



**MEMORANDUM**

**TO:** Ron Jordan, EPA

**FROM:** TJ Finseth, ERG

**DATE:** 24 July 2008

**SUBJECT: Meeting between EPA and UWAG on April 10, 2008:  
Draft Summary of Discussion**

EPA and ERG participated in a meeting with the Utility Water Act Group (UWAG) on April 10, 2008 to discuss and compare FGD effluent analytical results from the steam electric sampling episodes conducted in the summer/fall of 2007. Attachment 1 lists the attendees at the meeting.

This memorandum summarizes the meeting discussion points. The agenda for the meeting is presented in Attachment 2.

While EPA and UWAG shared their respective effluent data from the sampling episodes for discussion purposes during this meeting, both EPA and UWAG retained their respective data. Therefore, neither the EPA data nor the UWAG data are included as attachments to these notes. EPA data for each sampling episode can be found in the site specific sampling episode reports.

**Opening Remarks**

- Ron Jordan welcomed UWAG and explained that the purpose of the meeting was to discuss the sampling program analytical results for FGD effluent samples. Ron stated that he would also like to discuss any interferences observed during the analyses and how the laboratories dealt with interferences. Ron reiterated that the meeting was only to discuss the FGD effluent sample results.
- Donna Hill, UWAG, stated that she would like to compare the EPA and UWAG results to determine if the analytical results are significantly different. Donna stated that she would also like to discuss the problems associated with analyzing the matrix and the limitations of the methods.
- Kristy Bulleit, UWAG, also noted that they would appreciate understanding what EPA is planning next for the study and the schedule for the ELG Program Plans.

**Analytical Summary**

- EPA provided UWAG with a table identifying the analytical methods used to analyze EPA's samples collected during the sampling episodes. This handout is presented in Attachment 3.



- UWAG asked which laboratories performed the analyses for each of the methods presented in Attachment 3. EPA stated that ProChem Analytical performed the analyses for all of the classical parameters, as well as routine hexavalent chromium by ASTM D1687-92 and the routine metals by 200.7 and 245.1. EPA stated that Battelle Marine Sciences performed the analysis for all of the low-level metals (methods 1631, 1636, and 1638).
- EPA then provided UWAG with a summary describing the qualifications identified by EPA during the data review. This handout is presented in Attachment 4. ERG provided a description of the analytical summary and the data qualifications and responded to questions to clarify the information presented.
- CSC stated that the criteria used during the data review for the matrix spike/matrix spike duplicate (MS/MSD) percent recoveries was based on the method acceptance criteria presented in the method; however, if a method or specific analyte did not have a specified criteria, then a range of 75 – 125 percent was used as the criteria. CSC stated that Methods 200.7 and 245.1 do not have criteria; however, most of the metals covered by Method 1638 do have criteria, with the exception of arsenic and chromium.
- UWAG asked how many dilutions were performed. EPA stated that dilutions were performed, but they varied by sample and EPA did not have that information on hand during this meeting. CSC stated that the dilutions were typically 1:10 or 1:20 (not on the order of 1:1,000 dilutions). CSC stated that the laboratories had to deal with the high concentrations and interferences.
- CSC stated that the EPA laboratories did not use a dynamic reaction cell (DRC) or a collision cell for the analysis of the metals.
- ERG confirmed that J-Values presented in Table 1 of Attachment 4, are a subset of the number of results less than the reporting limit.
- UWAG stated which laboratories performed the analyses for their samples:
  - Aqua-Tech: classicals and routine hexavalent chromium;
  - Trace Element Research Laboratory (TERL): routine metals (200.7) for all episodes except Mitchell and Cardinal;
  - Analytical Resources, Inc. (ARI): routine metals (200.7) for Mitchell and Cardinal episodes;
  - Brooks Rand: low-level metals (1638); and
  - Albion Environmental: low-level and routine mercury (1631E and 245.1).
- UWAG noted that low-level hexavalent chromium was not analyzed because hexavalent chromium was never detected during the routine analysis.

- UWAG stated that they performed a three-step validation process:
  - 1) Demonstration of analytical control: UWAG verified that the laboratories followed the method-specified calibration checks and method blanks.
  - 2) Verification of the data concentrations compared to the method detection limit (MDL) and reporting limit (RL): UWAG used the same qualifiers as the EPA for the U-flag (sample result <MDL) and the J-flag (sample result >MDL, but <RL). UWAG stated that the MDLs were developed based on a dilute acid matrix. UWAG also developed a Q-flag, which is a quantitation limit based on two times the RL, which is based on an MDL study of spiked sea water.
  - 3) MS/MSD percent recovery acceptance criteria of 75 -125 percent: UWAG stated that they felt the method acceptance criteria for the 1638 methods was too loose; therefore, they chose to use 75 – 125 percent as the recovery acceptance criteria for all metals. UWAG also used a 20% relative standard deviation (RSD) for all method and digestion duplicates. UWAG stated that a duplicate analysis was performed from the same bottle for every sample.
- UWAG stated that they only performed the MS/MSD analyses for the total recoverable metals. UWAG stated that if the total result was flagged for the MS/MSD result being outside the acceptance criteria, then the dissolved result was also flagged.
- UWAG stated that the laboratories had particular issues with the silver and barium analyses because of interferences. UWAG stated that silver had chloride interferences and barium had sulfite interferences.
- UWAG stated that they used an E-flag for all samples that were analyzed after the analytical holding time.
- UWAG stated that one lesson they learned during the sampling was that the spiking levels should be determined after the results were scanned. For the first episode, Brooks Rand did not scan the samples before determining the spike levels and found that several of the spike levels fell outside the range for acceptable analyses. Therefore, for the later episodes, Brooks Rand scanned the samples first and then determined the spike level. UWAG stated that they used a spike level of one to five times the sample result. UWAG stated that if the spike level used for the MS/MSD analysis did not fall in the range of one to five times the sample result, then the data were qualified with an I-flag. UWAG stated that they made an exception for spikes that were not possible (e.g, calcium, sulfate) and the exception was based on the dilution test in 200.7.
- EPA stated that they did not have the laboratories scan the sample before determining the spike level. CSC stated that the spike levels used for the analysis were typically in the middle of the calibration curve and were in the range of one to five times the sample result.

- UWAG stated that Brooks Rand performs the 1638 analysis for 21 elements and that the laboratory used the DRC technique for the analysis of arsenic and selenium in every sample. UWAG stated that they wanted the laboratory to use the DRC for more of the metals, because UWAG believes it reduces the interferences encountered in the analysis; however, the laboratory was not comfortable using it for other metals.
- UWAG stated that they performed an analysis of DRC results to non-DRC results for arsenic and selenium, and they did not see a significant difference in the results. UWAG stated that the DRC uses rhodium as the internal standard, oxygen as the reaction gas, and a 50-fold dilution.

### Data Review

- UWAG stated that the samples collected from Big Bend were the most difficult to analyze because of the high TDS levels. UWAG noted that high TDS levels limit the ICP-MS analysis. UWAG stated that the TDS and chloride levels are dependent on the recycle of the slurry in the scrubber. For example, samples from Widows Creek had the lowest TDS levels because they operate once-through scrubber systems.
- UWAG provided a handout that compared the metal analytical results for each analyte by the routine and low-level metals and for each of the different sampling episodes. This handout is not provided in these notes because it was draft for discussion purposes only.
- UWAG stated that TERL, the laboratory performing the routine metals analysis, is a research type laboratory and took a lot of time analyzing the samples, but still produced a lot of U- and J-flagged results. UWAG stated that when ARI, a commercial laboratory, analyzed the routine metals for Mitchell, almost all of the results were flagged with either a U or J.
- UWAG stated that the large dilutions that are required for this matrix magnify the variability between the two methods. Further, the samples are like seawater samples containing higher levels of other analytes that can cause interferences. UWAG stated that because there is “so much” in the samples, it is hard to control the matrices.
- EPA and UWAG exchanged FGD effluent data sets for each of the sampling episodes and compared the results. The data sets are not provided in these notes because they were draft results for discussion purposes only.
- UWAG asked EPA if they might cut out some of the analytes from the analyses. EPA stated that they are not considering it at this time. UWAG stated that EPRI is performing some methods development work and they would like to focus the analyses on a limited number of analytes.

- UWAG stated that the low-level dissolved mercury results for the samples filtered on site compared to the laboratory-filtered samples were significantly different for the Big Bend sampling episode. UWAG stated that the two Big Bend results had a relative percent difference (RPD) greater than 100 percent.
- UWAG stated that they performed a round robin analysis of the FGD effluent results for each sampling episode. During the sample collection, UWAG collected a large volume of sample and then split the large volume and sent it to different laboratories. UWAG compared the results from the various laboratories to determine the variability in the analytical results. Some of the laboratories included in the round robin were Consol, CH2M HILL, Brooks Rand, Albion Environmental, and Frontier Geosciences.
- To determine if the results were in general agreement, UWAG determined the RSD between the samples and if the RSD was less than 25%, then the samples were in consensus. UWAG noted that U- and R-flagged data were not included in the calculation of the RSD.
- UWAG provided EPA with a handout showing the results of the round robin for each sampling episode. The results of the round robin varied episode by episode. UWAG noted that the results for CH2M HILL were not good (in comparison to the other laboratories) for the first couple of episodes, but improved for the last two episodes.
- UWAG noted that the round robin for the Big Bend sampling episode was not taken from a large volume, but rather from several bottles taken in sequence.
- UWAG stated that they performed a point-by-point validation for the round robin analyses, which has been fully documented. (Note: No data or other documentation was provided to EPA.)

#### **Improving Laboratory Analysis for FGD Wastewater Matrix**

- UWAG stated that they feel neither 1638 nor 200.7 are good methods for this matrix. UWAG stated they especially have concerns regarding the ability of commercial laboratories to appropriately perform the 200.7 analysis. At the same time, however, Albion stated that Method 200.7 has the potential to be a good, robust method. Albion suggests that the laboratories perform recalibrations and drift corrections prior to analyzing the samples. Albion also stated that multiple wavelengths can be used to evaluate the matrix, and that corrections can be made using calculations.
- Albion stated that there are concerns that using DBA and other additives in the scrubber may create selenium compounds that cause issues with the analysis of the wastewater. (Note: No examples or data were provided to EPA.)

- Albion stated that the ICP/MS tends to overestimate the sample result. In addition, Albion stated that the MS/MSD might not show all the interferences with the analysis. Albion gave an example where a mass element cannot be digested and is seen in both the original analysis and the MS/MSD analysis. In this instance, the result is overestimated, but the MS/MSD doesn't show any issues with the analysis. (Note: No examples or data were provided to support the assertions.)
- Albion stated that with two different methods providing different analytical results, a third independent method is needed to verify which of the analytical results is more accurate.
- Albion stated that preconcentration techniques could be used to improve the analysis of certain elements or certain methods. However, Albion stated that preconcentration techniques do not work for all elements and that other approaches may work better for other elements.
- EPA asked if many of Albion's suggestions are items that are already included in the methods. Albion stated that they were, but that the laboratories may not be utilizing them.
- UWAG stated that attention to detail is needed when analyzing these samples and they expressed concern that commercial laboratories may not take the time or effort to perform the analyses correctly or with enough detail to produce accurate results.
- Albion stated that some of the corrections to the methods are specific to the analyte of interest. Therefore, UWAG would like to focus the methods development work on a shorter list of analytes than the 27 metals EPA is currently analyzing.

### **EPRI Methods Development and Treatment Technology Study**

- UWAG stated that EPRI is evaluating treatment technologies for FGD wastewater and are, therefore, also looking at methods development work (particularly for mercury, arsenic, selenium, and five other analytes). EPRI is currently focused on selenium and a few other elements. UWAG stated that the project will look at both influent and effluent FGD wastewater samples and will look at 10 different control technologies:
  - Iron cementation (laboratory scale);
  - Biological system – GE ABMet® (currently pilot scale, but full scale coming soon);
  - Nalco polymeric chelate (laboratory scale);
  - Wetlands (surface flow – full scale; vertical flow – pilot scale);
  - Taconite tailings (laboratory scale);

- Sorption;
  - Nano-scale iron reagents (laboratory scale);
  - Organo-sulfide precipitation (full scale);
  - Filtration (mercury in colloidal); and
  - Ion exchange.
- UWAG stated that Southern Company is also looking at a non-biological Chiyoda treatment technology for the removal of selenium. They are currently conducting a pilot-scale test.
  - UWAG stated that the EPRI testing will continue over the next couple of years. Two performance tests are scheduled to be conducted at two plants this year.

### **EPA Detailed Study Plans**

- EPA stated that they plan to sample at least one more plant, but ideally they would sample two more plants. EPA stated that they may be able to complete sampling at one plant this fiscal year, and then hopefully would sample at a second plant next fiscal year.
- EPA stated that the soonest the sampling could occur would be in three months.
- Albion suggested that a methods deviation task could be incorporated into the next episode, focusing on arsenic and selenium.
- EPA would also like to complete more site visits to observe other types of facilities that haven't been the focus of the detailed study.

1. The purpose of this meeting is to discuss the proposed changes to the...  
2. The meeting is open to all interested parties...

3. The meeting will be held on...  
4. The meeting will be held at...

5. The meeting will be held at...  
6. The meeting will be held at...

7. Proposed Agenda

8. The meeting will be held at...  
9. The meeting will be held at...  
10. The meeting will be held at...

**Attachment 1  
List of Attendees**

11. The meeting will be held at...  
12. The meeting will be held at...  
13. The meeting will be held at...

List of Attendees at the Meeting on April 10, 2008

Name	Organization (Representing)	Telephone	E-mail
Paul Boothe	Albion Environmental	(972) 268 2677	pboothe@albionenv.com
Kristy Bulleit	Hunton & Williams (UWAG)	(202) 955 1547	kbulleit@hunton.com
Liz Aldridge	Hunton & Williams (UWAG)	(804) 788 8549	ealdridge@hunton.com
Donna Hill	Southern Company (UWAG)	(205) 257 5234	dbhill@southernco.com
Lindy Johnson	Tennessee Valley Authority (UWAG)	(423) 751 3361	lpjohnson@tva.gov
Ron Jordan	EPA/Office of Water	(202) 566 1003	jordan.ronald@epa.gov
Josh Hall	EPA/Office of Water	(202) 566 1002	hall.josh@epa.gov
Jan Goodwin	EPA/Office of Water	(202) 566 1060	goodwin.janet@epa.gov
Lemuel Walker	EPA/Office of Water	(202) 566 1077	walker.lemuel@epa.gov
Rob Stachowiak	EPA/Office of General Counsel	(202) 564 0580	stachowiak.robert@epa.gov
Deb Bartram	ERG (Contractor to EPA)	(703) 633 1669	deborah.bartram@erg.com
T.J. Finseth	ERG (Contractor to EPA)	(703) 994 7130	thomas.finseth@erg.com
Barbara Beard	Computer Sciences Corporation (Contractor to EPA)	(703) 461 2154	bbeard2@csc.com
Chip McCarty	Computer Sciences Corporation (Contractor to EPA)	(703) 461 2392	hmccarty@csc.com

**Attachment 2**  
**Agenda for EPA-UWAG FGD Effluent Sampling Data Meeting**

**EPA-UWAG FGD Effluent Sampling Data Meeting  
April 10, 2008**

**EPA West Building  
Rio Grande Conference Room (6231F)  
1:00-5:00 PM**

**AGENDA**

1. Preliminaries
  - Introductions
  - Purpose of the meeting
2. Review of analytical methods used (including method modifications)
3. Analytical summary (including data qualifications)
4. Improving laboratory analyses for this matrix (e.g. DRC/CRC, info to provide labs to improve)
5. Review of EPA & UWAG FGD effluent sampling data
  - a. Big Bend (FGD effluent)
  - b. Homer City (FGD effluent)
  - c. Mitchell (FGD effluent)
  - d. Widows Creek (FGD effluent)
6. Other Topics
  - a. EPA Plans for additional sampling (Pleasant Prairie?) & site visits
  - b. Industry Plans for evaluating treatment technologies & analytical methods
  - c. Form 2C project update

EPRI Steam Electric Sampling Data Meeting  
April 10, 2008

EPRI 5600 Building  
1111 Century Center East, Room 4031B  
1000 S. 10th St.

AGENDA

8:00 AM  
Registration  
8:30 AM  
Start of the meeting

9:00 AM  
Review of analytical methods used including field measurements

10:00 AM  
Review of analytical methods used including lab measurements

11:00 AM  
Review of analytical methods used including lab measurements

### Attachment 3

## Analytical Methods Used by EPA for the Steam Electric Sampling Program

1. EPA Method 8260  
2. EPA Method 8210  
3. EPA Method 8215  
4. EPA Method 8211

5. EPA Method 8212  
6. EPA Method 8213  
7. EPA Method 8214  
8. EPA Method 8216

### Analytical Methods Used by EPA for the Steam Electric Sampling Program

Method Number	Parameter	Method Type
<b>Classicals</b>		
SM 5210 B	Biochemical Oxygen Demand (BOD <sub>5</sub> )	Probe
SM 2540 D	Total Suspended Solids (TSS)	Gravimetric
SM 2540 C	Total Dissolved Solids (TDS)	Gravimetric
ASTM D516-90	Sulfate	Turbidimetric
SM 4500-Cl-C	Chloride	Titrimetric, mercuric nitrate
SM 4500-NH <sub>3</sub> F (18th ed.)	Ammonia as Nitrogen	Distillation, potentiometric
SM 4500-NO <sub>3</sub> H	Nitrate/Nitrite as Nitrogen <sup>1</sup>	Autoanalyzer
SM 4500-N, C	Total Kjeldahl Nitrogen (TKN)	Digestion, distillation, potentiometric
EPA 365.3 (Rev 1978)	Total phosphorus	Digestion, spectrophotometric
EPA 1664A	Hexane Extractable Material (HEM)	Gravimetric
EPA 1664A	Silica Gel Treated Hexane Extractable Material (SGT-HEM)	Gravimetric
<b>Metals</b>		
EPA 1631E	Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry	Oxidation, Purge and Trap, and CVAFS
EPA 1636	Determination of Hexavalent Chromium by Ion Chromatography	Ion Chromatography
EPA 1638	Determination of Trace Elements in Ambient Waters by Inductively Coupled Plasma – Mass Spectroscopy (includes antimony, arsenic, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc)	ICP/MS
EPA 200.7, 245.1	Metals by Inductively Coupled Plasma Atomic Emission Spectrometry and Cold Vapor Atomic Absorption Spectroscopy	ICP and CVAA
ASTM D1687-92	Hexavalent Chromium	Colorimetric

<sup>1</sup> EPA method 353.2 was used for the Nitrate/Nitrite as Nitrogen analysis for the Homer City sampling episode. Standard Method 4500-NO<sub>3</sub> H was used for the Widows Creek and Mitchell sampling episodes. Nitrate/Nitrite as Nitrogen was not analyzed for the Big Bend sampling episode.

Item	Description	Value
1	Item 1	100
2	Item 2	200
3	Item 3	300
4	Item 4	400
5	Item 5	500
6	Item 6	600
7	Item 7	700
8	Item 8	800
9	Item 9	900
10	Item 10	1000
11	Item 11	1100
12	Item 12	1200
13	Item 13	1300
14	Item 14	1400
15	Item 15	1500
16	Item 16	1600
17	Item 17	1700
18	Item 18	1800
19	Item 19	1900
20	Item 20	2000
21	Item 21	2100
22	Item 22	2200
23	Item 23	2300
24	Item 24	2400
25	Item 25	2500
26	Item 26	2600
27	Item 27	2700
28	Item 28	2800
29	Item 29	2900
30	Item 30	3000
31	Item 31	3100
32	Item 32	3200
33	Item 33	3300
34	Item 34	3400
35	Item 35	3500
36	Item 36	3600
37	Item 37	3700
38	Item 38	3800
39	Item 39	3900
40	Item 40	4000
41	Item 41	4100
42	Item 42	4200
43	Item 43	4300
44	Item 44	4400
45	Item 45	4500
46	Item 46	4600
47	Item 47	4700
48	Item 48	4800
49	Item 49	4900
50	Item 50	5000

**Attachment 4**  
**Analytical Summary and Data Qualifications**

## Analytical Summary and Data Qualifications

### Summary of Sampling Program Results

- EPA's steam electric sampling program database contains 3,163 sample results (including field blank and duplicate samples). Only 57 of the 3,163 results (or 1.8%) were qualified during the data review process.
- Excluding field blank results, EPA's steam electric sampling program database contains 2,208 sample results. Only 56 of the 2,208 results (or 2.5%) were qualified during the data review process.
- The following is the list of qualifiers identified during the review of EPA's steam electric sampling data and shown in the data tables:
  - R-Qualifier: MS/MSD % recovery outside method acceptance criteria;
  - T-Qualifier: MS/MSD RPD outside method acceptance criteria;
  - L-Qualifier: Result between 5x and 10x laboratory blank results;
  - O-Qualifier: OPR % recovery below method acceptance criteria; and
  - E-Qualifier: Sample analyzed outside holding time.
- There were no O-Qualifiers associated with the FGD effluent or FGD effluent duplicate samples; therefore, the O-Qualifier is not referenced in the remainder of this summary.

### Summary of FGD Effluent Sample Results

- EPA's steam electric sampling program database contains 1,032 sample results for FGD effluent samples (including field blank and duplicate samples). Only 21 of the 1,032 results (or 2.0%) were qualified during the data review process. There were no data qualifiers associated with the field blank results.
- Excluding the field blank results, EPA's steam electric sampling program database contains 716 sample results for FGD effluent samples. Only 21 of the 716 results (or 2.9%) were qualified during the data review process.
- Table 1 shows a break out of the sample results for FGD effluent samples by the analyte group.
- Seven of the thirteen qualified results for the routine metals are from the Big Bend sampling episode and four of them are from the Homer City sampling episode. Widows Creek and Mitchell each had one routine metal qualified result.

**Table 1. Number of Samples and Qualified Results for Each Analyte Group**

Analyte Group	Number of FGD Effluent Samples Analyzed <sup>1</sup>	Number of Qualified Results	Number of Results less than the Reporting Limit	Number of Results Classified as J-Values
Classicals	84	4	15	NA
Routine Metals	432	13	249	152
Low-Level Metals	200	4	92	65
<b>All Analytes</b>	<b>716</b>	<b>21</b>	<b>356</b>	<b>217</b>

<sup>1</sup> – Number of samples shown excludes field blanks.

J-Values – Results measured above the MDL, but less than the reporting limit.

NA – Not Applicable.

- Table 2 shows the number of qualifiers for each analyte group by the type of qualifier.
- Note that two of the results for the routine metals were qualified by both the R-qualifier and the T-qualifier; therefore, the total number of qualifiers presented in Table 2 does not match Table 1.
- All three of the classical results with E-Qualifiers are from the Widows Creek sampling episode.
- Both of the low-level results with T-Qualifiers are from the Mitchell sampling episode.
- Both of the low-level results with L-Qualifiers are from the Widows Creek sampling episode.

**Table 2. Number of Qualified Values by Type of Qualifier and Analyte Group**

Analyte Group	Number of R-Qualifiers	Number of T-Qualifiers	Number of L-Qualifiers	Number of E-Qualifiers
Classicals	1	0	0	3
Routine Metals	11 <sup>a</sup>	4 <sup>a</sup>	0	0
Low-Level Metals	0	2	2	0
<b>All Analytes</b>	<b>12<sup>a</sup></b>	<b>6<sup>a</sup></b>	<b>2</b>	<b>3</b>

a – Two of the results were qualified for both an R- and a T-Qualifier.  
 R-Qualifier – MS/MSD % recovery outside method acceptance criteria.  
 T-Qualifier – MS/MSD % RPD outside method acceptance criteria.  
 L-Qualifier – Result between 5x and 10x laboratory blank result.  
 E-Qualifier – Sample analyzed outside holding time.

- Table 3 shows the number of qualifiers for each analyte by the type of qualifier.
- Note that two of the results for the routine metals were qualified by both the R-qualifier and the T-qualifier.
- The two total phosphorus results that have E-Qualifiers are from the Widows Creek sampling episode. The results are for the FGD Effluent and the FGD Effluent Duplicate.
- The two barium results that have R-Qualifiers are from the Homer City sampling episode. The results are for the FGD Effluent and one is the total results and the other is the dissolved result. The dissolved result is also qualified for a T-Qualifier.
- Two of the selenium results that have R-Qualifiers are from the Big Bend sampling episode. They are the total and dissolved result from the FGD Effluent. One of the other results is the dissolved result for the Homer City FGD Effluent and the fourth one is the total result for the Mitchell FGD Effluent.
- The two nickel results that have L-Qualifiers are from the Widows Creek sampling episode. Both are dissolved results and are for the FGD Effluent and the FGD Effluent Duplicate.

**Table 3. Number of Qualified Values by Type of Qualifier and Analyte**

Analyte	Number of Samples Analyzed <sup>1</sup>	Number of R-Qualifiers	Number of T-Qualifiers	Number of L-Qualifiers	Number of E-Qualifiers
<b>Classicals</b>					
Nitrate/Nitrite, as N	6	1	0	0	0
Total Phosphorus	8	0	0	0	2
TSS	8	0	0	0	1
<b>Routine Metals</b>					
Antimony	16	1	1	0	0
Arsenic	16	1	1	0	0
Barium	16	2 <sup>a</sup>	1 <sup>a</sup>	0	0
Iron	16	1	0	0	0
Manganese	16	1	0	0	0
Molybdenum	16	1	1	0	0
Selenium	16	4	0	0	0
<b>Low-Level Metals</b>					
Arsenic	16	0	1	0	0
Nickel	16	0	0	2	0
Selenium	16	0	1	0	0

<sup>1</sup> – Number of samples shown excludes field blanks.

a – One of the results was qualified for both an R- and a T-Qualifier.

R-Qualifier – MS/MSD % recovery outside method acceptance criteria.

T-Qualifier – MS/MSD % RPD outside method acceptance criteria.

L-Qualifier – Result between 5x and 10x laboratory blank result.

E-Qualifier – Sample analyzed outside holding time.

