TENNESSEE VALLEY AUTHORITY

# Analytical Evaluation of the Performance Evaluation Fly Ash Samples from Kingston Fossil Plant

## TCLP and Total Metals Analysis

2010

TVA KIF ASH RECOVERY PROJECT

> For the TCLP Certification, Method 1311 is one of two "Method-Defined" US EPA procedures published with SW-846, and it is imperative that the external laboratory performs the TCLP extractions exactly as prescribed in SW-846 Method 1311 (without deviation). The external laboratory should be requested to perform the TCLP extractions at a rate of 2 per day over 5 non-consecutive days for a total of 10 TCLP extractions from each of the two external laboratories.
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> The TCLP leachate shall then be digested in accordance with SW-846 Method 3015A and analyzed for TCLP metals' list in accordance with SW-846 Method 6010B. The TCLP leachates shall also be digested and analyzed for mercury in accordance with SW-846 Method 7470.

The three contract laboratories are RJ Lee Group (RJ Lee), Frontier Global Sciences (Frontier), and Galbraith Laboratory (Galbraith). The samples were delivered to these laboratories around May 7, 2010. RJ Lee provided the results back on July 19, 2010. The results from Frontier were provided to us on Aug. 18, 2010. However, the TCLP results from Galbraith were not provided until Sept. 7, 2010 while the total metals results were delivered to us on Oct. 12, 2010. However, they had to rerun some of the TLCP extractions. Results of the reanalysis were finally delivered to us on Oct. 28, 2010.

This report summarizes the results from the three laboratories.

### TCLP Results

The reporting limits (RL) for the TCLP analysis are summarized in Table 1. However, Galbraith did not provide the RL in their results.

**Table 1. Reporting Limits for TCLP Analysis (mg/L).**

| Laboratory | Arsenic | Barium | Cadmium | Chromium | Lead | Mercury | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|
| RJ Lee | 0.05 | 0.20 | 0.010 | 0.020 | 0.05 | 0.0002 | 0.05 | 0.020 |
| Frontier | 0.11 | 1.11 | 0.011 | 0.022 | 0.06 | 0.001 | 0.11 | 0.011 |
| Fold Difference | 2.22 | 5.56 | 1.11 | 1.11 | 1.11 | 5.00 | 2.22 | 0.56 |

The difference among the RL for each analytes are also shown in the above table. Though Frontier also provided the results for Boron, it is not one of the contaminants listed for toxicity characteristic (D list), it is not being discussed in this report. For Cd, Cr, and Pb, the RL from the two laboratories were very similar. The RL for As and Se from Frontier were more than twice the RL from RJ Lee while the RL for Ag was about half of RJ Lee. For Ba and Hg, the RL from Frontier were almost five times those from RJ Lee.

The maximum concentrations of contaminants for toxicity characteristic are shown in Table 2.