SITE: TVA Kingston
BREAK: 2.2
OTHER:

AIR MONITORING RESULTS
KINGSTON FOSSIL FLY ASH RESPONSE
HARRIMAN, ROANE COUNTY, TENNESSEE

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EMERGENCY RESPONSE AND REMOVAL BRANCH
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AIR MONITORING RESULTS

KINGSTON FOSSIL FLY ASH RESPONSE
HARRIMAN, ROANE COUNTY, TENNESSEE

INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting this report summarizing air monitoring activities conducted at the Kingston Fossil Fly Ash Response in Harriman, Tennessee. EPA tasked Tetra Tech to monitor ambient particulate concentrations in and around the area impacted by the release of fly ash. The purpose of the investigation was to provide an initial characterization of the ambient air quality in the area surrounding the released ash. EPA will use the data to assess public health risks, in consultation with state and federal health agencies. Tetra Tech conducted the investigation using the Field Branches Quality System and Technical Procedures located at http://www.epa.gov/region4/sesd/fbqstp/.

Figure 1 depicts the sampling locations, and tables summarizing analytic data are included in this report.

SITUATION

On December 22, 2008, at approximately 0100 hours, the northeastern dike at the TVA Kingston Power Plant, located in Harriman, Roane County, Tennessee, failed. The dike retained one of three cells at the facility used for dewatering fly ash. Subsequently, approximately 5.4 million cubic yards of fly ash were released into two sloughs which flow into the Emory River. The release extended approximately 300 acres outside of the ash storage areas. Local emergency officials first responded to the scene, and then shortly thereafter, began to assist residents affected by the fly ash flow. Three residential homes became condemned as a result of the release.

On December 22, 2008, the National Response Center (NRC), and subsequently the U.S. Environmental Protection Agency (EPA) Region 4, was notified of the incident. A Federal On-Scene Coordinator (OSC) and Tetra Tech START contractor were mobilized to the TVA Kingston Power Plant Facility the same day.

MONITORING ACTIVITIES

Beginning on December 27, 2008, EPA contractors staged a fixed monitor near on-going response activities to assess particulate generation in the area immediately around active disturbance of the ash. This monitor was operated for approximately 10 hours per day.

On December 30, 2008, EPA contractors commenced monitoring at eight additional locations. Five locations are in the immediate vicinity of the release on the Kingston Fossil Plant property, and four others are in residential areas near the release. The monitoring locations are presented in Figure 1. Monitoring was performed with a portable monitor equipped with a 2.5 micrometer filter. This particulate matter-2.5 (PM-2.5) filter removes the particulates that are too large to be inhaled deep into human lungs, about 2.5 micrometers in width. The second monitor was rotated through all nine locations throughout the day, monitoring each location for approximately 10 minutes, and returning to each location several times.

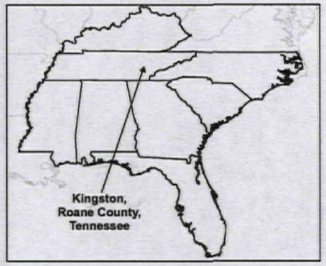
On January 1, 2009, both instruments were equipped with a PM-10 filter. PM-10 includes all particles with a diameter of 10 micrometers or less, including the PM-2.5 particles. PM-10 particles are small

MAP SOURCE: USDA NAIP, 2007.

LEGEND

AIR MONITORING STATIONS

0 455 910 1,820 Feet



United States
Environmental Protection Agency

KINGSTON FOSSIL PLANT
FLY ASH RESPONSE
KINGSTON,
ROANE COUNTY,
TENNESSEE
TDD: TTEMI-05-001-0084

TVA KINGSTON
FOSSIL PLANT SITE

FIGURE 1

EPA AIR
MONITORING LOCATIONS

TETRA TECH

T R & Associates, Inc.
EPA Region 4 START

enough to be inhaled, but do not generally penetrate deep into the lungs, whereas PM-2.5 particles can penetrate into the deepest portions. The standard was moved to the PM-10 particle size to validate comparable data being collected by TVA.

MONITORING RESULTS

Table 1 summarizes the daily averages recorded at the various locations since EPA monitoring began on December 27, 2008. The short-term (24-hour or daily average) National Ambient Air Quality Standard (NAAQS) for PM-10 is 150 micrograms per cubic meter of air ($\mu g/m^3$). The NAAQS for PM-2.5 is 35 $\mu g/m^3$. For total particulate readings, the Occupational Safety and Health Administration Permissible Exposure Level (PEL) for nuisance dust of 5.0 mg/kg is presented for comparison.

As shown in the attached table, no exceedance of the NAAQS for either PM-2.5 or PM-10 or the PEL (based on daily averages) has been observed to date. The wet nature of the ash and the continuing rain and fog in the days since the release has served to keep ambient particulate levels low.

Beginning December 28, 2008, TVA set up low-volume samplers on the plant property. On January 1, 2009, these were moved to the surrounding residential areas. The samples are being analyzed for arsenic, beryllium, cadmium, chromium, lead, selenium, thallium, vanadium, PM-10 dust, and quartz. As of January 3, 2009, TVA has collected 120 air samples for laboratory analysis. TVA is also using mobile monitoring units to collect real-time particulate data. To date, TVA has recorded 743 real-time particulate values.

As of January 4, 2008, EPA and TVA continue to monitor dust concentrations in the immediate vicinity of the ash and in nearby residential areas.

CONCLUSION

EPA data indicates that particulate levels in the area around the TVA ash release have remained below EPA standards for ambient air quality throughout the monitored periods of the response. Rain and moisture in the ash are factors contributing to the low reading. TVA is currently installing long term air monitors. Continued air monitoring through the clean up is necessary to protect human health.

TABLE 1
EPA PARTICULATE MONITORING RESULTS
MONITORING PERFORMED DECEMBER 27, 2008, THROUGH JANUARY 3, 2009

Date	Number of Sample Point	Type	Location	Min	Units	Max	Units	Avg	Units
12/27/08	Continuous 10-hr day	Totals	On site	NA	NA	0.775	mg/m3	0.000	mg/m3
12/28/08	Continuous 10-hr day	Totals	On site	NA	NA	0.010	mg/m3	0.000	mg/m3
12/29/08	Continuous 10-hr day	Totals	On site	NA	NA	1.586	mg/m3	0.003	mg/m3
12/30/08	3 (instantaneous)	Totals	On site	0.000	mg/m3	0.030	mg/m3	NA	NA
12/30/08	8 (instantaneous)	PM-2.5	On site	1.8	µg/m3	8.3	µg/m3	NA	NA
12/31/08	3 (instantaneous)	Totals	On site	0.000	mg/m3	0.001	mg/m3	NA	NA
12/31/08	10 (instantaneous)	PM-2.5	On site	4.6	µg/m3	15.6	µg/m3	NA	NA
12/31/08	10 (instantaneous)	PM-2.5	Off site	3.4	µg/m3	11.6	µg/m3	NA	NA
01/01/09	Continuous 10-hr day	PM-10	On site	NA	NA	119.3	µg/m3	6.1	µg/m3
01/01/09	13 (instantaneous)	PM-10	On site	4	µg/m3	23.8	µg/m3	NA	NA
01/01/09	8 (instantaneous)	PM-10	Off site	7.2	µg/m3	16.9	µg/m3	NA	NA
01/02/09	Continuous 10-hr day	PM-10	On site	NA	NA	56.8	µg/m3	18.5	µg/m3
01/02/09	19 (instantaneous)	PM-10	On site	8.4	µg/m3	26.7	µg/m3	NA	NA
01/02/09	9 (instantaneous)	PM-10	Off site	11.7	µg/m3	19.5	µg/m3	NA	NA
01/03/09	2 (instantaneous)[1]	PM-10	On site	66.7	µg/m3	85.7	µg/m3	NA	NA

Notes: 1 - air monitoring was halted at 0930 due to instrumentation interference from the continuous light precipitation

Standards used: PM-2.5= 35 µg/m3
PM-10= 150 µ/m3
Total PM= 5.0 mg/kg

mg/m3= milligrams per cubic meter of air
µg/m3= micrograms per cubic meter of air