

Summary of TDEC's Surface Water Data (all values ug/L)

(Note: This table does not include other agency data.
Approximately 120 observations for each parameter.)

Metal	Lowest Criterion for Applicable Classified Uses	*Average Concentration (Detection Level)	Number of Criteria Violations	Maximum Concentration Observed
Thallium	0.24 (c)	0.17 (0.3)	23	1.50
Aluminum	750 (b)	538.6 (6.4)	10	15000
Lead	(d) 5.0 (a)	0.86 (0.1)	7	16.0
Arsenic	10 (a)	2.07 (0.93)	5	43.0
Iron	1,000 (b)	489.2 (2.9)	9	10000
Mercury	0.05 (c)	(0.13)	5	0.17
Copper	(d)	2.35 (0.38)	2	22.0
Cadmium	(d)	(0.41)	1	0.60
Selenium	5 (b)	0.90 (1.30)	0	3.60
Beryllium	4 (a)	0.12 (0.11)	0	1.60
Manganese	1000 (b)	46.1 (0.42)	0	330

* For purposes of calculating average concentrations, one-half of detection level was used for values below detection.

- (a) Criterion for protection of domestic water supply [TDEC Rule 1200-4-03-.03(1)(j)];
- (b) Criterion for protection of fish and aquatic life [TDEC Rule 1200-4-03-.03(3)(g), (h), or (i)];
- (c) Criterion for consumption of fish and drinking water from same body of water [TDEC Rule 1200-4-03-.03(4)(j)]; and
- (d) Hardness-dependant fish and aquatic life dissolved criterion.

Recreation - Both TDEC and the TDH have stated that recreation in and on the water at locations other than the immediate area of the spill should be unaffected by the incident. Still, many who might use the lake for recreation are wary, and marinas and other local tourist businesses report cancelations. TDEC is committed to helping Roane County get the message out that recreation on and near Watts Bar Reservoir is safe.

Bacteriological and Radiological Impacts - The ash does not contain bacteria that might impact recreational use of the lower Emory River. It is possible for some metals such as iron to stimulate bacteria growth. These are not disease-causing bacteria, but might cause aesthetic problems. As water temperatures warm this spring, TDEC will watch to see if this occurs.

TDEC does not consider the ash to pose a threat to water quality due to radioactivity. However, there may be pockets of radioactive cesium in area sediment from historical activities at Oak Ridge. If any of these are found to be in the impact area, special plans will need to be made to avoid disturbing them.

Fishing – Fishing in the impacted area will remain unavailable until recovery is completed. Other than in the immediate spill area, fishing is safe and it is safe to eat most kinds of fish from Watts Bar. There has been a long-term advisory against consumption of catfish, striped bass and hybrid bass from Watts Bar because of polychlorinated biphenyl (PCB) contamination, and those advisories remain unchanged. There is also an existing advisory based on mercury in fish tissue for all fish species in the Emory River from mile 12.4 to mile 21.8. That is a 9.4 mile reach above the City of Harriman. TDEC is uncertain as to the source of mercury in fish collected in that location.

In partnership with TWRA, additional fish tissue samples have been collected. Those analytical results are not yet available. TWRA has announced that they will continue a semi-annual sampling schedule for fish tissue looking for metals associated with the ash, such as selenium, arsenic, mercury, cadmium and lead. TDEC will use those results to determine if the TDEC Watts Bar advisory needs to be changed.

TDEC's advisories for consumption of fish taken from Tennessee waters are in the second half of the document at:

<http://www.tn.gov/environment/wpc/publications/advisories.pdf>

TDEC's water sampling plan is available at:

http://www.state.tn.us/environment/kingston/pdf/monitor_plans/water_sampling_plan.pdf

A map showing the locations of our surface water sampling stations and the area where wells were tested is on the next page and may also be found at:

http://www.state.tn.us/environment/kingston/pdf/monitor_plans/KingstonMap.pdf

Results of TDEC's surface water monitoring are posted at:

http://www.state.tn.us/environment/kingston/surface_water.shtml

All of our public water supply monitoring data are on TDEC's site at:
<http://www.state.tn.us/environment/kingston/wtp.shtml>

Status of Clean-Up Activities

Ash Retention Structures – Within the first days of the incident, TVA proposed and TDEC and EPA approved installation of three weirs. Weir 1 was installed below water level across the Emory River channel to retain ash that was in the river and potentially moving along the river bottom. Weir 2 was installed on the west bank of the river to retain that portion of the spilled material that was not in the reservoir. Weir 3 was installed in a slough to divert drainage water from the spill site. Weirs 1 and 2 can be seen in Figure 7 of the dredging plan and Weir 3 is shown on the Overall Site Plan in the Interim Drainage Plan (see link below).

Site Drainage Controls – TVA has developed engineering plans for controlling runoff from the exposed ash in and adjoining the Emory River. This plan has been reviewed and approved by TDEC and EPA. It is posted on TDEC's web page at:
<http://www.state.tn.us/environment/kingston/pdf/tva/ProposedInterimDrainagePlan030209.pdf>

Dredging Operations – The Phase 1 Emory River Dredging Plan will remove ash from the river channel to a depth of 710 feet mean sea level. The approved plan calls for a pilot dredging program for the first 60 days, which began on March 19, 2009. It is anticipated that a sustainable pace will be determined based on initial operations. If three dredges are operating at an estimated 20 hours per day, they will be able to move approximately 9,000 cubic yards per day.

TDEC considers that it is critical to remove the massive amount of ash now in the Emory River as soon as it can be safely done. Presently, the ash presents a risk of flooding to upstream areas in the event of a significant rainfall and perhaps a greater risk of being washed downstream where recovery would be less efficient and further complicated by mixing with legacy contaminated sediments. TDEC sought and received comments from experts in the area of dredging, coal ash, toxicology, and protection of fish and aquatic life from EPA Region 4 in Atlanta, the Region 4 Science and Ecosystem Support Division Laboratory in Athens, the Corps of Engineers Nashville District Office, the Corps' Engineer Research and Development Center Environmental Laboratory at Vicksburg, the U.S. Fish and Wildlife Service, the Tennessee Wildlife Resources Agency, and Vanderbilt University.

These comments served as the basis for TVA's revisions to the dredge plan and accompanying monitoring plan. The approved dredge plan is available at:
http://www.state.tn.us/environment/kingston/pdf/tva/ProposedDredgePlanPhaseI_022309.pdf

AIR

Initially, the ash was in a mud-like state and stayed that way because of rainfall through most of January 2009. Predictably, that worked in favor of air quality and kept particulate levels well below the particulate National Ambient Air Quality Standards (NAAQS).

Toward the very end of January, extremely cold and dry polar air coupled with high wind speeds caused the ash to begin to dry and hampered watering of the roads because of icing issues. Attempts to straw and seed the area for a vegetative covering failed because of seed germination issues.

A new strategy to cover the area with a cellulosic binder erosion control material called Flex-Terra™ began on January 31, 2009, and thus far, the dust suppression effectiveness of the material is working. There are approximately 300 acres of surface area comprising the ash slide and as of March 23, 2009, enough material to cover 167 acres has been applied to the site. (Some of the acreage was retreated due to damage from traffic.)

TVA is applying this cover at the manufacturer recommended rate, and it should be effective at dust suppression for approximately 12 months. TDEC will monitor TVA's progress in covering the rest of the ash with this material and the continued dust suppressing effectiveness of the applied material over time.

Water trucks continually patrol the site haul roads and paved roads to minimize the dust from traffic. Additionally, street vacuum trucks clean paved roads and portable road sign style radar units help people to remember the 15 mph speed limit on the paved plant roads.

Track out of ash and ash bearing materials caked on the wheels and undercarriage of vehicles leaving the site onto public roadways are being addressed by the installation of three wheel/undercarriage wash racks at the site. Security personnel at the site have been instructed to turn any vehicle attempting to leave the site without undergoing decontamination back to the cleaning stations.

Air monitors ring the site to keep watch over clean-up related air exposure impacts to the public and the efficacy of dust suppression measures at the site. Both TDEC and TVA, with both TDEC and EPA auditing the TVA monitoring, operate monitors in the area.

Total Suspended Particulate monitoring is conducted to gauge the quantity of all sizes of particles that are suspended in the ambient air. In addition, the filters from these samplers are analyzed for metals found in the ash. TDEC is working with the TDH, EPA and Centers for Disease Control's Agency for Toxic Substances and Disease Registry Program to interpret the metals data in terms of public health protection.

Fractional particulate monitoring for both PM-10 (10 microns and down particles) and PM_{2.5} (2.5 microns and down particles) is also conducted at the site and compared to the NAAQS for these

materials that have been established by EPA. A summary table and map of the air monitor types, sampling frequency and monitor locations are shown on *Images 5-9*.

TDEC is of the current belief that the air-monitoring network is credible and that the dust suppression procedures being used is effective. To date, no exceedances of the NAAQS for PM-10 and PM_{2.5} have been measured in the vicinity of the coal ash spill in Kingston by either TDEC or TVA operated monitors. Additionally, the metals data available thus far has been reviewed by state and federal staff knowledgeable in environmental toxicology to ensure no adverse health effects develop from possible exposures. TDEC will not hesitate to modify our monitoring or dust suppression requirements as needed to address the new information going forward.

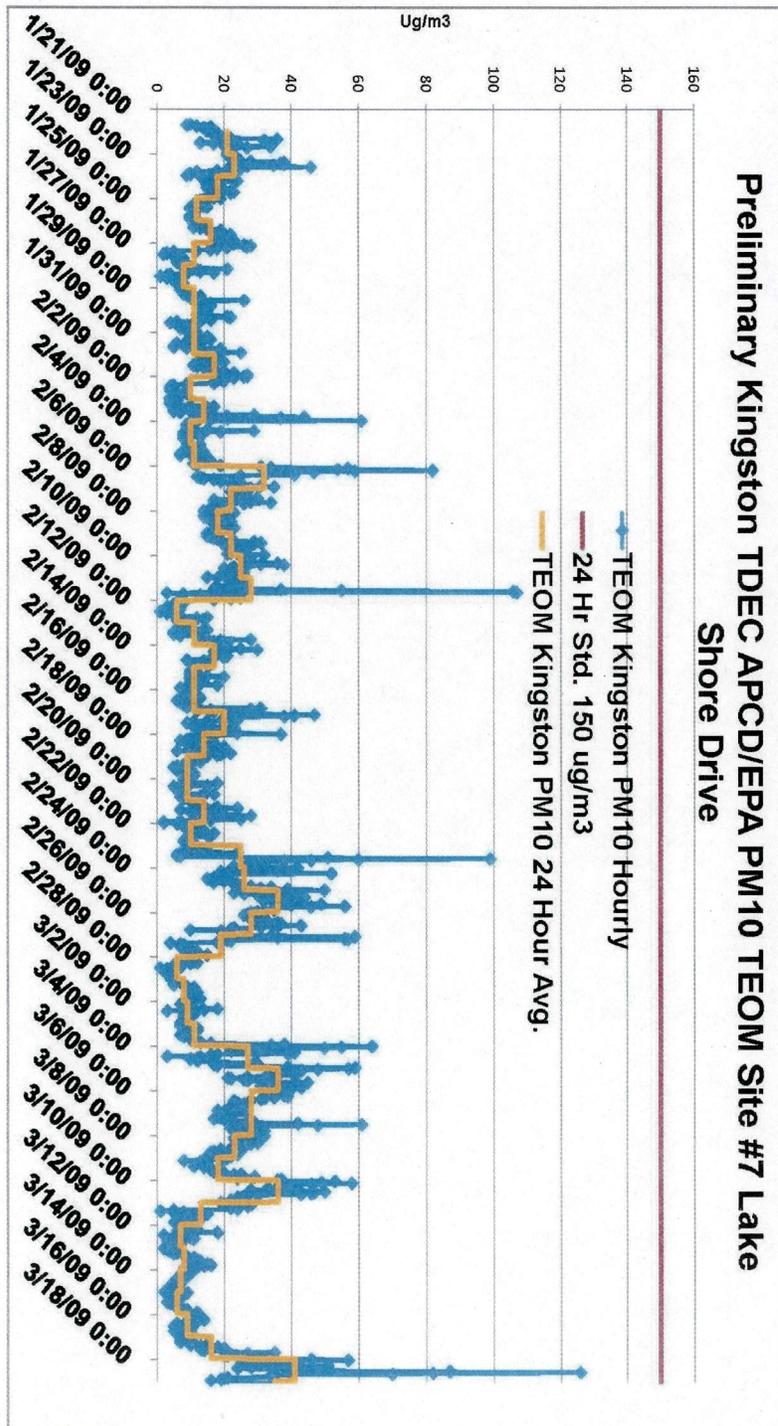


Image 6



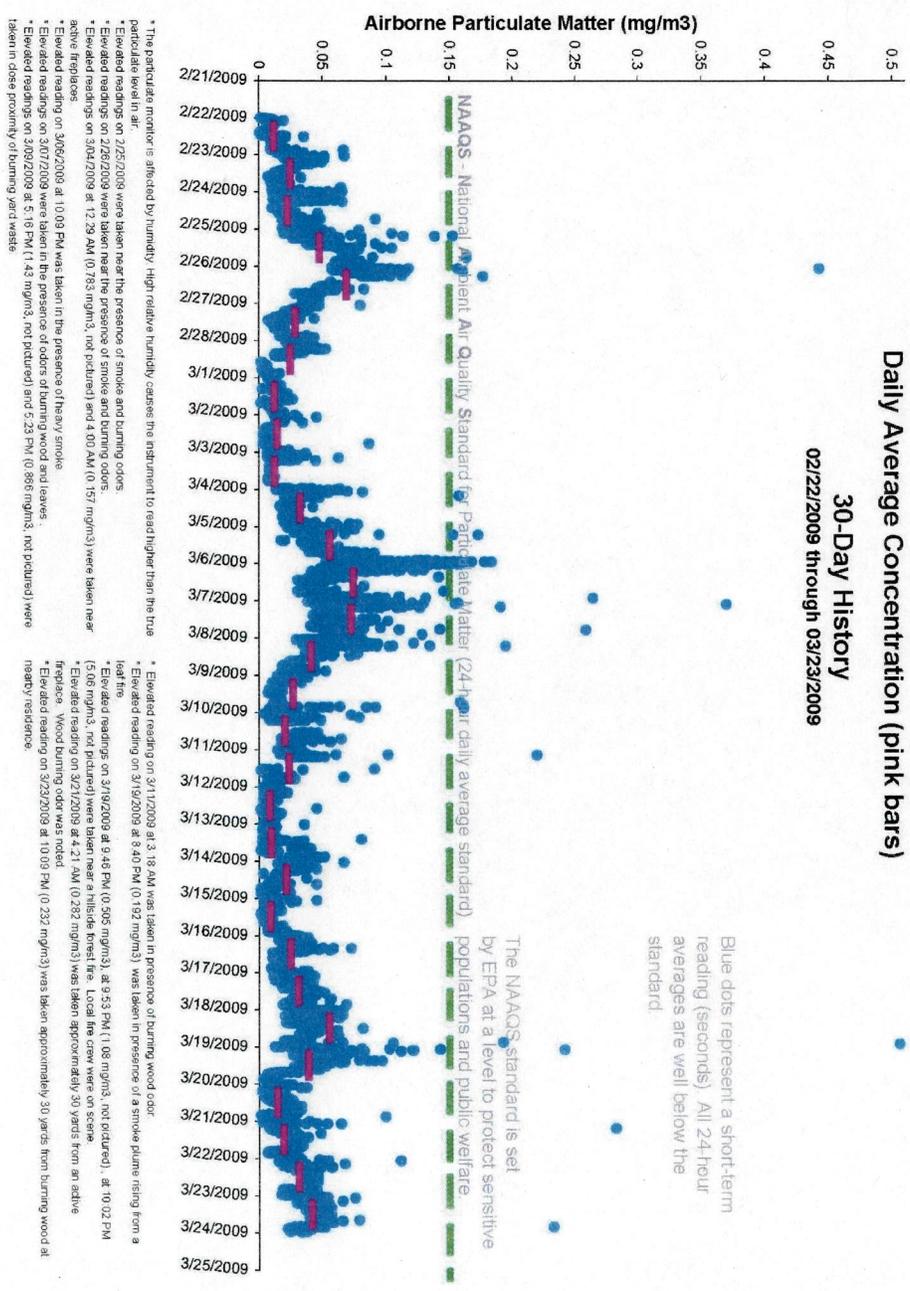
Image 7

TVA Kingston Air Sampling Results (blue dots)

Daily Average Concentration (pink bars)

30-Day History

02/22/2009 through 03/23/2009



* The particulate monitor is affected by humidity. High relative humidity causes the instrument to read higher than the true particulate level in air.

- * Elevated readings on 2/25/2009 were taken near the presence of smoke and burning odors.
- * Elevated readings on 2/26/2009 were taken near the presence of smoke and burning odors.
- * Elevated readings on 3/04/2009 at 12:29 AM (0.783 mg/m³, not pictured) and 4:00 AM (0.157 mg/m³) were taken near active fireplaces.
- * Elevated reading on 3/06/2009 at 10:09 PM was taken in the presence of heavy smoke.
- * Elevated readings on 3/07/2009 were taken in the presence of odors of burning wood and leaves.
- * Elevated readings on 3/09/2009 at 5:16 PM (1.43 mg/m³, not pictured) and 5:23 PM (0.886 mg/m³, not pictured) were taken in close proximity of burning yard waste.

- * Elevated reading on 3/11/2009 at 3:18 AM was taken in presence of burning wood odor.
- * Elevated reading on 3/19/2009 at 8:40 PM (0.192 mg/m³) was taken in presence of a smoke plume rising from a leaf fire.
- * Elevated readings on 3/19/2009 at 9:46 PM (0.505 mg/m³), at 9:53 PM (1.08 mg/m³, not pictured), at 10:02 PM (5.06 mg/m³, not pictured) were taken near a hillside forest fire. Local fire crew were on scene.
- * Elevated reading on 3/21/2009 at 4:21 AM (0.282 mg/m³) was taken approximately 30 yards from an active fireplace. Wood burning odor was noted.
- * Elevated reading on 3/23/2009 at 10:09 PM (0.232 mg/m³) was taken approximately 30 yards from burning wood at nearby residence.

Image 8

Particulate Monitoring Stations

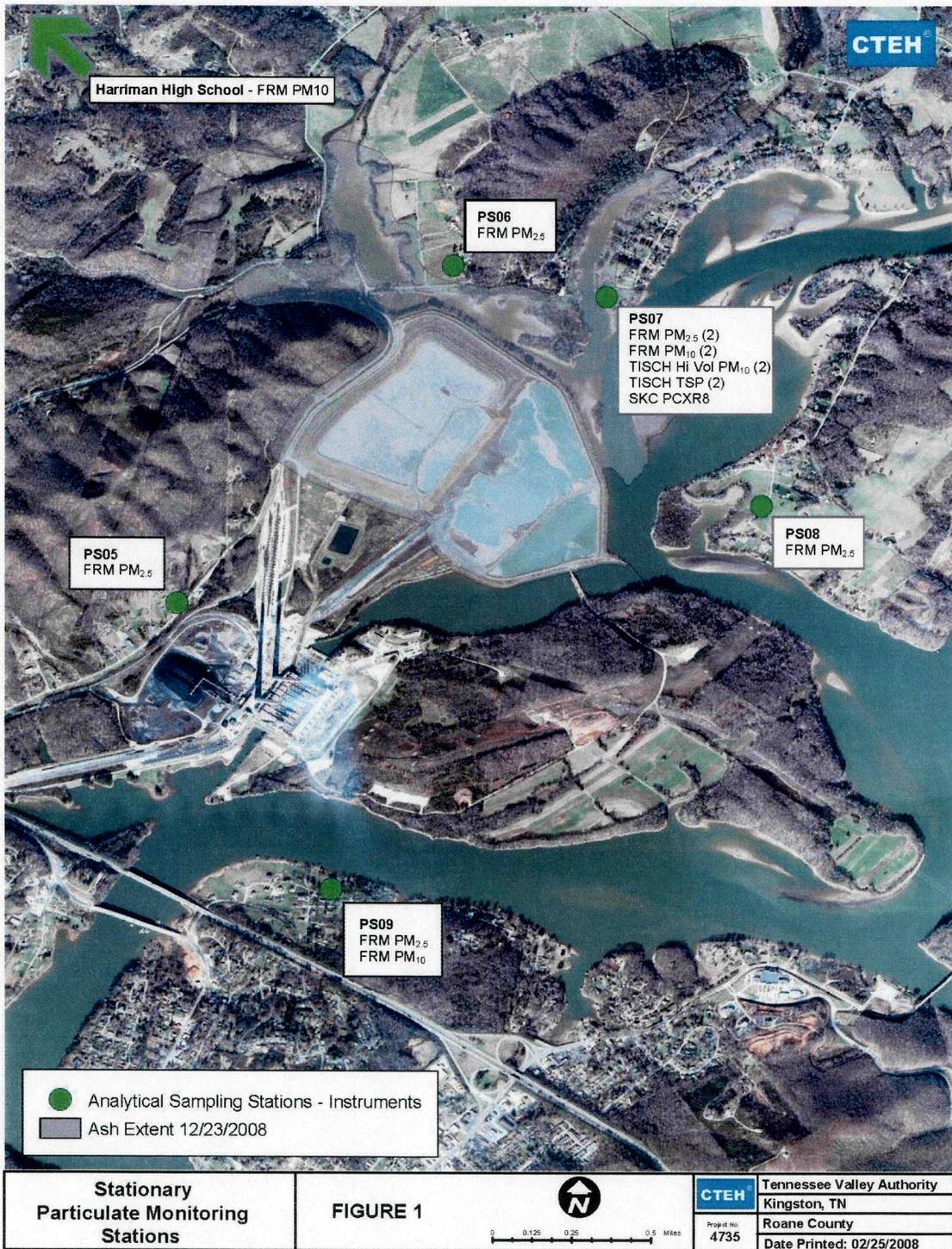


Image 9