North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

November 19, 2014

Mr. Jim Sumner
Environmental Testing Solutions, Inc.
P.O. Box 7565
Asheville, NC 28802-7565

Dear Mr. Sumner,

Results of the 2014 Performance Evaluation toxicity test series have been reviewed by Aquatic Toxicology Branch staff. Our Branch was also a participant in the chronic and acute *Ceriodaphnia dubia* tests, acute *Pimephales promelas* test, pH, conductivity, and hardness analyses that were performed. Following the summary of overall results, test results generated by your laboratory will be discussed.

***Ceriodaphnia dubia* chronic**

There were nine chronic *Ceriodaphnia* tests performed using Solution A following the December 2010 revision of the "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure." The mean IC25 was 5.46% with a standard deviation of 2.15 (Figure 1). All nine laboratories met minimum quality control criteria and reported results that were within the allowable two standard deviations from the mean IC25.

***Ceriodaphnia dubia* acute**

There were eight acute *Ceriodaphnia* tests conducted using Solution B following the methods described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms,* (Fifth Edition), EPA-821-R-02-012, October 2002. The mean LC50 value was 9.66% with a standard deviation of 1.96 (Figure 2). All eight laboratories reported results that met minimum quality control criteria and were within two standard deviations of the mean LC50 value.

***Pimephales promelas* acute**

Eight laboratories conducted acute *Pimephales promelas* tests using Solution C following the methods described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms* (Fifth Edition), EPA 821-R-02-012, October 2002. The mean LC50 value was 15.44% with a standard deviation of 1.82 (Figure 3). All eight laboratories reported results that met minimum quality control criteria and were within two standard deviations of the mean LC50 value.

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pH

There were nine pH results reported for each of Solutions D and E. For the 2014 performance testing review, pH results were evaluated to the nearest 0.1 pH unit because a) Standard Methods recommends reporting pH values to the nearest 0.1 pH unit as ±0.1 pH units represent accuracy under normal conditions; and b) ATB did not specify how many significant figures to report. ATB will review pH data analysis for the 2015 Performance Evaluation.

Mean pH calculated for Solution D was 4.0 with a standard deviation of 0.05 (Figure 4). All nine laboratories reported results that were within two standard deviations of the mean pH.

For Solution E, the mean was 6.9 with a standard deviation of 0.1 (Figure 5). All nine laboratories reported results that were within two standard deviations of the mean pH.

Conductivity

There were nine conductivity results reported for each of Solutions F and G. The mean was 159.9 µmhos/cm for Solution F, with a standard deviation of 15.6 (Figure 6). Eight laboratories reported results that were within two standard deviations of the mean conductivity. One laboratory reported a result that was slightly outside the allowable two standard deviations from the mean conductivity value.

For Solution G the mean was 1609.8 µmhos/cm with a standard deviation of 35.0 (Figure 7). Eight of the nine laboratories reported results that were within two standard deviations of the mean conductivity. One laboratory reported a result that was slightly outside the allowable two standard deviations from the mean conductivity value.

Hardness

There were nine total hardness results reported for Solutions H and I. Mean total hardness for Solution H was 24.6 mg/L with a standard deviation of 3.0 (Figure 8). All the laboratories reported results that were within two standard deviations of the mean hardness.

For Solution I, the mean was 41.3 mg/L with a standard deviation of 3.0 (Figure 9). All the laboratories reported results that were within two standard deviations of the mean hardness.

Individual Lab Discussion

The results of the chronic and acute *Ceriodaphnia dubia*, acute *Pimephales promelas*, and pH, conductivity, and hardness solution analyses test results have been reviewed and are enclosed. Environmental Testing Solutions, Inc.'s test results were all found to be within acceptable ranges.

Please refer to the following list to determine your respective Lab # for each enclosure.

Figure 1	*Ceriodaphnia* Chronic Solution A	Lab # 1
Figure 2	*Ceriodaphnia* Acute Solution B	Lab # 6
Figure 3	*Pimephales promelas* Acute Solution C	Lab # 8
Figures 4-9	pH, Conductivity, Hardness	Lab # 3

Thank you for your cooperation in this study. We appreciate your commitment to maintaining certification with the State of North Carolina. If you have any questions, please contact Carol Hollenkamp or me at (919) 743-8401.

Sincerely,

Cindy Moore

Cindy Moore, Supervisor
Aquatic Toxicology Branch

Enclosures
cc: Carol Hollenkamp

Figure 1: 2014 Performance Evaluation
Chronic *Ceriodaphnia dubia* IC25 Results Solution A

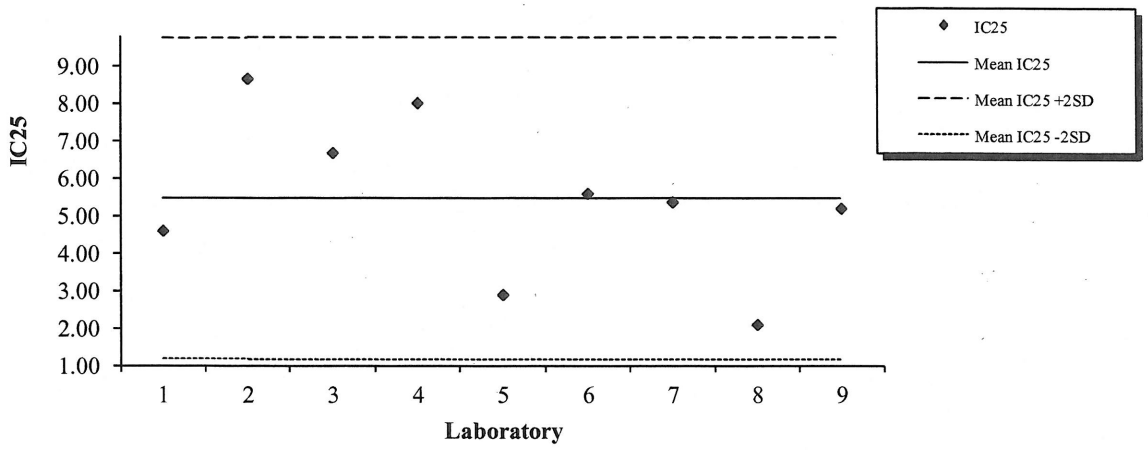

Figure 2: 2014 Performance Evaluation
Acute 48hr *Ceriodaphnia dubia* LC50 Results Solution B

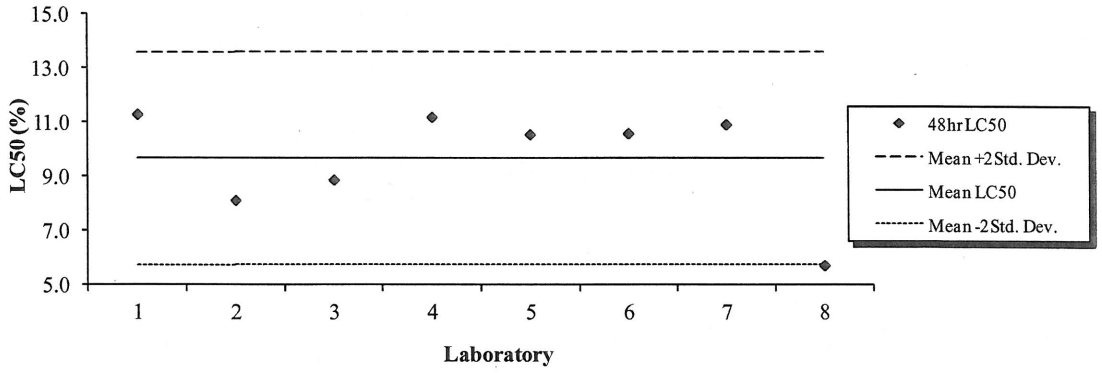

Figure 3: 2014 Performance Evaluation
Acute 48 hr *Pimephales promelas* LC50 Results Solution C

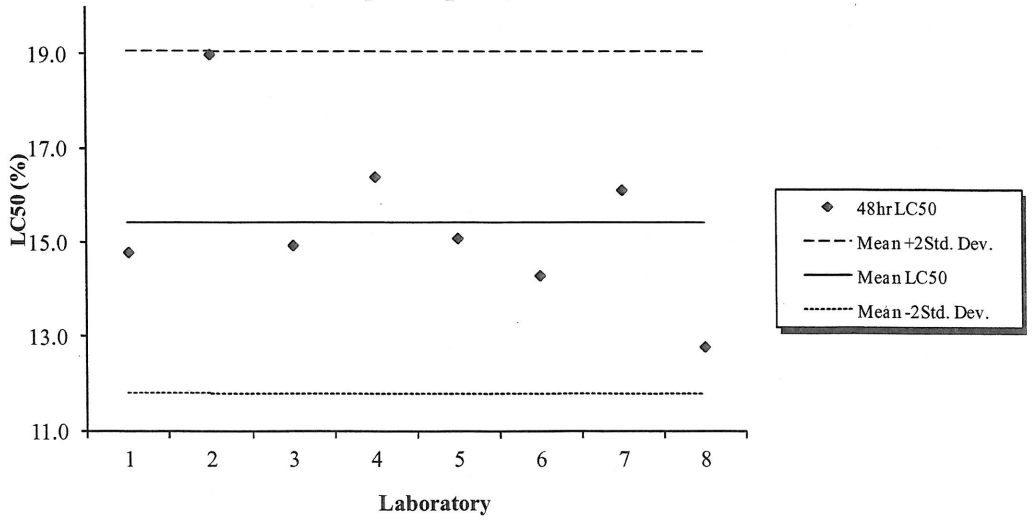

Figure 4: 2014
Performance Evaluation
pH Results Solution D

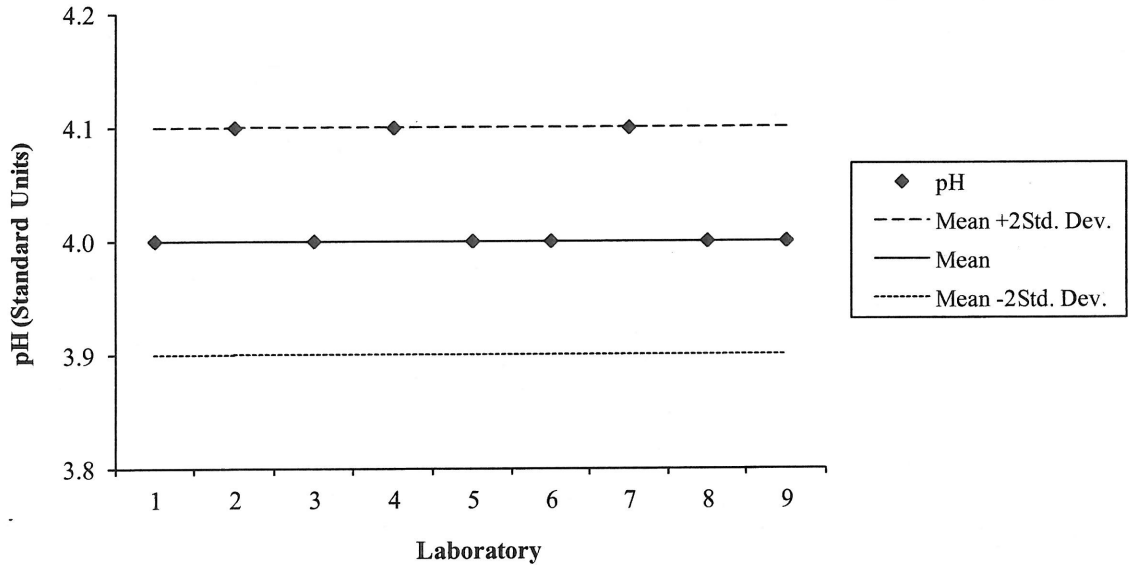

Figure 5: 2014 Performance Evaluation
pH Results Solution E

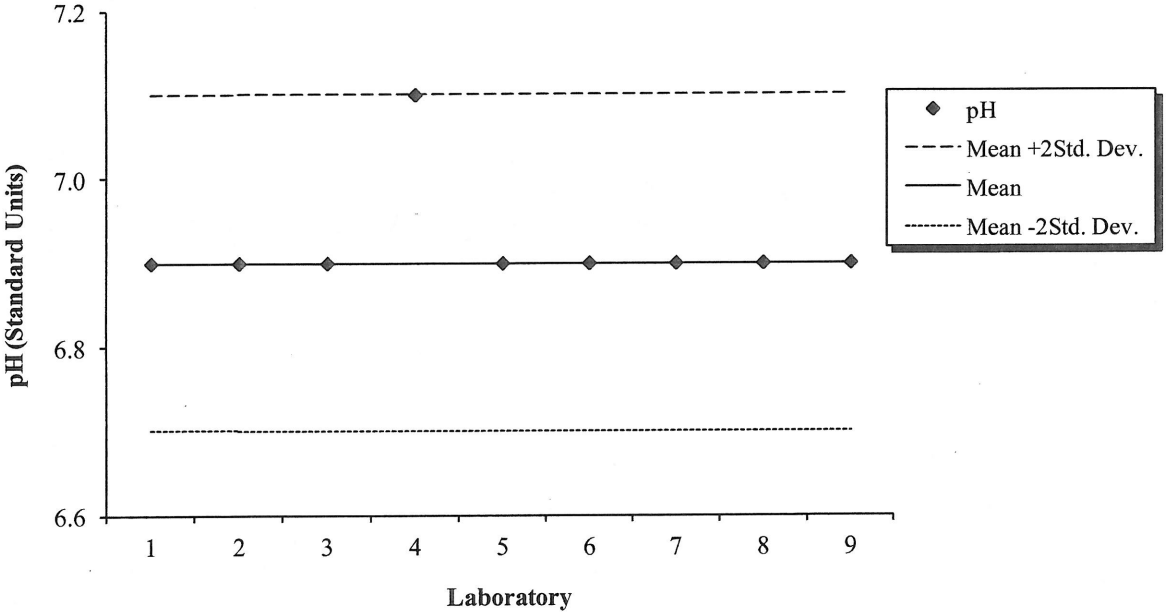

Figure 6: 2014 Performance Evaluation
Conductivity Results Solution F

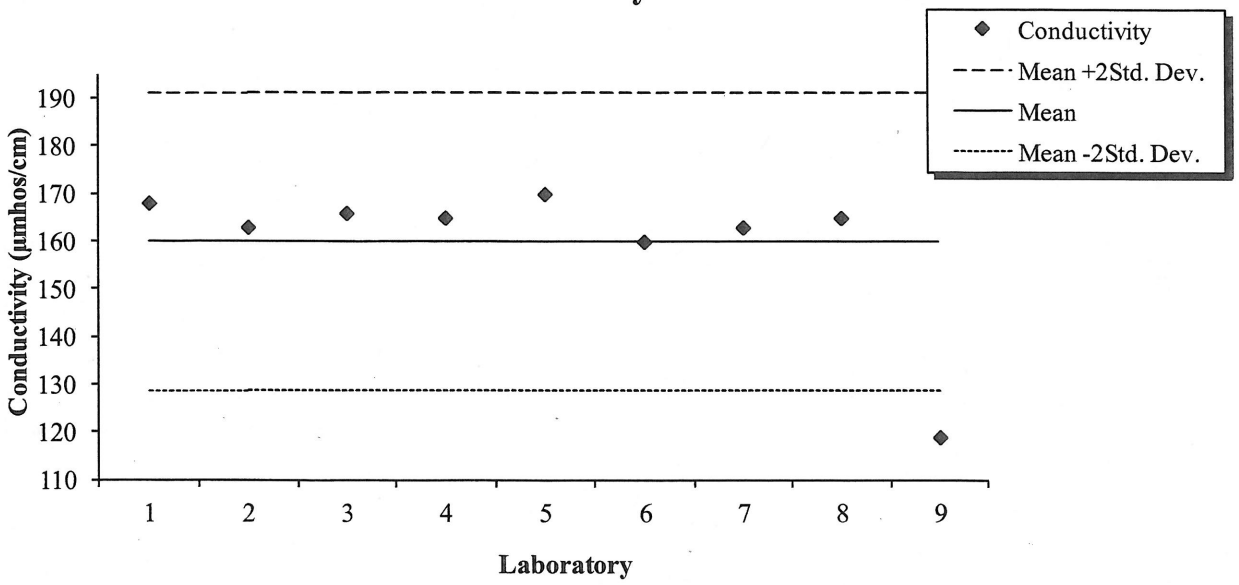

Figure 7: 2014 Performance Evaluation
Conductivity Results Solution G

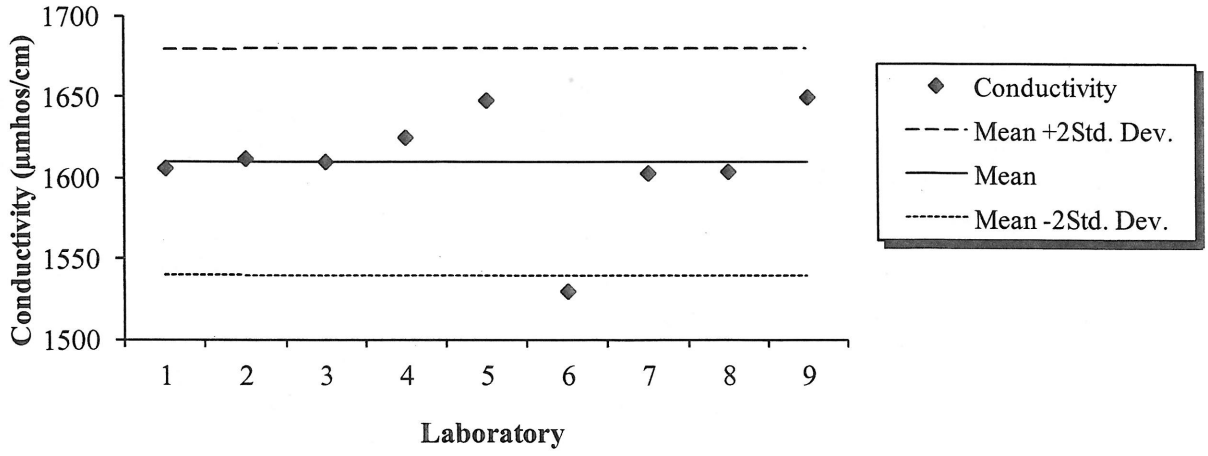

Figure 8: 2014 Performance Evaluation Hardness Results Solution H

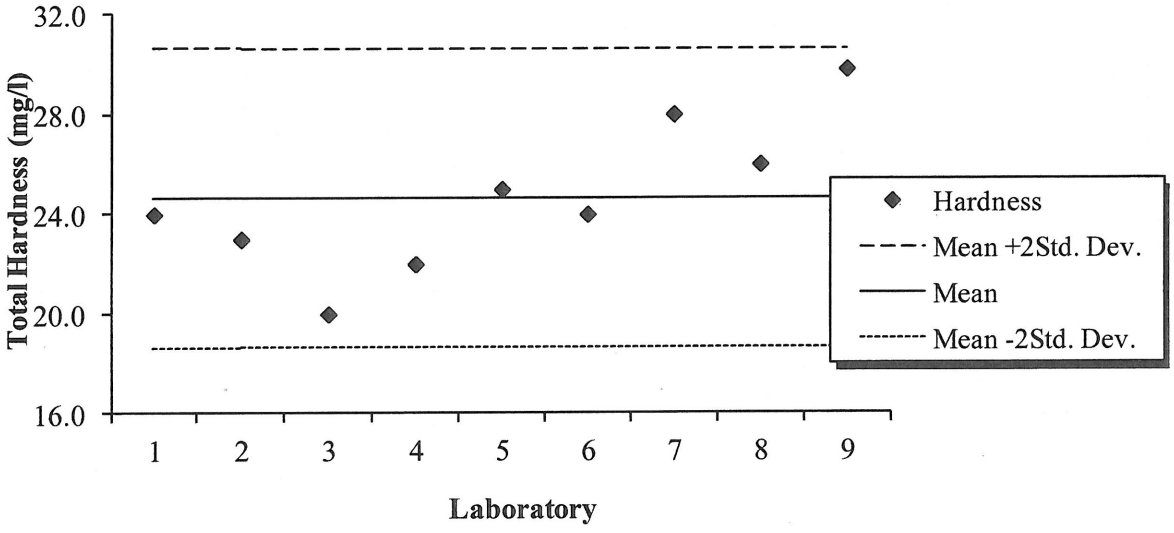

Figure 9: 2014 Performance Evaluation Hardness Results Solution I