

**POTABLE WATER SAMPLING RESULTS
KINGSTON FOSSIL FLY ASH RESPONSE
HARRIMAN, ROANE COUNTY, TENNESSEE**

Prepared for:



:

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POTABLE WATER SAMPLING RESULTS

TVA KINGSTON FOSSIL PLANT FLY ASH RESPONSE HARRIMAN, ROANE COUNTY, TENNESSEE

INTRODUCTION

The Tetra Tech EM Inc. Superfund Technical Assessment and Response Team (START) is submitting this report summarizing potable water sampling activities conducted at the Kingston Fossil Fly Ash Response in Harriman, Tennessee. EPA tasked START to collect potable water samples from both the raw intake water and final treated water at the Kingston, Cumberland, and Rockwood treatment systems. EPA Region 4 Science Ecosystem and Support Division (SESD) also sampled municipal potable water supplies and three residential wells. The purpose of the investigation was to provide an initial characterization of potentially impacted potable water supplies. START conducted the investigation using the Field Branches Quality System and Technical Procedures (<http://www.epa.gov/region4/sesd/fbqstp/>).

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.

SAMPLING ACTIVITIES

EPA contractor, Tetra Tech, collected raw and finished water samples from the Kingston and Rockwood plants on two different dates. Finished water refers to the water that has passed through all of the processes in a water treatment plant and is ready to be delivered to the consumer. The raw water intake was sampled from the river on 12/23/08. This sample was split with Tennessee Valley Authority (TVA) and sent to independent laboratories for analysis. This procedure allows for verification of data. This sample was analyzed for total metals (SW846 Method 6020, 7470A) by a National Environmental Laboratory Accreditation Program (NELAP) certified laboratory. On December 29, 2008, both the raw intake lines and the finished water were sampled at two potentially impacted public potable water treatment plants, the Kingston and Rockwood water treatment plants. These were analyzed for total metals (Method 6020, 7470A), total dissolved metals (Method 6020, 7470A), total dissolved silica, and total silica (Method 6020).

EPA personnel from the Science and Ecosystem Support Division (SESD) mobilized to the site on December 30, 2008 in order to assist with potable well sampling activities. SESD collected three residential well samples, one sample from a residence supplied by the Kingston public system, and six raw intake and finished water samples from the Kingston, Rockwood and Cumberland plants. The ability to obtain access under a short time constraint limited the sample size of the initial residential well sampling. Tennessee Department of Environment and Conservation (TDEC) continued to sample

residential wells in the days that followed. The samples were analyzed by the SESD laboratory located in Athens, Georgia, for total metals (Method 6020, 7470A), total dissolved metals (Method 6020, 7470A), and total suspended solids (Method 130.2). The laboratory has not finalized the results of the total suspended solids analyses; therefore, those results are not discussed here.

The following table identifies EPA potable water samples, their location, and corresponding analyses:

Table 1: Potable Water Sample Descriptions

Sample ID	Date Collected	TAL Total Metals	TAL Dissolved Metals	Total Suspended Solids	Total Dissolved Silica	Total Suspended Silica	Location
KIF-KWTPI	12/23/08	X					Kingston Plant Raw Water (River Intake)
KWTPI-WS01	12/29/08	X	X		X	X	Kingston Plant Raw Water (Supply Line)
KWTDW-WS02	12/29/08	X	X		X	X	Kingston Plant Finished Water
RWDW-WS03	12/29/08	X	X		X	X	Rockwood Plant Raw Water (Supply Line)
RWWTI-WS04	12/29/08	X	X		X	X	Rockwood Plant Finished Water
KWT1A	12/30/08	X	X	X			Kingston Plant Raw Water (Supply Line)
KWT2A	12/30/08	X	X	X			Kingston Plant Finished Water
KWT3A	12/30/08	X	X	X			Rockwood Plant Raw Water (Supply Line)
KWT4A	12/30/08	X	X	X			Rockwood Plant Finished Water
KWT5A	12/30/08	X	X	X			Cumberland Plant Raw Water (Supply Line)
KWT6A	12/30/08	X	X	X			Cumberland Plant Finished Water
1007	12/30/08	X	X	X			1007 Swan Pond Road (Well)
1015	12/30/08	X	X	X			1015 Swan Pond Road (Well)
937	12/30/08	X	X	X			937 Swan Pond Road (Well)
993	12/30/08	X	X	X			993 Swan Pond Road (Public System)

Figure 1 shows a map of all potable water sample locations.

SAMPLING RESULTS

The Tables 2, 3, and 4 contains summary analytical results for all EPA collected data, sorted by date. Each table includes the Federal Maximum Contaminant Levels (MCL) for comparative purposes. The MCLs represent the maximum permissible level of a contaminant in water delivered to any user of a public water system. On December 23, 2008, the raw water collected from the river at the Kingston plant intake exceeded the MCL for thallium (0.002 mg/L) with a value of 0.00619 mg/L. None of the samples collected on December 29, 2008 exceeded the MCLs for any analyte.

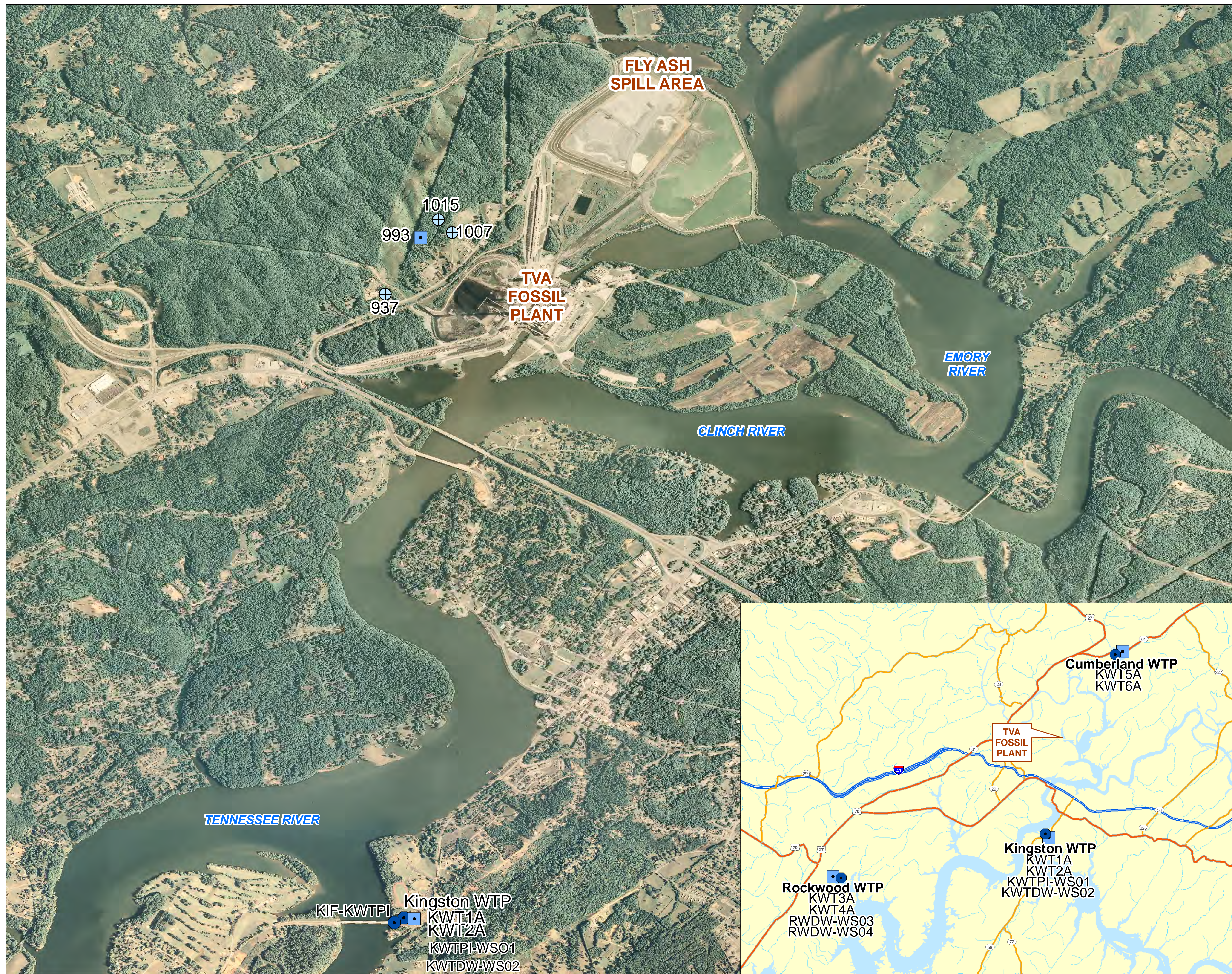
Analysis of the SESD data collected December 30, 2008 indicates that no analytes above the MCLs were detected in either finished or raw water at the three public plants. Similarly, no levels above the MCLs were noted in the residential wells.

TVA has collected 15 samples of raw intake water and 5 samples of finished water from the Kingston and Rockwood Treatment plants, as well as the Watts Bar Nuclear Power Plant. TDEC collected splits of two of these and sent them for analysis to the Tennessee Department of Health laboratory in Nashville, Tennessee. TVA collected samples from two private wells, one industrial well, and a natural spring.

To date, TDEC has collected approximately 20 residential well samples within a 4 mile radius. These results are pending.

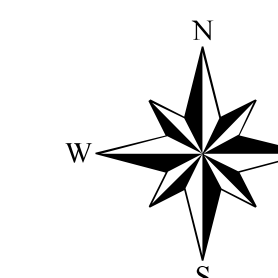
CONCLUSION

EPA, TDEC, and TVA have conducted sampling of both the raw and finished water at the public water treatment plants in the areas affected by the TVA ash spill. Based on the analysis of the samples collected by EPA on December 23, 29, and 30, 2008, there appears to be no current impact to public potable water supply in the affected area at this time. Characterization of residential wells is ongoing. No exceedences of MCLs of residential wells were noted in EPA's initial sampling.

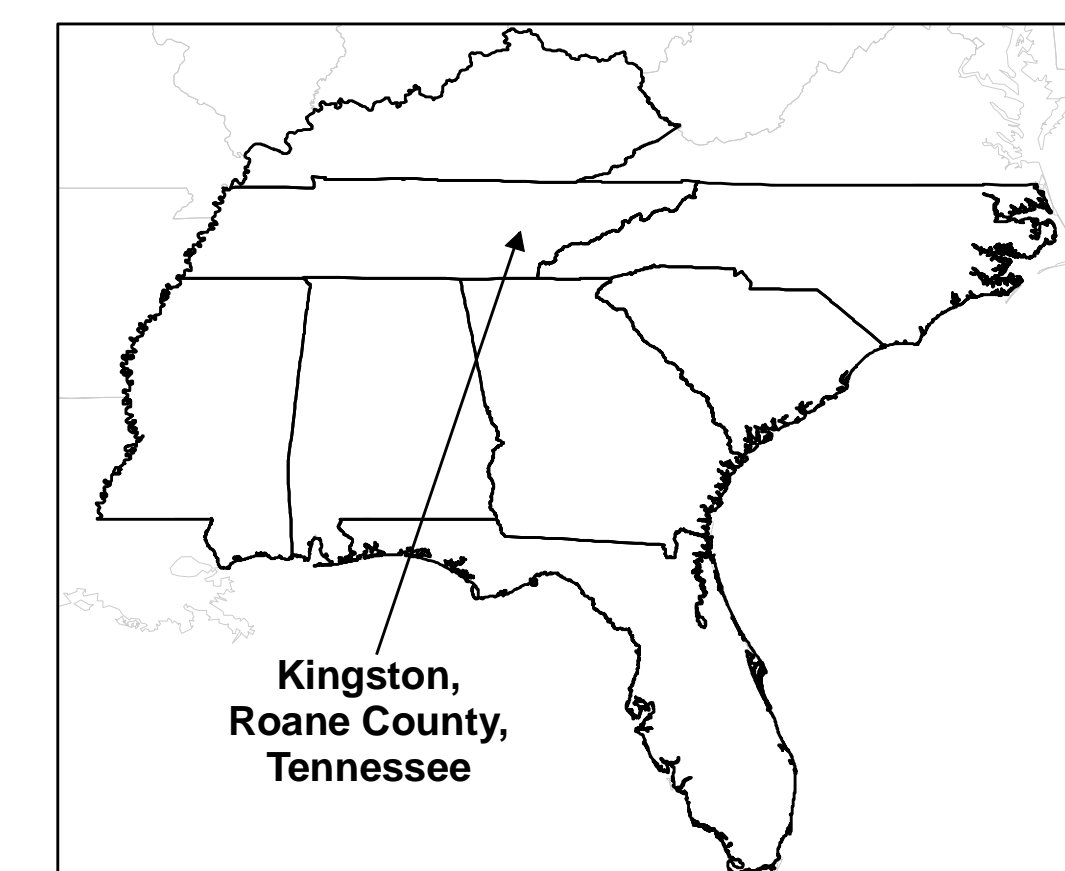


LEGEND

- EPA RAW WATER
- EPA FINISHED WATER
- ⊕ EPA WELL WATER



0 2,000 4,000 Feet



United States
Environmental Protection Agency

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

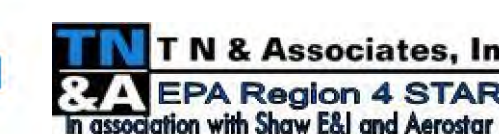
**TVA KINGSTON
FOSSIL PLANT SITE**

FIGURE 1

**EPA POTABLE WATER
SAMPLING LOCATIONS**



TETRA TECH



T.N. & Associates, Inc.
EPA Region 4 START
in association with Shaw E&I and Aerostar

TABLE 2
EPA START POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER
SAMPLE COLLECTED DECEMBER 23, 2008

Sample Designation:	Maximum	KIF-KWTPI
Sample Collection Date:	Contaminant	12/23/2008
Field Quality Control:	Level	(Kingston Raw)
Total Suspended Solids (mg/L)		
Total Suspended Solids	NL	NA
Dissolved Metals (mg/L)		
Aluminum	NL	NA
Antimony	0.006	NA
Arsenic	0.01	NA
Barium	2	NA
Beryllium	0.004	NA
Cadmium	0.005	NA
Calcium	NL	NA
Chromium	0.1	NA
Cobalt	NL	NA
Copper	1.3	NA
Iron	NL	NA
Lead	0.015	NA
Magnesium	NL	NA
Manganese	NL	NA
Mercury	0.002	NA
Nickel	NL	NA
Potassium	NL	NA
Selenium	0.05	NA
Silica	NL	NA
Silver	NL	NA
Sodium	NL	NA
Thallium	0.002	NA
Vanadium	NL	NA
Zinc	NL	NA
Total Metals (mg/L)		
Aluminum	NL	0.388
Antimony	0.006	0.02 U
Arsenic	0.01	0.05 U
Barium	2	0.0234
Beryllium	0.004	0.01 U
Cadmium	0.005	0.005 U
Calcium	NL	16.1
Chromium	0.1	0.01 U
Cobalt	NL	0.02 U
Copper	1.3	0.01 U
Iron	NL	0.386
Lead	0.015	0.01 U
Magnesium	NL	4.16
Manganese	NL	0.0487
Mercury	0.002	0.0002 U
Nickel	NL	0.02 U
Potassium	NL	1.95
Selenium	0.05	0.02 U
Silver	NL	0.01 U
Sodium	NL	8.77
Thallium	0.002	0.00619 J
Vanadium	NL	0.01 U
Zinc	NL	0.02 U

Notes:

Detections are listed in **BOLD**.

Highlighted results exceeded the Tennessee Water Quality Criteria.

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

mg/L = Milligrams per liter

NA = The sample was not analyzed for this analyte.

NL = Not listed

U = The analyte was analyzed for, but was not detected at or above the associated value.

TABLE 3
EPA START POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER AND TREATED WATER
SAMPLES COLLECTED DECEMBER 29, 2008

Sample Designation:	Maximum	KWTPI-WS01	KWTDW-WS02	RWWTI-WS04
Sample Collection Date:	Contaminant	12/29/2008	12/29/2008	12/29/2008
Sample Location:	Level	(Kingston Raw)	(Kingston Finished)	(Rockwood Raw)
Total Suspended Solids (mg/L)				
Total Suspended Solids	NL	10.5	5 U	8
Dissolved Metals (mg/L)				
Aluminum	NL	0.2 U	0.2 U	0.2 U
Antimony	0.006	0.02 U	0.02 U	0.02 U
Arsenic	0.01	0.05 U	0.05 U	0.05 U
Barium	2	0.0192 J	0.0179 J	0.0251
Beryllium	0.004	0.01 U	0.01 U	0.01 U
Cadmium	0.005	0.005 U	0.005 U	0.005 U
Calcium	NL	14.2	14.0	17.9
Chromium	0.1	0.01 U	0.01 U	0.01 U
Cobalt	NL	0.02 U	0.02 U	0.02 U
Copper	1.3	0.01 U	0.0037 J	0.01 U
Iron	NL	0.1 U	0.1 U	0.1 U
Lead	0.015	0.01 U	0.01 U	0.01 U
Magnesium	NL	3.67	3.66	5.87
Manganese	NL	0.015 U	0.015 U	0.015 U
Mercury	0.002	0.00014 J	0.00003 J	0.00004 J
Nickel	NL	0.02 U	0.02 U	0.02 U
Potassium	NL	1.60	1.64	1.49
Selenium	0.05	0.02 U	0.02 U	0.02 U
Silica	NL	1.94	2.12	2.03
Silver	NL	0.01 U	0.01 U	0.0003 J
Sodium	NL	8.36	11.6	6.37
Thallium	0.002	0.02 U	0.02 U	0.02 U
Vanadium	NL	0.01 U	0.01 U	0.01 U
Zinc	NL	0.0337	0.02 U	0.0633
Total Metals (mg/L)				
Aluminum	NL	0.423	0.0427 J	0.149 J
Antimony	0.006	0.02 U	0.02 U	0.02 U
Arsenic	0.01	0.05 U	0.05 U	0.05 U
Barium	2	0.0258	0.0217	0.0316
Beryllium	0.004	0.01 U	0.01 U	0.01 U
Cadmium	0.005	0.005 U	0.005 U	0.005 U
Calcium	NL	15.5	15.8	19.8
Chromium	0.1	0.01 U	0.01 U	0.01 U
Cobalt	NL	0.02 U	0.02 U	0.02 U
Copper	1.3	0.00441 J	0.00551 J	0.00356 J
Iron	NL	0.512	0.1 U	0.175
Lead	0.015	0.01 U	0.01 U	0.01 U
Magnesium	NL	4.34	4.41	6.87
Manganese	NL	0.106	0.015 U	0.0496
Mercury	0.002	0.00041	0.00008 J	0.00014 J
Nickel	NL	0.02 U	0.02 U	0.02 U
Potassium	NL	1.90	1.89	1.77
Selenium	0.05	0.02 U	0.02 U	0.02 U
Silver	NL	0.01 U	0.01 U	0.01 U
Sodium	NL	9.45	16.1	7.27
Thallium	0.002	0.02 U	0.02 U	0.02 U
Vanadium	NL	0.01 U	0.01 U	0.01 U
Zinc	NL	0.0712	0.02 U	0.0991

Notes:

Detections are listed in **BOLD**.

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

mg/L = Milligrams per liter

NA = The sample was not analyzed for this analyte.

NL = Not listed

U = The analyte was analyzed for, but was not detected at or above the associated value.

TABLE 3
EPA START POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER AND TREATED WATER
SAMPLES COLLECTED DECEMBER 29, 2008

Sample Designation:	TWQC	RWDW-WS03
Sample Collection Date:		12/29/2008
Sample Location:		(Rockwood Finished)
Total Suspended Solids (mg/L)		
Total Suspended Solids	NL	5 U
Dissolved Metals (mg/L)		
Aluminum	NL	0.0235 J
Antimony	0.006	0.02 U
Arsenic	0.01	0.05 U
Barium	2	0.0248
Beryllium	0.004	0.01 U
Cadmium	0.005	0.005 U
Calcium	NL	17.9
Chromium	0.1	0.01 U
Cobalt	NL	0.02 U
Copper	1.3	0.01 U
Iron	NL	0.1 U
Lead	0.015	0.01 U
Magnesium	NL	5.87
Manganese	NL	0.015 U
Mercury	0.002	0.00002 J
Nickel	NL	0.02 U
Potassium	NL	1.64
Selenium	0.05	0.02 U
Silica	NL	2.14
Silver	NL	0.01 U
Sodium	NL	7.30
Thallium	0.002	0.02 U
Vanadium	NL	0.01 U
Zinc	NL	0.0240
Total Metals (mg/L)		
Aluminum	NL	0.0326 J
Antimony	0.006	0.02 U
Arsenic	0.01	0.05 U
Barium	2	0.0295
Beryllium	0.004	0.01 U
Cadmium	0.005	0.005 U
Calcium	NL	20.0
Chromium	0.1	0.01 U
Cobalt	NL	0.02 U
Copper	1.3	0.01 U
Iron	NL	0.1 U
Lead	0.015	0.01 U
Magnesium	NL	6.97
Manganese	NL	0.015 U
Mercury	0.002	0.00005 J
Nickel	NL	0.02 U
Potassium	NL	1.92
Selenium	0.05	0.02 U
Silver	NL	0.01 U
Sodium	NL	8.31
Thallium	0.002	0.02 U
Vanadium	NL	0.01 U
Zinc	NL	0.0321

Notes:

Detections are listed in **BOLD**.

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

mg/L = Milligrams per liter

NA = The sample was not analyzed for this analyte.

NL = Not listed

U = The analyte was analyzed for, but was not detected at or above the associated value.

TABLE 4
EPA SEDS POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER, TREATED WATER, AND PRIVATE WELL WATER
Samples collected 12/30/08

Sample Designation:	Tennessee Water	1007	1007D	1015	1015D	937
Sample Collection Date:	Quality Criteria	12/30/2008	12/30/2008	12/30/2008	12/30/2008	12/30/2008
Sample Location:	(TWQC)	1007 Swan Pond Rd.	1007 Swan Pond Rd.	1015 Swan Pond Rd.	1015 Swan Pond Rd.	937 Swan Pond Rd.
Analysis:		Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Sample Type:		Well Water	Well Water	Well Water	Well Water	Well Water
Aluminum	NE	100 U, J, QR-1	100 U, J, QR-1	100 U, J, QR-1	100 U, J, QR-1	100 U, J, QR-1
Antimony	6	1 U	1 U	3	1 U	1 U
Arsenic	10	1 U	1 U	1 U	1 U	1 U
Barium	2000	73	71	69	73	120
Beryllium	4	3 U	3 U	3 U	3 U	3 U
Cadmium	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Calcium	NE	21000	18000	28000	30000	57000
Chromium	100	5 U	5 U	16	5 U	5 U
Cobalt	NE	5 U	5 U	5 U	5 U	5 U
Copper	1300	16 J, QR-2	10 U	32 J, QR-2	10 U	10 U
Iron	NE	120	100 U	1000	480	100 U
Lead	15	1 U	1 U	7.2	1 U	1 U
Magnesium	NE	7800	7800	8000	8700	8200
Manganese	NE	7.6	5 U	580	610	29
Mercury	2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Molybdenum	NE	5 U	5 U	5 U	5 U	5 U
Nickel	NE	10 U	10 U	10 U	10 U	10 U
Potassium	NE	2900	3100	3200	3400	2100
Selenium	50	2 U	2 U	2 U	2 U	2 U
Silver	NE	5 U	5 U	5 U	5 U	5 U
Sodium	NE	230000	240000	15000	16000	11000
Strontium	NE	340	330	400	430	360
Thallium	2	1 U	1 U	1 U	1 U	1 U
Tin	NE	15 U	15 U	15 U	15 U	15 U
Titanium	NE	5 U, J, QR-1	5 U, J, QR-1	5 U, J, QR-1	5 U, J, QR-1	5 U, J, QR-1
Vanadium	NE	5 U	5 U	5 U	5 U	5 U
Yttrium	NE	3 U	3 U	3 U	3 U	3 U
Zinc	NE	15	10 U	48	45	10 U

TABLE 4
EPA SEDS POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER, TREATED WATER, AND PRIVATE WELL WATER
Samples collected 12/30/08

Sample Designation:	Tennessee Water	937D	993	993D	KWT1A	KWT1AD
Sample Collection Date:	Quality Criteria	12/30/2008	12/30/2008	12/30/2008	12/30/2008	12/30/2008
Sample Location:	(TWQC)	937 Swan Pond Rd.	993 Swan Pond Rd.	993 Swan Pond Rd.	Kingston Intake	Kingston Intake
Analysis:		Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Sample Type:		Well Water	Public Water	Public Water	Raw Water	Raw Water
Aluminum	NE	100 U, J, QR-1	100 U, J, QR-1	100 U, J, QR-1	210 J, QR-1	100 U, J, QR-1
Antimony	6	1 U	1 U	1 U	1 U	1 U
Arsenic	10	1 U	1 U	1 U	1 U	1 U
Barium	2000	120	26	26	19 J, QR-1	18 J, QR-1
Beryllium	4	3 U	3 U	3 U	3 U	3 U
Cadmium	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Calcium	NE	56000	23000	23000	18000	18000
Chromium	100	5 U	5 U	5 U	5 U	5 U
Cobalt	NE	5 U	5 U	5 U	5 U	5 U
Copper	1300	10 U	46 J, QR-2	41 J, QR-2	11 J, QR-2	10 U
Iron	NE	100 U	100 U	100 U	260	100 U
Lead	15	1 U	2.4	1.3	1 U	1 U
Magnesium	NE	7900	6900	7100	4400	4200
Manganese	NE	23	5 U	5 U	38	5.9
Mercury	2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Molybdenum	NE	5 U	5 U	5 U	5 U	5 U
Nickel	NE	10 U	10 U	10 U	10 U	10 U
Potassium	NE	2100	2300	2200	2300	2300
Selenium	50	2 U	2 U	2 U	2 U	2 U
Silver	NE	5 U	5 U	5 U	5 U	5 U
Sodium	NE	12000	9200	9100	10000	10000
Strontium	NE	360	67	66	67	66
Thallium	2	1 U	1 U	1 U	1 U	1 U
Tin	NE	15 U	15 U	15 U	15 U	15 U
Titanium	NE	5 U, J, QR-1	5 U, J, QR-1	5 U, J, QR-1	5 U, J, QR-1	5 U, J, QR-1
Vanadium	NE	5 U	5 U	5 U	5 U	5 U
Yttrium	NE	3 U	3 U	3 U	3 U	3 U
Zinc	NE	10 U	42	39	31	25

TABLE 4
EPA SEDS POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER, TREATED WATER, AND PRIVATE WELL WATER
Samples collected 12/30/08

Sample Designation:	Tennessee Water	KWT2A	KWT2AD	KWT3A	KWT3AD	KWT4A
Sample Collection Date:	Quality Criteria	12/30/2008	12/30/2008	12/30/2008	12/30/2008	12/30/2008
Sample Location:	(TWQC)	Kingston Treated	Kingston Treated	Rockwood Intake	Rockwood Intake	Rockwood Treated
Analysis:		Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Sample Type:		Treated Water	Treated Water	Raw Water	Raw Water	Treated Water
Aluminum	NE	100 U, J, QR-1	100 U, J, QR-1	100 U	100 U	100 U
Antimony	6	1 U	1 U	1 U	1 U	1 U
Arsenic	10	1 U	1 U	1 U	1 U	1 U
Barium	2000	17 J, QR-1	17 J, QR-1	27	23	27
Beryllium	4	3 U	3 U	3 U	3 U	3 U
Cadmium	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Calcium	NE	17000	17000	21000	22000	23000
Chromium	100	5 U	5 U	5 U	5 U	5 U
Cobalt	NE	5 U	5 U	5 U	5 U	5 U
Copper	1300	11 J, QR-2	12 J, QR-2	10 U	10 U	10 U
Iron	NE	100 U	100 U	100 U	100 U	100 U
Lead	15	1 U	1 U	1 U	1 U	1 U
Magnesium	NE	4100	4300	6700	7000	7300
Manganese	NE	5 U	5 U	8.4	5 U	5 U
Mercury	2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Molybdenum	NE	5 U	5 U	5 U	5 U	5 U
Nickel	NE	10 U	10 U	10 U	10 U	10 U
Potassium	NE	2100	2200	1800	2000	1900
Selenium	50	2 U	2 U	2 U	2 U	2 U
Silver	NE	5 U	5 U	5 U	5 U	5 U
Sodium	NE	14000	14000	7600	7700	8700
Strontium	NE	63	65	64	66	67
Thallium	2	1 U	1 U	1 U	1 U	1 U
Tin	NE	15 U	15 U	15 U	15 U	15 U
Titanium	NE	5 U, J, QR-1	5 U, J, QR-1	5 U	5 U	5 U
Vanadium	NE	5 U	5 U	5 U	5 U	5 U
Yttrium	NE	3 U	3 U	3 U	3 U	3 U
Zinc	NE	10 U	10 U	26	25	23

TABLE 4
EPA SEDS POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER, TREATED WATER, AND PRIVATE WELL WATER
Samples collected 12/30/08

Sample Designation:	Tennessee Water	KWT4AD	KWT4AX	KWT4ADX	KWT5A	KWT5AD
Sample Collection Date:	Quality Criteria	12/30/2008	12/30/2008	12/30/2008	12/30/2008	12/30/2008
Sample Location:	(TWQC)	Rockwood Treated	Rockwood Treated	Rockwood Treated	Cumberland Intake	Cumberland Intake
Analysis:		Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Sample Type:		Treated Water	Treated Water	Treated Water	Raw Water	Raw Water
Aluminum	NE	100 U	100 U	100 U	360	100 U
Antimony	6	1 U	1 U	1 U	1 U	1 U
Arsenic	10	1 U	1 U	1 U	1 U	1 U
Barium	2000	25	25	26	22	20
Beryllium	4	3 U	3 U	3 U	3 U	3 U
Cadmium	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Calcium	NE	22000	22000	22000	10000	10000
Chromium	100	5 U	5 U	5 U	5 U	5 U
Cobalt	NE	5 U	5 U	5 U	5 U	5 U
Copper	1300	10 U	10 U	10 U	25	22
Iron	NE	100 U	100 U	100 U	410	100 U
Lead	15	1 U	1 U	1 U	1 U	1 U
Magnesium	NE	7200	7300	7100	4200	4200
Manganese	NE	5 U	5 U	5 U	45	43
Mercury	2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Molybdenum	NE	5 U	5 U	5 U	5 U	5 U
Nickel	NE	10 U	10 U	10 U	10 U	10 U
Potassium	NE	2100	1800	1800	1300	1300
Selenium	50	2 U	2 U	2 U	2 U	2 U
Silver	NE	5 U	5 U	5 U	5 U	5 U
Sodium	NE	8500	8400	8400	2700	2800
Strontium	NE	65	65	63	29	29
Thallium	2	1 U	1 U	1 U	1 U	1 U
Tin	NE	15 U	15 U	15 U	15 U	15 U
Titanium	NE	5 U	5 U	5 U	9.4	5 U
Vanadium	NE	5 U	5 U	5 U	5 U	5 U
Yttrium	NE	3 U	3 U	3 U	3 U	3 U
Zinc	NE	23	23	24	10 U	10 U

TABLE 4
EPA SEDS POTABLE WATER SAMPLING RESULTS
SAMPLING OF RAW INTAKE WATER, TREATED WATER, AND PRIVATE WELL WATER
Samples collected 12/30/08

Sample Designation:	Tennessee Water	KWT6A	KWT6AD	PRES BLK
Sample Collection Date:	Quality Criteria	30-Dec-2008	30-Dec-2008	30-Dec-2008
Sample Location:	(TWQC)	Cumberland Treated	Cumberland Treated	NA
Analysis:		Total Metals	Dissolved Metals	Total Metals
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Sample Type:		Treated Water	Treated Water	Preservative Blank
Aluminum	NE	100 U	100 U	100 U, J, QR-1
Antimony	6	1 U	1 U	1 U
Arsenic	10	1 U	1 U	1 U
Barium	2000	22	21	5 U, J, QR-1
Beryllium	4	3 U	3 U	3 U
Cadmium	5	0.5 U	0.5 U	0.5 U
Calcium	NE	11000	10000	250 U
Chromium	100	5 U	5 U	5 U
Cobalt	NE	5 U	5 U	5 U
Copper	1300	10 U	10 U	10 U
Iron	NE	100 U	100 U	100 U
Lead	15	1 U	1 U	1 U
Magnesium	NE	4300	4200	250 U
Manganese	NE	36	36	5 U
Mercury	2	0.1 U	0.1 U	0.1 U
Molybdenum	NE	5 U	5 U	5 U
Nickel	NE	10 U	10 U	10 U
Potassium	NE	1400	1300	1000 U
Selenium	50	2 U	2 U	2 U
Silver	NE	5 U	5 U	5 U
Sodium	NE	6200	6000	1000 U
Strontium	NE	29	28	5 U
Thallium	2	1 U	1 U	1 U
Tin	NE	15 U	15 U	15 U
Titanium	NE	5 U	5 U	5 U, J, QR-1
Vanadium	NE	5 U	5 U	5 U
Yttrium	NE	3 U	3 U	3 U
Zinc	NE	13	14	10 U

Notes:

Detections are listed in **BOLD**.

QR-1 = MRL verification recovery less than lower control limits.

NE = Not established

QR-2 = MRL verification recovery greater than upper control limits.

µg/kg = Micrograms per kilogram

U = The analyte was analyzed for, but was not detected at or above the associated value.

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.