

## APPENDIX D. QUALITY ASSURANCE RESULTS

The Data Quality Objectives (DQOs) used to evaluate the results of the SRWP monitoring effort are detailed in the Program's QAPP (SRWP 2006). These DQOs are the detailed quality control specifications for precision, accuracy, representativeness, comparability, and completeness. These DQOs are used as comparison criteria during data quality review to determine if the minimum requirements have been met and the data may be used as planned.

### Results of Field and Laboratory QC Analyses

Quality Control (QC) data are summarized in **Table 1** through **Table 8** and discussed below.

#### *Hold Times*

Results were evaluated for compliance with required preparation and analytical hold times. With the exceptions discussed below, all analyses met the target data quality objectives for hold times:

- One E. coli analysis was initiated after the allowable hold time.
- Fifteen total dissolved solids analyses were initiated after the allowable hold time.

#### *Method Detection Limits and Quantitation Limits*

Target Method Detection Limits (MDL) and Quantitation Limits (QL) were assessed for all parameters (**Table 1**). With the exceptions discussed below, all analyses met the target data quality objectives:

- The analytical MDL and QL for 20 total dissolved solids analyses were elevated above the DQOs because the samples required dilution for analysis. All sample results were greater than the elevated QL and were not adversely affected or qualified.
- The analytical MDL and QL for 37 total suspended solids analyses were elevated above the DQOs because the samples required dilution for analysis. All sample results were greater than the elevated QL and were not adversely affected or qualified.
- The analytical MDL (10 samples) and QL (14 samples) for a small number of sulfate (as SO<sub>4</sub>) analyses were elevated above the DQOs because the samples required dilution for analysis. All but one environmental sample result was greater than its associated QL, resulting in only one result requiring a J-flag qualifier.
- The analytical MDL for all ammonia analyses was elevated above the DQO. All sample results were non-detect at the elevated MDL (0.04 mg/L). Actual sample concentrations existing between the target Program MDL and the realized analytical MDL could not be quantified under the existing analytical conditions. However, all analytical QLs for ammonia were adequate to assess exceedances of relevant water quality objectives.
- The analytical MDL for 19 total Kjeldahl nitrogen analyses was elevated above the DQO. Most sample results were greater than the elevated MDL (0.08 mg/L) and were not adversely affected or qualified. However, 7 results were below detection at the

elevated MDL and one result required a J-flag qualifier for an estimated concentration between the elevated MDL and the Program QL.

- The analytical MDL for 99, nitrate-nitrite analyses was elevated above the DQO. Most sample results were greater than the elevated MDL (0.03 mg/L) and were not adversely affected or qualified. However, 17 results were non-detect at the elevated MDL and 23 results required a J-flag qualifier. All analytical QLs for nitrogen, nitrate-nitrite were adequate to access exceedances of relevant water quality objectives.
- The analytical QL for 31 orthophosphate (as P) analyses was elevated above the DQO. Of the 17 sample results that required a J-flag qualifier, only 3 contained orthophosphate (as P) concentrations above the SRWP target QL (0.05 mg/L) and the realized analytical QL (0.1 mg/L).
- The analytical MDL (16 samples) and QL (one sample) for a small number of total organic carbon analyses were elevated above the DQOs because the samples required dilution for analysis. All sample results were greater than their associated QLs and were not adversely affected or qualified.
- The analytical MDL and QL for all dicofol analyses were elevated above the DQOs. All environmental results were below detection.

### **Field Blanks**

Field blanks were collected and analyzed for E. coli, DOC, TOC, mercury, methylmercury, nutrients, and pesticides (**Table 2**). With the exceptions discussed below, analytes of interest were generally not detected in field blanks:

- Total kjeldahl nitrogen was detected above the MDL and below the QL in two field blank analyses. Two environmental results were qualified as *upper limit* due to potential contamination.
- Nitrogen, nitrate-nitrite was detected above the MDL in six field blank analyses. Three of these analyses measured nitrogen, nitrate-nitrite concentrations above the QL. Six environmental results were qualified as *upper limit* due to potential contamination. It should be noted that one field blank analysis was associated with a method blank analysis showing analytical contamination.
- Orthophosphate (as P) was detected above the QL in one field blank analysis. One environmental result was qualified as *upper limit* due to potential contamination.
- Total phosphorus (as P) was detected above the MDL in 13 field blank analyses. Ten of these analyses measured total phosphorus (as P) concentrations above the QL. Eleven environmental results were qualified as *upper limit* due to potential contamination.
- Organic carbon was detected above the MDL in 12 dissolved organic carbon field blank analyses. Five of these analyses measured organic carbon concentrations above the QL. Nine environmental results were qualified as *upper limit* due to potential contamination. It should be noted that one field blank analysis was associated with a method blank analysis showing analytical contamination.

- Methylmercury was detected above the MDL in five field blank analyses. One of these analyses measured methylmercury above the QL. Two environmental results were qualified as *upper limit* due to potential contamination.
- Mercury was detected above the MDL in six field blank analyses. Two of these analyses measured methylmercury concentrations above the QL. Two environmental results were qualified as *upper limit* due to potential contamination.

### **Field Duplicates**

Field duplicate samples were collected and analyzed for all parameters (**Table 3**). The data quality objective for field duplicates is a Relative Percent difference (RPD) not exceeding 25%. With the exceptions discussed below, all field replicates met this data quality objective. Each occurrence of a calculated RPD exceeding the DQO resulted in the qualification of a single environmental result as *estimated*.

- 12 total suspended solids results
- One turbidity result
- One sulfate (as SO<sub>4</sub>) result
- Six total kjeldahl nitrogen results
- 13, nitrate-nitrite (as N) results
- Two orthophosphate (as P) results
- Four total phosphorus (as P) results
- Three dissolved organic carbon results
- One total organic carbon result
- 12 methylmercury results
- Five mercury results
- Two EPA 507 pesticide results
- Two EPA 625m pesticide results

### **Method Blanks**

Method blanks were analyzed for TDS, TSS, DOC, TOC, turbidity, mercury, methylmercury, nutrients, sulfate (as SO<sub>4</sub>), ultraviolet absorption (at 254 nm) and pesticides (**Table 4**). The data quality objective for method blanks is no detectible concentrations of the analyte of interest. With the exceptions discussed below, all analyses met this data quality objective:

- Total suspended solids were detected above the MDL in one method blank analysis. Associated environmental results were either non-detect or had concentrations greater than five times the measured method blank concentration, and thus did not require qualification.
- Sulfate (as SO<sub>4</sub>) was detected above the MDL in 23 method blank analyses. All of the detected method blank results were below the QL. All associated environmental

results had concentrations greater than five times the concentration measured in the various method blanks, and thus did not require qualification.

- Nitrogen, nitrate-nitrite was detected above the MDL in 3 method blank analyses. All of the detected method blank results were below the QL. Eight environmental results were qualified as *upper limit* due to potential analytical contamination.
- Organic carbon was detected above the MDL in 3 dissolved organic carbon and 2 total organic carbon method blank analyses. All of the detected method blank results were below the QL. Ten environmental results were qualified as *upper limit* due to potential analytical contamination.
- Methylmercury was detected above the MDL in 8 methylmercury method blank analyses. All of the detected method blank results were below the QL. Eighteen environmental results were qualified as *upper limit* due to potential analytical contamination.

### **Laboratory Control Spikes**

Laboratory Control Spike (LCS) recoveries were analyzed for TDS, TSS, DOC, TOC, turbidity, mercury, methylmercury, nutrients, sulfate (as SO<sub>4</sub>), and pesticides (**Table 5**). The data quality objective for Laboratory Control Spikes (LCS) is 80-120% recovery of the analytes of interest for most analytes. The data quality objectives for LCS recoveries of pesticides vary by analyte and are based on the standard deviation of actual recoveries for the method. The data quality objective for LCS duplicates is a Relative Percent Difference (RPD) not exceeding 20%. With the exceptions discussed below, all LCS recovery and LCS RPD analyses met data quality objectives:

- The result of one LCS analyses for pesticides by EPA 507 was greater than the maximum acceptable recovery DQO. This LCS analysis for thiobencarb resulted in two environmental results being qualified as *high biased*.
- The results of two LCS analyses for carbamate pesticides (chloroxuron and oryzalin) by EPA 8321A were greater than the maximum acceptable recovery DQO. Because all associated environmental sample results were below detection, no environmental results were qualified. Additionally, the results of four LCS analyses for mexacarbate by EPA 8321A were lower than the minimum acceptable recovery DQO. Twelve environmental data were qualified as *low biased* on this basis.

### **Laboratory Duplicates**

Laboratory Duplicates were analyzed for TDS, TSS, turbidity, ultraviolet absorption (at 254 nm) and pesticides (**Table 6**). The data quality objective for laboratory duplicates is a Relative Percent Difference (RPD) not exceeding 20%. With the exceptions discussed below, all laboratory duplicate analyses met this data quality objective:

- The RPD for 4 pair of Laboratory Duplicate analyses for pesticides by EPA 625m were greater than the DQO. The 4 associated environmental sample results were qualified as *estimated*.

**Matrix Spikes and Matrix Spike Duplicates**

Matrix Spikes and Matrix Spike Duplicates were analyzed for DOC, TOC, mercury, methylmercury, nutrients, sulfate (as SO<sub>4</sub>), and pesticides (**Tables 7 and 8**). The data quality objective for matrix spikes is 80-120% recovery of most analytes of interest. The data quality objective for matrix spike recoveries of pesticides varies for each analyte or surrogate and is based on the standard deviation of actual recoveries for the method. The data quality objective for matrix spike duplicates is a Relative Percent difference (RPD) not exceeding 25%. With the exceptions discussed below, all analyses met these data quality objectives:

- Matrix Spike recoveries for 30 sulfate (as SO<sub>4</sub>) analyses were above the DQO. Because these 30 analyses were performed in non-SRWP matrices, no environmental data required qualification.
- Matrix Spike recoveries for 2 ammonia (as N) analyses were below the DQO. Because these 2 analyses were performed on non-SRWP matrices, no environmental data required qualification.
- Matrix Spike recoveries for 9 total kjeldahl nitrogen analyses fell either below or above the DQO. Because these 9 analyses were performed in non-SRWP matrices, no environmental data required qualification.
- Matrix Spike recoveries for 8 nitrogen, nitrate-nitrite analyses fell either below or above the DQO. Because these 8 analyses were performed in non-SRWP matrices, no environmental data required qualification.
- Matrix Spike recoveries for 1 orthophosphate (as P) analysis was above the DQO. Because the associated environmental result as non-detect, no qualification was necessary.
- Matrix Spike recoveries for 6 total phosphorus (as P) analyses were below the DQO. Because these 6 analyses were performed in non-SRWP matrices, no environmental data required qualification.
- Matrix Spike recoveries for 8 methylmercury analyses fell either below or above the DQO. Because these 8 analyses were performed in non-SRWP matrices, no environmental data required qualification.
- Matrix Spike recoveries for 6 mercury analyses fell either below or above the DQO. This resulted in the qualification of one environmental result as *high biased*.
- Matrix Spike recoveries for 13 pesticide analyses by EPA 625m were below the DQO. This resulted in qualification of three environmental results as *low biased*.
- Matrix Spike recoveries for three pesticide analyses by EPA 8321A were above the DQO. Because the associated environmental results were below detection, no environmental data required qualification. Additionally, Matrix Spike recoveries for six pesticide analyses by EPA 8321A were below the DQO. This resulted in qualification of two environmental results as *low biased*.
- The RPD for 1 pair of Matrix Spike Duplicate analyses for sulfate (as SO<sub>4</sub>) was greater than the DQO. Because the analysis was performed in a non-SRWP matrix, no environmental data required qualification.

- The RPD for 1 pair of Matrix Spike Duplicate analyses for total kjeldahl nitrogen was greater than the DQO. Because the analysis was performed in a non-SRWP matrix, no environmental data required qualification.
- The RPD for 1 pair of Matrix Spike Duplicate analyses for nitrogen, nitrate-nitrite was greater than the DQO. Because the analysis was performed in a non-SRWP matrix, no environmental data required qualification.
- The RPD for 6 pair of Matrix Spike Duplicate analyses for methylmercury were greater than the DQO. Because these 6 analyses were performed in non-SRWP matrices, no environmental data required qualification.
- The RPD for 14 pair of Matrix Spike Duplicate analyses for pesticides by EPA 625m were greater than the DQO. Seven associated environmental sample results were qualified as *estimated*. However, all associated environmental results were below detection, thus making the estimated qualification inconsequential.
- The RPD for 17 pair of Matrix Spike Duplicate analyses for carbamate pesticides by EPA 8321A was greater than the DQO. The 17 associated environmental sample results were qualified as *estimated*. However, all associated environmental results were below detection, thus making the estimated qualification inconsequential.

### **Surrogate Recoveries**

Surrogate recoveries were analyzed for organophosphorus and carbamate pesticides in environmental as well as field and laboratory QC analyses, including surrogate recoveries in field blanks, field duplicates, method blanks, laboratory control spikes, matrix spikes and matrix spike duplicates. The data quality objectives (DQOs) for surrogate recoveries of pesticides vary by surrogate and are based on the standard deviation of actual recoveries for the method. With the exceptions discussed below surrogate recovery analyses met data quality objectives:

- The results of two environmental sample surrogate recovery analyses for pesticides by EPA 507 were greater than the maximum acceptable recovery DQO. Because the recoveries for two additional surrogate compounds added to each of these two samples were in control, no corrective actions were taken and no environmental samples required qualification.
- The result of one field blank surrogate recovery analyses for pesticides by EPA 625m was greater than the maximum acceptable recovery DQO. Because the recoveries for two additional surrogate compounds added to the field blank sample were in control, no corrective actions were taken and no environmental samples required qualification.
- The results of four environmental sample surrogate recovery analyses for carbamate pesticides by EPA 8321A were greater than the maximum acceptable recovery DQO. Because the recoveries for two additional surrogate compounds added to each of these four samples were in control, no corrective actions were taken and no environmental samples required qualification.
- The results of two surrogate recovery analyses from a single environmental sample for carbamate pesticides by EPA 8321A were greater than the maximum acceptable recovery DQO. Because a third surrogate compound recovery in the sample was in

control and all analytes evaluated in the sample were below detection, no corrective actions were taken and the environmental sample did not require qualification.

- The result of one field blank surrogate recovery analysis for carbamate pesticides by EPA 8321A was greater than the maximum acceptable recovery DQO. Because the recoveries for two additional surrogate compounds added to the field blank sample were in control, no corrective actions were taken and no environmental samples required qualification.
- The result of one matrix spike duplicate surrogate recovery analysis for carbamate pesticides by EPA 8321A was greater than the maximum acceptable recovery DQO. Recoveries for two additional surrogate compounds added to the same matrix spike duplicate sample were in control. Target compound recoveries in the matrix spike duplicate sample were in control with the exception of a single high recovery for aminocarb. No corrective measures were taken and no environmental samples required qualification.

### Completeness

The objectives for completeness are intended to apply to the monitoring program as a whole. Of the 234 initial water column samples planned by the SRWP, all 234 were collected and all collected samples were analyzed, for an overall sampling and analysis success rate of 100%. Additional follow-up samples were also collected and analyzed at several locations.

### Summary of Precision and Accuracy

Based on the QC data for the monitoring discussed above, the precision and accuracy of the majority of monitoring results meet the DQOs and there were no systematic sampling or analytical problems. These data are adequate for the purposes of the SRWP's monitoring program and few results required qualification. Of the 191 total qualified data, 68 results were qualified as *estimated* due to high variability in lab or field replicate analyses, 24 results were qualified as *estimated* due to high variability in matrix spike recovery analyses, 16 results were qualified as *estimated* based on holding time exceedances, 20 results were qualified as *high biased* or *low biased*, and 69 results were potentially affected by contamination and qualified as *upper limits*. Of the results qualified as *upper limits*, 17 were below the QL, and none of the data qualified as *upper limits* were exceedances of water quality objectives. Of the 12,837 analytical results generated from April 2006 – August 2007, 191 results required qualification, resulting in 98.5% valid and unqualified data with no restrictions on use.

**Table 1. Summary of Field Blank Quality Control Sample Evaluations for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	Data Quality Objective	Number of Analyses	Number Passing	% Success
EPA 350.2	Ammonia, as N	< MDL	1	1	100%
EPA 351.3	Total Kjeldahl Nitrogen	< MDL	16	14	88%
EPA 353.2	Nitrogen, Nitrate-Nitrite	< MDL	16	10	63%
EPA 365.2	Total Phosphorus (as P)	< MDL	15	2	13%
EPA 365.2 (filtered)	Orthophosphate (as P)	< MDL	17	16	94%
EPA 415.1	Total Organic Carbon	< MDL	4	4	100%
EPA 415.1	Dissolved Organic Carbon	< MDL	14	2	14%
EPA 1630	Methylmercury	< MDL	20	15	75%
EPA 1631E	Mercury	< MDL	20	14	70%
EPA 507	Molinate & Thiobencarb	< MDL	4	4	100%
EPA 625m	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	< MDL	726	726	100%
EPA 8321A	Carbamate and Urea Pesticides	< MDL	350	350	100%
SM20-9223	E. coli	< MDL	17	17	100%
<b>Totals</b>			<b>1220</b>	<b>1175</b>	<b>96%</b>



**Table 2. Summary of Field Duplicate Quality Control Sample Results for SRWP Monitoring: April 2006 – August 2007**

Method		Data Quality Objective	Number Analyses	Number Passing	% Success
EPA 160.1	Total Dissolved Solids	RPD $\leq$ 25%	17	17	100%
EPA 160.2	Total Suspended Solids	RPD $\leq$ 25%	23	11	48%
EPA 180.1	Turbidity	RPD $\leq$ 25%	17	16	94%
EPA 300.0	Sulfate (as SO <sub>4</sub> )	RPD $\leq$ 25%	13	12	92%
EPA 350.2	Ammonia as N	RPD $\leq$ 25%	1	1	100%
EPA 351.3	Total Kjeldahl Nitrogen	RPD $\leq$ 25%	18	12	67%
EPA 353.2	Nitrogen, Nitrate-Nitrite	RPD $\leq$ 25%	18	5	28%
EPA 365.2	Total Phosphorus (as P)	RPD $\leq$ 25%	18	14	78%
EPA 365.2 (filtered)	Orthophosphate (as P)	RPD $\leq$ 25%	17	15	88%
EPA 415.1	Total Organic Carbon	RPD $\leq$ 25%	4	3	75%
EPA 415.1	Dissolved Organic Carbon	RPD $\leq$ 25%	16	13	81%
EPA 1630	Methylmercury	RPD $\leq$ 25%	21	9	43%
EPA 1631E	Mercury	RPD $\leq$ 25%	21	16	76%
EPA 507	Molinate & Thiobencarb	RPD $\leq$ 25%	4	2	50%
EPA 625m	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	RPD $\leq$ 25%	655	653	99.7%
EPA 8321A	Carbamate and Urea Pesticides	RPD $\leq$ 25%	275	275	100%
SM20-5910B	Ultraviolet Absorption (254 nm)	RPD $\leq$ 25%	15	15	100%
Toxicity tests	Ceriodaphnia, Selenastrum, Hyalella	RPD $\leq$ 25%	18	18	100%
<b>Totals</b>			<b>1156</b>	<b>1092</b>	<b>94.5%</b>

**Table 3. Summary of Method Blank Results for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	Data Quality Objective	Number of Analyses	Number Passing	% Success
EPA 160.1	Total Dissolved Solids	< MDL	40	40	100%
EPA 160.2	Total Suspended Solids	< MDL	46	45	98%
EPA 180.1	Turbidity	< MDL	20	20	100%
EPA 300.0	Sulfate (as SO <sub>4</sub> )	< MDL	31	8	26%
EPA 350.2	Ammonia as N	< MDL	3	3	100%
EPA 351.3	Total Kjeldahl Nitrogen	< MDL	42	42	100%
EPA 353.2	Nitrogen, Nitrate-Nitrite	< MDL	29	26	90%
EPA 365.2	Total Phosphorus (as P)	< MDL	30	30	100%
EPA 365.2 (filtered)	Orthophosphate (as P)	< MDL	34	34	100%
EPA 415.1	Total Organic Carbon	< MDL	42	40	95%
EPA 415.1	Dissolved Organic Carbon	< MDL	41	38	93%
EPA 1630	Methylmercury	< MDL	71	63	89%
EPA 1631E	Mercury	< MDL	61	61	100%
EPA 507	Molinate & Thiobencarb	< MDL	4	4	100%
EPA 625(m)	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	< MDL	866	866	100%
EPA 8321A	Carbamate and Urea Pesticides	< MDL	400	400	100%
SM20-9223	E. coli	< MDL	31	31	100%
<b>Totals</b>			<b>1791</b>	<b>1751</b>	<b>97.8%</b>

**Table 4. Summary of Lab Control Spike Results for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 160.1	Total Dissolved Solids	80-120%	40	40	100%
EPA 160.2	Total Suspended Solids	80-120%	46	46	100%
EPA 180.1	Turbidity	80-120%	28	28	100%
EPA 300.0	Sulfate (as SO <sub>4</sub> )	80-120%	31	31	100%
EPA 350.2	Ammonia as N	80-120%	3	3	100%
EPA 351.3	Total Kjeldahl Nitrogen	80-120%	42	42	100%
EPA 353.2	Nitrogen, Nitrate-Nitrite	80-120%	29	29	100%
EPA 365.2	Total Phosphorus (as P)	80-120%	32	32	100%
EPA 365.2 (filtered)	Orthophosphate (as P)	80-120%	34	34	100%
EPA 415.1	Total Organic Carbon	80-120%	43	43	100%
EPA 415.1	Dissolved Organic Carbon	80-120%	42	42	100%
EPA 1630	Methylmercury	67-133%	71	71	100%
EPA 1631E	Mercury	80-120%	61	61	100%
EPA 507	Molinate & Thiobencarb	(1)	4	3	75%
EPA 8321A	Carbamate Pesticides	(1)	425	419	99%
<b>Totals</b>			<b>891</b>	<b>884</b>	<b>99%</b>

1. Data Quality Objectives for pesticide LCS recoveries vary by parameter and are based on 3x the standard deviation of the lab's actual recoveries for each parameter.

**Table 5. Summary of Surrogate Recovery Results for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	Data Quality Objective	Number of Analyses	Number Passing	% Success
EPA 507	Molinate & Thiobencarb	(1)	16	14	88%
EPA 625(m)	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	(1)	936	934	99.8%
EPA 8321A	Carbamate and Urea Pesticides	(1)	204	197	97%
<b>Totals</b>			<b>1156</b>	<b>1145</b>	<b>99%</b>

Note:

1. Data Quality Objectives for pesticide Surrogate recoveries vary by parameter and are based on 3x the standard deviation of the lab's actual recoveries for each parameter.

**Table 6. Summary of Lab Duplicate Results for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	Data Quality Objective	Number of Pairs Analysed	Number Passing	% Success
EPA 160.1	Total Dissolved Solids	≤20% RPD	25	25	100%
EPA 160.2	Total Suspended Solids	≤20% RPD	44	44	100%
EPA 180.1	Turbidity	≤20% RPD	27	27	100%
EPA 625(m)	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	≤20% RPD	731	727	99.5%
SM20-5910B	Ultraviolet Absorption (254 nm)	≤20% RPD	31	31	100%
<b>Totals</b>			<b>858</b>	<b>854</b>	<b>99.5%</b>

**Table 7. Summary of Matrix Spike Recovery Results for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	Data Quality Objective	Number of Analyses	Number Passing	% Success
EPA 300.0	Sulfate (as SO <sub>4</sub> )	90-110% (2)	60	30	50%
EPA 350.2	Ammonia as N	80-120% (2)	6	4	67%
EPA 351.3	Total Kjeldahl Nitrogen	80-120% (2)	84	75	89%
EPA 353.2	Nitrogen, Nitrate-Nitrite	80-120% (2)	46	38	83%
EPA 365.2	Total Phosphorus (as P)	80-120% (2)	56	52	90%
EPA 365.2 (filtered)	Orthophosphate (as P)	80-120%	38	37	97%
EPA 415.1	Total Organic Carbon	80-120%	64	64	100%
EPA 415.1	Dissolved Organic Carbon	80-120%	62	62	100%
EPA 1630	Methylmercury	65-135% (2)	114	106	93%
EPA 1631E	Mercury	71-125%	114	108	95%
EPA 625(m)	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	(1)	1240	1227	99%
EPA 8321A	Carbamate and Urea Pesticides	(1)	600	591	99%
<b>Totals</b>			<b>2486</b>	<b>2394</b>	<b>96.3%</b>

Note:

1. Data Quality Objectives for pesticide matrix spike recoveries vary by parameter and are based on 3x the standard deviation of the lab's actual recoveries for each parameter.
2. All matrix spikes with recoveries outside of the DQO were in non-SRWP matrices.

**Table 8. Summary of Matrix Spike Duplicate Precision Results for SRWP Monitoring: April 2006 – August 2007**

Method	Analyte	Data Quality Objective	Number of Pairs Analyzed	Number Passing	% Success
EPA 300.0	Sulfate (as SO <sub>4</sub> )	≤25% RPD (1)	30	29	97%
EPA 350.2	Ammonia as N	≤25% RPD	3	3	100%
EPA 351.3	Total Kjeldahl Nitrogen	≤25% RPD (1)	42	41	98%
EPA 353.2	Nitrogen, Nitrate-Nitrite	≤25% RPD (1)	23	22	96%
EPA 365.2	Total Phosphorus (as P)	≤25% RPD	29	29	100%
EPA 365.2 (filtered)	Orthophosphate (as P)	≤25% RPD	19	19	100%
EPA 415.1	Total Organic Carbon	≤25% RPD	32	32	100%
EPA 415.1	Dissolved Organic Carbon	≤25% RPD	31	31	100%
EPA 1630	Methylmercury	≤25% RPD (1)	57	51	89%
EPA 1631E	Mercury	≤25% RPD	57	57	100%
EPA 625(m)	Organophosphorus, Organochlorine, Triazine, and Pyrethroid Pesticides	≤25% RPD	620	606	97.7%
EPA 8321	Carbamate and Urea Pesticides	≤25% RPD	300	283	94%
<b>Totals</b>			<b>1243</b>	<b>1203</b>	<b>97%</b>