: 14	EVAL0016
Field Sample ID: 06		**[2]** Elapsed: 20	4073
Method: SW8082B		**[3]**	3000
Matrix: S **Sub ID:** *		**[4]**	
Caption: AROCLOR-1248			
Error: Hold Time Exceeded Between Start and Prep			

Delivery Group: PT002TST	**C-Of-C Item:**002	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 71		**[1]** Dilution Code: 03	EVAL0002
Field Sample ID: 03		**[2]** Sub Category: PCB	0
Method: SW8082B		**[3]**	3200
Matrix: S **Sub ID:** *		**[4]**	
Caption:			
Error: Flags set during Surrogate Evaluation Process			

Delivery Group: PT002TST	**C-Of-C Item:**003	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 72		**[1]** Dilution Code: 04	EVAL0002
Field Sample ID: 04		**[2]** Sub Category: PCB	0
Method: SW8082B		**[3]**	3200
Matrix: S **Sub ID:** *		**[4]**	
Caption:			
Error: Flags set during Surrogate Evaluation Process			

Delivery Group: PT002TST	**C-Of-C Item:**005	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 74		**[1]** Dilution Code: 06	EVAL0002
Field Sample ID: 06		**[2]** Sub Category: PCB	0
Method: SW8082B		**[3]**	3200
Matrix: S **Sub ID:** *		**[4]**	
Caption:			
Error: Flags set during Surrogate Evaluation Process			

Delivery Group: PT002TST	**C-Of-C Item:**005	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 74		**[1]**	EVAL0003
Field Sample ID: 06		**[2]**	0
Method: SW8082B		**[3]**	3300
Matrix: S **Sub ID:** *		**[4]**	
Caption:			
Error: Flags set during Method Blank Evaluation Process			

Delivery Group: PT002TST	**C-Of-C Item:**004	**TDMS Error Detail Messages**	Warning
Lab Sample ID: 73		**[1]**	EVAL0003
Field Sample ID: 05		**[2]**	0
Method: SW8082B		**[3]**	3300
Matrix: S **Sub ID:** *		**[4]**	
Caption:			
Error: Flags set during Method Blank Evaluation Process			

EXHIBIT B.2-4 CHAIN-OF-CUSTODY SUMMARY REPORT

Chain Of Custody Summary
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010

Lab Delivery Group: PT002TST
Chain of Custody ID: RFW0900010
SAP Code: 0001
Weston Work Order:
Client Work Order:
Program:

Cooler ID:
Lab Code: ITS

Turn Around Time: 0
Sampling Company: RFW

Project File/Reference Number:

C of C Item: 001
Lab Sample ID: 70
Field Sample ID: 02
Facility ID:
Location ID:

Field Type: 0
Col. Type: S

Matrix: S
C of C Matrix: S
Collected: 08/05/1998 00:00
Lab Received: 08/06/1998 00:00
TAT Start Date: 08/05/1998 00:00

Upper Depth: 0
Lower Depth: 0
Round:
CLP Required: N

Method	Partial	Sub ID	Description	MS/MSD	Confirm	Canceled
SW8082B		None	PCBs (Short)	/		

C of C Item: 002
Lab Sample ID: 71
Field Sample ID: 03
Facility ID:
Location ID:

Field Type: 0
Col. Type: S

Matrix: S
C of C Matrix: S
Collected: 08/05/1998 00:00
Lab Received: 08/06/1998 00:00
TAT Start Date: 08/05/1998 00:00

Upper Depth: 0
Lower Depth: 0
Round:
CLP Required: N

Method	Partial	Sub ID	Description	MS/MSD	Confirm	Canceled
SW8082B		None	PCBs (Short)	/		

C of C Item: 003
Lab Sample ID: 72
Field Sample ID: 04
Facility ID:
Location ID:

Field Type: 0
Col. Type: S

Matrix: S
C of C Matrix: S
Collected: 08/05/1998 00:00
Lab Received: 08/06/1998 00:00
TAT Start Date: 08/05/1998 00:00

Upper Depth: 0
Lower Depth: 0
Round:
CLP Required: N

Method	Partial	Sub ID	Description	MS/MSD	Confirm	Canceled
SW8082B		None	PCBs (Short)	/		

C of C Item: 004
Lab Sample ID: 73
Field Sample ID: 05
Facility ID:
Location ID:

Field Type: 0
Col. Type: S

Matrix: S
C of C Matrix: S
Collected: 08/05/1998 00:00
Lab Received: 08/06/1998 00:00
TAT Start Date: 08/05/1998 00:00

Upper Depth: 0
Lower Depth: 0
Round:
CLP Required: N

Method	Partial	Sub ID	Description	MS/MSD	Confirm	Canceled
SW8082B		None	PCBs (Short)	/		

C of C Item: 005
Lab Sample ID: 74
Field Sample ID: 06
Facility ID:
Location ID:

Field Type: 0
Col. Type: S

Matrix: S
C of C Matrix: S
Collected: 08/05/1998 00:00
Lab Received: 08/06/1998 00:00
TAT Start Date: 08/05/1998 00:00

Upper Depth: 0
Lower Depth: 0
Round:
CLP Required: N

Method	Partial	Sub ID	Description	MS/MSD	Confirm	Canceled
SW8082B		None	PCBs (Short)	/		

EXHIBIT B.2-5 FIELD BLANK REPORT

Field Blank Report
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010 SAP ID: 0001

15:49:50
09/02/1998

Fld. Type	C of C ID	Delivery Group	Lab Sample ID	Method	Col. Type	Field Sample ID	Sub ID	Date Collected	Date Received
0	RFW0900010	PT002TST	74	SW8082B	S	06	*	08/05/1998	
2	RFW0000103	PT002	361989	SW8082B	S	080598SM01	*	08/05/1998	
0	RFW0900010	PT002TST	73	SW8082B	S	05	*	08/05/1998	
2	RFW0000103	PT002	361989	SW8082B	S	080598SM01	*	08/05/1998	
0	RFW0900010	PT002TST	72	SW8082B	S	04	*	08/05/1998	
2	RFW0000103	PT002	361989	SW8082B	S	080598SM01	*	08/05/1998	
0	RFW0900010	PT002TST	71	SW8082B	S	03	*	08/05/1998	
2	RFW0000103	PT002	361989	SW8082B	S	080598SM01	*	08/05/1998	
0	RFW0900010	PT002TST	70	SW8082B	S	02	*	08/05/1998	
2	RFW0000103	PT002	361989	SW8082B	S	080598SM01	*	08/05/1998	

EXHIBIT B.2-6 EVALUATED FLAG REPORT

Evaluated Flag Report
Delivery Group ID: PT002TST
Chain of Custody ID: RFW0900010 SAP ID: 0001

15:49:52
09/02/1998

Lab ID	Dil. Code	Matrix	Method	Caption/Analyte	Lab Result	Lab Flag	Eval Result	Eval Flag	Param ID	Sub
70	02	S	SW8082B	AROCLOR-1254	570			J-	4059	*
70	02	S	SW8082B	AROCLOR-1260	4500			J-	4058	*
70	02	S	SW8082B	1,2,4-TRICHLOROBENZENE	98.0	U		UJ	686	*
70	02	S	SW8082B	AROCLOR-1248	510	U		UJ	4073	*
71	03	S	SW8082B	AROCLOR-1260	91000			J	4058	*
71	03	S	SW8082B	AROCLOR-1248	12000	U			4073	*
71	03	S	SW8082B	AROCLOR-1254	15000			J	4059	*
71	03	S	SW8082B	1,2,4-TRICHLOROBENZENE	2300	U			686	*
72	04	S	SW8082B	1,2,4-TRICHLOROBENZENE	36.0	U		UJ	686	*
72	04	S	SW8082B	AROCLOR-1260	1600			J	4058	*
72	04	S	SW8082B	AROCLOR-1254	270			J	4059	*
72	04	S	SW8082B	AROCLOR-1248	180	U		UJ	4073	*
73	05	S	SW8082B	AROCLOR-1248	190	U			4073	*
73	05	S	SW8082B	AROCLOR-1254	280				4059	*
73	05	S	SW8082B	AROCLOR-1260	2100				4058	*
73	05	S	SW8082B	1,2,4-TRICHLOROBENZENE	20		37.0	U	686	*
74	06	S	SW8082B	1,2,4-TRICHLOROBENZENE	20		210	U	686	*
74	06	S	SW8082B	AROCLOR-1260	9200			J	4058	*
74	06	S	SW8082B	AROCLOR-1254	1100	U		UJ	4059	*
74	06	S	SW8082B	AROCLOR-1248	1100	U		UJ	4073	*

APPENDIX B.3

ANALYTICAL DATA EVALUATION

B.3 ANALYTICAL DATA EVALUATION

All on-site analytical data will be evaluated according to *Region I EPA NE Data Validation Functional Guidelines for Evaluating Environmental Analyses* and those criteria established in Table 14-2 of the QAPP. The evaluation results will be reviewed by the data evaluator/chemist, a data evaluation worksheet (see Exhibit B.3-1) will be completed, and qualification edits will be performed, if deemed necessary, based on professional judgement. The program "Manual Evaluation" will be used to perform the edits. The evaluation deliverable will be signed and dated upon completion of the process. Technical Data Management System (TDMS) can evaluate the following parameters:

- Holding Times
- Surrogate Recoveries
- Laboratory Blanks
- Field Blanks
- Laboratory Control Samples Recoveries and Precision
- Matrix Spike/Matrix Spike Duplicates Recoveries and Precision
- Field Duplicate Precision
- Percent Solids

Following evaluation, four qualification code letters, or flags, will be used to qualify the analytical data. "J" codes mean the value was an estimated quantity. "U" codes indicate that the material was analyzed for, but not detected at, the concentration indicated, or it was not detected above laboratory contaminant criteria. "UJ" codes mean the material was analyzed for but was not detected and the sample quantitation limit was an estimated quantity. "R" codes denote rejected values.

TDMS and the data evaluation/chemist will perform a technical review of the data using the following decision process and criteria information to make evaluation flag assignments. All applicable QC limits and criteria are established in the TDMS electronic SAP (e-SAP).

B.3.1 Holding Times (HT)

The holding time period for PCB and 1,2,4-Trichlorobenzene is as follows:

Collection date to extraction date, then extraction date to analysis date.

- **If:** Specified HT < Elapsed Time
  Then: J all detections and UJ all nondetections for the samples.

B.3.2 Calibration

The data evaluation/chemist reviews case narratives and report forms for calibration information. TDMS does not process calibration data, so evaluation flagging will be edited into the database, if deemed necessary, based on professional judgement.

B.3.3 Surrogates (SUR)

The surrogates used for the analysis are specified in the e-SAP.

- **If:** ≥ Two SUR % R>150% and no SUR %R<30%
  Then: J all detections for the sample fraction.

- **If:** ≥ Two SUR % R<30% and all SUR % R ≥ 10%
  Then: J all detections for the sample fraction and UJ all nondetections for the sample fraction.

- **If:** ≥ One SUR %R<30% and one SUR %R>150%
  Then: J all detections for the sample fraction and UJ all nondetections for the sample fraction.

- **If:** SUR % R diluted out
  Then: No qualification action.

B.3.4 Blank Contamination

Each blank contaminant's action level (AL) is based upon the highest relative concentration of contaminant among the laboratory method and instrument blanks and the field blanks (equipment

blanks and trip blanks). Aqueous equipment and trip blanks determine action in aqueous samples only (see B.3.4.2 for EB soil action).

B.3.4.1 Highest Concentration

Each analyte present in any blank having the highest relative concentration selected among all blanks (relative to their detection limits [DLs]) [soils–Lab Blanks, waters–Lab and Field Blanks].

B.3.4.2 Action Levels for Uncommon Contaminants

The AL for contaminants not listed as common laboratory contaminants is determined by multiplying the largest blank value from B.3.4.1 by 5.

- **If:** The AL for a contaminant > the detected value for the analyte in the associated field sample (after multiplying the detected value by the appropriate DL ratio)
  Then: U the detection in the associated field sample. If the detected value < the Sample Quantitation Limit (SQL), then replace the detected value with the SQL.

- **If:** Contamination exists in equipment blank (EB) or trip blank (TB) and the associated non-aqueous field sample
  Then: EB or TB detection in associated field samples as necessary.

B.3.5 Laboratory Control Samples (LCS)

The spikes used for the method are specified in the e-SAP. The laboratory LCSs are associated to field samples by their matrix.

B.3.5.1 Laboratory Control Sample (LCS)/LCS Duplicate (LCSD)

- **If:** The %R for the LCS spiked analyte (SA) >130%
  Then: J detections for the SA in all associated field samples.

- **If:** 10%≤%R for the LCS SA <50%
  Then: J detections and UJ nondetections for the SA in associated field samples.

- **If:** The %R for the LSC SA <10%
  Then: J detections and R nondetections for the SA in associated field samples.

- **If:** RPD > 40% for the LCS/LCSD
  Then: J detections and UJ nondetections for the SA in associated field samples.

B.3.6 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The spikes used for the method and applicable control limits are specified in the e-SAP. Organic method MS/MSDs are associated to their unspiked sample alone.

- **If:** The %R for either the MS or MSD SA >130%
  Then: J detections for the SA in the associated field sample.

- **If:** The %R for either the MS or MSD SA <50% and ≥10%
  Then: J detections and UJ nondetections for the SA in the associated field sample.

- **If:** The %R for either the MS or MSD SA <10%
  Then: J detections and R nondetections for the SA in the associated field sample.

- Calculate the RPD for the MS and MSD if an MSD was analyzed.

  If: RPD for the SA > 40%
  Then: J detections and UJ nondetections for the SA in the associated field sample.

B.3.7 Field Duplicates

In order to evaluate this QC parameter, the Absolute Difference (AD) for the duplicate and its pair are calculated and the procedures below are followed. A field duplicate is associated to a field sample by area, location, collection type, and sampling round or depth. Organic method field duplicate flagging is associated to the pair only.

B.3.7.1 Aqueous Samples

- **If:** The DA is in both the field duplicate and its pair at levels ≥ 2X SQL
  Then: Calculate the RPD for the DA in the field duplicate and its pair.

  – **If:** The RPD >30%
  Then: J detections for the DA in the field duplicate and its pair.

- **If:** The DA is only in either the field duplicate or only in its pair and the DA concentration is ≥ 2X SQL (no RPD calculated)
  Then: J the detection and UJ the nondetection for the DA in the field duplicate and its pair.

B.3.7.2 Soil/Sediment Samples

- **If:** The DA is in both the field duplicate and its pair at levels 2X ≥SQL
  Then: Calculate the RPD for the DA in the field duplicate and its pair.

  – **If:** The RPD >50%
    Then: J detections for the DA in the field duplicate and its pair.

- **If:** The DA is only in either the field duplicate or only in its pair and the DA concentration is ≥ 2X SQL
  Then: J the detection and UJ the nondetection for the DA in the field duplicate and its pair.

B.3.8 Percent Solids

- **If:** 10%≤ the sample Percent Solids ≤30%
  Then: J detections and R nondetections for all the sample methods.

- **If:** The sample Percent Solids<10%
  Then: R detections and nondetections for all the sample methods.

B.3.9 Overall Qualifier

The overall data qualifier for a sample analyte result is selected based upon the highest ranking qualifier in the following hierarchy: R>UJ>U>J

EXHIBIT B.3-1 DATA EVALUATION WORKSHEET ON-SITE PCB ANALYSES

COC#_____
LAB SDG#:_____

DATA EVALUATION WORKSHEET
ON-SITE PCB ANALYSES

	YES	NO
1. Holding time evaluation was performed and qualifiers were applied as necessary.	_____	_____
Comments _____		
2. Field Duplicate evaluation was performed and qualifiers were applied as required.	_____	_____
Comments _____		
3. Surrogate recovery evaluation was performed and qualifiers were applied as required.	_____	_____
Comments _____		
4. Matrix Spike/Matrix Spike Duplicate Recovery and RPD evaluation were performed and qualifiers were applied as required.	_____	_____
Comments _____		
5. LCS Recovery evaluation was performed and qualifiers were applied as necessary.	_____	_____
Comments _____		
6. Method Blank evaluation was performed and qualifiers were applied as necessary.	_____	_____
Comments _____		
7. Field Blank evaluation was performed and flags were applied as required.	_____	_____
Comments _____		
8. % Solids evaluation was performed and qualifiers were applied as necessary.	_____	_____
Comments _____		
9. Initial Calibration(s) present.	_____	_____
10. Initial Calibration criteria met: $r \geq 0.995$	_____	_____

If no, Calibration outliers are as follows:

Compound	Corr. Coef	Date/Time	Affected Samples	Action
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

DATA EVALUATION WORKSHEET
ON-SITE PCB ANALYSES

	YES	NO
11. Continuing Calibration(s) present	_____	_____
12. Continuing Calibration criteria met, %D≤25%.	_____	_____

If no, Calibration outliers are as follows:

Compound	%D	Date/Time	Affected Samples	Action
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

	YES	NO
13. Verification Samples Analyzed.	_____	_____
14. Verification criteria met: %D≤75% and both results >2x SQL, or Both results ≤2x SQL, or One >2x SQL and one ≤2X SQL and %D≤ 75%	_____	_____

If no, Verification result outliers are as follows

Compound	On-site Result	Verification Result	%D	Flag (if applicable)
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

	YES	NO
15. PE Analyzed: Sample #_____	_____	_____
16. PE criteria met (See Region I Functional Guidelines)	_____	_____

If no, PE result outliers are as follows

Compound	Conc.	Reg I PES Score	Samples Affected	Action
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Comments:_____

_____

_____

_____

Validator:_____ Date:_____

APPENDIX B.4

ELECTRONIC SAMPLE ANALYSIS PLAN (E-SAP) OF METHODS AND ANALYTES

B.4 ELECTRONIC SAMPLE ANALYSIS PLAN (e-SAP) OF METHODS AND ANALYTES

The e-SAP is project specific, based on criteria established within the QAPP, and is divided into two files: method and analyte. The method file establishes the method code (assigned by TDMS system administrator [see section 5.0 of the sitewide QAPP]), matrix, holding time requirements, chain-of-custody category, and sub ID (internal classification). The analyte file stores compound names (captions), detection limits, surrogate recovery limits, and MS/MSD/LCS and RPD control limits. The evaluation process within TDMS accesses and uses the QC information from these files; see Exhibits B.4-1 and B.4-2.

EXHIBIT B.4-1 ELECTRONIC SAMPLE ANALYSIS PLAN OF METHODS

Housatonic River Electronic SAP - Method

Method	Matrix	# Days to Prep	# Days to Analysis	Chain of Custody Category	Sub Id
ASA1821	S	0	0	POROSITY	*
ASTM2937	S	0	0	BULK DENSITY	*
ASTM4318	S	0	0	ATTERBERG LIMITS	*
ASTMD422	S	0	0	GRAIN SIZE	*
EPA10200	W	0	7	GW INORGANICS	*
EPA130.2	W	0	180	GW INORGANICS	*
EPA160.1	W	0	7	GW INORGANICS	*
EPA160.2	W	0	7	GW INORGANICS	*
EPA1668	S	365	365	PCB CONGENERS	*
EPA1668	W	365	365	PCB CONGENERS	*
EPA180.1	W	0	2	GW INORGANICS	*
EPA310.1	W	0	14	GW INORGANICS	*
EPA350.2	W	0	28	GW INORGANICS	*
EPA351.3	W	0	28	GW INORGANICS	*
EPA353.2	W	0	28	GW INORGANICS	*
EPA354.1	W	0	2	GW INORGANICS	*
EPA3652A	W	0	2	GW INORGANICS	*
EPA3652B	W	0	28	GW INORGANICS	*
EPA405.1	W	0	2	GW INORGANICS	*

Method	Matrix	# Days to Prep	# Days to Analysis	Chain of Custody Category	Sub Id
EPA415.1	W	0	28	GW INORGANICS	*
EPA4151B	W	0	28	GW INORGANICS	*
EPA418.1	W	0	28	INORGANIC	*
SM4500OC	W	0	1	GW INORGANICS	*
SW1010	W	0	0	INORGANIC	*
SW6010B	S	0	180	METALS	*
SW6010B	W	0	180	METALS - FILTERED	S
SW6010B	W	0	180	METALS	*
SW6010C	W	0	180	METALS	*
SW7470A	W	0	28	METALS - FILTERED	S
SW7470A	W	0	28	METALS	*
SW7471A	S	0	28	METALS	*
SW8081A	S	14	40	PESTICIDES	*
SW8081A	W	7	40	PESTICIDES	*
SW8082	W	7	40	PCBS	*
SW8082	W	7	40	PCBS, FILTERED	S
SW8082A	S	14	40	PCBS	*
SW8082A	W	7	40	PCBS	*
SW8082B	S	14	40	PCBS	*
SW8082B	W	7	40	PCBS	*
SW8082M	S	14	40	PCBS	*

Method	Matrix	# Days to Prep	# Days to Analysis	Chain of Custody Category	Sub Id
SW8082M	W	7	40	PCBS	*
SW8141A	S	14	40	OP PESTICIDES	*
SW8141A	W	7	40	OP PESTICIDES	*
SW8150B	S	14	40	HERBICIDES	*
SW8150B	W	7	40	HERBICIDES	*
SW8260B	S	0	14	VOLATILES	*
SW8260B	W	0	14	VOLATILES	*
SW8270C	S	14	40	SEMIVOLATILES	*
SW8270C	W	7	40	SEMIVOLATILES	*
SW8290	S	30	45	DIOXIN/FURANS (HIGH	*
SW8290	W	30	45	DIOXIN/FURANS (HIGH	*
SW9010B	S	0	14	INORGANIC	*
SW9010B	W	0	14	INORGANIC	*
SW9014	W	0	14	INORGANIC	*
SW9030B	S	0	7	INORGANIC	*
SW9030B	W	0	7	INORGANIC	*
SW9034	W	0	7	INORGANIC	*
SW9040B	W	0	1	GW INORGANICS	*
SW9050A	W	0	1	GW INORGANICS	*
SW9060M	S	0	28	INORGANIC	*
SWSIM	S	14	40	PAHS	*

Method	Matrix	# Days to Prep	# Days to Analysis	Chain of Custody Category	Sub Id
SWSIM	W	7	40	PAHS	*

EXHIBIT B.4-2 ELECTRONIC SAMPLE ANALYSIS PLAN (e-SAP) OF ANALYTES

Housatonic River Electronic SAP - Analyte

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
ASA1821	S	*	POROSITY								
ASTM2937	S	*	BULK DENSITY								
ASTM4318	S	*	ATTERBERG LIMITS								
ASTMD422	S	*	GRAIN SIZE DISTRIBUTION								
EPA10200	W	*	CHLOROPHYLL-A	0.1	MG/L						
EPA130.2	W	*	HARDNESS	2.0	MG/L	125	75	20	130	70	30
EPA160.1	W	*	TOTAL DISSOLVED SOLIDS	5.0	MG/L	125	75	20	130	70	30
EPA160.2	W	*	TOTAL SUSPENDED SOLIDS	0.5	MG/L	125	75	20	130	70	30
EPA180.1	W	*	TURBIDITY	0.2	NTU	125	75	20	130	70	30
EPA310.1	W	*	ALKALINITY	1.0	MG/L	125	75	20	130	70	30
EPA350.2	W	*	AMMONIA	0.02	MG/L	125	75	20	130	70	30
EPA351.3	W	*	TKN	0.2	MG/L	125	75	20	130	70	30
EPA353.2	W	*	NITRATE	0.01	MG/L	125	75	20	130	70	30
EPA354.1	W	*	NITRITE	0.005	MG/L	125	75	20	130	70	30
EPA3652A	W	*	ORTHOPHOSPHATE	0.01	MG/L	125	75	20	130	70	30
EPA3652B	W	*	PHOSPHATE	0.01	MG/L	125	75	20	130	70	30
EPA405.1	W	*	BOD 5 DAY	0.2	MG/L						
EPA415.1	W	*	TOTAL ORGANIC CARBON	0.5	MG/L	125	75	20	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
EPA4151B	W	*	DISSOLVED ORGANIC CARBON	0.5	MG/L	125	75	20	130	70	30
EPA418.1	W	*	TOTAL PETROLEUM HYDROCARBONS	0.4	MG/L	125	75	20	130	70	30
SM4500OC	W	*	DISSOLVED OXYGEN	0.2	MG/L						
SW1010	W	*	IGNITABILITY	150	DEG						
SW6010B	S	*	ANTIMONY	1.0	MG/K	125	75	20	130	70	50
SW6010B	S	L	ANTIMONY, LCS	1.0	MG/K	125	75	20	130	70	50
SW6010B	S	*	ARSENIC	0.6	MG/K	125	75	20	130	70	50
SW6010B	S	L	ARSENIC, LCS	0.6	MG/K	125	75	20	130	70	50
SW6010B	S	*	BARIUM	0.99	MG/K	125	75	20	130	70	50
SW6010B	S	L	BARIUM, LCS	0.99	MG/K	125	75	20	130	70	50
SW6010B	S	*	BERYLLIUM	0.04	MG/K	125	75	20	130	70	50
SW6010B	S	L	BERYLLIUM, LCS	0.04	MG/K	125	75	20	130	70	50
SW6010B	S	*	CADMIUM	0.09	MG/K	125	75	20	130	70	50
SW6010B	S	L	CADMIUM, LCS	0.09	MG/K	125	75	20	130	70	50
SW6010B	S	*	CHROMIUM	0.29	MG/K	125	75	20	130	70	50
SW6010B	S	L	CHROMIUM, LCS	0.29	MG/K	125	75	20	130	70	50
SW6010B	S	*	COBALT	0.39	MG/K	125	75	20	130	70	50
SW6010B	S	L	COBALT, LCS	0.39	MG/K	125	75	20	130	70	50
SW6010B	S	*	COPPER	0.37	MG/K	125	75	20	130	70	50
SW6010B	S	L	COPPER, LCS	0.37	MG/K	125	75	20	130	70	50
SW6010B	S	*	LEAD	0.28	MG/K	125	75	20	130	70	50

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW6010B	S	L	LEAD, LCS	0.28	MG/K	125	75	20	130	70	50
SW6010B	S	*	NICKEL	0.38	MG/K	125	75	20	130	70	50
SW6010B	S	L	NICKEL, LCS	0.38	MG/K	125	75	20	130	70	50
SW6010B	S	*	SELENIUM	0.49	MG/K	125	75	20	130	70	50
SW6010B	S	L	SELENIUM, LCS	0.49	MG/K	125	75	20	130	70	50
SW6010B	S	*	SILVER	0.31	MG/K	125	75	20	130	70	50
SW6010B	S	L	SILVER, LCS	0.31	MG/K	125	75	20	130	70	50
SW6010B	S	*	THALLIUM	0.65	MG/K	125	75	20	130	70	50
SW6010B	S	L	THALLIUM, LCS	0.65	MG/K	125	75	20	130	70	50
SW6010B	S	*	TIN	0.52	MG/K	125	75	20	130	70	50
SW6010B	S	L	TIN, LCS	0.52	MG/K	125	75	20	130	70	50
SW6010B	S	*	VANADIUM	0.4	MG/K	125	75	20	130	70	50
SW6010B	S	L	VANADIUM, LCS	0.4	MG/K	125	75	20	130	70	50
SW6010B	S	*	ZINC	0.41	MG/K	125	75	20	130	70	50
SW6010B	S	L	ZINC, LCS	0.41	MG/K	125	75	20	130	70	50
SW6010B	W	*	ANTIMONY	10.0	UG/L	125	75	20	130	70	30
SW6010B	W	S	ANTIMONY, FILTERED	10.0	UG/L	125	75	20	130	70	30
SW6010B	W	L	ANTIMONY, LCS	10.0	UG/L	125	75	20	130	70	30
SW6010B	W	*	ARSENIC	6.0	UG/L	125	75	20	130	70	30
SW6010B	W	S	ARSENIC, FILTERED	6.0	UG/L	125	75	20	130	70	30
SW6010B	W	L	ARSENIC, LCS	6.0	UG/L	125	75	20	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW6010B	W	*	BARIUM	9.9	UG/L	125	75	20	130	70	30
SW6010B	W	S	BARIUM, FILTERED	9.9	UG/L	125	75	20	130	70	30
SW6010B	W	L	BARIUM, LCS	9.9	UG/L	125	75	20	130	70	30
SW6010B	W	*	BERYLLIUM	0.4	UG/L	125	75	20	130	70	30
SW6010B	W	S	BERYLLIUM, FILTERED	0.4	UG/L	125	75	20	130	70	30
SW6010B	W	L	BERYLLIUM, LCS	0.4	UG/L	125	75	20	130	70	30
SW6010B	W	*	CADMIUM	0.9	UG/L	125	75	20	130	70	30
SW6010B	W	S	CADMIUM, FILTERED	0.9	UG/L	125	75	20	130	70	30
SW6010B	W	L	CADMIUM, LCS	0.9	UG/L	125	75	20	130	70	30
SW6010B	W	*	CHROMIUM	2.9	UG/L	125	75	20	130	70	30
SW6010B	W	S	CHROMIUM, FILTERED	2.9	UG/L	125	75	20	130	70	30
SW6010B	W	L	CHROMIUM, LCS	2.9	UG/L	125	75	20	130	70	30
SW6010B	W	*	COBALT	3.9	UG/L	125	75	20	130	70	30
SW6010B	W	S	COBALT, FILTERED	3.9	UG/L	125	75	20	130	70	30
SW6010B	W	L	COBALT, LCS	3.9	UG/L	125	75	20	130	70	30
SW6010B	W	*	COPPER	3.7	UG/L	125	75	20	130	70	30
SW6010B	W	S	COPPER, FILTERED	3.7	UG/L	125	75	20	130	70	30
SW6010B	W	L	COPPER, LCS	3.7	UG/L	125	75	20	130	70	30
SW6010B	W	*	LEAD	2.8	UG/L	125	75	20	130	70	30
SW6010B	W	S	LEAD, FILTERED	2.8	UG/L	125	75	20	130	70	30
SW6010B	W	L	LEAD, LCS	2.8	UG/L	125	75	20	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW6010B	W	*	NICKEL	3.8	UG/L	125	75	20	130	70	30
SW6010B	W	S	NICKEL, FILTERED	3.8	UG/L	125	75	20	130	70	30
SW6010B	W	L	NICKEL, LCS	3.8	UG/L	125	75	20	130	70	30
SW6010B	W	*	SELENIUM	4.9	UG/L	125	75	20	130	70	30
SW6010B	W	S	SELENIUM, FILTERED	4.9	UG/L	125	75	20	130	70	30
SW6010B	W	L	SELENIUM, LCS	4.9	UG/L	125	75	20	130	70	30
SW6010B	W	*	SILVER	3.1	UG/L	125	75	20	130	70	30
SW6010B	W	S	SILVER, FILTERED	3.1	UG/L	125	75	20	130	70	30
SW6010B	W	L	SILVER, LCS	3.1	UG/L	125	75	20	130	70	30
SW6010B	W	*	THALLIUM	6.5	UG/L	125	75	20	130	70	30
SW6010B	W	S	THALLIUM, FILTERED	5.2	UG/L	125	75	20	130	70	30
SW6010B	W	L	THALLIUM, LCS	6.5	UG/L	125	75	20	130	70	30
SW6010B	W	*	TIN	5.2	UG/L	125	75	20	130	70	30
SW6010B	W	S	TIN, FILTERED	6.5	UG/L	125	75	20	130	70	30
SW6010B	W	L	TIN, LCS	5.2	UG/L	125	75	20	130	70	30
SW6010B	W	*	VANADIUM	4.0	UG/L	125	75	20	130	70	30
SW6010B	W	S	VANADIUM, FILTERED	4.0	UG/L	125	75	20	130	70	30
SW6010B	W	L	VANADIUM, LCS	4.0	UG/L	125	75	20	130	70	30
SW6010B	W	*	ZINC	4.1	UG/L	125	75	20	130	70	30
SW6010B	W	S	ZINC, FILTERED	4.1	UG/L	125	75	20	130	70	30
SW6010B	W	L	ZINC, LCS	4.1	UG/L	125	75	20	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW6010C	W	*	ANTIMONY	10.0	UG/L	125	75	20	130	70	30
SW6010C	W	S	ANTIMONY, FILTERED	10.0	UG/L	125	75	20	130	70	30
SW6010C	W	L	ANTIMONY, LCS	10.0	UG/L	125	75	20	130	70	30
SW6010C	W	*	ARSENIC	6.0	UG/L	125	75	20	130	70	30
SW6010C	W	S	ARSENIC, FILTERED	6.0	UG/L	125	75	20	130	70	30
SW6010C	W	L	ARSENIC, LCS	6.0	UG/L	125	75	20	130	70	30
SW6010C	W	*	BARIUM	9.9	UG/L	125	75	20	130	70	30
SW6010C	W	S	BARIUM, FILTERED	9.9	UG/L	125	75	20	130	70	30
SW6010C	W	L	BARIUM, LCS	9.9	UG/L	125	75	20	130	70	30
SW6010C	W	*	BERYLLIUM	0.4	UG/L	125	75	20	130	70	30
SW6010C	W	S	BERYLLIUM, FILTERED	0.4	UG/L	125	75	20	130	70	30
SW6010C	W	L	BERYLLIUM, LCS	0.4	UG/L	125	75	20	130	70	30
SW6010C	W	*	CADMIUM	0.9	UG/L	125	75	20	130	70	30
SW6010C	W	S	CADMIUM, FILTERED	0.9	UG/L	125	75	20	130	70	30
SW6010C	W	L	CADMIUM, LCS	0.9	UG/L	125	75	20	130	70	30
SW6010C	W	L	CALCIUM, LCS	413.5	UG/L	125	75	20	130	70	30
SW6010C	W	*	CALCIUM, TOTAL	413.5	UG/L	125	75	20	130	70	30
SW6010C	W	*	CHROMIUM	2.9	UG/L	125	75	20	130	70	30
SW6010C	W	S	CHROMIUM, FILTERED	2.9	UG/L	125	75	20	130	70	30
SW6010C	W	L	CHROMIUM, LCS	2.9	UG/L	125	75	20	130	70	30
SW6010C	W	*	COBALT	3.9	UG/L	125	75	20	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW6010C	W	S	COBALT, FILTERED	3.9	UG/L	125	75	20	130	70	30
SW6010C	W	L	COBALT, LCS	3.9	UG/L	125	75	20	130	70	30
SW6010C	W	*	COPPER	3.7	UG/L	125	75	20	130	70	30
SW6010C	W	S	COPPER, FILTERED	3.7	UG/L	125	75	20	130	70	30
SW6010C	W	L	COPPER, LCS	3.7	UG/L	125	75	20	130	70	30
SW6010C	W	*	LEAD	2.8	UG/L	125	75	20	130	70	30
SW6010C	W	S	LEAD, FILTERED	2.8	UG/L	125	75	20	130	70	30
SW6010C	W	L	LEAD, LCS	2.8	UG/L	125	75	20	130	70	30
SW6010C	W	L	MAGNESIUM, LCS	170.3	UG/L	125	75	20	130	70	30
SW6010C	W	*	MAGNESIUM, TOTAL	170.3	UG/L	125	75	20	130	70	30
SW6010C	W	*	NICKEL	3.8	UG/L	125	75	20	130	70	30
SW6010C	W	S	NICKEL, FILTERED	3.8	UG/L	125	75	20	130	70	30
SW6010C	W	L	NICKEL, LCS	3.8	UG/L	125	75	20	130	70	30
SW6010C	W	*	SELENIUM	4.9	UG/L	125	75	20	130	70	30
SW6010C	W	S	SELENIUM, FILTERED	4.9	UG/L	125	75	20	130	70	30
SW6010C	W	L	SELENIUM, LCS	4.9	UG/L	125	75	20	130	70	30
SW6010C	W	*	SILVER	3.1	UG/L	125	75	20	130	70	30
SW6010C	W	S	SILVER, FILTERED	3.1	UG/L	125	75	20	130	70	30
SW6010C	W	L	SILVER, LCS	3.1	UG/L	125	75	20	130	70	30
SW6010C	W	*	THALLIUM	6.5	UG/L	125	75	20	130	70	30
SW6010C	W	S	THALLIUM, FILTERED	5.2	UG/L	125	75	20	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW6010C	W	L	THALLIUM, LCS	6.5	UG/L	125	75	20	130	70	30
SW6010C	W	*	TIN	5.2	UG/L	125	75	20	130	70	30
SW6010C	W	S	TIN, FILTERED	6.5	UG/L	125	75	20	130	70	30
SW6010C	W	L	TIN, LCS	5.2	UG/L	125	75	20	130	70	30
SW6010C	W	*	VANADIUM	4.0	UG/L	125	75	20	130	70	30
SW6010C	W	S	VANADIUM, FILTERED	4.0	UG/L	125	75	20	130	70	30
SW6010C	W	L	VANADIUM, LCS	4.0	UG/L	125	75	20	130	70	30
SW6010C	W	*	ZINC	4.1	UG/L	125	75	20	130	70	30
SW6010C	W	S	ZINC, FILTERED	4.1	UG/L	125	75	20	130	70	30
SW6010C	W	L	ZINC, LCS	4.1	UG/L	125	75	20	130	70	30
SW7470A	W	*	MERCURY	0.1	UG/L	125	75	20	130	70	30
SW7470A	W	S	MERCURY, FILTERED	0.1	UG/L	125	75	20	130	70	30
SW7470A	W	L	MERCURY, LCS	0.1	UG/L	125	75	20	130	70	30
SW7471A	S	*	MERCURY	0.05	MG/K	125	75	20	130	70	50
SW7471A	S	L	MERCURY, LCS	0.05	MG/K	125	75	20	130	70	50
SW8081A	S	*	4,4'-DDD	3.4	UG/K	159	47	30	130	70	50
SW8081A	S	*	4,4'-DDE	3.4	UG/K	157	45	30	130	70	50
SW8081A	S	*	4,4'-DDT	3.4	UG/K	157	43	30	130	70	50
SW8081A	S	*	ALDRIN	1.7	UG/K	137	40	30	130	70	50
SW8081A	S	*	ALPHA-BHC	1.7	UG/K	125	35	30	130	70	50
SW8081A	S	*	BETA-BHC	1.7	UG/K	137	42	30	130	70	50

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8081A	S	*	CHLORDANE	17	UG/K				130	70	50
SW8081A	S	*	DECACHLOROBIPHENYL		UG/K	150	50	0	150	50	0
SW8081A	S	*	DELTA-BHC	1.7	UG/K	167	1	30	130	70	50
SW8081A	S	*	DIELDRIN	3.4	UG/K	146	36	30	130	70	50
SW8081A	S	*	ENDOSULFAN I	1.7	UG/K	137	48	30	130	70	50
SW8081A	S	*	ENDOSULFAN II	3.4	UG/K	160	42	30	130	70	50
SW8081A	S	*	ENDOSULFAN SULFATE	3.4	UG/K	162	25	30	130	70	50
SW8081A	S	*	ENDRIN	3.4	UG/K	152	37	30	130	70	50
SW8081A	S	*	ENDRIN ALDEHYDE	3.4	UG/K	145	5	30	130	70	50
SW8081A	S	*	GAMMA-BHC (LINDANE)	1.7	UG/K	130	35	30	130	70	50
SW8081A	S	*	HEPTACHLOR	1.7	UG/K	248	1	30	130	70	50
SW8081A	S	*	HEPTACHLOR EPOXIDE	1.7	UG/K	146	44	30	130	70	50
SW8081A	S	*	ISODRIN	1.7	UG/K	140	30	30	130	70	50
SW8081A	S	*	KEPONE	1.7	UG/K	140	30	30	130	70	50
SW8081A	S	*	METHOXYCHLOR	17	UG/K	159	54	30	130	70	50
SW8081A	S	*	TETRACHLORO-M-XYLENE		UG/K	132	27	0	132	27	0
SW8081A	S	*	TOXAPHENE	170	UG/K				130	70	50
SW8081A	W	*	4,4'-DDD	0.1	UG/L	126	67	30	126	67	30
SW8081A	W	*	4,4'-DDE	0.1	UG/L	128	55	30	128	55	30
SW8081A	W	*	4,4'-DDT	0.1	UG/L	125	65	30	125	65	30
SW8081A	W	*	ALDRIN	0.05	UG/L	107	48	30	107	48	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8081A	W	*	ALPHA-BHC	0.05	UG/L	117	46	30	117	46	30
SW8081A	W	*	BETA-BHC	0.05	UG/L	118	60	30	118	60	30
SW8081A	W	*	CHLORDANE	0.5	UG/L						
SW8081A	W	*	DECACHLOROBIPHENYL		UG/L	144	36	0	144	36	0
SW8081A	W	*	DELTA-BHC	0.05	UG/L	113	59	30	113	59	30
SW8081A	W	*	DIELDRIN	0.1	UG/L	113	66	30	113	66	30
SW8081A	W	*	ENDOSULFAN I	0.05	UG/L	118	70	30	118	70	30
SW8081A	W	*	ENDOSULFAN II	0.1	UG/L	120	73	30	120	73	30
SW8081A	W	*	ENDOSULFAN SULFATE	0.1	UG/L	124	56	30	124	56	30
SW8081A	W	*	ENDRIN	0.1	UG/L	131	56	30	131	56	30
SW8081A	W	*	ENDRIN ALDEHYDE	0.1	UG/L	140	70	30	140	70	30
SW8081A	W	*	GAMMA-BHC (LINDANE)	0.05	UG/L	115	58	30	115	58	30
SW8081A	W	*	HEPTACHLOR	0.05	UG/L	113	66	30	113	66	30
SW8081A	W	*	HEPTACHLOR EPOXIDE	0.05	UG/L	115	70	30	115	70	30
SW8081A	W	*	ISODRIN	0.05	UG/L	140	30	30	140	30	30
SW8081A	W	*	KEPONE	0.05	UG/L	140	30	30	140	30	30
SW8081A	W	*	METHOXYCHLOR	0.5	UG/L	140	70	30	140	70	30
SW8081A	W	*	TETRACHLORO-M-XYLENE		UG/L	132	30	0	132	30	0
SW8081A	W	*	TOXAPHENE	5.0	UG/L						
SW8082	W	*	1,2,4-TRICHLOROBENZENE	0.1	UG/L	140	60	30	130	70	30
SW8082	W	S	1,2,4-TRICHLOROBENZENE, FILTERED	0.1	UG/L	140	60	30	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8082	W	*	AROCLOR-1016	0.014	UG/L	140	60	30	130	70	30
SW8082	W	S	AROCLOR-1016, FILTERED	0.014	UG/L	140	60	30	130	70	30
SW8082	W	*	AROCLOR-1221	0.014	UG/L				130	70	30
SW8082	W	S	AROCLOR-1221, FILTERED	0.014	UG/L				130	70	30
SW8082	W	*	AROCLOR-1232	0.014	UG/L				130	70	30
SW8082	W	S	AROCLOR-1232, FILTERED	0.014	UG/L				130	70	30
SW8082	W	*	AROCLOR-1242	0.014	UG/L				130	70	30
SW8082	W	S	AROCLOR-1242, FILTERED	0.014	UG/L				130	70	30
SW8082	W	*	AROCLOR-1248	0.014	UG/L				130	70	30
SW8082	W	S	AROCLOR-1248, FILTERED	0.014	UG/L				130	70	30
SW8082	W	*	AROCLOR-1254	0.014	UG/L				130	70	30
SW8082	W	S	AROCLOR-1254, FILTERED	0.014	UG/L				130	70	30
SW8082	W	*	AROCLOR-1260	0.014	UG/L	140	60	30	130	70	30
SW8082	W	S	AROCLOR-1260, FILTERED	0.014	UG/L	140	60	30	130	70	30
SW8082	W	*	DECACHLOROBIPHENYL		UG/L	144	36	0	144	36	0
SW8082	W	S	DECACHLOROBIPHENYL, FILTERED		UG/L	144	36	0	144	36	0
SW8082	W	*	TETRACHLORO-M-XYLENE		UG/L	132	30	0	132	30	0
SW8082	W	S	TETRACHLORO-M-XYLENE, FILTERED		UG/L	132	30	0	132	30	0
SW8082	W	*	TOTAL PCB	0.014	UG/L				130	70	30
SW8082	W	S	TOTAL PCB, FILTERED	0.014	UG/L				130	70	30
SW8082A	S	*	1,2,4-TRICHLOROBENZENE	3.3	UG/K	140	60	30	130	70	50

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8082A	S	*	AROCLOR-1016	17	UG/K	140	60	30	130	70	50
SW8082A	S	*	AROCLOR-1221	17	UG/K				130	70	50
SW8082A	S	*	AROCLOR-1232	17	UG/K				130	70	50
SW8082A	S	*	AROCLOR-1242	17	UG/K				130	70	50
SW8082A	S	*	AROCLOR-1248	17	UG/K				130	70	50
SW8082A	S	*	AROCLOR-1254	17	UG/K				130	70	50
SW8082A	S	*	AROCLOR-1260	17	UG/K	140	60	30	130	70	50
SW8082A	S	*	DECACHLOROBIPHENYL		UG/K	150	50	0	150	50	0
SW8082A	S	*	TETRACHLORO-M-XYLENE		UG/K	132	27	0	132	27	0
SW8082A	S	*	TOTAL PCB	17	UG/K				130	70	50
SW8082A	W	*	1,2,4-TRICHLOROBENZENE	0.1	UG/L	140	60	30	130	70	30
SW8082A	W	*	AROCLOR-1016	0.5	UG/L	140	60	30	130	70	30
SW8082A	W	*	AROCLOR-1221	0.5	UG/L				130	70	30
SW8082A	W	*	AROCLOR-1232	0.5	UG/L				130	70	30
SW8082A	W	*	AROCLOR-1242	0.5	UG/L				130	70	30
SW8082A	W	*	AROCLOR-1248	0.5	UG/L				130	70	30
SW8082A	W	*	AROCLOR-1254	0.5	UG/L				130	70	30
SW8082A	W	*	AROCLOR-1260	0.5	UG/L	140	60	30	130	70	30
SW8082A	W	*	DECACHLOROBIPHENYL		UG/L	144	36	0	144	36	0
SW8082A	W	*	TETRACHLORO-M-XYLENE		UG/L	132	30	0	132	30	0
SW8082A	W	*	TOTAL PCB	0.5	UG/L				130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8082B	S	*	1,2,4-TRICHLOROBENZENE	3.3	UG/K	140	60	30	130	70	50
SW8082B	S	*	AROCLOR-1248	17	UG/K				130	70	50
SW8082B	S	*	AROCLOR-1254	17	UG/K				130	70	50
SW8082B	S	*	AROCLOR-1260	17	UG/K	140	60	30	130	70	50
SW8082B	S	*	DECACHLOROBIPHENYL		UG/K	150	50	0	150	50	0
SW8082B	S	*	TETRACHLORO-M-XYLENE		UG/K	132	27	0	132	27	0
SW8082B	S	*	TOTAL PCB	17	UG/K				130	70	50
SW8082B	W	*	1,2,4-TRICHLOROBENZENE	0.1	UG/L	140	60	30	130	70	30
SW8082B	W	*	AROCLOR-1248	0.014	UG/L				130	70	30
SW8082B	W	*	AROCLOR-1254	0.014	UG/L				130	70	30
SW8082B	W	*	AROCLOR-1260	0.014	UG/L	140	60	30	130	70	30
SW8082B	W	*	DECACHLOROBIPHENYL		UG/L	144	36	0	144	36	0
SW8082B	W	*	TETRACHLORO-M-XYLENE		UG/L	132	30	0	132	30	0
SW8082B	W	*	TOTAL PCB	0.014	UG/L				130	70	30
SW8082M	S	*	1,2,4-TRICHLOROBENZENE	10	UG/K	130	50	40	130	50	50
SW8082M	S	*	AROCLOR-1248	500	UG/K						
SW8082M	S	*	AROCLOR-1254	500	UG/K						
SW8082M	S	*	AROCLOR-1260	500	UG/K	130	50	40	130	50	50
SW8082M	S	*	DECACHLOROBIPHENYL		UG/K	150	50	0	150	50	0
SW8082M	S	*	TETRACHLORO-M-XYLENE		UG/K	132	27	0	132	27	0
SW8082M	S	*	TOTAL PCB	500	UG/K						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8082M	W	*	1,2,4-TRICHLOROBENZENE	5.0	UG/L	130	50	40	130	50	30
SW8082M	W	*	AROCLOR-1248	20	UG/L						
SW8082M	W	*	AROCLOR-1254	20	UG/L						
SW8082M	W	*	AROCLOR-1260	20	UG/L	130	50	40	130	50	30
SW8082M	W	*	DECACHLOROBIPHENYL		UG/L	144	36	0	144	36	0
SW8082M	W	*	TETRACHLORO-M-XYLENE		UG/L	132	30	0	132	30	0
SW8082M	W	*	TOTAL PCB	20	UG/L						
SW8141A	S	*	DIMETHOATE	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	DISULFOTON	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	FAMPHUR	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	METHYL PARATHION	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	O,O,O-TRIETHYL PHOSPHOROTHIOATE	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	PARATHION	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	PHORATE	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	SULFOTEP	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	THIONAZIN	33	UG/K	140	40	30	130	70	50
SW8141A	S	*	TRIBUTYLPHOSPHATE		UG/K	140	40	0	140	40	0
SW8141A	S	*	TRIPHENYLPHOSPHATE		UG/K	140	40	0	140	40	0
SW8141A	W	*	DIMETHOATE	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	DISULFOTON	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	FAMPHUR	1.0	UG/L	140	40	30	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8141A	W	*	METHYL PARATHION	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	O,O,O-TRIETHYL PHOSPHOROTHIOATE	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	PARATHION	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	PHORATE	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	SULFOTEP	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	THIONAZIN	1.0	UG/L	140	40	30	130	70	30
SW8141A	W	*	TRIBUTYLPHOSPHATE		UG/L	140	40	0	140	40	0
SW8141A	W	*	TRIPHENYLPHOSPHATE		UG/L	140	40	0	140	40	0
SW8150B	S	*	2,4,5-T	4.8	UG/K	150	40	30	130	70	50
SW8150B	S	*	2,4,5-TP (SILVEX)	4.8	UG/K	150	40	30	130	70	50
SW8150B	S	*	2,4-D	47	UG/K	150	40	30	130	70	50
SW8150B	S	*	DICHLOROPHENYL ACETIC ACID		UG/K	150	40	0	150	40	0
SW8150B	W	*	2,4,5-T	0.095	UG/L	150	40	30	130	70	30
SW8150B	W	*	2,4,5-TP (SILVEX)	0.095	UG/L	150	40	30	130	70	30
SW8150B	W	*	2,4-D	0.94	UG/L	150	40	30	130	70	30
SW8150B	W	*	DICHLOROPHENYL ACETIC ACID		UG/L	150	40	0	150	40	0
SW8260B	S	*	1,1,1,2-TETRACHLOROETHANE	5	UG/K	108	72	40	108	72	40
SW8260B	S	*	1,1,1-TRICHLOROETHANE	5	UG/K	122	74	40	122	74	40
SW8260B	S	*	1,1,2,2-TETRACHLOROETHANE	5	UG/K	108	74	40	108	74	40
SW8260B	S	*	1,1,2-TRICHLOROETHANE	5	UG/K	126	81	40	126	81	40
SW8260B	S	*	1,1-DICHLOROETHANE	5	UG/K	111	81	40	111	81	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8260B	S	*	1,1-DICHLOROETHENE	5	UG/K	113	75	40	113	75	40
SW8260B	S	*	1,2,3-TRICHLOROPROPANE	5	UG/K	137	81	40	137	81	40
SW8260B	S	*	1,2-DIBROMO-3-CHLOROPROPANE	5	UG/K	132	33	40	132	33	40
SW8260B	S	*	1,2-DIBROMOETHANE	5	UG/K	114	90	40	114	90	40
SW8260B	S	*	1,2-DICHLOROBENZENE-D4		UG/K	120	80	0	120	80	0
SW8260B	S	*	1,2-DICHLOROETHANE	5	UG/K	110	80	40	110	80	40
SW8260B	S	*	1,2-DICHLOROETHANE-D4		UG/K	120	80	0	120	80	0
SW8260B	S	*	1,2-DICHLOROPROPANE	5	UG/K	115	79	40	115	79	40
SW8260B	S	*	1,4-DIOXANE	500	UG/K	140	60	40	140	60	40
SW8260B	S	*	2-BUTANONE	25	UG/K	140	60	40	140	60	40
SW8260B	S	*	2-CHLORO-1,3-BUTADIENE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	2-CHLOROETHYL VINYL ETHER	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	2-HEXANONE	25	UG/K	140	60	40	140	60	40
SW8260B	S	*	3-CHLOROPROPENE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	4-BROMOFLUOROBENZENE		UG/K	121	74	0	121	74	0
SW8260B	S	*	4-METHYL-2-PENTANONE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	ACETONE	25	UG/K	140	60	40	140	60	40
SW8260B	S	*	ACROLEIN	25	UG/K	140	60	40	140	60	40
SW8260B	S	*	ACRYLONITRILE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	BENZENE	5	UG/K	116	78	40	116	78	40
SW8260B	S	*	BROMODICHLOROMETHANE	5	UG/K	112	78	40	112	78	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8260B	S	*	BROMOFORM	5	UG/K	120	82	40	120	82	40
SW8260B	S	*	BROMOMETHANE	5	UG/K	118	72	40	118	72	40
SW8260B	S	*	CARBON DISULFIDE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	CARBON TETRACHLORIDE	5	UG/K	106	62	40	106	62	40
SW8260B	S	*	CHLOROBENZENE	5	UG/K	115	81	40	115	81	40
SW8260B	S	*	CHLOROETHANE	5	UG/K	113	65	40	113	65	40
SW8260B	S	*	CHLOROFORM	5	UG/K	106	74	40	106	74	40
SW8260B	S	*	CHLOROMETHANE	5	UG/K	118	68	40	118	68	40
SW8260B	S	*	CIS-1,3-DICHLOROPROPENE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	DIBROMOCHLOROMETHANE	5	UG/K	112	72	40	112	72	40
SW8260B	S	*	DIBROMOMETHANE	5	UG/K	117	83	40	117	83	40
SW8260B	S	*	DICHLORODIFLUOROMETHANE	5	UG/K	116	78	40	116	78	40
SW8260B	S	*	ETHYL BENZENE	5	UG/K	124	74	40	124	74	40
SW8260B	S	*	ETHYL METHACRYLATE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	IODOMETHANE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	ISOBUTANOL	500	UG/K	140	60	40	140	60	40
SW8260B	S	*	METHACRYLONITRILE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	METHYL METHACRYLATE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	METHYLENE CHLORIDE	5	UG/K	110	80	40	110	80	40
SW8260B	S	*	PROPIONITRILE	20	UG/K	140	60	40	140	60	40
SW8260B	S	*	STYRENE	5	UG/K	124	80	40	124	80	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8260B	S	*	TETRACHLOROETHENE	5	UG/K	107	71	40	107	71	40
SW8260B	S	*	TOLUENE	5	UG/K	126	78	40	126	78	40
SW8260B	S	*	TOLUENE-D8		UG/K	117	81	0	117	81	0
SW8260B	S	*	TRANS-1,2-DICHLOROETHENE	5	UG/K	109	77	40	109	77	40
SW8260B	S	*	TRANS-1,3-DICHLOROPROPENE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	TRANS-1,4-DICHLORO-2-BUTENE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	TRICHLOROETHENE	5	UG/K	109	70	40	109	70	40
SW8260B	S	*	TRICHLOROFLUOROMETHANE	5	UG/K	111	67	40	111	67	40
SW8260B	S	*	VINYL ACETATE	5	UG/K	140	60	40	140	60	40
SW8260B	S	*	VINYL CHLORIDE	5	UG/K	118	78	40	118	78	40
SW8260B	S	*	XYLENES	5	UG/K	140	60	40	140	60	40
SW8260B	W	*	1,1,1,2-TETRACHLOROETHANE	0.5	UG/L	108	72	40	108	72	40
SW8260B	W	*	1,1,1-TRICHLOROETHANE	0.5	UG/L	122	74	40	122	74	40
SW8260B	W	*	1,1,2,2-TETRACHLOROETHANE	0.5	UG/L	108	74	40	108	74	40
SW8260B	W	*	1,1,2-TRICHLOROETHANE	0.5	UG/L	126	81	40	126	81	40
SW8260B	W	*	1,1-DICHLOROETHANE	0.5	UG/L	111	81	40	111	81	40
SW8260B	W	*	1,1-DICHLOROETHENE	0.5	UG/L	113	75	40	113	75	40
SW8260B	W	*	1,2,3-TRICHLOROPROPANE	0.5	UG/L	137	81	40	137	81	40
SW8260B	W	*	1,2-DIBROMO-3-CHLOROPROPANE	0.5	UG/L	132	33	40	132	33	40
SW8260B	W	*	1,2-DIBROMOETHANE	0.5	UG/L	114	90	40	114	90	40
SW8260B	W	*	1,2-DICHLOROBENZENE-D4		UG/L	124	69	0	124	69	0

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8260B	W	*	1,2-DICHLOROETHANE	0.5	UG/L	110	80	40	110	80	40
SW8260B	W	*	1,2-DICHLOROETHANE-D4		UG/L	141	72	0	141	72	0
SW8260B	W	*	1,2-DICHLOROPROPANE	0.5	UG/L	115	79	40	115	79	40
SW8260B	W	*	1,4-DIOXANE	50	UG/L	140	60	40	140	60	40
SW8260B	W	*	2-BUTANONE	2.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	2-CHLORO-1,3-BUTADIENE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	2-CHLOROETHYL VINYL ETHER	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	2-HEXANONE	2.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	3-CHLOROPROPENE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	4-BROMOFLUOROBENZENE		UG/L	122	72	0	122	72	0
SW8260B	W	*	4-METHYL-2-PENTANONE	2.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	ACETONE	2.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	ACROLEIN	2.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	ACRYLONITRILE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	BENZENE	0.5	UG/L	116	78	40	116	78	40
SW8260B	W	*	BROMODICHLOROMETHANE	0.5	UG/L	112	78	40	112	78	40
SW8260B	W	*	BROMOFORM	0.5	UG/L	120	82	40	120	82	40
SW8260B	W	*	BROMOMETHANE	0.5	UG/L	118	72	40	118	72	40
SW8260B	W	*	CARBON DISULFIDE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	CARBON TETRACHLORIDE	0.5	UG/L	106	62	40	106	62	40
SW8260B	W	*	CHLOROBENZENE	0.5	UG/L	115	81	40	115	81	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8260B	W	*	CHLOROETHANE	0.5	UG/L	113	65	40	113	65	40
SW8260B	W	*	CHLOROFORM	0.5	UG/L	106	74	40	106	74	40
SW8260B	W	*	CHLOROMETHANE	0.5	UG/L	118	68	40	118	68	40
SW8260B	W	*	CIS-1,3-DICHLOROPROPENE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	DIBROMOCHLOROMETHANE	0.5	UG/L	112	72	40	112	72	40
SW8260B	W	*	DIBROMOMETHANE	0.5	UG/L	117	83	40	117	83	40
SW8260B	W	*	DICHLORODIFLUOROMETHANE	0.5	UG/L	116	78	40	116	78	40
SW8260B	W	*	ETHYL BENZENE	0.5	UG/L	124	74	40	124	74	40
SW8260B	W	*	ETHYL METHACRYLATE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	IODOMETHANE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	ISOBUTANOL	50	UG/L	140	60	40	140	60	40
SW8260B	W	*	METHACRYLONITRILE	2	UG/L	140	60	40	140	60	40
SW8260B	W	*	METHYL METHACRYLATE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	METHYLENE CHLORIDE	0.5	UG/L	110	80	40	110	80	40
SW8260B	W	*	PROPIONITRILE	2	UG/L	140	60	40	140	60	40
SW8260B	W	*	STYRENE	0.5	UG/L	124	80	40	124	80	40
SW8260B	W	*	TETRACHLOROETHENE	0.5	UG/L	107	71	40	107	71	40
SW8260B	W	*	TOLUENE	0.5	UG/L	126	78	40	126	78	40
SW8260B	W	*	TOLUENE-D8		UG/L	110	88	0	110	88	0
SW8260B	W	*	TRANS-1,2-DICHLOROETHENE	0.5	UG/L	109	77	40	109	77	40
SW8260B	W	*	TRANS-1,3-DICHLOROPROPENE	0.5	UG/L	140	60	40	140	60	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8260B	W	*	TRANS-1,4-DICHLORO-2-BUTENE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	TRICHLOROETHENE	0.5	UG/L	109	70	40	109	70	40
SW8260B	W	*	TRICHLOROFLUOROMETHANE	0.5	UG/L	111	67	40	111	67	40
SW8260B	W	*	VINYL ACETATE	0.5	UG/L	140	60	40	140	60	40
SW8260B	W	*	VINYL CHLORIDE	0.5	UG/L	118	78	40	118	78	40
SW8260B	W	*	XYLENES	0.5	UG/L	140	60	40	140	60	40
SW8270C	S	*	1,2,4,5-TETRACHLOROBENZENE	330	UG/K						
SW8270C	S	*	1,2,4-TRICHLOROBENZENE	330	UG/K	118	64	40	118	64	40
SW8270C	S	*	1,2-DICHLOROBENZENE	330	UG/K	113	63	40	113	63	40
SW8270C	S	*	1,2-DICHLOROBENZENE-D4		UG/K	130	20	0	130	20	0
SW8270C	S	*	1,3,5-TRINITROBENZENE	330	UG/K						
SW8270C	S	*	1,3-DICHLOROBENZENE	330	UG/K	118	58	40	118	58	40
SW8270C	S	*	1,4-DICHLOROBENZENE	330	UG/K	117	58	40	117	58	40
SW8270C	S	*	1,4-NAPHTHOQUINONE	330	UG/K						
SW8270C	S	*	1-NAPHTHYLAMINE	330	UG/K						
SW8270C	S	*	2,3,4,6-TETRACHLOROPHENOL	330	UG/K						
SW8270C	S	*	2,4,5-TRICHLOROPHENOL	800	UG/K	121	52	40	121	52	40
SW8270C	S	*	2,4,6-TRIBROMOPHENOL		UG/K	122	19	0	122	19	0
SW8270C	S	*	2,4,6-TRICHLOROPHENOL	330	UG/K	122	57	40	122	57	40
SW8270C	S	*	2,4-DICHLOROPHENOL	330	UG/K	127	61	40	127	61	40
SW8270C	S	*	2,4-DIMETHYLPHENOL	330	UG/K	116	50	40	116	50	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	S	*	2,4-DINITROPHENOL	800	UG/K	194	10	40	194	10	40
SW8270C	S	*	2,4-DINITROTOLUENE	330	UG/K	124	64	40	124	64	40
SW8270C	S	*	2,6-DICHLOROPHENOL	330	UG/K						
SW8270C	S	*	2,6-DINITROTOLUENE	330	UG/K	130	63	40	130	63	40
SW8270C	S	*	2-ACETYLAMINOFLUORENE	330	UG/K						
SW8270C	S	*	2-CHLORONAPHTHALENE	330	UG/K	116	69	40	116	69	40
SW8270C	S	*	2-CHLOROPHENOL	330	UG/K	112	47	40	112	47	40
SW8270C	S	*	2-CHLOROPHENOL-D4		UG/K	130	20	0	130	20	0
SW8270C	S	*	2-FLUOROBIPHENYL		UG/K	115	30	0	115	30	0
SW8270C	S	*	2-FLUOROPHENOL		UG/K	121	25	0	121	25	0
SW8270C	S	*	2-METHYLNAPHTHALENE	330	UG/K	120	70	40	120	70	40
SW8270C	S	*	2-METHYLPHENOL	330	UG/K	125	47	40	125	47	40
SW8270C	S	*	2-NAPHTHYLAMINE	330	UG/K						
SW8270C	S	*	2-NITROANILINE	800	UG/K	127	62	40	127	62	40
SW8270C	S	*	2-NITROPHENOL	330	UG/K	128	56	40	128	56	40
SW8270C	S	*	2-PICOLINE	330	UG/K						
SW8270C	S	*	2-s-butyl-4,6-dinitrophenol(Dinoseb)	330	UG/K						
SW8270C	S	*	3,3'-DICHLOROBENZIDINE	330	UG/K	139	10	40	139	10	40
SW8270C	S	*	3,3'-DIMETHYLBENZIDINE	330	UG/K						
SW8270C	S	*	3-METHYLCHOLANTHRENE	330	UG/K						
SW8270C	S	*	3-NITROANILINE	800	UG/K	116	23	40	116	23	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	S	*	4,6-DINITRO-2-METHYLPHENOL	800	UG/K	151	33	40	151	33	40
SW8270C	S	*	4-AMINOBIPHENYL	330	UG/K						
SW8270C	S	*	4-BROMOPHENYL PHENYL ETHER	330	UG/K	126	61	40	126	61	40
SW8270C	S	*	4-CHLORO-3-METHYLPHENOL	330	UG/K	128	60	40	128	60	40
SW8270C	S	*	4-CHLOROANILINE	330	UG/K	106	10	40	106	10	40
SW8270C	S	*	4-CHLORODIPHENYLETHER	330	UG/K	117	64	40	117	64	40
SW8270C	S	*	4-DIMETHYLAMINOAZOBENZENE	330	UG/K						
SW8270C	S	*	4-METHYLPHENOL	330	UG/K	121	55	40	121	55	40
SW8270C	S	*	4-NITROANILINE	800	UG/K	131	34	40	131	34	40
SW8270C	S	*	4-NITROPHENOL	800	UG/K	141	46	40	141	46	40
SW8270C	S	*	4-NITROQUINOLINE-1-OXIDE	330	UG/K						
SW8270C	S	*	5-NITRO-O-TOLUIDINE	330	UG/K						
SW8270C	S	*	7,12-DIMETHYLBENZ(A)ANTHRACENE	330	UG/K						
SW8270C	S	*	ACENAPHTHENE	330	UG/K	114	65	40	114	65	40
SW8270C	S	*	ACENAPHTHYLENE	330	UG/K	114	65	40	114	65	40
SW8270C	S	*	ACETOPHENONE	330	UG/K						
SW8270C	S	*	ALPHA, ALPHA DIMETHYLPHENETHYLA	330	UG/K						
SW8270C	S	*	ANILINE	800	UG/K	122	10	40	122	10	40
SW8270C	S	*	ANTHRACENE	330	UG/K	120	65	40	120	65	40
SW8270C	S	*	ARAMITE	330	UG/K						
SW8270C	S	*	AZOBENZENE	330	UG/K						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	S	*	BENZO(A)ANTHRACENE	330	UG/K	117	57	40	117	57	40
SW8270C	S	*	BENZO(B)FLUORANTHENE	330	UG/K	132	54	40	132	54	40
SW8270C	S	*	BENZO(K)FLUORANTHENE	330	UG/K	136	47	40	136	47	40
SW8270C	S	*	BENZO[A]PYRENE	330	UG/K	122	66	40	122	66	40
SW8270C	S	*	BENZO[GHI]PERYLENE	330	UG/K	169	10	40	169	10	40
SW8270C	S	*	BENZYL ALCOHOL	330	UG/K	162	32	40	162	32	40
SW8270C	S	*	BIS(2-CHLOROETHOXY) METHANE	330	UG/K	131	59	40	131	59	40
SW8270C	S	*	BIS(2-CHLOROETHYL)ETHER	330	UG/K	132	54	40	132	54	40
SW8270C	S	*	BIS(2-CHLOROISOPROPYL)ETHER	330	UG/K	125	57	40	125	57	40
SW8270C	S	*	BIS(2-ETHYLHEXYL) PHTHALATE	330	UG/K	140	57	40	140	57	40
SW8270C	S	*	BUTYL BENZYL PHTHALATE	330	UG/K	129	57	40	129	57	40
SW8270C	S	*	CHLOROBENZILATE	330	UG/K						
SW8270C	S	*	CHRYSENE	330	UG/K	121	66	40	121	66	40
SW8270C	S	*	DI-N-BUTYLPHTHALATE	330	UG/K	118	65	40	118	65	40
SW8270C	S	*	DI-N-OCTYLPHTHALATE	330	UG/K	146	44	40	146	44	40
SW8270C	S	*	DIALLATE	330	UG/K						
SW8270C	S	*	DIBENZO(A,H)ANTHRACENE	330	UG/K	145	41	40	145	41	40
SW8270C	S	*	DIBENZOFURAN	330	UG/K	119	67	40	119	67	40
SW8270C	S	*	DIETHYLPHTHALATE	330	UG/K	121	67	40	121	67	40
SW8270C	S	*	DIMETHYLPHTHALATE	330	UG/K	125	65	40	125	65	40
SW8270C	S	*	ETHYL METHANESULFONATE	330	UG/K						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	S	*	FLUORANTHENE	330	UG/K	117	66	40	117	66	40
SW8270C	S	*	FLUORENE	330	UG/K	117	64	40	117	64	40
SW8270C	S	*	HEXACHLOROBENZENE	330	UG/K	126	61	40	126	61	40
SW8270C	S	*	HEXACHLOROBUTADIENE	330	UG/K	128	60	40	128	60	40
SW8270C	S	*	HEXACHLOROCYCLOPENTADIENE	330	UG/K	134	10	40	134	10	40
SW8270C	S	*	HEXACHLOROETHANE	330	UG/K	118	57	40	118	57	40
SW8270C	S	*	HEXACHLOROPROPENE	330	UG/K						
SW8270C	S	*	INDENO(1,2,3-C,D)PYRENE	330	UG/K	156	25	40	156	25	40
SW8270C	S	*	ISOPHORONE	330	UG/K	123	63	40	123	63	40
SW8270C	S	*	ISOSAFROLE	330	UG/K						
SW8270C	S	*	M-DINITROBENZENE	330	UG/K						
SW8270C	S	*	METHAPYRILENE	330	UG/K						
SW8270C	S	*	METHYL METHANESULFONATE	330	UG/K						
SW8270C	S	*	N-NITROSO-DI-N-BUTYLAMINE	330	UG/K						
SW8270C	S	*	N-NITROSODI-N-PROPYLAMINE	330	UG/K	117	59	40	117	59	40
SW8270C	S	*	N-NITROSODIETHYLAMINE	330	UG/K						
SW8270C	S	*	N-NITROSODIMETHYLAMINE	330	UG/K	139	29	40	139	29	40
SW8270C	S	*	N-NITROSODIPHENYLAMINE	330	UG/K	131	52	40	131	52	40
SW8270C	S	*	N-NITROSOMETHYLETHYLAMINE	330	UG/K						
SW8270C	S	*	N-NITROSOMORPHOLINE	330	UG/K						
SW8270C	S	*	N-NITROSOPIPERIDINE	330	UG/K						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	S	*	N-NITROSOPYRROLIDINE	330	UG/K						
SW8270C	S	*	NAPHTHALENE	330	UG/K	118	65	40	118	65	40
SW8270C	S	*	NITROBENZENE	330	UG/K	125	60	40	125	60	40
SW8270C	S	*	NITROBENZENE-D5		UG/K	120	23	0	120	23	0
SW8270C	S	*	O-TOLUIDINE	330	UG/K						
SW8270C	S	*	P-PHENYLENEDIAMINE	330	UG/K						
SW8270C	S	*	PENTACHLOROBENZENE	330	UG/K						
SW8270C	S	*	PENTACHLOROETHANE	330	UG/K						
SW8270C	S	*	PENTACHLORONITROBENZENE	330	UG/K						
SW8270C	S	*	PENTACHLOROPHENOL	800	UG/K	137	25	40	137	25	40
SW8270C	S	*	PHENACETIN	330	UG/K						
SW8270C	S	*	PHENANTHRENE	330	UG/K	121	64	40	121	64	40
SW8270C	S	*	PHENOL	330	UG/K	118	54	40	118	54	40
SW8270C	S	*	PHENOL-D5		UG/K	113	24	0	113	24	0
SW8270C	S	*	PRONAMIDE	330	UG/K						
SW8270C	S	*	PYRENE	330	UG/K	140	49	40	140	49	40
SW8270C	S	*	PYRIDINE	330	UG/K	146	10	40	146	10	40
SW8270C	S	*	SAFROLE	330	UG/K						
SW8270C	S	*	TERPHENYL-D14		UG/K	137	18	0	137	18	0
SW8270C	W	*	1,2,4,5-TETRACHLOROBENZENE	10	UG/L						
SW8270C	W	*	1,2,4-TRICHLOROBENZENE	10	UG/L	129	41	40	129	41	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	W	*	1,2-DICHLOROBENZENE	10	UG/L	121	45	40	121	45	40
SW8270C	W	*	1,2-DICHLOROBENZENE-D4		UG/L	110	16	0	110	16	0
SW8270C	W	*	1,3,5-TRINITROBENZENE	10	UG/L						
SW8270C	W	*	1,3-DICHLORBENZENE	10	UG/L	122	41	40	122	41	40
SW8270C	W	*	1,4-DICHLOROBENZENE	10	UG/L	131	28	40	131	28	40
SW8270C	W	*	1,4-NAPHTHOQUINONE	10	UG/L						
SW8270C	W	*	1-NAPHTHYLAMINE	10	UG/L						
SW8270C	W	*	2,3,4,6-TETRACHLOROPHENOL	10	UG/L						
SW8270C	W	*	2,4,5-TRICHLOROPHENOL	25	UG/L	136	50	40	136	50	40
SW8270C	W	*	2,4,6-TRIBROMOPHENOL		UG/L	123	10	0	123	10	0
SW8270C	W	*	2,4,6-TRICHLOROPHENOL	10	UG/L	121	67	40	121	67	40
SW8270C	W	*	2,4-DICHLOROPHENOL	10	UG/L	121	67	40	121	67	40
SW8270C	W	*	2,4-DIMETHYLPHENOL	10	UG/L	121	58	40	121	58	40
SW8270C	W	*	2,4-DINITROPHENOL	25	UG/L	143	12	40	143	12	40
SW8270C	W	*	2,4-DINITROTOLUENE	10	UG/L	122	67	40	122	67	40
SW8270C	W	*	2,6-DICHLOROPHENOL	10	UG/L						
SW8270C	W	*	2,6-DINITROTOLUENE	10	UG/L	119	73	40	119	73	40
SW8270C	W	*	2-ACETYLAMINOFLUORENE	10	UG/L						
SW8270C	W	*	2-CHLORONAPHTHALENE	10	UG/L	125	55	40	125	55	40
SW8270C	W	*	2-CHLOROPHENOL	10	UG/L	110	67	40	110	67	40
SW8270C	W	*	2-CHLOROPHENOL-D4		UG/L	110	33	0	110	33	0

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	W	*	2-FLUOROBIPHENYL		UG/L	116	43	0	116	43	0
SW8270C	W	*	2-FLUOROPHENOL		UG/L	110	21	0	110	21	0
SW8270C	W	*	2-METHYLNAPHTHALENE	10	UG/L	126	58	40	126	58	40
SW8270C	W	*	2-METHYLPHENOL	10	UG/L	131	31	40	131	31	40
SW8270C	W	*	2-NAPHTHYLAMINE	10	UG/L						
SW8270C	W	*	2-NITROANILINE	25	UG/L	122	70	40	122	70	40
SW8270C	W	*	2-NITROPHENOL	10	UG/L	115	71	40	115	71	40
SW8270C	W	*	2-PICOLINE	10	UG/L						
SW8270C	W	*	2-s-butyl-4,6-dinitrophenol(Dinoseb)	10	UG/L						
SW8270C	W	*	3,3'-DICHLOROBENZIDINE	10	UG/L	158	19	40	158	19	40
SW8270C	W	*	3,3'-DIMETHYLBENZIDINE	10	UG/L						
SW8270C	W	*	3-METHYLCHOLANTHRENE	10	UG/L						
SW8270C	W	*	3-NITROANILINE	25	UG/L	134	28	40	134	28	40
SW8270C	W	*	4,6-DINITRO-2-METHYLPHENOL	25	UG/L	134	44	40	134	44	40
SW8270C	W	*	4-AMINOBIPHENYL	10	UG/L						
SW8270C	W	*	4-BROMOPHENYL PHENYL ETHER	10	UG/L	131	60	40	131	60	40
SW8270C	W	*	4-CHLORO-3-METHYLPHENOL	10	UG/L	128	60	40	128	60	40
SW8270C	W	*	4-CHLOROANILINE	10	UG/L	137	14	40	137	14	40
SW8270C	W	*	4-CHLORODIPHENYLETHER	10	UG/L	118	63	40	118	63	40
SW8270C	W	*	4-DIMETHYLAMINOAZOBENZENE	10	UG/L						
SW8270C	W	*	4-METHYLPHENOL	10	UG/L	111	48	40	111	48	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	W	*	4-NITROANILINE	25	UG/L	140	51	40	140	51	40
SW8270C	W	*	4-NITROPHENOL	25	UG/L	74	13	40	74	13	40
SW8270C	W	*	4-NITROQUINOLINE-1-OXIDE	10	UG/L						
SW8270C	W	*	5-NITRO-O-TOLUIDINE	10	UG/L						
SW8270C	W	*	7,12-DIMETHYLBENZ(A)ANTHRACENE	10	UG/L						
SW8270C	W	*	ACENAPHTHENE	10	UG/L	115	66	40	115	66	40
SW8270C	W	*	ACENAPHTHYLENE	10	UG/L	114	60	40	114	60	40
SW8270C	W	*	ACETOPHENONE	10	UG/L						
SW8270C	W	*	ALPHA, ALPHA DIMETHYLPHENETHYLA	10	UG/L						
SW8270C	W	*	ANILINE	25	UG/L	114	38	40	114	38	40
SW8270C	W	*	ANTHRACENE	10	UG/L	121	76	40	121	76	40
SW8270C	W	*	ARAMITE	10	UG/L						
SW8270C	W	*	AZOBENZENE	10	UG/L						
SW8270C	W	*	BENZO(A)ANTHRACENE	10	UG/L	115	72	40	115	72	40
SW8270C	W	*	BENZO(B)FLUORANTHENE	10	UG/L	141	50	40	141	50	40
SW8270C	W	*	BENZO(K)FLUORANTHENE	10	UG/L	135	56	40	135	56	40
SW8270C	W	*	BENZO[A]PYRENE	10	UG/L	125	64	40	125	64	40
SW8270C	W	*	BENZO[GHI]PERYLENE	10	UG/L	130	58	40	130	58	40
SW8270C	W	*	BENZYL ALCOHOL	10	UG/L	158	35	40	158	35	40
SW8270C	W	*	BIS(2-CHLOROETHOXY) METHANE	10	UG/L	130	62	40	130	62	40
SW8270C	W	*	BIS(2-CHLOROETHYL)ETHER	10	UG/L	119	64	40	119	64	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	W	*	BIS(2-CHLOROISOPROPYL)ETHER	10	UG/L	116	64	40	116	64	40
SW8270C	W	*	BIS(2-ETHYLHEXYL) PHTHALATE	10	UG/L	150	55	40	150	55	40
SW8270C	W	*	BUTYL BENZYL PHTHALATE	10	UG/L	128	52	40	128	52	40
SW8270C	W	*	CHLOROBENZILATE	10	UG/L						
SW8270C	W	*	CHRYSENE	10	UG/L	122	70	40	122	70	40
SW8270C	W	*	DI-N-BUTYLPHTHALATE	10	UG/L	122	70	40	122	70	40
SW8270C	W	*	DI-N-OCTYLPHTHALATE	10	UG/L	175	41	40	175	41	40
SW8270C	W	*	DIALLATE	10	UG/L						
SW8270C	W	*	DIBENZO(A,H)ANTHRACENE	10	UG/L	124	71	40	124	71	40
SW8270C	W	*	DIBENZOFURAN	10	UG/L	123	65	40	123	65	40
SW8270C	W	*	DIETHYLPHTHALATE	10	UG/L	125	50	40	125	50	40
SW8270C	W	*	DIMETHYLPHTHALATE	10	UG/L	129	12	40	129	12	40
SW8270C	W	*	ETHYL METHANESULFONATE	10	UG/L						
SW8270C	W	*	FLUORANTHENE	10	UG/L	134	63	40	134	63	40
SW8270C	W	*	FLUORENE	10	UG/L	122	66	40	122	66	40
SW8270C	W	*	HEXACHLOROBENZENE	10	UG/L	128	64	40	128	64	40
SW8270C	W	*	HEXACHLOROBUTADIENE	10	UG/L	123	68	40	123	68	40
SW8270C	W	*	HEXACHLOROCYCLOPENTADIENE	10	UG/L	83	10	40	83	10	40
SW8270C	W	*	HEXACHLOROETHANE	10	UG/L	133	21	40	133	21	40
SW8270C	W	*	HEXACHLOROPROPENE	10	UG/L						
SW8270C	W	*	INDENO(1,2,3-C,D)PYRENE	10	UG/L	119	65	40	119	65	40

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	W	*	ISOPHORONE	10	UG/L	124	69	40	124	69	40
SW8270C	W	*	ISOSAFROLE	10	UG/L						
SW8270C	W	*	M-DINITROBENZENE	10	UG/L						
SW8270C	W	*	METHAPYRILENE	10	UG/L						
SW8270C	W	*	METHYL METHANESULFONATE	10	UG/L						
SW8270C	W	*	N-NITROSO-DI-N-BUTYLAMINE	10	UG/L						
SW8270C	W	*	N-NITROSODI-N-PROPYLAMINE	10	UG/L	129	65	40	129	65	40
SW8270C	W	*	N-NITROSODIETHYLAMINE	10	UG/L						
SW8270C	W	*	N-NITROSODIMETHYLAMINE	10	UG/L	103	27	40	103	27	40
SW8270C	W	*	N-NITROSODIPHENYLAMINE	10	UG/L	132	64	40	132	64	40
SW8270C	W	*	N-NITROSOMETHYLETHYLAMINE	10	UG/L						
SW8270C	W	*	N-NITROSOMORPHOLINE	10	UG/L						
SW8270C	W	*	N-NITROSOPIPERIDINE	10	UG/L						
SW8270C	W	*	N-NITROSOPYRROLIDINE	10	UG/L						
SW8270C	W	*	NAPHTHALENE	10	UG/L	125	54	40	125	54	40
SW8270C	W	*	NITROBENZENE	10	UG/L	121	69	40	121	69	40
SW8270C	W	*	NITROBENZENE-D5		UG/L	114	35	0	114	35	0
SW8270C	W	*	O-TOLUIDINE	10	UG/L						
SW8270C	W	*	P-PHENYLENEDIAMINE	10	UG/L						
SW8270C	W	*	PENTACHLOROBENZENE	10	UG/L						
SW8270C	W	*	PENTACHLOROETHANE	10	UG/L						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8270C	W	*	PENTACHLORONITROBENZENE	10	UG/L						
SW8270C	W	*	PENTACHLOROPHENOL	25	UG/L	156	13	40	156	13	40
SW8270C	W	*	PHENACETIN	10	UG/L						
SW8270C	W	*	PHENANTHRENE	10	UG/L	118	72	40	118	72	40
SW8270C	W	*	PHENOL	10	UG/L	68	23	40	68	23	40
SW8270C	W	*	PHENOL-D5		UG/L	110	10	0	110	10	0
SW8270C	W	*	PRONAMIDE	10	UG/L						
SW8270C	W	*	PYRENE	10	UG/L	137	59	40	137	59	40
SW8270C	W	*	PYRIDINE	10	UG/L	93	21	40	93	21	40
SW8270C	W	*	SAFROLE	10	UG/L						
SW8270C	W	*	TERPHENYL-D14		UG/L	141	33	0	141	33	0
SW8290	S	*	1,2,3,4,6,7,8-HPCDD	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,4,6,7,8-HPCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,4,7,8,9-HPCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,4,7,8-HXCDD	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,4,7,8-HXCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,6,7,8-HXCDD	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,6,7,8-HXCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,7,8,9-HXCDD	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,7,8,9-HXCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	1,2,3,7,8-PECDD	0.1	PG/G	130	70	25	130	70	50

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8290	S	*	1,2,3,7,8-PECDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	13C-2378-TCDD		PG/G	140	60	0	140	60	0
SW8290	S	*	2,3,4,6,7,8-HXCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	2,3,4,7,8-PECDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	2,3,7,8-TCDD	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	2,3,7,8-TCDF	0.1	PG/G	130	70	25	130	70	50
SW8290	S	*	OCDD	0.5	PG/G	130	70	25	130	70	50
SW8290	S	*	OCDF	0.5	PG/G	130	70	25	130	70	50
SW8290	S	*	TOTAL HPCDD	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL HPCDF	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL HXCDD	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL HXCDF	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL PECDD	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL PECDF	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL TCDD	0.1	PG/G				130	70	50
SW8290	S	*	TOTAL TCDF	0.1	PG/G				130	70	50
SW8290	W	*	1,2,3,4,6,7,8-HPCDD	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,4,6,7,8-HPCDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,4,7,8,9-HPCDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,4,7,8-HXCDD	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,4,7,8-HXCDF	1.0	PG/L	130	70	25	130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW8290	W	*	1,2,3,6,7,8-HXCDD	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,6,7,8-HXCDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,7,8,9-HXCDD	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,7,8,9-HXCDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,7,8-PECDD	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	1,2,3,7,8-PECDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	13C-2378-TCDD		PG/L	140	60	0	140	60	0
SW8290	W	*	2,3,4,6,7,8-HXCDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	2,3,4,7,8-PECDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	2,3,7,8-TCDD	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	2,3,7,8-TCDF	1.0	PG/L	130	70	25	130	70	30
SW8290	W	*	OCDD	5.0	PG/L	130	70	25	130	70	30
SW8290	W	*	OCDF	5.0	PG/L	130	70	25	130	70	30
SW8290	W	*	TOTAL HPCDD	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL HPCDF	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL HXCDD	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL HXCDF	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL PECDD	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL PECDF	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL TCDD	1.0	PG/L				130	70	30
SW8290	W	*	TOTAL TCDF	1.0	PG/L				130	70	30

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SW9010B	S	*	CYANIDE	0.5	MG/K	125	75	20	130	70	50
SW9010B	S	L	CYANIDE, LCS	0.5	MG/K	125	75	20	130	70	50
SW9010B	W	*	CYANIDE	5.0	UG/L	125	75	20	130	70	30
SW9010B	W	L	CYANIDE, LCS	5.0	UG/L	125	75	20	130	70	30
SW9014	W	*	CYANIDE, REACTIVE	2.9	MG/L	125	75	20	130	70	30
SW9030B	S	*	SULFIDE	5.0	MG/K	125	75	20	130	70	50
SW9030B	S	L	SULFIDE, LCS	5.0	MG/K	125	75	20	130	70	50
SW9030B	W	*	SULFIDE	0.5	MG/L	125	75	20	130	70	30
SW9030B	W	L	SULFIDE, LCS	0.5	MG/L	125	75	20	130	70	30
SW9034	W	*	SULFIDE, REACTIVE	2.0	MG/L	125	75	20	130	70	30
SW9040B	W	*	PH	0.2	PH						
SW9050A	W	*	SPECIFIC CONDUCTANCE	1.0	US/C						
SW9060M	S	*	TOTAL ORGANIC CARBON	100	MG/K	125	75	20	130	70	50
SWSIM	S	*	ACENAPHTHENE	10	UG/K						
SWSIM	S	*	ACENAPHTHENE-D10		UG/K	130	20	0	130	20	0
SWSIM	S	*	ACENAPHTHYLENE	10	UG/K						
SWSIM	S	*	ANTHRACENE	10	UG/K						
SWSIM	S	*	BENZO(A)ANTHRACENE	10	UG/K						
SWSIM	S	*	BENZO(A)PYRENE	10	UG/K						
SWSIM	S	*	BENZO(B)FLUORANTHENE	10	UG/K						
SWSIM	S	*	BENZO(G,H,I)PERYLENE	10	UG/K						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SWSIM	S	*	BENZO(K)FLUORANTHENE	10	UG/K						
SWSIM	S	*	CHRYSENE	10	UG/K						
SWSIM	S	*	CHRYSENE-D12		UG/K	130	20	0	130	20	0
SWSIM	S	*	DIBENZ(A,H)ANTHRACENE	10	UG/K						
SWSIM	S	*	FLUORANTHENE	10	UG/K						
SWSIM	S	*	FLUORENE	10	UG/K						
SWSIM	S	*	INDENO(1,2,3-CD)PYRENE	10	UG/K						
SWSIM	S	*	NAPHTHALENE	10	UG/K						
SWSIM	S	*	NAPHTHALENE-D8		UG/K	130	20	0	130	20	0
SWSIM	S	*	PERYLENE-D12		UG/K	130	20	0	130	20	0
SWSIM	S	*	PHENANTHRENE	10	UG/K						
SWSIM	S	*	PHENANTHRENE-D10		UG/K	130	20	0	130	20	0
SWSIM	S	*	PYRENE	10	UG/K						
SWSIM	W	*	ACENAPHTHENE	0.02	UG/L						
SWSIM	W	*	ACENAPHTHENE-D10		UG/L	130	20	0	130	20	0
SWSIM	W	*	ACENAPHTHYLENE	0.02	UG/L						
SWSIM	W	*	ANTHRACENE	0.02	UG/L						
SWSIM	W	*	BENZO(A)ANTHRACENE	0.02	UG/L						
SWSIM	W	*	BENZO(A)PYRENE	0.02	UG/L						
SWSIM	W	*	BENZO(B)FLUORANTHENE	0.02	UG/L						
SWSIM	W	*	BENZO(G,H,I)PERYLENE	0.02	UG/L						

Method	Matrix	Sub Id	Analyte	Detection Limits	Reporting Units	Matrix Spike Control Limits High	Matrix Spike Control Limits Low	Matrix Spike Control Limits RPD	Blank Spike Control Limits High	Blank Spike Control Limits Low	Blank Spike Control Limits RPD
SWSIM	W	*	BENZO(K)FLUORANTHENE	0.02	UG/L						
SWSIM	W	*	CHRYSENE	0.02	UG/L						
SWSIM	W	*	CHRYSENE-D12		UG/L	130	20	0	130	20	0
SWSIM	W	*	DIBENZ(A,H)ANTHRACENE	0.02	UG/L						
SWSIM	W	*	FLUORANTHENE	0.02	UG/L						
SWSIM	W	*	FLUORENE	0.02	UG/L						
SWSIM	W	*	INDENO(1,2,3-CD)PYRENE	0.02	UG/L						
SWSIM	W	*	NAPHTHALENE	0.02	UG/L						
SWSIM	W	*	NAPHTHALENE-D8		UG/L	130	20	0	130	20	0
SWSIM	W	*	PERYLENE-D12		UG/L	130	20	0	130	20	0
SWSIM	W	*	PHENANTHRENE	0.02	UG/L						
SWSIM	W	*	PHENANTHRENE-D10		UG/L	130	20	0	130	20	0
SWSIM	W	*	PYRENE	0.02	UG/L						

APPENDIX B.5

EXCEPTION/OUTLIER REPORTS BASED ON QUALITY CONTROL (QC) CRITERIA CHECKS

B.5 EXCEPTION/OUTLIER REPORTS BASED ON QUALITY CONTROL (QC) CRITERIA CHECKS

The final section of the evaluation package deliverables comprises summaries of the QC criteria checks. Each TDMS evaluation phase is summarized in an individual report and lists only the criteria outliers (those results that do not meet the criteria established with the e-SAP). In addition, a degree of completeness report of each QC parameter can be generated. See Exhibit B.5-1.

EXHIBIT B.5-1 EXCEPTION/OUTLIER REPORTS BASED ON QUALITY CONTROL (QC) CRITERIA CHECKS

HOLDING TIME CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Field Batch	Lab Sample	Analysis Method	Sample Type	Dilut. Code	Field Sample ID	Date Coll.	Date Recv.	Prep. Date	Date Anal.	Holding Time Exception Description

METHOD BLANK COMPLETENESS SUMMARY
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW6010

Prep. Batch	Lab Sample ID	CAPTION	Result Flag	Result	SAP Det. Limit	Result Units	Matrix
94L1166	-MB1	ZINC, TOTAL		95.4	20	UG/L	Water

Analysis Method: SW8240

Prep. Batch	Lab Sample ID	CAPTION	Result Flag	Result	SAP Det. Limit	Result Units	Matrix
94LVB130	-MB1	ACETONE		20	10	UG/KG	Soil
94LVB130	-MB1	METHYLENE CHLORIDE		7	5	UG/KG	Soil
94LVB130	-MB1	METHYLENE CHLORIDE		11	5	UG/KG	Soil
94LVB130	-MB1	ACETONE		13	10	UG/KG	Soil
94LVB130	-MB1	METHYLENE CHLORIDE		6	5	UG/KG	Soil
94LVB130	-MB1	ACETONE		12	10	UG/KG	Soil
94LVB130	-MB1	METHYLENE CHLORIDE		9.1	5	UG/KG	Soil
94LVB130	-MB1	ACETONE		18	10	UG/KG	Soil
94LVB130	-MB1	METHYLENE CHLORIDE		8	5	UG/KG	Soil

Analysis Method: SW8270

Prep. Batch	Lab Sample ID	CAPTION	Result Flag	Result	SAP Det. Limit	Result Units	Matrix
94LE1481	-MB1	DI-N-BUTYL PHTHALATE		420	330	UG/KG	Soil

METHOD BLANK COMPLETENESS TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	**Total Hits**	**Total Analytes**	**Number In Control**
JENKINS	0	2	2 out of 2
SW6010	0	50	50 out of 50
SW7041	0	4	4 out of 4
SW7060	0	4	4 out of 4
SW7421	0	4	4 out of 4
SW7471	0	4	4 out of 4
SW7740	0	4	4 out of 4
SW7841	0	4	4 out of 4
SW8080	0	56	56 out of 56
SW8240	9	165	156 out of 165
SW8270	1	192	191 out of 192
SW8330	0	10	10 out of 10
SW9010	0	2	2 out of 2
TOTAL			**491 out of 501**
% COMPLETENESS			**98.00%**

For Matrix of Water			
Analysis Method	**Total Hits**	**Total Analytes**	**Number In Control**
SW6010	1	42	41 out of 42
SW7041	0	3	3 out of 3
SW7060	0	3	3 out of 3
SW7421	0	3	3 out of 3
SW7470	0	2	2 out of 2
SW7740	0	3	3 out of 3
SW7841	0	3	3 out of 3
SW8080	0	28	28 out of 28
SW8240	0	33	33 out of 33
SW8270	0	64	64 out of 64
SW8330	0	10	10 out of 10
SW9010	0	2	2 out of 2
TOTAL			**195 out of 196**
% COMPLETENESS			**99.49%**

FIELD BLANK COMPLETENESS SUMMARY
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW6010

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Result	SAP Det. Limit	Units	Matrix
9407L306	-001	FB-0210A	IRON, TOTAL		232	100	UG/L	Water
9407L328	-007	FB-0206B	ZINC, TOTAL		24.3	20	UG/L	Water

Analysis Method: SW8240

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Result	SAP Det. Limit	Units	Matrix
9407L328	-006	FB-0206A	ACETONE	B	39	10	UG/L	Water
9407L328	-006	FB-0206A	METHYLENE CHLORIDE	B	10	5	UG/L	Water
9407L328	-007	FB-0206B	ACETONE	B	40	10	UG/L	Water
9407L328	-007	FB-0206B	METHYLENE CHLORIDE	B	5	5	UG/L	Water

Analysis Method: SW8270

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Result	SAP Det. Limit	Units	Matrix
9407L328	-007	FB-0206B	BIS(2-ETHYLHEXYL) PHTHALATE	B	17	10	UG/L	Water

FIELD BLANK COMPLETENESS TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Water			
Analysis Method	Total Hits	Total Analytes	Number In Control
SW6010	2	84	82 out of 84
SW7041	0	6	6 out of 6
SW7060	0	6	6 out of 6
SW7421	0	6	6 out of 6
SW7470	0	6	6 out of 6
SW7740	0	6	6 out of 6
SW7841	0	6	6 out of 6
SW8080	0	56	56 out of 56
SW8240	4	66	62 out of 66
SW8270	1	128	127 out of 128
SW8330	0	20	20 out of 20
SW9010	0	4	4 out of 4
TOTAL			**387 out of 394**
% COMPLETENESS			**98.22%**

SURROGATE OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW8080

Field Batch	Lab Sample ID	Field Sample ID	Sample Type	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L307	-009	SS-0209A	F	TETRA-CHLORO-M-XYLENE	*	129	118	28	Soil
9407L328	-007	FB-0206B	F	DECACHLOROBIPHENYL	*	21	126	22	Water
94LE1491	-MB1		MB	TETRA-CHLORO-M-XYLENE	*	120	118	28	Soil

Analysis Method: SW8240

Field Batch	Lab Sample ID	Field Sample ID	Sample Type	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L307	-009	SS-0209A	F	TOLUENE-D8	*	118	117	81	Soil
9407L307	-009	SS-0209A	F	TOLUENE-D8	*	121	117	81	Soil
9407L328	-003	SS-0205C	F	1,2-DICHLOROETHANE-D4	*	68	121	70	Soil

Analysis Method: SW8270

Field Batch	Lab Sample ID	Field Sample ID	Sample Type	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L307	-002	SS-0211B	F	2-FLUOROBIPHENYL	*	22	115	30	Soil
9407L307	-002	SS-0211B	F	2-FLUOROPHENOL	*	19	121	25	Soil
9407L307	-002	SS-0211B	F	NITROBENZENE-D5	*	19	120	23	Soil
9407L307	-002	SS-0211B	F	2,4,6-BR3-PHENOL	*	16	122	19	Soil
9407L307	-002	SS-0211B	F	PHENOL-D5	*	18	113	24	Soil

SURROGATE OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	**Total Out**	**Total Analytes**	**Number In Control**
SW8080	2	62	60 out of 62
SW8240	3	99	96 out of 99
SW8270	5	204	199 out of 204
TOTAL			**355 out of 365**
% COMPLETENESS			**97.26%**

For Matrix of Water			
Analysis Method	**Total Out**	**Total Analytes**	**Number In Control**
SW8080	1	10	9 out of 10
SW8240	0	9	9 out of 9
SW8270	0	30	30 out of 30
TOTAL			**48 out of 49**
% COMPLETENESS			**97.96%**

BS/BSD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW7421

Prep. Batch	Lab Sample ID	Caption	Recovery Amount	Result Flag	Blank Spike High	Blank Spike Low	Matrix
94L1165	-LC2	LEAD, LCS	79.7		120	80	Soil

Analysis Method: SW8080

Prep. Batch	Lab Sample ID	Caption	Recovery Amount	Result Flag	Blank Spike High	Blank Spike Low	Matrix
94LE1491	-MB1	ENDRIN	138		121	56	Water
94LE1491	-MB1	4,4'-DDT	128		127	38	Water
94LE1491	-MB1	GAMMA BHC (LINDANE)	125		123	56	Water

Analysis Method: SW8270

Prep. Batch	Lab Sample ID	Caption	Recovery Amount	Result Flag	Blank Spike High	Blank Spike Low	Matrix
94LE1481	-MB1	PENTACHLOROPHENOL	112	*	109	17	Soil
94LE1481	-MB1	2,4-DINITROTOLUENE	95	*	89	28	Soil
94LE1481	-MB1	P-NITROPHENOL	87	*	80	10	Water
94LE1481	-MB1	P-NITROPHENOL	101	*	80	10	Water

Analysis Method: SW8330

Prep. Batch	Lab Sample ID	Caption	Recovery Amount	Result Flag	Blank Spike High	Blank Spike Low	Matrix
94LLC109	-MB1	1,3,5-TRINITROBENZENE	51	*	102	52	Water

BS/BSD OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	Total Out	Total Analytes	Number In Control
SW6010	0	100	100 out of 100
SW7041	0	8	8 out of 8
SW7060	0	8	8 out of 8
SW7421	1	8	7 out of 8
SW7471	0	4	4 out of 4
SW7740	0	8	8 out of 8
SW7841	0	8	8 out of 8
SW8080	0	18	18 out of 18
SW8240	0	5	5 out of 5
SW8270	2	55	53 out of 55
SW8330	0	20	20 out of 20
SW9010	0	4	4 out of 4
TOTAL			**243 out of 246**
% COMPLETENESS			**98.78%**

For Matrix of Water			
Analysis Method	Total Out	Total Analytes	Number In Control
SW6010	0	84	84 out of 84
SW7041	0	6	6 out of 6
SW7060	0	6	6 out of 6
SW7421	0	6	6 out of 6
SW7470	0	2	2 out of 2
SW7740	0	6	6 out of 6
SW7841	0	6	6 out of 6
SW8080	3	12	9 out of 12
SW8270	2	22	20 out of 22
SW8330	1	20	19 out of 20
SW9010	0	4	4 out of 4
TOTAL			**168 out of 174**
% COMPLETENESS			**96.55%**

BS/BSD RPD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW8080

Prep. Batch	Lab Sample ID	Caption	Calc. RPD	SAP RPD	BS Recovery	BS Flag	BSD Recovery	Flag BSD	Matrix
94LE1389	-MB1	ALDRIN	30.00	22	115		85		Water
94LE1389	-MB1	ENDRIN	28.00	21	138		104		Water
94LE1389	-MB1	GAMMA BHC (LINDANE)	17.00	15	125		105		Water

Analysis Method: SW8270

Prep. Batch	Lab Sample ID	Caption	Calc. RPD	SAP RPD	BS Recovery	BS Flag	BSD Recovery	Flag BSD	Matrix
94LE1469	-MB1	PENTACHLOROPHENOL	60.00	47	21		39		Soil

Analysis Method: SW8330

Prep. Batch	Lab Sample ID	Caption	Calc. RPD	SAP RPD	BS Recovery	BS Flag	BSD Recovery	Flag BSD	Matrix
94LE1374	-MB1	TETRYL	58.00	16	44		80		Water
94LE1374	-MB1	1,3,5-TRINITROBENZENE	40.00	20	51	*	77		Water
94LE1374	-MB1	2,6-DINITROTOLUENE	16.00	15	61		72		Water
94LLC109	-MB1	TETRYL	16.00	12	53		45		Soil

BS/BSD RPD OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	**Total Out**	**Total BS/BSD**	**Number In Control**
SW8080	0	6	6 out of 6
SW8270	1	22	21 out of 22
SW8330	1	10	9 out of 10
TOTAL			**36 out of 38**
% COMPLETENESS			**94.74%**

For Matrix of Water			
Analysis Method	**Total Out**	**Total BS/BSD**	**Number In Control**
SW8080	3	6	3 out of 6
SW8270	0	11	11 out of 11
SW8330	3	10	7 out of 10
TOTAL			**21 out of 27**
% COMPLETENESS			**77.78%**

MS/MSD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW6010

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L307	-001	SS-0211A	CADMIUM, TOTAL		73.1	125	75	Soil
9407L307	-001	SS-0211A	ZINC, TOTAL		72.6	125	75	Soil
9407L307	-001	SS-0211A	COPPER, TOTAL		70.7	125	75	Soil
9407L307	-001	SS-0211A	ZINC, TOTAL		73.2	125	75	Soil
9407L328	-001	SS-0205A	COPPER, TOTAL		131.7	125	75	Soil
9407L328	-001	SS-0205A	CADMIUM, TOTAL		69.8	125	75	Soil
9407L329	-001	SS-0204A	NICKEL, TOTAL		74.1	125	75	Soil
9407L329	-001	SS-0204A	SILVER, TOTAL		71.7	125	75	Soil
9407L329	-001	SS-0204A	BARIUM, TOTAL		74.9	125	75	Soil
9407L329	-001	SS-0204A	BERYLLIUM, TOTAL		73.2	125	75	Soil
9407L329	-001	SS-0204A	COBALT, TOTAL		72.4	125	75	Soil
9407L329	-001	SS-0204A	COPPER, TOTAL		73.7	125	75	Soil

Analysis Method: SW7041

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L307	-001	SS-0211A	ANTIMONY, TOTAL		62.4	125	75	Soil
9407L307	-001	SS-0211A	ANTIMONY, TOTAL		66.0	125	75	Soil
9407L328	-001	SS-0205A	ANTIMONY, TOTAL		63.6	125	75	Soil
9407L328	-001	SS-0205A	ANTIMONY, TOTAL		60.0	125	75	Soil
9407L329	-001	SS-0204A	ANTIMONY, TOTAL		73.5	125	75	Soil
9407L329	-001	SS-0204A	ANTIMONY, TOTAL		56.7	125	75	Soil

Analysis Method: SW7060

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L306	-003	SS-0210A	ARSENIC, TOTAL		-12	125	75	Soil
9407L306	-003	SS-0210A	ARSENIC, TOTAL		-9.5	125	75	Soil
9407L307	-001	SS-0211A	ARSENIC, TOTAL		70.7	125	75	Soil
9407L307	-001	SS-0211A	ARSENIC, TOTAL		61.0	125	75	Soil
9407L329	-001	SS-0204A	ARSENIC, TOTAL		69.1	125	75	Soil
9407L329	-001	SS-0204A	ARSENIC, TOTAL		66.7	125	75	Soil

MS/MSD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW7421

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L306	-003	SS-0210A	LEAD, TOTAL		42.9	125	75	Soil
9407L306	-003	SS-0210A	LEAD, TOTAL		61.9	125	75	Soil
9407L307	-001	SS-0211A	LEAD, TOTAL		0.00	125	75	Soil
9407L307	-001	SS-0211A	LEAD, TOTAL		0.00	125	75	Soil
9407L329	-001	SS-0204A	LEAD, TOTAL		23.0	125	75	Soil
9407L329	-001	SS-0204A	LEAD, TOTAL		38.1	125	75	Soil

Analysis Method: SW7740

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L306	-003	SS-0210A	SELENIUM, TOTAL		74.0	125	75	Soil
9407L328	-001	SS-0205A	SELENIUM, TOTAL	NC	0.00	125	75	Soil
9407L329	-001	SS-0204A	SELENIUM, TOTAL		0.00	125	75	Soil
9407L329	-001	SS-0204A	SELENIUM, TOTAL		0.00	125	75	Soil

Analysis Method: SW7841

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L306	-003	SS-0210A	THALLIUM, TOTAL		71.2	125	75	Soil
9407L307	-001	SS-0211A	THALLIUM, TOTAL		57.7	125	75	Soil
9407L307	-001	SS-0211A	THALLIUM, TOTAL		36.5	125	75	Soil

Analysis Method: SW8270

Field Batch	Lab Sample ID	Field Sample ID	Caption	Result Flag	Recovery Amount	QC Spike High	QC Spike Low	Matrix
9407L328	-001	SS-0205A	2,4-DINITROTOLUENE	*	99	89	28	Soil
9407L328	-001	SS-0205A	2,4-DINITROTOLUENE	*	91	89	28	Soil

MS/MSD OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	**Total Out of Control**	**Total Analytes**	**Number In Control**
SW6010	12	76	64 out of 76
SW7041	6	8	2 out of 8
SW7060	6	8	2 out of 8
SW7421	6	8	2 out of 8
SW7471	0	4	4 out of 4
SW7740	4	8	4 out of 8
SW7841	3	8	5 out of 8
SW8080	0	12	12 out of 12
SW8240	0	10	10 out of 10
SW8270	2	22	20 out of 22
SW9010	0	2	2 out of 2
TOTAL			**127 out of 166**
% COMPLETENESS			**76.51%**

MS/MSD RPD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW6010

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	MS Recovery	MSD Recovery	Matrix
9407L306	-003	SS-0210A	MANGANESE, TOTAL	25.99	20	111.	85.7	Soil
9407L307	-001	SS-0211A	COPPER, TOTAL	28.92	20	70.7	94.6	Soil
9407L329	-001	SS-0204A	MANGANESE, TOTAL	20.80	20	75.8	93.4	Soil
9407L329	-001	SS-0204A	NICKEL, TOTAL	21.23	20	74.1	91.7	Soil
9407L329	-001	SS-0204A	SILVER, TOTAL	23.29	20	71.7	90.6	Soil
9407L329	-001	SS-0204A	BARIUM, TOTAL	23.24	20	74.9	94.6	Soil
9407L329	-001	SS-0204A	BERYLLIUM, TOTAL	24.88	20	73.2	94	Soil
9407L329	-001	SS-0204A	CADMIUM, TOTAL	27.92	20	75.5	100	Soil
9407L329	-001	SS-0204A	COBALT, TOTAL	23.31	20	72.4	91.5	Soil
9407L329	-001	SS-0204A	COPPER, TOTAL	21.44	20	73.7	91.4	Soil
9407L329	-001	SS-0204A	VANADIUM, TOTAL	22.97	20	79.4	100	Soil

Analysis Method: SW7041

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	MS Recovery	MSD Recovery	Matrix
9407L329	-001	SS-0204A	ANTIMONY, TOTAL	25.81	20	56.7	73.5	Soil

Analysis Method: SW7060

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	MS Recovery	MSD Recovery	Matrix
9407L306	-003	SS-0210A	ARSENIC, TOTAL	NC	20	-9.5	-12	Soil

Analysis Method: SW7421

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	MS Recovery	MSD Recovery	Matrix
9407L306	-003	SS-0210A	LEAD, TOTAL	36.26	20	61.9	42.9	Soil
9407L307	-001	SS-0211A	LEAD, TOTAL	NC	20	0	0	Soil
9407L329	-001	SS-0204A	LEAD, TOTAL	49.43	20	38.1	23	Soil

MS/MSD RPD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW7740

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	MS Recovery	MSD Recovery	Matrix
9407L328	-001	SS-0205A	SELENIUM, TOTAL	200.00	20	87.3	0	Soil
9407L329	-001	SS-0204A	SELENIUM, TOTAL	NC	20	0	0	Soil

Analysis Method: SW7841

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	MS Recovery	MSD Recovery	Matrix
9407L306	-003	SS-0210A	THALLIUM, TOTAL	27.81	20	94.2	71.2	Soil
9407L307	-001	SS-0211A	THALLIUM, TOTAL	45.01	20	36.5	57.7	Soil

MS/MSD RPD OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	Total Out	Total MS/MSD	Number In Control
SW6010	11	38	27 out of 38
SW7041	1	4	3 out of 4
SW7060	1	4	3 out of 4
SW7421	3	4	1 out of 4
SW7471	0	2	2 out of 2
SW7740	2	4	2 out of 4
SW7841	2	4	2 out of 4
SW8080	0	6	6 out of 6
SW8240	0	5	5 out of 5
SW8270	0	11	11 out of 11
SW9010	0	1	1 out of 1
TOTAL			**63 out of 83**
% COMPLETENESS			**75.90%**

LAB DUPLICATE RPD OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	Total Out	Total LD	Number In Control
E160.3	0	4	4 out of 4
SW6010	0	50	50 out of 50
SW7041	0	4	4 out of 4
SW7060	0	4	4 out of 4
SW7421	0	4	4 out of 4
SW7471	0	2	2 out of 2
SW7740	0	4	4 out of 4
SW7841	0	4	4 out of 4
SW9010	0	1	1 out of 1
SW9045	0	3	3 out of 3
TOTAL			80 out of 80
% COMPLETENESS			100.00%

LAB DUPLICATE RPD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Field Batch	Lab Sample ID	Field Sample ID	Caption	Calc. RPD	SAP RPD	Field Result		Lab Dup.		Matrix
						Value	Flag	Value	Flag	

LCS RPD OUT OF CRITERIA CHECK
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Prep. Batch	Lab Sample IDs	Recovery Amounts	Result Flags	Caption	Calc. RPD	SAP RPD	Matrix

LCS RPD OUT OF CRITERIA TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	Total Out	LCS Total	Number In Control
SW6010	0	50	50 out of 50
SW7041	0	4	4 out of 4
SW7060	0	4	4 out of 4
SW7421	0	4	4 out of 4
SW7471	0	2	2 out of 2
SW7740	0	4	4 out of 4
SW7841	0	4	4 out of 4
SW9010	0	2	2 out of 2
TOTAL			**74 out of 74**
% COMPLETENESS			**100.00%**

For Matrix of Water			
Analysis Method	Total Out	LCS Total	Number In Control
SW6010	0	42	42 out of 42
SW7041	0	3	3 out of 3
SW7060	0	3	3 out of 3
SW7421	0	3	3 out of 3
SW7470	0	1	1 out of 1
SW7740	0	3	3 out of 3
SW7841	0	3	3 out of 3
SW9010	0	2	2 out of 2
TOTAL			**60 out of 60**
% COMPLETENESS			**100.00%**

FIELD DUPLICATE RPD EXCEPTIONS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

Analysis Method: SW6010

	Field Batch	Lab Sample ID	Field Sample ID	Caption	Result	Result Flag	Calc. RPD	SAP RPD	Matrix
Field Dup.	9407L328	-011	SS-0212A	BARIUM, TOTAL	19.6		146.15	50	Soil
Field Res.	9407L328	-004	SS-0206A		126				
Field Dup.	9407L328	-011	SS-0212A	CADMIUM, TOTAL	.2	U	NC	50	Soil
Field Res.	9407L328	-004	SS-0206A		.27				

Analysis Method: SW8080

	Field Batch	Lab Sample ID	Field Sample ID	Caption	Result	Result Flag	Calc. RPD	SAP RPD	Matrix
Field Dup.	9407L328	-011	SS-0212A	4,4'-DDT	8.5		NC	50	Soil
Field Res.	9407L328	-004	SS-0206A		8.3	U			

Analysis Method: SW8240

	Field Batch	Lab Sample ID	Field Sample ID	Caption	Result	Result Flag	Calc. RPD	SAP RPD	Matrix
Field Dup.	9407L328	-011	SS-0212A	ACETONE	5	JB	NC	50	Soil
Field Res.	9407L328	-004	SS-0206A		10	U			
Field Dup.	9407L328	-011	SS-0212A	METHYLENE CHLORIDE	20	B	NC	50	Soil
Field Res.	9407L328	-004	SS-0206A		5	U			

Analysis Method: SW8270

	Field Batch	Lab Sample ID	Field Sample ID	Caption	Result	Result Flag	Calc. RPD	SAP RPD	Matrix
Field Dup.	9407L328	-011	SS-0212A	INDENO(1,2,3-C,D)PYRENE	350	U	NC	50	Soil
Field Res.	9407L328	-004	SS-0206A		44	J			
Field Dup.	9407L328	-011	SS-0212A	BENZO(GHI)PERYLENE	350	U	NC	50	Soil
Field Res.	9407L328	-004	SS-0206A		49	J			
Field Dup.	9407L328	-011	SS-0212A	DI-N-BUTYL PHTHALATE	220	JB	68.66	50	Soil
Field Res.	9407L328	-004	SS-0206A		450	B			

FIELD DUPLICATE RPD EXCEPTION TOTALS
TDMS DEMO SYSTEM - AREA 02
SAMPLE SAP
SURFACE SOIL

For Matrix of Soil			
Analysis Method	Total Out	Total FD	Number In Control
E160.3	0	1	1 out of 1
SW6010	2	8	6 out of 8
SW7041	0	1	1 out of 1
SW7060	0	1	1 out of 1
SW7421	0	1	1 out of 1
SW7471	0	1	1 out of 1
SW7740	0	1	1 out of 1
SW7841	0	1	1 out of 1
SW8080	1	28	27 out of 28
SW8240	2	33	31 out of 33
SW8270	3	64	61 out of 64
SW8330	0	10	10 out of 10
SW9045	0	1	1 out of 1
TOTAL			**143 out of 151**
% COMPLETENESS			**94.70%**

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APPENDIX C

QAPP ADDENDUM FOR TISSUE ANALYSES

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C. QAPP ADDENDUM FOR TISSUE ANALYSES

C.1 INTRODUCTION

Appendix C consists of text and table addendums as associated with the sections referenced in the QAPP. Appendix C addresses only those issues related to tissue sample analysis, sampling of which was performed at various OU locations as outlined in the specific Work Plan. All tissue samples are being managed by the U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center. Primary analyses will be performed by the Geochemical and Environmental Research Group, College of Geosciences, Texas A&M University. The laboratory SOPs relevant to the tissue analyses are referenced throughout the Appendix C addendums and are supplied in Appendix D. The general procedures established in the QAPP are to be followed, except for those analytical protocols specifically referenced in Appendices C and D.

C.2 PROJECT DATA QUALITY OBJECTIVES

The overall site data quality objective is to collect a sufficient quality and quantity of data based on the OU such that scientifically based decisions can be made in order to:

- Determine the extent of contamination and migration of the primary compounds of concern, Aroclor-1254 and Aroclor-1260, for characterization/removal/risk assessment activities by content in various fish, avian, and mammal specimens.
- Determine extent of PCB weathering at specific OU locations with the examination of PCB congener results.
- Determine the absence or presence of other hazardous substances in addition to the contaminants of concern by OC pesticide, and dioxin/furan analyses.
- Determine the extent of hazardous substance migration off-site by waterway or other mode of redistribution by content in various fish, avian, and mammal specimens.
- Make effective use of modeling tools to predict long-term trends and potential risks associated with location-specific PCB redistribution/disposition/accumulation in soil and sediment media as well as any inter-related biological tissues.
- Use as support in litigation against the Potentially Responsible Parties (PRP).

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9810 (GC-ECD)	PCB Congeners	Field Sampling	Field Duplicate	As supplied	RPD < 50%	NA
		Laboratory	Matrix Spike and Matrix Spike Duplicate	When required	Per Table C-2	1. As per SOP-9810, Section 3.3
			Interspersed Calibration	Minimum of 4 concentrations	Calibration curve R≥0.995	1. Evaluate 2. Recalibrate when QC criterion is not met
			Retention Time Window	Each calibration standard	±4 sec for each analyte retention calibration standard	1. Evaluate 2. Reanalyze all samples analyzed since the last retention time check
			Surrogate	Every sample	Per Table C-3	As per SOP-9810, Section 3.3
			Method Blank	One per 20 or fewer samples	<3 x MDL or analytes >10 x blank	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary
			Ongoing Precision and Recovery (OPR)/Standard Reference Materials	When required	See Table C-2	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary
			Performance Evaluation Sample	As supplied	Per Laboratory Data Validation Functional Guidelines for Environmental Analyses (99-0100)	1. Evaluate PE score report 2. Evaluate batch 3. Recommend action

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9810 (GC-ECD)	PCBs and Organo-chlorine Pesticides	Field Sampling	Field Duplicate	As supplied	RPD <50%	As per SOP-9810, Section 3.3.4.2
		Laboratory	Matrix Spike and Matrix Spike Duplicate	When required	Per Table C-2	As per SOP-9810, Section 3.3.3.3
			Interspersed Calibration	Four-point calibration for all analytes	Calibration R≥0.995	1. Evaluate 2. Recalibrate when QC criterion is not met
			Degradation Check Solution, (DDT and Dieldrin)	Prior to initial calibration	Degradation of the labile chlorinated compounds in the injection port ≤15%	1. Stop analytical run 2. Clean injection port
			Retention Time Window	Each calibration standard	±4 sec for each analyte retention calibration standard	1. Evaluate 2. Reanalyze all samples analyzed since the last retention time check
			Surrogate	Every sample	Per Table C-3	As per SOP-9810, Section 3.4.5.2
			Method Blank	One per each QC batch of 20 or fewer samples	<3x MDL, not more than 2 target compounds with concentrations >3x MDL or analytes > 10 x blank	As per SOP-9810, Section 3.3.1
			Laboratory Blank Spike (LBS) and Laboratory Blank Spike Duplicate (LBSD)	When required	80% of the target compounds should have between 40% and 130% recoveries. If the LBSD has been included, the recoveries from LBS and LBSD should agree within an RPD of ≤30%	As per SOP-9810, Section 3.3

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9810 (GC-ECD) (Cont.)	PCBs and Organo-chlorine Pesticides	Laboratory (cont.)	Laboratory Duplicate	When required	RPD≤30%	1. Recalculate or reanalyze the duplicate and the original sample 2. Recalibrate or re-extract the analytical QC batch
			Performance Evaluation Sample/ Standard Reference Materials	As supplied	Per Laboratory Data Validation Functional Guidelines for Evaluating Environmental Analyses (99-0100)	1. Evaluate PE score report 2. Evaluate batch 3. Recommend action
SOP-9722 (HRGC-HRMS)	Polychlorinated dibenzo-p-dioxins/ polychlorinated dibenzofurans (PCDD/PCDF) Compounds	Field Sampling	Field Duplicate	As supplied	RPD≤50%	1. Recalculate and/or reanalyze the duplicate and/or original sample 2. Instrument maintenance and/or recalibration
		Laboratory	Matrix Spike and Matrix Spike Duplicate	When required	Per Table C-2.1	1. Recalculate and/or re-analyze the MS and MSD 2. Instrument maintenance and/or recalibration
			Initial and Continuing Calibrations	As per SOP-9722 Section 3.3	As per SOP-9722, Section 3.3	1. Evaluate 2. Recalibrate when QC criterion is not met
			Identification/ Retention Times/ Ion Abundance Ratios/Signal to Noise/Interferences	As per SOP-9722 Section 3.2	As per SOP-9722, Section 3.2 S/N exceeds 10:1 for all ions Ion abundance ratio ±15% Interference S/N ≤3	1. Evaluate 2. Rerun as necessary 3. Criteria must be met before samples are run

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9722 (HRGC-HRMS) (Cont.)	Polychlorinated dibenzo-p-dioxins/ polychlorinated dibenzofurans (PCDD/PCDF) Compounds	Laboratory (Cont.)	Instrument Performance Check	As per SOP-9722 Section 3.1	As per SOP-9722, Section 3.1	1. Evaluate 2. Retune instrument 3. Verify
			Laboratory Duplicate	When required	RPD ≤30%	1. Recalculate or reanalyze the duplicate and/or the original sample 2. Instrument maintenance and/or recalibration
			Standard Reference Material (SRM)	When required	70%-130% of the certified or consensus value of the analyte, with no more than 1/3 of the analytes exceeding this criteria	1. Recalculate or reanalyze the SRM 2. Instrument maintenance and/or recalibration
			Labeled Compound Recovery	All samples	Recoveries within 40%-135%	1. Stop analytical run 2. Clean injection port 3. Rerun all affected samples
			Initial Precision and Recovery (IPR)	Prior to any analysis by this method	See SOP-9722, Table 7	1. Evaluate 2. Repeat until criteria are met
			Ongoing Precision and Recovery (OPR)	One per 20 or fewer samples	See Table C-2	1. Rerun 2. Evaluate batch (Narrate) 3. If criteria are not met, reanalyze as necessary
			Method Blank	One per 20 or fewer samples	<½ PQL	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9722 (HRGC-HRMS) (Cont.)	Polychlorinated dibenzo-p-dioxins/ polychlorinated dibenzofurans (PCDD/PCDF) Compounds	Laboratory (Cont.)	Laboratory Blank Spike (LBS)	As required	70%-130% recoveries of the spiked amount	1. Recalculate and/or reanalyze the LBS 2. Instrument maintenance and/or recalibaration and re-extraction of the analytical batch
			Performance Evaluation Sample	As supplied	Per Laboratory Data Validation Functional Guidelines for Evaluating Environmental Analyses (99-0100)	1. Evaluate PE score report 2. Evaluate batch 3. Recommend action

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9733 (GC/MS-SIM)	Polynuclear Aromatic Hydrocarbons	Field Sampling	Field Duplicate	As supplied	RPD ≤50%	3. Recalculate and/or reanalyze the duplicate and/or original sample 4. Instrument maintenance and/or recalibration
		Laboratory	Matrix Spike and Matrix Spike Duplicate	When required	%R = 40-120% RPD ≤25%	3. Recalculate and/or re-analyze the MS and MSD 4. Instrument maintenance and/or recalibration
			Initial and Continuing Calibrations	As per SOP-9733 Section 3.4	As per SOP-9733, Section 3.4	1. Evaluate 2. Recalibrate when QC criterion is not met
			Identification/ Retention Times/ Ion Abundance	As per SOP-9733 Section 3.2	As per SOP-9733, Section 3.2	1. Evaluate 2. Rerun as necessary 3. Criteria must be met before samples are run
			Instrument Performance Check	As per SOP-9733 Section 3.1	As per SOP-9733, Section 3.1	1. Evaluate 2. Retune instrument 3. Verify
			Laboratory Duplicate	One per 20 or fewer samples	RPD ≤ 25%	1. Recalculate or reanalyze the duplicate and/or the original sample 2. Instrument maintenance and/or recalibration
			Internal Standard Solution	All samples	See SOP-9733, Section 5.2	1. Evaluate 2. Re-extract as necessary
			Standard Check Solution	Every Analytical Batch	Average %D ≤25% of known for all compounds >LCL, and no single %D >35%	1. Recalculate or reanalyze the Standard Check 2. Instrument maintenance and/or recalibration

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9733 (GC/MS-SIM) (cont.)	Polynuclear Aromatic Hydrocarbons (cont.)	Laboratory (cont.)	Standard Reference Material (SRM)	When required	See SOP-9733 Section 3.5.5	1. Recalculate or reanalyze the SRM 2. Instrument maintenance and/or recalibration
			Surrogate (d_{12}-perylene)	All samples	%R = 40-120%	1. Evaluate batch (Narrate) 2. If criteria are not met, reanalyze as necessary
			Method Blank	One per 20 or fewer samples	<½ PQL	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary
			Laboratory Blank Spike/Spike Duplicate	One per 20 or fewer samples	%R = 40-120% RPD ≤25%	1. Recalculate and/or reanalyze BS/BSD and samples. 2. Instrument maintenance or recalibration.
SOP-0008 (GC-FID)	Aliphatic Hydrocarbons	Field Sampling	Field Duplicate	As supplied	RPD ≤50%	1. Recalculate and/or reanalyze the duplicate and/or original sample 2. Instrument maintenance and/or recalibration
		Laboratory	Matrix Spike and Matrix Spike Duplicate	When required	%R = 40-120% RPD ≤25%	5. Recalculate and/or re-analyze the MS and MSD 6. Instrument maintenance and/or recalibration
			Initial and Continuing Calibrations	As per SOP-0008 Section 3.2.2	As per SOP-0008, Section 3.2.2	1. Evaluate 2. Recalibrate when QC criterion is not met
			Internal Standard Solution	As per SOP-0008 Section 5.4	As per SOP-0008, Section 5.4	1. Evaluate 2. Re-extract as necessary

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-0008 (GC-FID) (cont.)	Aliphatic Hydrocarbons (cont.)	Laboratory (cont.)	Laboratory Duplicate	One per 20 or fewer samples	RPD ≤25%	1. Recalculate or reanalyze the duplicate and/or the original sample 2. Instrument maintenance and/or recalibration
			Standard Reference Material (SRM)	When required	See SOP-0008 Section 3.0	1. Recalculate or reanalyze the SRM 2. Instrument maintenance and/or recalibration
			Standard Check Solution	Every Analytical Batch	Average %D ≤25% of known for all compounds > LCL, and no single %D >35%	1. Recalculate or reanalyze the Standard Check 2. Instrument maintenance and/or recalibration
			Surrogate (deuterated n-C_{12}, C_{20}, C_{24}, & C_{30})	All samples	%R = 40-120%	1. Evaluate batch (Narrate) 2. If criteria are not met, reanalyze as necessary
			Method Blank	One per 20 or fewer samples	<½ PQL	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary
			Laboratory Blank Spike/Spike Duplicate	One per 20 or fewer samples	%R = 40-120% RPD ≤ 25%	1. Recalculate and/or reanalyze BS/BSD and samples 2. Instrument maintenance or recalibration

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-0101 HPLC	Plant Pigments	Field Sampling	Field Duplicate	As supplied	RPD <50%	NA
		Laboratory	Lab Duplicate	When required	RPD ≤25%	1. As per SOP-0101, Section 3.3.2
			Initial Calibration	Minimum of 2 concentrations	Calibration curve R≥0.995	1. Evaluate 2. Recalibrate when QC criterion is not met
			Calibration Check Standard	Every Analytical Batch	Average %D for all analytes within ±25%	1. Evaluate 2. Recalibrate when QC criterion is not met
			Retention Time Window	Each calibration standard	±0.2 minutes for each analyte retention calibration standard	1. Evaluate 2. Reanalyze all samples analyzed since the last retention time check
			Method Blank	One per 20 or fewer samples	<3 x MDL or analytes >10 x blank	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary
SOP-9728 (HRGC-HRMS)	PCB Congeners	Field Sampling	Field Duplicate	As supplied	RPD ≤50%	1. Recalculate and/or reanalyze the duplicate and/or original sample 2. Instrument maintenance and/or recalibration
		Laboratory	Matrix Spike and Matrix Spike Duplicate	When required	%R = 70-130% RPD ≤20%	1. Recalculate and/or re-analyze the MS and MSD 2. Instrument maintenance and/or recalibration
			Initial and Continuing Calibrations	As per SOP-9728 Section 3.3	As per SOP-9728, Section 3.3	1. Evaluate 2. Recalibrate when QC criterion is not met

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9728 (HRGC-HRMS) (cont.)	PCB Congeners (cont.)	Laboratory (cont.)	Identification/ Retention Times/ Ion Abundance Ratios/Signal to Noise/ Interferences	As per SOP-9728 Section 3.2	As per SOP-9728, Section 3.2	1. Evaluate 2. Rerun as necessary 3. Criteria must be met before samples are run
			Instrument Performance Check	As per SOP-9728 Section 5.1	As per SOP-9728, Section 5.1	1. Evaluate 2. Retune instrument 3. Verify
			Laboratory Duplicate	When required	RPD≤30%	1. Recalculate or reanalyze the duplicate and/or the original sample 2. Instrument maintenance and/or recalibration
			Standard Reference Material (SRM)	When required	See SOP-9728	1. Recalculate or reanalyze the SRM 2. Instrument maintenance and/or recalibration
			Labeled Compound Recovery	All samples	Recoveries within 40%-135%	1. Stop analytical run 2. Clean injection port 3. Rerun all affected samples
			Method Blank	One per 20 or fewer samples	<½ PQL	1. Rerun 2. Evaluate batch (Narrate) 3. Re-extract as necessary
			Laboratory Blank Spike (LBS)	As required	70%-130% recoveries of the spiked amount	1. Recalculate and/or reanalyze the LBS 2. Instrument maintenance and/or recalibration and re-extraction of the analytical batch

Table C-1

Analytical Measurements Quality Control Requirements (Table 4-2 Addendum) (Continued)

Analysis Method (SOP Reference)	Parameter	Field/Lab Req.	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SOP-9728 (HRGC-HRMS) (cont.)	PCB Congeners (cont.)	Laboratory (cont.)	Performance Evaluation Sample	As supplied	Per Laboratory Data Validation Functional Guidelines for Evaluating Environmental Analyses (99-0100)	1. Evaluate PE score report 2. Evaluate batch 3. Recommend action

Table C-2

Spike Accuracy and Precision Limits (Table 4-3 Addendum)

Fraction	Spike Compound	Tissue (MS/MSD)	
		% Recovery	RPD
Chlorinated Pesticides	1,2,4,5-tetrachlorobenzene	40-130	30
	1,2,3,4-tetrachlorobenzene	40-130	30
	pentachlorobenzene	40-130	30
	hexachlorobenzene	40-130	30
	pentachloroanisole	40-130	30
	alpha-HCH	40-130	30
	beta-HCH	40-130	30
	delta-HCH	40-130	30
	gamma-HCH (lindane)	40-130	30
	heptachlor	40-130	30
	heptachlor epoxide	40-130	30
	alpha-chlordane	40-130	30
	gamma-chlordane	40-130	30
	oxychlordane	40-130	30
	cis-nonachlor	40-130	30
	trans-nonachlor	40-130	30
	2,4'-DDE	40-130	30
	4,4'-DDE	40-130	30
	2,4'-DDD	40-130	30
	4,4'-DDD	40-130	30
	2,4'-DDT	40-130	30
	4,4'-DDT	40-130	30
	aldrin	40-130	30
	dieldrin	40-130	30
	endosulfan II	40-130	30
	endrin	40-130	30
	mirex	40-130	30
PCB Congeners	PCB-8*/5	40-130	30
	PCB-18*/17	40-130	30
	PCB-28*	40-130	30
	PCB-29*	40-130	30
	PCB-44*	40-130	30
	PCB-52*	40-130	30

Table C-2

Spike Accuracy and Precision Limits
(Table 4-3 Addendum Continued)

Fraction	Spike Compound	Tissue (MS/MSD)	
		% Recovery	RPD
PCB Congeners (continued)	PCB-66*	40-130	30
	PCB-87*/115	40-130	30
	PCB-101*/90	40-130	30
	PCB-105*	40-130	30
	PCB-110*/77	40-130	30
	PCB-118*	40-130	30
	PCB-128*	40-130	30
	PCB-138*/160	40-130	30
	PCB-153*/132	40-130	30
	PCB-170*/190	40-130	30
	PCB-180*	40-130	30
	PCB-187*	40-130	30
	PCB-195*/208	40-130	30
	PCB-201*/157/173	40-130	30
	PCB-206*	40-130	30
	PCB-209*	40-130	30

*Target analytes included in the calibration mixtures. Indicates co-eluting congeners on a DB-5 column. The order of co-eluting congeners is given according to their relative contribution in common Aroclor mixtures.

Table C-2.1

Spike Accuracy and Precision Limits—PCDDs/PCDFs (Table 4-3 Addendum - Continued)

Fraction	Spike Compound	Tissue (MS/MSD)		Tissue (OPR)
		%Recovery	RPD	Concentration pg/µL
PCDDs/PCDFs	2,3,7,8-TCDD	40-130	30	6.7-15.8
	1,2,3,7,8-PeCDD	40-130	30	35-71
	1,2,3,4,7,8-HxCDD	40-130	30	35-82
	1,2,3,6,7,8-HxCDD	40-130	30	38-67
	1,2,3,7,.8,9-HxCDD	40-130	30	32-81
	1,2,3,4,6,7,8-HpCDD	40-130	30	35-70
	OCDD	40-130	30	78-144
	2,3,7,8-TCDF	40-130	30	75-158
	1,2,3,7,8-PeCDF	40-130	30	40-67
	2,3,4,7,8-HxCDF	40-130	30	34-80
	1,2,3,4,7,8-HxCDF	40-130	30	36-67
	1,2,3,6,7,8-HxCDF	40-130	30	42-65
	2,3,4,6,7,8-HxCDF	40-130	30	35-78
	1,2,3,7,8,9-HxCDF	40-130	30	39-65
	1,2,3,4,6,7,8-HpCDF	40-130	30	41-61
	1,2,3,4,7,8,9-HpCDF	40-130	30	39-69
	OCDF	40-130	30	63-170

Table C-3

Surrogate Spike and Labeled Compound Spike Solution Recovery Limits (Table 4-4 Addendum)

Fraction	Surrogate Compound	Tissue % Recovery
PCB Congeners & Pesticides	PCB-103	40-120
	DBOFB	40-120
Dioxin/Furan	$^{13}C_{12}$-2,3,7,8-TCDD	25-164
	$^{13}C_{12}$-2,3,7,8-TCDF	24-169
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	25-181
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	24-185
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	21-178
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	32-141
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	28-130
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	26-152
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	26-123
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	29-147
	$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	28-136
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	23-140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	28-143
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	26-138
	$^{13}C_{12}$-OCDD	17-157

Table C-4

Valid Value List for Analysis Method (Table 5-4 Addendum)

Analytical Code	Description	Matrix
EPA1668TI	PCB Congeners (GC-ECD)	Tissue
SW8081TI	Organochlorine Pesticides (GC-ECD)	Tissue
SW8082TI	PCBs (GC-ECD)	Tissue
SW8290TI	PCDD/PCDF - High Res (HRGC-HRMS)	Tissue

Table C-5

Required Containers, Preservation Techniques, and Holding Times for Tissue Samples (Table 6-1 Addendum)

Parameter	Analytical Reference (SOP Reference)	Sample Container	Sample Volume	Preservation	Maximum Holding Time
PCB Congeners	SOP-9810	Aluminum foil, metal, glass	Approximately 200 g of sample[a] for all analyses	-20 °C	2 years[b, c]
Organochlorine Pesticides/PCBs	SOP-9810				
Dioxins/Furans (PCDDs/PCDFs)	SOP-9722				
Polynuclear Aromatic Hydrocarbons	SOP-9733				
Aliphatic Hydrocarbons	SOP-0008				
Pigments	SOP-0101	Amber glass Teflon-lined cap	1 Liter	-20ºC	2 years
PCB Congeners (HRMS)	SOP-9728	Amber glass Teflon-lined cap	1 Liter	-20ºC	2 years [c]

[a] Matrices consist of whole fish, fish filets, amphibians (frogs), turtles, water fowl, small mammals, and/or earthworms.

[b] Archives of Environmental Contamination and Toxicology. 1990. 19:748-781 (fish tissue analyzed over approximately a 2-year period with no changes in concentrations).

[c] Matrices consist of soils and/or sediments.

Table C-6

Appendix IX Pesticide Compound Reporting Limits (SOP-9810) (Table 7-6 Addendum)

Analytical Parameter	CAS Number	Tissue Reporting Limit (ppb)**
1,2,3,4-tetrachlorobenzene*	95-94-3	10
1,2,4,5-tetrachlorobenzene*	634-66-2	10
2,4'-DDE*	3424-82-6	10
2,4'-DDD*	53-19-0	10
2,4'-DDT*	789-02-6	10
4,4'-DDD*	72-54-8	10
4,4'-DDE*	72-55-9	10
4,4'-DDT*	50-29-3	10
Aldrin*	309-00-2	10
alpha-BHC*	319-84-6	10
alpha-chlordane*	56534-02-2	10
beta-BHC*	319-85-7	10
Chlorpyrifos*	2921-88-2	10
cis-nonachlor*	129303-29-3	10
delta-BHC	319-86-8	10
Dieldrin*	60-57-1	10
Endosulfan I	959-98-8	10
Endosulfan II*	33213-65-9	10
Endrin	72-20-8	10
gamma-BHC* (Lindane)	58-89-9	10
gamma-chlordane*	5566-34-7	10
Heptachlor	76-44-8	10
Heptachlor epoxide*	1024-57-3	10
Hexachlorobenzene*	118-74-1	10
Mirex*	2385-85-5	10
Oxychlordane*	27304-13-8	10
Pentachloroanisole*	1825-21-4	10
Pentachlorobenzene*	608-93-5	10
trans-nonachlor	39765-80-5	10
Toxaphene	8001-35-2	10

*Target analytes included in the calibration mixtures.

** Tissue reporting limits are based on a 10-gram initial sample weight.

Table C-7

PCB Compound Reporting Limits (SOP-9810)
(Table 7-7 Addendum)

Analytical Parameter	CAS Number	Tissue Reporting Limit (ppb)*
PCB - Aroclor 1242	53469-21-9	50
PCB - Aroclor 1248	12672-29-6	50
PCB - Aroclor 1254	11097-69-1	50
PCB – Aroclor 1260	11096-82-5	50
Total PCBs	1336-36-3	50

* Tissue reporting limits are based on a 10-gram initial sample weight.

Table C-8

PCB Congener/Homologue Reporting Limits (SOP-9304)
(Table 7-8 Addendum)

CAS Number	Tissue Reporting Limits (ppb)**
PCB-1	0.01
PCB-7/9	0.01
PCB-8*/5	0.01
PCB-15	0.01
PCB-16/32	0.01
PCB-18*/17	0.01
PCB-22/51	0.01
PCB-24/27	0.01
PCB-25	0.01
PCB-26	0.01
PCB-28*	0.01
PCB-29*	0.01
PCB-30	0.01
PCB-31	0.01
PCB-33/20	0.01
PCB-39	0.01
PCB-40	0.01
PCB-41/64	0.01
PCB-42/59/37	0.01
PCB-44*	0.01
PCB-45	0.01
PCB-46	0.01
PCB-47/75	0.01
PCB-48	0.01
PCB-49	0.01
PCB-52*	0.01
PCB-53	0.01

Table C-8

PCB Congener/Homologue Reporting Limits (SOP-9304)
(Table 7-8 Addendum Continued)

CAS Number	Tissue Reporting Limits (ppb)**
PCB-60/56	0.01
PCB-63	0.01
PCB-66*	0.01
PCB-67	0.01
PCB-69	0.01
PCB-70	0.01
PCB-72	0.01
PCB-74/61	0.01
PCB-77*	0.01
PCB-81*	0.01
PCB-82	0.01
PCB-83	0.01
PCB-84	0.01
PCB-85	0.01
PCB-87*/115	0.01
PCB-91/55	0.01
PCB-92	0.01
PCB-95/80	0.01
PCB-97	0.01
PCB-99	0.01
PCB-101*/90	0.01
PCB-105*	0.01
PCB-107	0.01
PCB-110*/77	0.01
PCB-114	0.01
PCB-118*	0.01
PCB-119	0.01
PCB-126*	0.01
PCB-128*	0.01

Table C-8

PCB Congener/Homologue Reporting Limits (SOP-9304)
(Table 7-8 Addendum Continued)

CAS Number	Tissue Reporting Limits (ppb)**
PCB-129	0.01
PCB-130	0.01
PCB-135	0.01
PCB-136	0.01
PCB-138*/160	0.01
PCB-141/179	0.01
PCB-146	0.01
PCB-149/123	0.01
PCB-151	0.01
PCB-153*/132	0.01
PCB-156	0.01
PCB-158	0.01
PCB-166	0.01
PCB-167	0.01
PCB-169*	0.01
PCB-170*/190	0.01
PCB-171/202	0.01
PCB-172	0.01
PCB-174	0.01
PCB-175	0.01
PCB-176/137	0.01
PCB-177	0.01
PCB-178	0.01
PCB-180*	0.01
PCB-183	0.01
PCB-185	0.01
PCB-187*	0.01
PCB-189	0.01
PCB-191	0.01

Table C-8

PCB Congener/Homologue Reporting Limits (SOP-9304)
(Table 7-8 Addendum Continued)

CAS Number	Tissue Reporting Limits (ppb)**
PCB-193	0.01
PCB-194	0.01
PCB-195*/208	0.01
PCB-197	0.01
PCB-199	0.01
PCB-200	0.01
PCB-201*/157/173	0.01
PCB-203/196	0.01
PCB-205	0.01
PCB-206*	0.01
PCB-207	0.01
PCB-209	0.01
Total monochlorobiphenyl	1.0
Total dichlorobiphenyl	1.0
Total trichlorobiphenyl	1.0
Total pentachlorobiphenyl	1.0
Total hexachlorobiphenyl	1.0
Total heptachlorobiphenyl	1.0
Total octachlorobiphenyl	1.0
Total nonachlorobiphenyl	1.0

* Target analytes included in the calibration mixtures. Indicates co-eluting congeners on a DB-5 column. The order of co-eluting congeners is given according to their relative contribution in common Aroclor mixtures.
**Tissue reporting limits are based on a 10-gram initial sample weight.

Table C-9

PCDD/PCDF Compound Reporting Limits (SOP-9722) (Table 7-11 Addendum)

Analytical Parameter	CAS Number	Tissue Reporting Limit (ppt)*
2,3,7,8-TCDD	1746-01-6	1
1,2,3,7,8-PeCDD	40321-76-4	5
1,2,3,6,7,8-HxCDD	57653-85-7	5
1,2,3,4,7,8-HxCDD	39227-28-6	5
1,2,3,7,8,9-HxCDD	19408-74-3	5
1,2,3,4,6,7,8-HpCDD	35822-46-9	5
1,2,3,4,6,7,8,9-OCDD	3268-87-9	10
2,3,7,8-TCDF	51207-31-9	1
1,2,3,7,8-PeCDF	57117-41-6	5
2,3,4,7,8-PeCDF	57117-31-4	5
1,2,3,6,7,8-HxCDF	57117-44-9	5
1,2,3,7,8,9-HxCDF	72918-21-9	5
1,2,3,4,7,8-HxCDF	70648-26-9	5
2,3,4,6,7,8-HxCDF	60851-34-5	5
1,2,3,4,6,7,8-HpCDF	67562-39-4	5
1,2,3,4,7,8,9-HpCDF	55673-89-7	5
1,2,3,4,6,7,8,9-OCDF	39001-02-0	10

*Tissue reporting limits are based on a 10-gram initial sample weight.

Table C-10

Aliphatic Hydrocarbon Reporting Limits (SOP-0008)

Analytical Parameter	CAS Number	Tissue Reporting Limit (µg/kg)
N-Pentadecane	629-62-9	10
N-Decane	124-18-5	10
N-Triacontane	638-68-6	10
N-Tetracosane	646-31-1	10
N-Heneicosane	629-94-7	10
N-Heptadecane	629-78-7	10
N-Hexadecane	544-76-3	10
N-Pentacosane	629-99-2	10
N-Tricosane	638-67-5	10
N-Hentriacontane	630-04-6	10
N-Heptacosane	593-49-7	10
N-Nonadecane	629-92-5	10
N-Tridecane	629-50-5	10
Pristane	1921-70-6	10
Phytane	638-36-8	10
N-Nonacosane	630-03-5	10
N-Dotriacontane	544-85-4	10
N-Tritriacontane	630-05-7	10
N-Tetratriacontane	14167-59-0	10
N-Tetradecane	629-59-4	10
N-Dodecane	112-40-3	10
N-Eicosane	112-95-8	10
N-Undecane	1120-21-4	10
N-Octadecane	593-45-3	10
N-Docosane	629-97-0	10
N-Hexacosane	630-01-3	10
N-Octacosane	630-02-4	10

Table C-11

Polynuclear Aromatic Hydrocarbon Reporting Limits (SOP-9733)

Analytical Parameter	CAS Number	Tissue Reporting Limit (µg/kg)
1,6,7-Trimethylnaphthalene	2245-38-7	5
1-Methylnaphthalene	90-12-0	5
1-Methylphenanthrene	832-69-9	5
2,6 Dimethylnaphthalene	581-42-0	5
2-Methylnaphthalene	91-57-6	5
Acenaphthene	83-32-9	5
Acenaphthylene	208-96-8	5
Anthracene	120-12-7	5
Benzo(a)anthracene	56-55-3	5
Benzo(a)pyrene	50-32-8	5
Benzo(b)fluoranthene	205-99-2	5
Benzo(e)pyrene	192-97-2	5
Benzo(g,h,i)perylene	191-24-2	5
Benzo(k)fluoranthene	207-08-9	5
Biphenyl	92-52-4	5
C1-Chrysenes	NA	5
C1-Dibenzothiophenes	NA	5
C1-Fluoranthenes & Pyrenes	NA	5
C1-Fluorenes	NA	5
C1-Naphthalenes	NA	5
C1-Phenanthrenes & Anthracenes	NA	5
C2-Chrysenes	NA	5
C2-Dibenzothiophenes	NA	5
C2-Fluorenes	NA	5
C2-Naphthalenes	NA	5
C2-Phenanthrenes & Anthracenes	NA	5
C3-Chrysenes	NA	5
C3-Dibenzothiophenes	NA	5

Table C-11

Polynuclear Aromatic Hydrocarbon Reporting Limits (SOP-9733) (Continued)

Analytical Parameter	CAS Number	Tissue Reporting Limit (µg/kg)
C3-Fluorenes	NA	5
C3-Naphthalenes	NA	5
C3-Phenanthrenes & Anthracenes	NA	5
C4-Chrysenes	NA	5
C4-Naphthalenes	NA	5
C4-Phenanthrenes & Anthracenes	NA	5
Chrysene	218-01-9	5
Dibenz(a,h)anthracene	53-70-3	5
Dibenzothiophene	132-65-0	5
Fluoranthene	206-44-0	5
Fluorene	86-73-7	5
Indeno(1,2,3-c,d)pyrene	193-39-5	5
Naphthalene	91-20-3	5
Perylene	198-55-0	5
Phenanthrene	85-01-8	5
Pyrene	129-00-0	5

Table C-12

PCB Congener Reporting Limits (HRMS) (SOP-9728)

Analytical Parameter	Soil/Sediment Reporting Limit (µg/kg)
PCB-77	1
PCB-81	1
PCB-105	1
PCB-114	1
PCB-118	1
PCB-123	1
PCB-126	1
PCB-156	1
PCB-157	1
PCB-166	1
PCB-167	1
PCB-169	1
PCB-170	1
PCB-189	1

Table C-13

Plant Pigment Reporting Limits (SOP-0101)

Analytical Parameter	Tissue Reporting Limit (µg/kg)
Chlorophyll A	0.05
Chlorophillide A	0.05
Chlorophyll C3	0.05
Chlorophyll C2	0.05
Peridinin	0.05
19-Butanoylfucoxanthin	0.05
Fucoxanthin	0.05
19-Hexanoylfucoxanthin	0.05
Neoxanthin	0.05
Pheophorbide A	0.05
Violaxanthin	0.05
Prasinoxanthin	0.05
Diadinoxanthin	0.05
Alloxanthin	0.05
Antheraxanthin	0.05
Diatoxanthin	0.05
Lutein	0.05
Zeaxanthin	0.05
Chlorophyll B	0.05
Chlorophyll A Epimer	0.05
Chlorophyll A (Prime)	0.05
Pheophytin B	0.05
Pheophytin A	0.05
Beta-Carotene	0.05

APPENDIX D

STANDARD OPERATING PROCEDURES—TISSUE ANALYSIS

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SOP-9214
CONFIRMATION OF ANALYTES BY FULL SCAN GAS CHROMATOGRAPHY/MASS SPECTROMETRY

SOP-9214 – Confirmation of Analytes by Full Scan Gas Chromatography/Mass Spectrometer

This SOP is being revised for form and content to reflect the current policies and procedures at GERG for the format of SOPs. The procedures outlined in this SOP are essentially correct.

Quality Assurance Manager

10/27/99
Date

CONFIRMATION OF ANALYTES BY FULL SCAN GAS CHROMATOGRAPHY/MASS SPECTROMETRY

1.0 SUMMARY OF METHOD

This standard operating procedure describes a method to confirm the presence of pesticides, PCB's and aliphatic hydrocarbons by full scan or SIM GC/MS . Samples are extracted and purified according to various GERG SOP's and initially analyzed by GC/ECD or GC/FID.

2.0 INTERFERENCES

Method interferences may be caused by contaminants in solvents, reagents, and glassware. All materials utilized in the analytical procedure are routinely demonstrated to be free from interferences under the conditions of the analysis.

Matrix interferences may be caused by naturally occurring biogenic materials extracted from the sample. The extent of matrix interferences varies considerably depending upon the nature of the sample analyzed. Matrix interferences are minimized by sample purification techniques described in detail under the appropriate GERG SOP's.

3.0 APPARATUS AND MATERIALS

3.1 Gas Chromatograph

The analytical system includes a temperature programmable gas chromatograph and all required accessories including syringes, analytical columns, and gases. The injection port is designed for splitless injection on capillary columns.

3.2 Column

A 30-m fused silica capillary column with DB-5 bonded phase, or equivalent. Capillary columns of 0.25 mm or 0.32 mm i.d. will be used.

3.3 Mass Spectrometer

A mass spectrometer operating at 70 eV (nominal) electron energy in the electron impact ionization mode and tuned to maximize the sensitivity of the instrument for the mass range 40-600 amu is used for analysis. The GC capillary column is inserted directly into the ion source of the mass spectrometer.

A computer system interfaced to the mass spectrometer continuously acquires and stores mass spectra throughout the duration of the chromatographic program. A mass spectrum can be obtained for each peak of interest utilizing background subtraction techniques. The computer also has software that allows searching GC/MS data files for ions of a specific mass and plotting ion abundances versus run time or scan number. The NIH/EPA/MSDC Mass Spectral Data Base (NBS Library) and Registry of Mass Spectral Data (Wiley Library) mass spectral database is available for initial identification of unknown analytes.

4.0 REFERENCE STANDARD SOLUTIONS

Reference standard solutions are purchased from commercial vendors (Supelco, Alltech). All pesticides, PCB's and aliphatic hydrocarbon compounds required by FWS will be analyzed under conditions identical to samples and their mass spectra stored for future reference.

5.0 EXTRACT SCREENING

Purified extracts will be initially screened by GC/ECD and GC/FID. GC/MS analyses will be imployed to confirm the presence of analytes. When analytes are detected in samples at 10 times the SIM limit of detection, 10% will be confirmed by full scan GC/MS.

6.0 ANALYSIS

6.1 GC/FID Operating Conditions

Injection Port:	300°C
Detector:	300°C
Oven Program	60°C for 1 min, then 6°C/min to 300°C, hold 5 min

6.2 GC/MS Operating Conditions

GC:	Injector Temp	300°C
	Transfer Line Temp	280°C
	Initial Oven Temp	60°C
	Initial Hold Time	0 min
	Ramp Rate	10°C/min
	Final Temperature	300°C
	Final Hold Time	6 min
MS:	Electron Energy	70 ev
	Scan Cycle	1/sec

6.3 Mass Spectrometer Tuning

The mass spectrometer is tuned daily according to manufacturer's specifications using PFTBA.

7.0 QUALITATIVE AND QUANTITATIVE CONFIRMATION

The identity of compounds identified by gas chromatography be analyzed by mass spectrometry, for the purpose of confirming analyte identification at a rate such that both of the following are met.

10% of the samples in a single submission are analyzed

1 sample per matrix is analyzed

If all of the analytes are less than the detection limit for performing the GC/MS confirmations this requirement is waived. The maximum acceptable mass spectrometric limit of detection is 0.1 and 0.01 ppb for single component organochlorines, individual PCB congeners or aliphatic hydrocarbons for tissue/sediment/soil and water, respectively. The limit of detection is 0.5 and 0.05 for toxaphene or total PCB in tissue/sediment/soil and water, respectively.

Confirmations are based on GC/MS by Electron Impact (EI) Mass Spectrometry using full scan or SIM with three or more ions monitored (Table 1). An analyte is reported as "CONFIRMED" when the spectrum contains at least three of the major ions. For the above ions to be accepted

Table 1.

Analyte	Quant Ion	Confirmation Ion	Confirmation Ion
Surrogate	66		
n-alkanes	57	43	71
Pristane, Phytane	183	57	43
PCB			
Cl_1	188	190	152
Cl_2	222	224	152
Cl_3	256	258	186
Cl_4	292	290	220
Cl_5	326	324	254
Cl_6	360	362	288
Cl_7	294	396	322
Cl_8	430	428	356
Cl_9	464	466	390
Cl_{10}	498	500	424
Pesticides			
Alpha-BHC	219	183	181
Beta-BHC	219	183	181
Gamma-BHC	219	183	181
Delta-BHC	219	183	181
HCB	284	142	249
Heptachlor	272	100	272
Heptachlor-Epoxide	353	355	81
Oxychlordane	272	369	424
Gamma-chlordane	373	375	377
Alpha-chlordane	373	375	377
Trans-nonachlor	409	407	272
Cis-nonachlor	409	407	272
Aldrin	263	265	66
Dieldrin	79	263	108
Endrin	81	263	82
Mirex	272	237	
2,4'DDE	246	248	176
4,4'DDE	246	248	176
2,4'DDD	235	237	165
4,4'DDD	235	237	165
2,4'DDT	235	237	165
4,4'DDT	125	237	165
Toxaphene	159	231	233
Endosulfan I	195	339	341
Endosulfan II	195	339	341
Endosulfan Sulfate	272	387	422

their mass chromatographic peaks should be at least three times the background noise, they must be within one scan of each other and match the retention times of the standard run under the same conditions. The relative abundances of the three selected ions must be within 30% of the expected abundances of these ions as determined from analysis of a standard of the compound run on the same instrument and under the same conditions. The three ions must be either selected from separate and unique isotopic cluster groups or if they are within a cluster group the isotopic peaks should be in the correct proportions and the isotopic ration tolerance match to the standard should be no greater than 20%.

A concentration estimate accompanies the spectral determination and it should be within an order of magnitude of the concentration reported using electron capture or flame ionization gas chromatography.

To report an analyte as "TENTATIVE CONFIRMED" the spectrum must contain at least two of the more abundant ions. For the above ions to be accepted their mass chromatographic peaks should be within one scan of each other and match the retention time of the standard run under the same conditions. One of the two ions must be the highest mass which occurs at > 20% of the base peak. The two ions must be selected from either separate and unique isotopic cluster groups or if they are within a cluster group the isotopic peaks should be in the correct proportions.

A concentration estimate accompanies the spectral determination and it should be within an order of magnitude of the concentration reported using electron capture or flame ionization gas chromatography.

If an analyte appears to be present, based on electron capture or flame ionization gas chromatography at a concentration higher than the limit of detection for mass spectrometry, and the identity of that compound cannot be confirmed or tentatively confirmed by mass spectrometry, it should be assumed that the electron capture or flame ionization result is due to an interference. The report should be adjusted (for all samples controlled by the GC/MS sample in question) to read < the former result. The detection limit is redefined as the apparent concentration due to the interference.

7.2 Quantification

Concentrations of the analytes will be determined based on the integrated abundance from the EICP of the primary characteristic ion as defined in Table 1. The internal standard technique will be used to quantify the analytes. Internal standards, d_{10}-fluorene for pesticides and deuterated alkanes for aliphatic hydrocarbons will be used for calculations.

The following formula is used to calculate the response factors of the internal standard to the calibration standard(s).

$$RF = (A_S \times C_{IS})/(A_{IS} \times C_S)$$

where:

A_S = Area of the characteristic ion for the parameter to be measured.
A_{IS} = Area of the characteristic ion for the internal standard.
C_{IS} = Concentration of the internal standard (ng/mL).
C_S = Concentration of the parameter to be measured (ng/mL).

The actual sample concentration (C) for each compound is calculated by the following formula:

$$C = (Ce) \times \frac{V_e}{V_s}$$

where:

C = Concentration in sample (ng/g).
V_e = The final extract volume (mL).
V_S = The original weight or volume of sample extracted (g).

8.0 QUALITY CONTROL/QUALITY ASSURANCE

8.1 GC/MS Tuning and Calibrations

8.1.2 GC/MS Tuning

The GC/MS is tuned as described in Section 6.3.

8.2 Quality Control Samples

8.2.1 Procedural Blank

Procedural blanks are analyzed and confirmed to be free of contaminants. If the procedural blank contains peaks, the analytical system is out of control and the source of the contaminant must be investigated and corrective measures taken and documented before further sample analysis proceeds.

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SOP-9415
DETERMINATION OF PERCENT DRY WEIGHT FOR BIOLOGICAL TISSUES

Geochemical and Environmental Research Group
STANDARD OPERATING PROCEDURES SOP-9415

DETERMINATION OF PERCENT DRY WEIGHT FOR BIOLOGICAL TISSUES

This document presents the protocol, materials, and quality control used in the performance of the above analysis.

Jennifer M. Wong
Laboratory Manager — 10/27/94 Date

Analytical Services Manager — 11.2.94 Date

Grace E Ekman
Quality Assurance Manager — 11/3/94 Date

Chief Chemist — 11/3/94 Date

DETERMINATION OF PERCENT DRY WEIGHT FOR BIOLOGICAL TISSUES

1.0 INTRODUCTION

The percent dry weight of a tissue on a wt/wt basis is the percent of solid material in a sample of biological tissue.

A tissue subsample is weighed, dried at 63-65°C for 24 hours and taken to constant weight. If the tissue is blubber or has high lipid content, the sample is freeze-dried to a constant weight. The percent dry weight is calculated.

2.0 SAFETY

2.1 The toxicity or carcinogenicity of each compound or reagent used in this standard operating procedure has not been precisely determined. However, each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. The laboratory maintains a current awareness file of OSHA regulations and MSDS (Material Safety Data Sheet) information regarding the safe handling of the chemicals specified in this method. A reference file of MSDS is available to all personnel involved in these analyses. All laboratory personnel should direct any questions regarding safety issues to their supervisors.

3.0 APPARATUS AND MATERIALS

3.1 Apparatus

Balance: top loading with an accuracy of 0.001 g, calibrated daily

Convection Oven: 63-65°C

Electrobalance: Cahn or equivalent, with an accuracy of 0.0001 mg, set on the 250 mg - 1 µg scale, calibrated daily

Freeze dryer: LabConco 8 or equivalent

3.2 Labware

Aluminum foil: heavy duty

Beakers: 10 mL capacity, borosilicate glass, heated at 103-105°C for 1 hour and cooled to room temperature in a desiccator before use.

Cutting tools (scissors, scalpels, etc.): stainless steel, washed, dried and rinsed with methylene chloride

Forceps: stainless steel, washed, dried and rinsed with methylene chloride

Jars: glass, 1 pint capacity,

Spatulas: stainless steel, washed, dried and rinsed with methylene chloride

Tweezers: stainless steel, anti-magnetic for microbalance

As described in the GERG SOP-9416, all glassware is washed and solvent rinsed or combusted at 440°C for 4 hours.

3.3 Solvents and Reagents

Methylene chloride: Burdick and Jackson pesticide grade or equivalent, lot tested.

4.0 PROCEDURE

4.1 Identify the samples listed on the Laboratory Sample Logbook benchsheet which require percent dry weight determinations.

4.2 Transfer the Project and the Sample ID, and Client Descriptor for each sample to the corresponding Laboratory Sample Dry Weight Logbook benchsheet. Label combusted 10 mL beakers with the benchsheet number and Preparation IDs and then oven-dry these beakers prior to use.

4.2.1 The combusted beakers are prepared for use by heating at 103-105°C for 1 hour and then cooling to room temperature in a desiccator. NOTE: Do not touch the

surface of the sample beakers after the initial drying and cooling process. Handle beakers with clean forceps only.

4.2.2 It is essential that the dried beakers and dried samples be kept/stored/cooled in the dessicator as much as possible during this procedure to minimize moisture pickup which would effect the final weight.

4.2.3 Note: When the sample(s) constant weight is not easily determined after four weighing procedures or when high lipid content causes a lipid layer to form on the sample surface, process the sample(s) according to the freeze-drier protocol in Section 4.5.

4.3 For samples (excluding blubbers) with total weight > 2 g:

4.3.1 Calibrate the toploading balance according to the manufacturer's instructions, if it has not already been done that day. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Initial Weighing" Box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.2 Using forceps, remove a dried beaker from the dessicator. Immediately place the 10 mL beaker on the toploading balance and weigh the empty beaker. Enter the weight under "Vial Weight" on the Laboratory Sample Dry Weight Logbook benchsheet. Thoroughly mix the homogenized sample. Weigh out a subsample (0.5-1 g) of the homogenized tissue into the beaker, taking no more than 1/3 of the total sample. Enter this weight under "Vial + Wet Smpl" in the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.2.1 Note any unusual sample characteristics (i.e., odor, oily) in the comment section of the dry weight benchsheet.

4.3.2.2 Prepare a method blank by using an empty beaker. The values for "Vial Weight" and "Vial + Wet Smpl" will be the same.

4.3.2.3 The duplicate samples for this method are the samples designated as matrix spike and the matrix spike duplicate samples for organic extractions. If MS/MSD samples are not being prepared, then the samples designated as original/duplicate samples for organic extractions may serve as the QC duplicate required for this procedure.

4.3.3 Using forceps, place all samples in the designated box. Cover the box loosely with aluminum foil. Initial, date, and write the benchsheet number on the aluminum foil. Place in 63-65°C convection oven for 24 hours.

4.3.4 Remove the box containing the samples from the oven and, using forceps, immediately place the samples in a desiccator. Allow the samples to cool to room temperature in the desiccator for 30 minutes.

4.3.4.1 It is essential that the dried beakers and dried samples be kept/stored/cooled in the dessicator as much as possible during this procedure to minimize moisture pickup which would effect the final weight.

4.3.5 Calibrate the toploading balance according to the manufacturer's instructions, if it has not already been done that day. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Final Weighing #1" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.6 Using forceps, remove the sample beaker from the dessicator, immediately place the beaker on the toploading balance, and weigh the 10 mL beaker with the dried sample. Enter the weight under "Vial + Dry Smpl #1" in the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.7 Reheat the samples to 64-65°C for at least 2 hours, and again cool in a desiccator for 30 minutes to room temperature.

4.3.8 Calibrate the toploading balance according to the manufacturer's instructions, if it has not already been done that day. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Final Weighing #2" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.9 Using forceps, remove the dried sample beaker from the dessicator, immediately place the sample beaker on the toploading balance, and weigh the 10 mL beaker with the dried sample on the toploading balance. Enter the weight under "Vial + Dry Smpl #2" in the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.10 If the difference between the first and second weight of the 10 mL beaker with the dried sample is less than 0.02 g, calculate the % dry weight according to Section 5.1 using the second weight. If the difference is greater than 0.02 g, continue the heating, cooling and weighing process until the difference in the last two weights is less than 0.02 g, and calculate the % dry weight based on the last weighing. Date and initial the "% Dry Wt Calculations" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.3.11 Calculate the relative percent difference (RPD) for the calculated % dry weight values for the original sample and the duplicates. The RPD should agree within ±25%, according to Section 5.2. If the RPD is not within specifications, reweigh the samples. If the RPDs still are not within specifications, the % Dry Weights may need to be redetermined, and the analyst's supervisor must be notified. For the blank, the absolute difference between the vial weight before and after drying should be less than 0.02 g.

4.3.12 Once the QA requirements stated in Section 4.3.11 are met, the dried subsamples for % dry weight can be discarded.

4.4 For samples (excluding blubbers) with total weight < 2 g

4.4.1 Make small aluminum weighing boats (approximately 7 mm diameter and 6 mm high) and aluminum covers (approximately 8 mm square). Place the weighing boats and covers in a beaker, cover with foil and combust at 440°C for 4 hours. Before using, heat at 103-105°C for 1 hour, immediately place the weighing boats in a dessicator, and cool the weighing boats for 30 minutes. Handle the boats and covers with forceps at all times after this point.

4.4.1.1 It is essential that the dried beakers and dried samples be kept/stored/cooled in the dessicator as much as possible during this procedure to minimize moisture pickup which would effect the final weight.

4.4.2 Calibrate the electrobalance with the authorized 200 mg weight according to the manufacturer's instructions. Initial and date the electrobalance calibration logbook, located near the instrument. Initial, date, and write the balance calibration date in the "Dry Weight: Initial Weighing" Box on the appropriate Laboratory Sample Dry Weight Logbook benchsheet.

4.4.3 Close the door on the electrobalance and tare the empty pan. Remove the dried weighing boat from the dessicator, immediately place the boat and cover on the pan and weigh. Handle the boat and cover with forceps at all times. Close the door on the electrobalance during each weighing. Enter the value under "Vial Weight" in the Laboratory Sample Dry Weight Logbook benchsheet. Mix the homogenized tissue thoroughly. Transfer a subsample (5-100 mg) of the homogenized tissue into the weighing boat using no more than 1/3 of the sample, replace the cover and weigh. Record the weight after the balance has stabilized (approximately 1-2 minutes). The cover will minimize

moisture loss. Enter this weight under "Vial + Wet Smpl" on the Laboratory Sample Dry Weight Logbook benchsheet. Add "mg" next to the value and note under "Comments" that the electrobalance was used for that sample. Place the weighing boat and cover in a labeled 10 mL beaker.

4.4.3.1 Note any unusual sample characteristics (i.e., odor, condition) in the comment section of the dry weight benchsheet.

4.4.3.2 Prepare a method blank by using an empty weighing boat and cover. The values for "Vial Weight" and "Vial + Wet Smpl" will be the same.

4.4.3.3 The duplicate samples for this method are the samples designated as the matrix spike and the matrix spike duplicate samples for the organic extraction procedures. If no MS/MSD are included in the extraction batch, the sample designated as the original/duplicate may be used for the QC samples required for this procedure.

4.4.4 Using forceps, place all samples in the designated box and cover loosely with aluminum foil. Initial, date, and write the benchsheet number on the aluminum foil. Place in 63-65°C convection oven for 24 hours.

4.4.5 Remove samples from oven using forceps and immediately place them in the dessicator. Allow the samples to cool for 30 minutes to room temperature in a desiccator.

4.4.5.1 It is essential that the dried beakers and dried samples be kept/stored/cooled in the dessicator as much as possible during this procedure to minimize moisture pickup which would effect the final weight.

4.4.6 Calibrate the electrobalance with the authorized 200 mg weight according to the manufacturer's instructions. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance.

located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Final Weighing #1" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.4.7 Using forceps, remove the dried sample in the weighing boat from the dessicator, immediately place the weighing boat (plus cover) containing the dried sample on the electrobalance pan and record this weight under "Vial + Dry Smpl #1" on the Laboratory Sample Dry Weight Logbook benchsheet.

4.4.8 Reheat the samples to 63-65°C for at least 2 hours, and immediately cool in a desiccator to room temperature.

4.4.9 Calibrate the electrobalance with the authorized 200 mg weight according to the manufacturer's instructions. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Final Weighing #2" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.4.10 Using forceps, remove the dried sample in the weighing boat from the dessicator, immediately place the weighing boat on the electrobalance pan and weigh the weighing boat (plus cover) containing the dried sample on the electrobalance. Record the value under "Vial + Dry Smpl #2" in the Laboratory Sample Dry Weight Logbook benchsheet.

4.4.11 If the difference between the first and second weight of the weighing boat plus cover with the dried sample is less than 0.1 mg, calculate the % dry weight according to Section 5.1 using the second weight. If the difference is greater than 0.1 mg, continue the heating, cooling and weighing process until the difference in the last two weights is less than 0.1 mg, and calculate the % dry weight based on the last weight. Date and initial the "% Dry Wt Calculations" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.4.12 Calculate the relative percent difference (RPD) for the calculated % dry weight values for the duplicates. The RPDs should agree within ±25%, according to Section 5.2. If the RPDs do not meet specifications, reweigh the samples. If the RPDs are still are not within specifications, the % Dry Weights may need to be redetermined beginning with part 4.4, and the analyst must notify the supervisor. For the blank, the absolute difference between the vial weight before and after drying should be less than 0.05 mg.

4.4.13 Once the QA requirements stated in Section 4.4.12 are met, the dried subsamples for % dry weight can be discarded.

4.5 For blubber samples

4.5.1 Calibrate the toploading balance according to the manufacturer's instructions, if it has not already been done that day. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Initial Weighing" Box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.1.1 It is essential that the dried beakers and freeze-dried samples be kept/stored/cooled in the dessicator as much as possible during this procedure to minimize moisture pickup which would effect the final weight.

4.5.2 Using forceps, remove a combusted dried 10 mL beaker from the dessicator, immediately place the dried 10 mL beaker on the toploading balance and weigh the beaker. Record the weight under "Vial Weight" on the Laboratory Sample Dry Weight Logbook benchsheet. Since it is difficult to homogenize blubber samples properly, to obtain a representative blubber sample from a solid blubber sample, remove a top to bottom cross-section (~1 g) using a clean scalpel or scissors. **DO NOT** include the skin unless

instructed otherwise. Leave a part of the skin attached to the original sample so that the outer side of the sample can be determined. This procedure will provide a representative sample through the fatty tissue. Taking no more than 1/3 of the total sample, place the subsample into the tared beaker, and weigh the beaker and subsample on the toploading balance. Record the weight under "Vial + Wet Smpl" on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.2.1 The combusted beakers are prepared for use by heating at 103-105°C for 1 hour and then cooling to room temperature in a desiccator. NOTE: Do not touch the surface of the sample beakers after the initial drying and cooling process. Handle beakers with clean forceps only.

4.5.2.2 Note any unusual sample characteristics (i.e., odor, condition) in the comment section of the dry weight benchsheet.

4.5.2.3 Prepare a method blank by using an empty beaker. The values for "Vial Weight" and "Vial + Wet Smpl" will be the same for this blank sample.

4.5.2.4 The duplicate samples for this method are the samples designated as the matrix spike and the matrix spike duplicate samples for the extraction batch. If no MS/MSD are being prepared, then the samples designated as original/duplicate for the extraction batch may be used as the required QC for this procedure.

4.5.3 Cover each sample beaker with aluminum foil. Punch holes in the foil. Place one layer of sample beakers in 1 pint glass jars and cover loosely with aluminum foil. Punch holes in the foil. Initial, date, and write the benchsheet number on the jar. Place in designated freezer overnight.

4.5.4 Transfer samples to the freeze-drier. Freeze-dry the sample for 5 days according to manufacturer's instructions

and GERG SOP-9312. Transfer the samples immediately from the freeze-dryer to a desiccator for at least 30 minutes before proceeding.

4.5.4.1 It is essential that the dried beakers and freeze-dried samples be kept/stored/cooled in the dessicator as much as possible during this procedure to minimize moisture pickup which would effect the final weight.

4.5.5 Calibrate the toploading balance according to the manufacturer's instructions, if it has not already been done that day. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Final Weighing #1" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.6 Using only forceps to handle the beaker, remove the freeze-dried sample from the dessicator and immediately weigh the 10 mL beaker with the dried sample on the toploading balance. Record the value under "Vial + Dry Smpl #1" on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.7 Freeze-dry the samples for at least 1 additional day and immediately transfer to a desiccator.

4.5.8 Calibrate the toploading balance according to the manufacturer's instructions, if it has not already been done that day. Record the date, calibration weight and the calibrator's initials in the calibration logbook for that particular balance, located near the balance. Initial, date, and write the balance calibration date in the "Dry Weight: Final Weighing #2" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.9 Using only forceps to handle the beaker, remove the freeze-dried sample from the dessicator and immediately weigh the 10 mL beaker with the dried sample on the

toploading balance. Record the value under "Vial + Dry Smpl #2" on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.10 If the difference between the first and second weights of the 10 mL beaker with the dried sample is less than 0.02 g, calculate the % dry weight according to Section 5.1 using the second weight. If the difference is greater than 0.02 g, continue the freeze-drying and weighing process until the difference in the last two weights is less than 0.02 g. Calculate the % dry weight based on the last weight. Date and initial the "% Dry Wt Calculations" box on the Laboratory Sample Dry Weight Logbook benchsheet.

4.5.11 Calculate the relative percent difference (RPD) for the calculated % dry weight values for the original samples duplicates. The RPDs should agree within ±25%, according to Section 5.2. If the RPDs do not meet specifications, reweigh the samples. If the RPDs still are not within specifications, the % Dry Weights may need to be redetermined starting with part 4.5, and the analyst's supervisor must be notified. For the blank, the absolute difference between the vial weight before and after drying should be less than 0.01 g.

4.5.12 If the QA requirements stated in Section 4.5.11 are met, the dried subsamples for % dry weight can be properly discarded.

5.0 CALCULATIONS

5.1 Percent Dry Weight

$$\%\text{Dry Weight} = \frac{[\text{Vial + Dry SMPL (g or mg)}] - \text{Vial Weight (g or mg)}}{[\text{Vial + Wet SMPL (g or mg)}] - \text{Vial Weight (g or mg)}} \times 100$$

5.2 Relative Percent Difference (RPD) between duplicates

$$\text{RPD} = \frac{|\text{Duplicate 1 value - Duplicate 2 value}|}{[\text{Duplicate 1 value + Duplicate 2 value}]/2} \times 100$$

6.0 QUALITY CONTROL

6.1 Process all quality control samples in a manner identical to actual samples.

6.2 Process a method blank and a duplicate with every sample set as stated on the Laboratory Analysis Request form. The method blank is an empty 10 mL beaker or an empty aluminum weighing boat and cover. Use the samples designated in the extraction batch as the MS and MSD or as the original/duplicate as the duplicate QC samples required for this procedure.

6.2.1 For the blank, the absolute difference between the vial weight before and after drying should be less than 0.02 g for the toploading balance and less than 0.05 mg for the electrobalance.

6.2.2 Calculate the RPD for the calculated % dry weights for the designated original samples and duplicates. The RPDs should agree within ±25%. If the RPDs do not meet specifications, reweigh the samples. If the RPDs still are not within specifications, subsamples for % dry weight may need to be redetermined. This decision must be made between the analyst and their supervisor.

6.3 Note in the Comments section of the Laboratory Sample Dry Weight Logbook if there are any unusual sample characteristics or if anything out of the ordinary happens to the sample.

6.4 Use Standard Laboratory Practice when filling out all paperwork. Use black waterproof ink. When correcting an entry, use one single line through the incorrect entry, date and initial change. Write a large letter Z through all the empty sample lines, date and initial.

7.0 REPORTING AND PERFORMANCE CRITERIA

7.1 Reporting and performance criteria are completed by the analytical and data management portions of the laboratory.

8.0 EXAMPLE FORMS

8.1 Laboratory Sample Dry Weight Logbook benchsheet

Laboratory Sample %Dry Weight Logbook

MISC TISSUE

Project Name/SDG#

Lab Manager DATE INIT

Comments

#	Sample ID	Client Descriptor	Vial Wt (g)	Vial + Wet Smpl (g)	Vial + Dry Sample (g) 1	2	3	4	Dry Wt (%)	Comments
1	BLANK									
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

% Dry Weight = [(Vial + Dry Smpl (g or mg)) - (Vial Weight (g or mg))] / [(Vial + Wet Smpl (g or mg)) - (Vial Weight (g or mg))] x 100

When the difference between replicate "Vial+Dry Smpl" weights is ≤ 0.05g use the last weight to calculate the percent dry weight.

Paste 9994-46.WKX Misc Tissue Dry Wts

RPD = [(Duplicate1 Value - Duplicate2 Value)] / [(Duplicate1 Value + Duplicate2 Value) / 2] x 100

The Relative Percent Difference (RPD) between duplicates must be ≤ 25%

RPD	Date/Init

Check One: ☐ MS/MSD ☐ SMPL/DUP

M 1550
Page 1 of 2

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DCN: GEP2-123098-AAET
Revision No.: 01
Date: 01/99

SOP-9701
PROCEDURE FOR THE PREPARATION OR MODIFICATION OF STANDARD OPERATING PROCEDURES

Geochemical and Environmental Research Group
STANDARD OPERATING PROCEDURES SOP-9701

PROCEDURE FOR THE PREPARATION OR MODIFICATION OF STANDARD OPERATING PROCEDURES

This document presents the procedures used in the performance of the above administrative activities.

Director 6-20-97 Date

Quality Assurance Manager 6/20/97 Date

SOP Author/Revision by: Grace Ekman

PROCEDURE FOR THE PREPARATION OR MODIFICATION OF STANDARD OPERATING PROCEDURES

1.0 PURPOSE

This document provides procedures for the staff at the Geochemical and Environmental Research Group (GERG) of the College of Geosciences and Maritime Studies at Texas A&M University to follow when developing new or modifying existing standard operating procedures (SOPs).

1.1 Summary

SOPs must use standardized formats, have an internal review process, and have management authorization and sign-off. A need to modify SOPs may occur as a result of the introduction of new or improved field or analytical techniques or modification of project related procedures.

1.2 Application

With the following exceptions, provisions of this SOP apply to GERG operations, staff, and management activities.

1.2.1 Activities required to show compliance with the FDA or EPA TSCA/FIFRA/CAA Good Laboratory Practices (GLP) regulations may use a modified format and are exempted from the format requirements of this SOP. Such SOPs will be included in the normal sequential number system when finalized but will be prefixed with a letter or letters denoting the specific project or purpose.

1.2.2 With the approval of the QA Manager, SOPs for research-based or limited use activities may use a modified format. Such SOPs will be prefixed with an "R" in front of the SOP, but will be included in the normal sequential numbering system for tracking SOPs.

2.0 SAFETY

The hazards, toxicity or carcinogenicity of each compound or reagent used in GERG's standard operating procedures have not been precisely determined.

However, each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. The laboratory maintains Material Safety Data Sheets (MSDS) which contain information regarding the safe handling of chemicals used at GERG's facilities. A reference file of MSDS is available to all personnel involved with these materials. All laboratory personnel should direct any questions regarding safety issues to their supervisors or the Safety Officer.

3.0 STANDARD OPERATING PROCEDURES

3.1 Preparation and Review

3.1.1 The Quality Assurance Manager is responsible for review, coordination, and final preparation of new or revised Standard Operation Procedures (SOPs).

3.1.2 The Deputy Directors or the QA Manager may delegate SOP preparation to the technical personnel having the expertise in the subject area of the SOP or may originate an SOP for any area of services offered by GERG.

3.1.3 Depending upon the content, one of three formats described in the following subsections may be used for an SOP. These formats are used for Administrative, Preparation or Instrumental activities (see Appendices 1, 2, and 3).

3.1.3.1 The format for an Administrative SOP is provided in Appendix 1. Administrative SOPs are defined as those SOPs which are not specifically related to an analytical process (e.g., an SOP for preparation of SOPs or data management procedures), but are applicable to essential repetitive administrative activities at GERG.

3.1.3.2 The format for a Preparation SOP is provided in Appendix 2. Preparation SOPs provide detailed information essential to all phases of the collection and handling of samples prior to analysis. This ensures the sample's representativeness, non-contamination, and appropriate handling and storage. The Preparation SOP is also used to stipulate

the required steps in the preparation of samples for specific analytical activity.

3.1.3.3 The format for an Instrumental SOP is provided in Appendix 3. Instrumental SOPs provide detailed criteria for the instrument used, including it's calibration, maintenance, and operation; potential interferences; data evaluation; and quality control criteria.

3.1.4 All SOPs must be reviewed and approved by the QA Manager.

3.1.4.1 Other personnel shall be designated by the QA Manager for the review of a SOP. Comments from the SOP review are advisory and may not be incorporated into the SOP if the comments are either non-essential or result in a reduction of the quality assurance or quality control aspects of an SOP.

3.1.4.2 Administrative SOPs must be signed by the Director of GERG and the QA Manager; preparation and instrumental SOPs must be signed by the QA Manager. The SOP must have a cover sheet (see Figure 1) with, as a minimum, the signatures of GERG's QA Manager. The author or the revision originator of an SOP will be indicated on the cover sheet.

3.1.4.3 After an SOP has been approved in final form, it is immediately effective for that specific SOP activity at GERG, provided that all necessary supplies or equipment are on-site and operational.

3.1.4.4 When a final SOP is prepared or modified during an on-going project, the client must be notified and their approval obtained prior to use of the SOP on their project. At their discretion, clients may reject the use of a new or modified SOP.

3.1.5 The original copy of any new or revised SOP will be maintained by the QA Manager and distributed to appropriate

management staff. Requests for additional copies of such documents should be directed to the QA Manager.

3.1.5.1 SOPs are numbered sequentially with the first two digits representing the year finalized. A master index of SOPs is maintained indicating: SOP number, title, revision number, date finalized, and, when applicable, the number of the SOP which supersedes the former SOP or if an SOP is not in use or not for distribution. All "superseded" SOPs are maintained in a separate file by the QA Manager.

4.0 DOCUMENT REVISION RESPONSIBILITY, FORMAT, AND REVIEW PROCEDURE

4.1 Revision Origination

4.1.1 All employees are encouraged to present their suggestions and their observations regarding quality improvement. Continuous improvement is a guiding principle in all aspects of GERG's operations.

4.1.2 The originator of the suggestion should describe the observation/problem and the proposed resolution to his/her immediate supervisor or to the QA Manager.

4.2 Revision Evaluation

4.2.1 The Quality Assurance (QA) Manager will evaluate the suggested revisions or new procedures and will make a decision on the validity and need for new or revised SOPs.

4.2.1.1 After review of a problem area and QA implications, the suggestion will either be adopted, thereby resulting in a new or revised SOP, or the concern will be addressed by a memorandum from the QA Manager.

4.3 Revision Format, Review, and Approval Procedure

4.3.1 All proposed changes to SOPs must follow the procedures and formats specified in this SOP. The revised or new document must, after thorough review, be approved or rejected by the QA Manager.

4.3.2 The original copy of any new or revised SOP will be maintained by the QA Manager and distributed to appropriate management staff. Requests for additional copies of such documents should be directed to the QA Manager.

4.4 Client Notification, Review and Approval

4.4.1 If a new or a revised SOP effects an on-going project, the client must be notified. The client must approve the revision prior to its use on the project. At the client's request, the project may be continued with the original version of the SOP.

Figure 1 -- Cover sheet

(Format For Header and Title of *SOPs, with appropriate font and spacing:)*

(HEADER followed by *SOP TITLE, i.e., for a Preparation SOP:* SOXHLET EXTRACTION OF SEDIMENTS FOR SURFACE PROSPECTING)

(Format For *an Administrative SOP cover sheet:*
This document presents the procedures to be used in the performance of the above administrative activities.)

(Format For *PREPARATION OR INSTRUMENT SOP cover sheet:*
This document presents the procedures, materials, and quality control used in the performance of the above preparation (or instrumental) activities.)

(Example of sign-off format shown below)

_____ _____
Director Date

_____ _____
Quality Assurance Manager Date

SOP Author/Revisions By: _____

Appendix 1

FORMAT FOR AN ADMINISTRATIVE SOP

The following format for an Administrative SOP is based upon SOP-9501 and presents an outline for the general requirements for repetitive administrative or documentation activities.

Section 1 is in required format, as indicated by use of Italics, although the wording should be modified to reflect the content and applicability of an Administrative SOP. The wording of Section 2 is required and may not be revised.

Only certain portions of SOP 9501 have been included to indicate the desired outline format to be used.

1.0 PURPOSE

1.1 Summary

This procedure [establishes the selection and training requirements] *for personnel involved in the operation, maintenance, and technical support of the Geochemical and Environmental Research Group (GERG), an off-campus center for applied research of the College of Geosciences and Maritime Studies at Texas A&M University.*

1.2 Application

The provisions of this SOP apply to GERG operations, staff, and management.

2.0 SAFETY

The hazards, toxicity or carcinogenicity of each compound or reagent used in GERG's standard operating procedures have not been precisely determined. However, each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. The laboratory maintains Material Safety Data Sheets (MSDS) which contain information regarding the safe handling of chemicals used at GERG's facilities. A reference file of MSDS is available to all personnel involved with these materials.

All laboratory personnel should direct any questions regarding safety issues to their supervisors or the Safety Officer.

3.0 RESPONSIBILITIES AND AUTHORITIES

4.0 PERSONNEL SELECTION

5.0 TRAINING

5.1 Requirements

5.2 Primary Training

5.3 Supplemental Training

5.4 Initial and Continuing Training

5.5 Primary Training Instruments

5.6 Initial Training

5.6.1 The Personnel Administrator will.....

5.6.1.1 The employee keeps.....

5.7 Continuing Training

6.0 Record Requirements

Appendix 2

FORMAT FOR A PREPARATION SOPs

The preparation SOP provides detailed procedures for essential field activities, describing the collection and handling of samples prior to analysis, and also delineates the steps required for the preparation of a sample for the appropriate analytical or instrumental activity. The procedures described in these SOPs ensure the sample's representativeness, non-contamination, and appropriate handling and storage.

The outline for sections 1 through 5 and the last section of each SOP are required elements for this type of SOP. When appropriate, sections may be added, omitted, or modified, or the abbreviation "NA" (not applicable) may be used. The wording of Section 2 is required and may not be revised.

1.0 PURPOSE

This document provides the procedures for [sample collection; field analysis of dissolved oxygen; sample extraction; sample extract purification; etc.] *which is used by staff of the Geochemical and Environmental Research Group (GERG) of the College of Geosciences and Maritime Studies at Texas A&M University.*

1.1 SUMMARY OF METHOD

[This section provides a BRIEF summary of the preparation activity. This section can concisely reference other GERG SOPs (by topic) which must be used in addition to the procedure described in this SOP. A more detailed description of such additional SOPs, including any required variances can be included later in this document.

1.2 APPLICABILITY

1.2.1 Matrix

[This section specifies general matrices in sentence format such as biological tissue, soil/sediment, water, or may be highly specific, such as "lichens only" or may be NA for certain field procedure such as launching and recovery of a datasonde.]

1.2.2 Interferences

[Typically this section may state either NA or the statements similar to the following which are relevant to sample preparation:

"High purity reagents and solvents must be used, and all equipment and glassware must be scrupulously cleaned. Laboratory method blanks must be prepared for analysis to demonstrate the lack of contamination during preparation activities that would interfere with the measurement of the target analytes. Gloves, certain plastic components, and certain greases must not be used if these will result in phthalate contamination."

"Column or gel permeation chromatographic procedures are used to remove undesired co-extracted interfering components; these procedures must be performed carefully to minimize loss of target analytes. Gloves, other plastic components, and certain greases must not be used if these will result in phthalate contamination."]

1.2.3 Special Precautions

[This section may omitted or may specify precautions which are pertinent to the preparation activity. It may refer to "Normal laboratory (or field) safety procedure...", or may contain special information from the MSDS for specific hazards or information regarding areas such as a "Caution: open samples in a biological safety cabinet"; or it may provide directions such as "Sample upstream of diesel fumes".]

1.2.4 Reporting Units

[When the Preparation SOP provides reportable data for a project, this section should specify the required reporting units, on both matrix specific and wet weight versus dry weight basis. This section may also be omitted or may use NA when appropriate.]

1.2.5 Method Detection Limits (MDL)

[If applicable, use of tabular MDL information on a separate sheet will aid in future updates for the SOP. This section can refer to the MDL information in the Instrumental SOP.]

2.0 SAFETY

The hazards, toxicity or carcinogenicity of each compound or reagent used in GERG's standard operating procedures have not been precisely determined. However, each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. The laboratory maintains Material Safety Data Sheets (MSDS) which contain information regarding the safe handling of chemicals used at GERG's facilities. A reference file of MSDS is available to all personnel involved with these materials. All laboratory personnel should direct any questions regarding safety issues to their supervisors or the Safety Officer.

3.0 QUALITY CONTROL REQUIREMENTS

[This section typically provides a numbered list with a definition and summary description of standard GERG QC (i.e., preparation of a method blank; preparation of the MS/MSD per 20 samples or less, etc.) and includes applicable QC acceptance criteria for the preparation activity. QC criteria typically would include RPD calculations and any calibration requirements. Note that this section should indicate that QC criteria for analytical results are addressed in the Instrumental SOP for the method blank, surrogates, MS/MSD, duplicates or SRM/LCS.

This section DOES NOT describe the preparation of the QC samples or material; such information is to be included in subsequent sections of the SOP.]

4.0 APPARATUS AND MATERIALS

4.1 Glassware and Hardware

[This section provides a numbered list (i.e., 4.1.1, 4.1.2) specifying the quantities and sizes of all equipment, including sources of specialty or trademark items. The phrase "or equivalent" should follow specialty glassware or equipment when applicable.]

4.2 Instrumentation

[This section may be omitted or may provide a numbered list with the make and model of required instruments and associated components. The phrase "or equivalent" should follow specialty equipment when applicable.]

5.0 REAGENTS AND CONSUMABLE MATERIALS

[The categories listed below are suggestions which will not apply to all Preparation SOPs.]

5.1 Reagents

[Includes DI or HPLC grade water]

5.2 Analytical Standards

5.3 Standard Reference Materials

5.4 Miscellaneous Material

[Includes filter paper, glass wool, etc.]

6.0 XXXXX, etc.

[If other SOPs are required before the activity described in this SOP can be performed, they should be included here and referred to in the correct sequence by the correct GERG SOP title. **If a variance to an SOP is required, it MUST be included here.**

If no SOPs are referenced, this and subsequent sections of the Preparation SOP provide the sequential detailed procedures for the preparation activity. For example, describe the preparation of reagents and column materials, then the column itself, before any description of loading an extract on the column.]

xx.0 Documentation Requirements [LAST SECTION of SOP]

[This section specifies what documentation is required to accompany samples/data at the completion of the preparation activity or where to file original documents. For example, "attach copy of lipid benchsheet", "original COC is filed", etc.]

Appendix 3

FORMAT FOR THE INSTRUMENTAL SOP

The following format for an Instrumental SOP represents the required instrument components, operating conditions, calibration, etc., which are essential for an instrumental analytical activity. This generic format should be followed, with modifications, as appropriate, for inorganic and organic areas of analysis.

The outline for sections 1 through 3 and the last section of each SOP are required elements for this type SOP. When appropriate, a section may be added, omitted, or the abbreviation "NA" (not applicable) may be used. The wording of Section 2 is required and may not be revised.

1.0 Purpose

This document provides the procedures used by the staff of the Geochemical and Environmental Research Group (GERG) of the College of Geosciences and Maritime Studies at Texas A&M University for the analysis of [analyte type] using [gas chromatography; colorimetric determination; etc.].

1.1 [This section provides a BRIEF summary of the instrumental or analytical system and defines the material analyzed (extracts prepared according to GERG SOPs; sediments; aqueous samples; etc.)].

1.2 Applicability

1.2.1 Matrix

1.3 Target Analytes and Criteria

1.3.1 Target Analyte List, Area, Response Factors, and Retention Times

[Reference to a tabular format is preferred unless the analyte list is short. This section presents data for the target analytes at a given concentration, such as a midpoint calibration standard, which has been determined by the instrumental activity described in this SOP.]

1.3.2 Other analytes having similar chemical and chromatographic characteristics may also be determined using this procedure after method validation.

1.4 Matrix Specific Detection and Reporting Limits

[Reference to a tabular format is preferred unless this is for a short analyte list.]

1.5 Applicable Concentration Range

[Usually this is the instrument calibration range without extract dilution.]

1.6 Interferences

[Specific information regarding common laboratory interferents (i.e., solvents, naphthalene, phthalates) or matrix specific contaminants (plant pigments) should be included here.]

17. Special Precautions

2.0 SAFETY

The hazards, toxicity or carcinogenicity of each compound or reagent used in GERG's standard operating procedures have not been precisely determined. However, each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. The laboratory maintains Material Safety Data Sheets (MSDS) which contain information regarding the safe handling of chemicals used at GERG's facilities. A reference file of MSDS is available to all personnel involved with these materials. All laboratory personnel should direct any questions regarding safety issues to their supervisors or the Safety Officer.

3.0 QUALITY CONTROL

3.1 Instrument Criteria

[e.g., vacuum level; GC/MS tune criteria, etc.]

3.2 Calibration Criteria

[e.g., within X% of true value; average RF= Z; RT shift = Y minutes, correlation coefficient = 0.9950, etc.]

3.3 Criteria for QC Samples for an Analytical Batch

[The following are some examples of QC criteria.]

3.3.1 Method Blank

3.3.1.1 Analyst discretion is used when contamination is present which does not adversely effect the overall analytical effort. When this occurs, a Sample Action Request form must be completed and approved before submitting related data to the client.

3.3.1.2 If major interferences for target analytes are present or if the target compounds are present in concentrations > 3 times the Method Detection Limit (MDL), the entire analytical batch must be re-extracted unless the sample(s) have concentrations > 10 times those found in the blank or the affected compound is not detected in the samples.

3.3.1.3 When target analytes are present in the method blank above the MDL, analytical data for those analytes in the samples must be flagged.

3.3.2 Surrogate Recovery

The surrogates used in each QC and field sample must meet QC recovery acceptance criteria, with the exception of samples affected by dilutions, matrix interferences, or advisory surrogates which are not used for quantitation.

3.3.2.1 Surrogate failure requires the re-extraction of a sample, except when four or more surrogates are used. One surrogate failure is allowed in this instance and the average recovery of those surrogates meeting the QC criteria for this sample may be used for calculations.

When this occurs, a Sample Action Request form must be completed and approved before submitting related data to the client.

3.3.2.2 When surrogate recoveries are impacted by matrix interferences or required dilutions as a result of high concentrations of analytes, the related analyte data should be flagged as estimated.

3.3.2.3 [Surrogates and recoveries specific to the analysis and matrix should be specified.]

3.3.3 Duplicates

Duplicate analyses evaluate both the actual sample homogeneity and the overall analytical system. RPD failure alone does not require re-extraction of the entire analytical batch.

3.3.1 The RPD is considered invalid and is not evaluated when results are less the 10 times the MDL.

3.3.2 The Relative Percent Difference between the original and its duplicate should not exceed 25 %.

[RPD is method specific; use appropriate % RPD.]

3.3.4 Matrix Spike and Matrix Spike Duplicate (MS/MSD)

Matrix spikes are used to evaluate sample homogeneity, potential effects of the sample matrix on analyte recovery, and the overall analytical system. Percent Recovery failure and/or RPD failure alone for the MS/MSD does not necessarily require re-extraction of the entire analytical batch.

3.3.4.1 [See Generic QA Manual or the QA Manager for additional information]

3.3.5 Standard Reference Material (SRM)

[Preferably, the recoveries of SRM are referred to as ±30% of the SRM range for the certified or consensus value of an analyte,

with no more the 35% of the analytes exceeding this criteria. The average value of the concentration range can also be used for % recovery determinations, but use of the MS/MSD or laboratory check sample is preferred.]

3.3.6 Laboratory Check Sample

[Usually applies to EPA methods; can be replaced with Laboratory Blank Spikes; see the Generic QA Manual.]

3.3.7 Laboratory Generated Quality Control

[Blank spikes, APAC, etc.; see the Generic QA Manual]

3.4 Analytical Criteria for Sample

[e.g., target compounds within RT window of ± B minutes; etc.]

4.0 CHROMATOGRAPHIC CONDITIONS

4.1 Analytical Column

5.0 DETECTOR CRITERIA

6.0 INSTRUMENT [TUNING AND/OR CALIBRATION] PROCEDURE

6.1 Tune (or Calibration) Procedure
6.2 Acceptance Criteria for tune [or calibration)

7.0 ANALYTICAL STANDARDS

(List of analytes, solution concentrations and amounts to be used for the surrogates, internal standards, recovery clean-up standards, matrix spikes, etc., for this procedure.)

8.0 REQUIRED SAMPLE DOCUMENTATION AND IDENTIFICATION

9.0 INJECTION PROCEDURE

10.0 CHROMATOGRAPHIC [INSTRUMENT] MAINTENANCE

xx.0 DOCUMENTATION REQUIRED FOR ANALYTICAL RESULTS [Last SOP Section]