December 17, 2008

Mark Boggs, WT 9D-K

KINGSTON GROUNDWATER MONITORING – DECEMBER 2008

On December 1 through 4, Bill Nichols and I conducted field-monitoring activities specified for Kingston groundwater monitoring. Groundwater samples were collected from Wells 4B, 6A, 13B, 16A, and 22 in the Ash Pond Area, and from G1B, G3A, G3B, G4B, G5A, G5B, and G6B in the Gypsum Disposal Area. Wells G3A and G3B were evacuated to allow recharge overnight before collecting the samples. This was due to high turbidity and the slow recharge rate. Routine samples (mineral, metal, nutrient, and TIC) were collected from all wells. Equipment blanks were collected after Well G6B and before Well G5B for the Gypsum Disposal Area, and after Well 6A and before Well 22 for the Ash Pond Area. Duplicate samples were collected from Well G6B and Well 16A. A portable Grundfos Rediflo 2 centrifugal pump and/or a Rolotec variable speed peristaltic pump were used for purging and sampling all wells.

Sample readings of Hydrolab parameters (temperature, pH, dissolved oxygen, conductivity, and oxidation-reduction potential) were determined utilizing a flow-through cell to eliminate groundwater-to-air contact for all wells. Alkalinity and acidity were determined by potentiometric titration using an Orion 250A+ pH meter. Standardization of instruments showed minimal drift on all parameters.

Samples were hand delivered by Bill Nichols to the Knoxville mailroom and mailed to the laboratory via TVA mail courier on December 4.

Attached are twelve Groundwater Data Field Worksheets (TVA 30066A (9-1999)), four Acidity and Alkalinity Field Worksheets (TVA 30533 (RD-BUS 4-92)), five Instrument Standardization forms (TVA 30035 (RG-ES-8-93)), two spreadsheet of water surface elevations, and two Environmental Science Corporation chain-of-custody forms with attachment.

If you have any questions or comments, please call me at (865) 673-2374 in Knoxville.

Samuel A. Grindstaff
Environmental Engineering Services East
GRN 2E-K

SAG:ELD
Attachments
cc (Attachments):
Daryl R. Armentrout, GRN 2E-K
Cynthia W. McCowan, KFP 1A-KST
Matthew D. Williams, WT 9D-K (orig.)
EDMS, CTR 1B-M

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	4B 84068		2008	12	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.71 4195	12.72 4194	102 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
2.37 4191		12.82 4190	KIF-4B-1208	☒ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(12.72)m - (4.71)m]	x	(8.107)L/m	=	64.9 (L)	129.8 (L)	75.5 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
150 / 112 Begin Purge →	1008	6.0	4.71	12.5						
	1009	↓	—	12.5	16.3	6.8	3.0	859	163	—
	1010	↓	—	12.5	16.6	6.8	3.0	878	184	—
4 L	1015	5.5	10.48	12.5	17.2	6.9	3.3	930	233	—
53L	1017	↓	—	12.5	17.4	6.9	3.1	924	250	—
69L →	1019	5.5	12.5	12.5	17.4	6.9	2.9	907	252	—
	STOPPED TO LET RECHARGE									
RESTART →	1306	3.5	6.63							
110 / 112 3.5L	1307	2.0	7.29	12.5	16.2	6.9	1.0	725	282	—
	1308	↓	—	12.5	16.5	6.9	0.9	725	274	—
8L	1309	↓	—	12.5	16.9	6.9	0.8	728	265	—
9.5L	1310	↓	8.02	12.5	16.9	6.9	0.8	729	262	—

Remarks:

Reviewed By: Survey Leader — 12/2/08 Date — Project Leader — 12/16/08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	12	02	(ET) CT

Pump Duration: 15 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1310	2.0	12.5	16.9	6.9	6.8	729	262	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	12	02

Turbidity 1350: ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: NONE

Odor: NONE

415	431	436	437
Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)
Time:	Time: 1505	Time:	Time: 1530
Initial:	Initial: MS	Initial:	Initial: MS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025456

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	6A 84068		2008	12	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.13 4195	8.88 4194	102 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
8.47 4191		8.92 4190	KIF-6A-1208	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.88)m - (4.13)m]	x	(8.107)L/m	=	38.5 (L)	77.0 (L)	51.5 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0907	7.0	4.13	8.6	—					—
7.0L	0908	5.0	5.04	8.6	18.2	5.9	0.3	4992	164	—
	0910	↓	—	8.6	18.6	5.9	0.3	4943	156	—
	0912	↓	—	8.6	18.6	5.9	0.3	4600	156	—
37.0L	0914	5.0	8.6	8.6	18.5	5.9	0.5	2740	163	—
→ STOPPED		TO	LAT	RECHARGE	—					—
RESTART →	1325	4.0	5.49	8.6	—					—
4.0L	1326	3.5	—	8.6	17.7	5.8	0.5	4077	176	—
	1327	↓	—	8.6	18.1	5.8	0.5	4079	173	—
11L	1328	↓	6.98	8.6	18.5	5.8	0.4	4078	171	—
14.5L	1329	↓	7.53	8.6	18.6	5.8	0.4	4076	170	—

110 HL

Remarks: KIF-APAFQ BLANK-1208 COLLECTED AFTER PURGING WELL 6A AND BEFORE WELL 22 @ 0920

Reviewed By: _____ Survey Leader 12-2-08 Date _____ Project Leader 12-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1329 (ET) CT
08	12	02	

Pump Duration: 11 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1329	3.5	8.6	18.6	5.8	0.4	4076	170	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	12	02

Turbidity 1350: ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: none
Odor: none

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	190		1740
Time:	Time: 1515	Time:	Time: 1528
Initial:	Initial: SAG	Initial:	Initial: SAG

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025457

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	13B 84068		2008	12	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
2.42 4195	25.68 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label
22.29 4191	To	25.34 4190	KIF-13B-1208

☒ Unfiltered ☐ Filtered ☐ Both
Filter Type and Size:

[Bottom of Well	-	Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(25.68)m	-	(2.42)m]	x	(2.027)L/m	=	47.1 (L)	94.2 (L)	99.5 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
135 Begin Purge →	1035	7.5	2.42	10.0	—	—	—	—	—	—
	1036	↓	6.15	10.0	16.8	7.1	0.5	417	75	—
20L	1038	↓	—	10.0	16.9	7.3	0.3	412	56	—
37.5L	1040	6.0	7.72	10.0	16.8	7.4	0.3	412	53	—
49.5L	1042	↓	—	10.0	16.7	7.7	0.2	425	46	—
61.5L	1044	5.0	8.13	10.0	16.7	7.8	0.2	423	44	—
71.5L	1046	↓	—	10.0	16.7	7.8	0.2	420	42	—
81.5L	1048	4.5	7.92	10.0	16.7	7.9	0.2	417	41	—
90.5L	1050	↓	—	10.0	16.7	7.9	0.2	415	38	—
99.5L	1052	↓	8.25	10.0	16.7	7.9	0.2	412	37	—
108.5L	1054	4.5	8.29	10.0	16.7	7.9	0.2	411	35	—

Remarks:

Reviewed By: [signature] Survey Leader 12-2-08 Date [signature] Project Leader 12-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1054
08	12	02	(ET) CT

Pump Duration: 19 min 72004
"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
	4193	4192	10	400	300	94	90	
1054	4.5	10.0	16.7	7.9	0.2	411	35	—

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	12	02

Turbidity 1350 ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: None
Odor: None

415	431	436	437
/	208	/	5
Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)
Time:	Time: 1522	Time:	Time: 1541
Initial:	Initial: [initials]	Initial:	Initial: [initials]

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ BOD ☐ COD ☐ TOC ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025458

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	16A 84068		2008	12	01

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
0.10 4195	20.16 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
16.98 4191		20.03 4190	KIF-16A-1208 KIF-16A-1208-DUP	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(20.16)m - (0.10)m]	x	(2.027)L/m	=	40.7 (L)	81.4 (L)	122.0 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☒ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1306	10.0	0.10	6.7						
	1307	1	2.50	6.7	17.0	7.0	0.4	329	85	—
	1309	1	—	6.7						
50L	1311	10.0	4.72	6.7	16.1	7.1	0.3	342	56	—
86L	1315	9.0	5.53	6.7	16.2	7.2	0.7	345	81	—
	1317	↓		6.7	16.3	7.2	0.8	345	90	—
122L	1319	↓	6.50	6.7	16.3	7.2	0.8	346	92	—

Remarks:

Reviewed By: Survey Leader 12/1/08 Date — Project Leader 12-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1319 (ET) CT
08	12	01	

Pump Duration: 13 min 72004
"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)
1319	9.0
	4193

Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
6.7	16.3	7.2	0.8	346	92	—
4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed: Year 08 Month 12 Day 01

Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: NONE

Odor: NONE

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	149 / 148		17 / 16
Time:	Time: 1449 / 1451	Time:	Time: 1454
Initial:	Initial: JAS / JAS	Initial:	Initial: JAS / JAS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025459

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	22 84068		2008	12	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
5.30 4195	14.1 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
6.10 4191		14.1 4190	KIF-22-1208	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(14.1)m - (5.30)m] x (2.027)L/m =	17.8 (L)	35.6 (L)	40L (L) 4186

Purge Pump: ☐ Bladder ☒ ~~Centrifugal~~ ☒ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ ~~Centrifugal~~ ☒ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0927	2.0	5.30	7.0						
	0928		5.34	7.0	17.2	6.1	1.0	375	261	
	0930		5.34	7.0	17.2	6.2	0.9	376	265	
16L	0935	2.0	5.34	7.0	17.6	6.3	0.6	377	273	
	0936		5.34	7.0	17.7	6.3	0.6	379	276	
22L	0938	2.0	5.34	7.0	17.8	6.3	0.5	378	280	
26L	0940		5.34	7.0	17.8	6.3	0.5	379	285	
36L	0945		5.34	7.0	17.8	6.3	0.4	382	290	
40L	0947	2.0	5.34	7.0	17.9	6.3	0.4	380	292	

Remarks:

Reviewed By: Survey Leader 12-2-08 Date Project Leader 12-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	0947 (ET) CT
08	12	02	

Pump Duration: 20 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)
0947	2.0
	4193

Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
7.0	17.9	6.3	0.4	380	292	—
4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	12	02

Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: NONE

Odor: NONE

415	431	436	437
Phenol Alkalinity mg/L (EPA 310.1)	~~Total Alk.~~ 70 mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1) 47
Time:	Time: 1526	Time:	Time: 1345
Initial:	Initial: JW	Initial:	Initial: JW

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ TOC ☐ COD ☐ TIC ☐ Ferrous ☐ Metals ☐ Dis. Metals ☐ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025460

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G1B 84068		2008	12	04

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
35.24 4195	39.19 4194	153 4188	SAG	WFN

☐ Depth of Screen ☒ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
NA 4191		NA 4190	KIF-G1B-1208	☒ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(39.19)m - (35.24)m] x (18.228)L/m =	72.0 (L)	144.0 (L)	154.0 (L) 4186

Purge Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

15.24

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1039	7.0	35.24	38.0						
	1042	7.0	—	38.0	15.1	7.4	8.9	389	336	—
	1047	7.0	—	38.0	15.2	7.4	8.7	405	335	—
91.0L	1052	7.0	36.19	38.0	15.3	7.4	8.6	413	371	—
126.0L	1057	7.0	—	38.0	15.3	7.4	8.3	422	381	—
140.0L	1059	7.0	—	38.0	15.3	7.4	8.0	446	384	—
154.0L	1101	7.0	36.35	38.0	15.3	7.4	7.8	448	384	—

300 ml

Remarks:

Reviewed By: _____ 12-4-08 _____ 12-16-08
Survey Leader Date Project Leader Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1101 (ET) CT
08	12	04	

Pump Duration: 22 min 72004
"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1101	7.0	38.0	15.3	7.4	7.8	448	384	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	12	04

Turbidity 1350: ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid
Color: TAN TINT
Odor: NONE

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
220		17	
Time:	Time: 1432	Time:	Time: 1445
Initial:	Initial: JDS	Initial:	Initial: JDS

Bottles Required: ☐ BOD ☐ TOC ☐ COD ☐ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS
Others (list): FQ

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

TVA 30066A [2-2008]

TVA-00025461

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number		Purge Date	Year	Month	Day
Kingston Groundwater	G3A	84068		2008	12	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.86 4195	9.74 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
6.6 4191	To	9.6 4190	KIF-G3A-1208	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well	-	Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(9.74)m	-	(3.86)m]	x	(2.027)L/m	=	11.9 (L)	23.8 (L)	30.0 (L) 4186

Purge Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Sample Pump: ☐ Bladder ☒ ~~Centrifugal~~ ☒ Peristaltic ☐ Dedicated Other (list):

200 HL

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0941	7.5	3.86	9.0						
7.5L	0942	5.75	7.10	9.0	15.7	6.1	2.5	244	333	—
19L	0944	3.5		9.0	16.5	6.5	2.9	241	346	—
26L	0946	3.5	9.0	9.0						
→	STOP	TO	LET	RECHARGE						
RESTART →	0917	0.7	3.90	9.0						
	0918		—	9.0	14.8	7.6	7.3	354	262	—
	0919		—	9.0	14.7	7.2	5.0	319	289	—
	0920		—	9.0	14.7	7.0	4.1	313	301	—
	0921		3.95	9.0	14.8	6.9	3.6	321	309	—
	0922			9.0	14.8	6.8	3.5	354	317	—
4.0L	0923	0.7	3.95	9.0	14.8	6.8	3.5	360	319	—

Remarks:

Reviewed By: [signature] Survey Leader 12-4-08 Date [signature] Project Leader 12-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	0923
08	12	04	(ET) CT

Pump Duration: 999 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
0923	0.7	9.0	14.8	6.8	3.5	360	319	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG		171		44
Date Analyzed	415	431	436	437
Year 08 Month 12 Day 04	Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)
Turbidity 1350 ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid	Time: Initial:	Time: 1435 Initial: [initials]	Time: Initial:	Time: 1449 Initial: [initials]
Color: TAN TINT Odor: NONE	Bottles Required ☐ BOD ☐ TOC ☐ COD ☒ TIC	☐ Ferrous ☒ Metals ☐ Dis. Metals	☒ Mineral ☐ Dis. Mineral ☒ Nutrient	☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Others (list): FQ

TVA 30066A [2-2008]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G3B 84068		2008	12	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.09 4195	19.19 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
12.8 4191		18.9 4190	KIF-G3B-1208	☒ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(19.19)m - (4.09)m]	x	(2.027)L/m	=	30.6 (L)	61.2 (L)	69.0 (L) 4186

Purge Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ Centrifugal ☒ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
230 HZ Begin Purge →	0921	8.0	4.09	18.5						
8L	0922	6.0	7.09	18.5	15.0	7.5	3.2	501	256	—
20L	0924	6.0	13.14	18.5	15.7	8.1	4.8	460	242	—
32L	0926	3.5	13.18	18.5	15.9	8.0	4.7	472	244	—
40L	0927	4.3	13.99	18.5	15.7	7.9	3.1	572	250	—
53L	0930	2.3	16.00	18.5	15.3	7.6	2.7	594	265	—
60L	0933	3.0	17.00	18.5	15.9	7.6	1.9	582	266	—
66L	0935	3.0	18.01	18.5	16.0	7.5	1.7	578	267	—
→	STOPPED TO GET REFERENCE AND SHUT									
RESTART →	0901	0.6	4.18	9.0						
	0902		5.07	9.0	14.9	8.4	8.5	484	207	—
	0903			9.0	14.8	8.5	8.4	485	208	—
	0904			9.0	14.7	8.4	8.4	484	209	—
3.0L	0905	0.6	5.51	9.0	14.6	8.5	8.3	484	209	—

Remarks:

Reviewed By: Survey Leader 12-4-08 Date; Project Leader 12-16-08 Date

Sample Collector: WFN		
Sample Date		Time
Year 08	Month 12 Day 04	0905 ET CT
Pump Duration: 999 min 72004		

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
0905	0.6	9.0	14.6	8.5	8.3	484	209	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG	20	124			Well Diameter (mm)	Vol. Factor (L/m)
Date Analyzed: Year 08 Month 12 Day 04	415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)	12.7 (0.5 in)	0.127
Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid	Time: 1438	Time: 1440	Time:	Time:	51 (2 in)	2.027
Color: None	Initial: MM	Initial: MM	Initial:	Initial:	76 (3 in)	4.560
Odor: None					102 (4 in)	8.107
					127 (5 in)	12.668
					153 (6 in)	18.228

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025463

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G4B 84068		2008	12	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
9.17 4195	25.02 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
18.8 4191		24.9 4190	KIF-G4B-1208	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(25.02)m - (9.17)m] x (2.027)L/m =	32.1 (L)	64.2 (L)	68.0 (L) 4186

Purge Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
190 ml Begin Purge →	1350	5.0	9.17	20.0	—	—	—	—	—	—
5L	1351	5.0	10.60	20.0	15.4	6.9	1.2	688	198	—
25L	1356	3.4	15.37	20.0	—	—	—	—	—	—
42L	1401	2.8	16.92	20.00	16.8	7.0	0.5	761	165	—
56L	1406	2.0	18.55	20.0	16.9	7.0	0.6	772	171	—
60L	1408	2.0	18.96	20.0	17.1	7.0	0.6	776	171	—
64L	1410	2.0	—	20.0	17.1	7.0	0.7	809	172	—
68L	1412	2.0	19.04	20.0	17.1	7.0	0.7	805	172	—

Remarks:

Reviewed By: _____ Survey Leader 12-3-08 Date _____ Project Leader 12-16-08 Date

Sample Collector: WFN			
Sample Date			Time
Year 08	Month 12	Day 03	(ET) CT
Pump Duration: 22 min 72004			

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1412	2.0	20.0	17.1	7.0	0.7	805	172	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year 08	Month 12	Day 03

Turbidity 1350: ☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: Cloudy/milky

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	394		59
Time:	Time: 1547	Time:	Time: 1553
Initial:	Initial: JAS	Initial:	Initial: MM

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

TVA 30066A [2-2008]

TVA-00025464

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G5A 84068		2008	12	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
6.78 4195	8.57 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
5.7 4191		8.7 4190	KIF-G5A-1208	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.57)m - (6.78)m]	x	(2.027)L/m	=	3.6 (L)	7.2 (L)	8.0 (L) 4186

Purge Pump: ☐ Bladder ☒ ~~Centrifugal~~ ☒ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ ~~Centrifugal~~ ☒ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1100	1.0	6.78	7.5						
	1101		6.78	7.5	14.2	6.6	3.7	172	339	—
	1103		6.78	7.5	15.2	6.6	2.5	293	318	—
	1105		6.78	7.5	15.4	6.6	2.4	295	317	—
	1107		6.78	7.5	15.3	6.7	2.4	299	318	—
	1108	1.0	6.78	7.5	15.2	6.7	2.4	301	318	—

Remarks:

Reviewed By: _____ 12-3-08 _____ 12-16-08
Survey Leader Date Project Leader Date

Sample Collector: WFN			
Sample Date			Time
Year 08	Month 12	Day 03	(ET) CT
Pump Duration: 8 min			72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1108	1.0	7.5	15.2	6.7	2.4	301	318	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year 08	Month 12	Day 03

Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: None
Odor: None

415	431	436	437
Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)
Time:	Time: 1618	Time:	Time: 1600
Initial:	Initial: SAG	Initial:	Initial: SAG

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ TOC ☐ COD ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025465

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G5B 84068		2008	12	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
6.65 4195	18.36 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
12.0 4191		18.1 4190	KIF-G5B-1208	☒ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(18.36)m - (6.65)m]	x	(2.027)L/m	=	23.7 (L)	47.4 (L)	52.0 (L) 4186

Purge Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1116	1.0	6.65	7.5						
1.0L	1117	0.5	7.50	7.5	15.1	7.2	3.9	419	274	—
	1127	0.5	8.60	9.0	15.3	7.4	3.2	420	264	—
7.0L	1130	0.5	9.00	9.0	15.0	7.4	3.1	419	252	—
→	STOPPED DUE TO EQUIPMENT ISSUES									
RESTART →	1137	2.2	9.00	15.0						
1.35 HR	1138	2.2	8.67	15.0	14.3	7.5	1.5	477	253	—
24L	1148	3.3	8.00	15.0	16.3	7.4	3.8	428	278	—
2.0L 1146 34L	1151	2.0	8.10	15.0	16.2	7.3	4.6	412	289	—
	1153	2.0	—	15.0	16.2	7.3	4.8	407	297	—
40L	1154	2.0	—	15.0	16.3	7.3	4.9	408	301	—
44L	1156	2.0	7.79	15.0	16.3	7.3	5.0	405	307	—
48L	1158	2.0	—	15.0	16.3	7.3	5.2	400	311	—
52L	1200	2.0	7.83	15.0	16.3	7.3	5.2	401	313	—

Remarks:

Reviewed By: Survey Leader 12-3-08 Date Project Leader 12-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1200 (ET) CT
08	12	03	

Pump Duration: 37 min 72004
"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1200	2.0	15.0	16.3	7.3	5.2	401	313	—
4193		4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	12	03

Turbidity 1350: ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid
Color: NONE
Odor: NONE

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	189		17
Time:	Time: 1615	Time:	Time: 1603
Initial:	Initial: RDS	Initial:	Initial: RDS

Bottles Required: ☐ BOD ☐ TOC ☐ COD ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS
Others (list): FQ

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

TVA 30066A [2-2008]

TVA-00025466

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G6B 84068		2008	12	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
11.25 4195	18.19 4194	51 4188	SAG	WFN

☒ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
11.9 4191		18.0 4190	KIF-G6B-1208 KIF-G6B-1208-DUP	☒ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(18.19)m - (11.25)m]	x	(2.027)L/m	=	14.10 (L)	28.20 (L)	32.00 (L) 4186

Purge Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☒ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
145 HL Begin Purge →	1020	2.0	11.25	15.0						
	1021	2.0	11.26	15.0	13.9	6.8	7.8	530	314	
6L	1023	2.0	11.26	15.0	14.9	6.9	7.7	531	319	
10L	1025	2.0	11.26	15.0	15.5	6.9	7.6	532	323	
	1028	2.0	11.26	15.0	16.0	6.9	7.5	533	331	
20L	1030	2.0	11.26	15.0	16.1	6.9	7.4	533	333	
24L	1032	2.0	11.26	15.0	16.1	6.9	7.3	532	333	
28L	1034	2.0	11.26	15.0	16.1	7.0	7.2	531	338	
32L	1036	2.0	11.26	15.0	16.2	7.0	7.1	531	339	

Remarks: KIF-GWPRO BLANK-1208 COLLECTED AFTER PURGING & SAMPLING WELL G6B AND BEFORE WELL G5A @ 1043

Reviewed By: _____ Survey Leader 12-3-08 Date _____ Project Leader 11-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	12	03	(ET) CT

Pump Duration: 16 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1036	2.0	15.0	16.2	7.0	7.1	531	339	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed			415	431	436	437
Year	Month	Day	Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)
08	12	03		274 | 274		49 | 50
			Time:	Time: 1611 | 1613	Time:	Time: 1607 | 1609
			Initial:	Initial: [illegible] | [illegible]	Initial:	Initial: [illegible] | [illegible]

Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid

Color: None

Odor: None

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ TOC ☐ COD ☒ TIC ☐ Ferrous ☒ Metals ☐ Dis. Metals ☒ Mineral ☐ Dis. Mineral ☒ Nutrient ☐ Phenol ☐ Filt TIC ☒ TSS/TDS

Others (list): FQ

TVA 30066A [2-2008]

TVA-00025467

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KINGSTON G.W.	12/01/08
SURVEY LEADER: SAG	
FIELD CREW: WFN	

NORMALITY	
ACID	0.02
BASE	0.02

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	ALKALINITY TITRATION(S) ml ACID TO pH 8.3	ALKALINITY TITRATION(S) PHENOL ALK (mg/L) (Ca CO_3)	ALKALINITY TITRATION(S) TOTAL ml ACID TO pH 4.5	ALKALINITY TITRATION(S) TOTAL ALK. (mg/L) (Ca CO_3)	ACIDITY TITRATION(S) ml BASE TO pH 3.7	ACIDITY TITRATION(S) MINERAL ACIDITY (mg/L) (Ca CO_3)	ACIDITY TITRATION(S) TOTAL ml BASE TO pH 8.3	ACIDITY TITRATION(S) CO_2 ACIDITY (mg/L) (Ca CO_3)
KIF-16A-1208	7.1	100	10			14.9	149			1.7	17
KIF-16A-1208-DUP	7.1	100	10			14.8	148			1.6	16

$$\text{ALKALINITY OR ACIDITY (mg/L } CaCO_3) = \frac{A \times N \times 50{,}000}{V}$$

A = ml TITRANT
N = TITRANT NORMALITY
V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — 12/01/08 (Date)

FE Proj. Eng. — 12-16-08 (Date)

DISTRIBUTION: (1) Original - Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) (4) Green - survey Leader (Field Notebook) (5) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

TVA-00025468

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KINGSTON G.W.	12/02/08
SURVEY LEADER	
SAG	
FIELD CREW	
WFN	

NORMALITY	
ACID	0.02
BASE	0.02

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TI-TRATED (ml)	FAC-TOR	ALKALINITY TITRATION(S) ml ACID TO pH 8.3	PHENOL ALK (mg/L) ($CaCO_3$)	TOTAL ml ACID TO pH 4.5	TOTAL ALK. (mg/L) ($CaCO_3$)	ACIDITY TITRATION(S) ml BASE TO pH 3.7	MINERAL ACIDITY (mg/L) ($CaCO_3$)	TOTAL ml BASE TO pH 8.3	CO_2 ACIDITY (mg/L) ($CaCO_3$)
KIF-4B-1208	7.0	100	10	—	—	11.1	111	—	—	1.7	17
KIF-6A-1208	5.9	100	10	—	—	19.0	190	—	—	—	—
KIF-13B-1208	7.8	100	10	—	—	20.8	208	—	—	0.5	5
KIF-22-1208	6.5	100	10	—	—	7.0	70	—	—	4.7	47
KIF-6A-1208	5.9	25	40	—	—	—	—	—	—	43.5	1740

$$\text{ALKALINITY OR ACIDITY (mg/L } CaCO_3) = \frac{A \times N \times 50{,}000}{V}$$

A = ml TITRANT
N = TITRANT NORMALITY
V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — Date: 12/2/08

FE Proj. Eng. — Date: 12-16-08

DISTRIBUTION: (1) Original - Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) (4) Green - survey Leader (Field Notebook) (5) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

TVA-00025469

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KINGSTON G.W.	12-3-08

SURVEY LEADER: SAG

FIELD CREW: WFN

NORMALITY

ACID: 0.02

BASE: 0.02

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	ALKALINITY TITRATION(S)				ACIDITY TITRATION(S)			
				ml ACID TO pH 8.3	PHENOL ALK (mg/L) ($CaCO_3$)	TOTAL ml ACID TO pH 4.5	TOTAL ALK. (mg/L) ($CaCO_3$)	ml BASE TO pH 3.7	MINERAL ACIDITY (mg/L) ($CaCO_3$)	TOTAL ml BASE TO pH 8.3	CO_2 ACIDITY (mg/L) ($CaCO_3$)
KIF-G4B-1208	7.1	100	10	—	—	39.4	394	—	—	5.9	59
KIF-G5A-1208	6.9	100	10	—	—	14.5	145	—	—	3.1	31
KIF-G5B-1208	7.3	100	10	—	—	18.9	189	—	—	1.7	17
KIF-G6B-1208	7.1	100	10	—	—	27.4	274	—	—	4.9	49
KIF-G6B-1208-DUP	7.1	100	10	—	—	27.4	274	—	—	5.0	50

$$\text{ALKALINITY OR ACIDITY (mg/L } CaCO_3) = \frac{A \times N \times 50{,}000}{V}$$

A = ml TITRANT

N = TITRANT NORMALITY

V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — 12-3-08 (Date)

FE Proj. Eng. — 12-16-09 (Date)

DISTRIBUTION: (1) Original - Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) (4) Green - survey Leader (Field Notebook) (5) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

TVA-00025470

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KINGSTON G. W.	12-4-08
SURVEY LEADER	
SAG	
FIELD CREW	
WFN	

NORMALITY	
ACID	0.02
BASE	0.02

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	ALKALINITY TITRATION(S)				ACIDITY TITRATION(S)			
				ml ACID TO pH 8.3	PHENOL ALK (mg/L) ($CaCO_3$)	TOTAL ml ACID TO pH 4.5	TOTAL ALK. (mg/L) ($CaCO_3$)	ml BASE TO pH 3.7	MINERAL ACIDITY (mg/L) ($CaCO_3$)	TOTAL ml BASE TO pH 8.3	CO_2 ACIDITY (mg/L) ($CaCO_3$)
KIF-G1B-1208	7.4	100	10	—	—	22.0	220	—	—	1.7	17
KIF-G3A-1208	6.9	100	10	—	—	17.1	171	—	—	4.4	44
KIF-G3B-1208	8.9	100	10	2.0	20	12.4	124	—	—	—	—

$$\text{ALKALINITY OR ACIDITY (mg/L } CaCO_3) = \frac{A \times N \times 50{,}000}{V}$$

A = ml TITRANT
N = TITRANT NORMALITY
V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — Date: 12-4-08

FE Proj. Eng. — Date: 12-16-08

DISTRIBUTION: (1) Original - Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) (4) Green - survey Leader (Field Notebook) (5) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

TVA-00025471

Instrument Standardization

Field Standardization of Instruments

Survey KIF Groundwater

	As Found	Check Final
Standardized By	WLM	WLM
Date/Time-Begin & End	12/11/08 @ 0625	12/14/08 @ 1245
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)	722	736

Instrument(s)		TVA Tag Number(s) or SN		
Type	SRY4a		Calibration Date	7/10/08
Model	DS5x	46804	Calibration Due Date	7/10/09

Field Measurements		Instrument Readings As Found	Adjusted To	Check Final	Remarks & Additional Information	
Temp. (°C)	Instrument	18.6		18.8		
	* Hand Thermometer	18.5		18.8	* Annual Ice Pt Ck Date	
	ID # 93M/00599					
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	19 / 8.74		19 / 8.93		
	Instrument (D.O)	8.88	8.74	8.97		
	Instrument (% Sat.)	100.1		101.3		
Conductivity (umhos/cm) (uS/cm)	Instrument	106	100	104	Date Expires	8/09
	Low Range	Conc of STD =	100		Lot #	1809110
	Instrument	1317	1413	1408	Date Expires	12/08
	High Range	Conc of STD =	1413		Lot #	12.07HDD
pH (std units) % slope of probe ____	Buffers Temp	21.6 / 21.5		21.8 / 22.0	Date Expires	Lot #
	Instrument @ 7.0	7.0	—	7.1	6/10	0523JBB
	Instrument @ 10.0	—	—	—	—	—
	Instrument @ 4.0	4.0	—	4.1	4/10	0410JCC
☒ ORP ☐ Sulfide	Instrument	284	291	291	Date Std Prepared	
	STD Temp/Conc.	22 / 291		22 / 291	12/01/08	
	Instrument	464	—	468	Date Std Prepared	
	STD Temp/Conc.	22 / 467		22 / 467	12/01/08	
Turbidity	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
Depth (m)	Instrument (0.0)					

Comments

Reviewed By: MW

TVA 30035 [10-2008]

TVA-00025472

Instrument Standardization

Field Standardization of Instruments

Survey KIF G.W. ALK/ACID

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	12/01/08 @ 1434	12/01/08 @ 1459
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN		
Type	Orion pH meter	E36635	Calibration Date	2/11/08
Model	250 A+		Calibration Due Date	2/11/09

Field Measurements		Instrument Readings: As Found	Instrument Readings: Adjusted To	Instrument Readings: Check Final	Remarks & Additional Information	
Temp. (°C)	Instrument					
	* Hand Thermometer				* Annual Ice Pt Ck Date	
	ID #					
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	/		/		
	Instrument (D.O)					
	Instrument (% Sat.)					
Conductivity (umhos/cm) (uS/cm)	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
pH (std units) % slope of probe 97.6	Buffers Temp	21.4/21.5/21.4		20.2/20.4/20.3	Date Expires	Lot #
	Instrument @ 7.0	6.99	7.01	7.01	02/10	01225AA
	Instrument @ 10.0	9.98	10.00	9.98	02/09	0206HPW
	Instrument @ 4.0	3.99	4.00	3.98	04/10	0410JCC
☐ ORP ☐ Sulfide	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
Turbidity	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
Depth (m)	Instrument (0.0)					

Comments

Reviewed By:

Instrument Standardization

Field Standardization of Instruments

Survey KIF GW. ALK/ACID

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	12 10 2 08 @ 1442	12 10 2 08 @ 1550
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	Orion pH meter	FL3GC35	Calibration Date 02/11/08
Model	250A+		Calibration Due Date 02/11/09

Field Measurements		Instrument Readings: As Found	Instrument Readings: Adjusted To	Instrument Readings: Check Final	Remarks & Additional Information	
Temp. (°C)	Instrument					
	* Hand Thermometer				* Annual Ice Pt Ck Date	
	ID #					
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	/		/		
	Instrument (D.O)					
	Instrument (% Sat.)					
Conductivity (umhos/cm) (uS/cm)	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
pH (std units) % slope of probe 97.2	Buffers Temp	21.9 / 21.6 / 21.8		19 5 / 19.5 / 19.8	Date Expires	Lot #
	Instrument @ 7.0	7.16	7.01	7.03	02/10	0122JAA
	Instrument @ 10.0	10.11	10.00	10.00	02/09	0206HWW
	Instrument @ 4.0	4.12	4.01	4.02	04/10	0410JCC
☐ ORP ☐ Sulfide	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
Turbidity	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
Depth (m)	Instrument (0.0)					

Comments

Reviewed By:

Instrument Standardization

Field Standardization of Instruments

Survey KIF G.W. ALK/ACID

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	12 103 108 @ 1525	12 103 108 @ 1620
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	ORION pH METER	E36635	Calibration Date 2/11/08
Model	250 A+		Calibration Due Date 2/11/09

Field Measurements		Instrument Readings As Found	Adjusted To	Check Final	Remarks & Additional Information	
Temp. (°C)	Instrument					
	* Hand Thermometer				* Annual Ice Pt Ck Date	
	ID #					
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	/		/		
	Instrument (D.O)					
	Instrument (% Sat.)					
Conductivity (umhos/cm) (uS/cm)	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
pH (std units) % slope of probe 97.3	Buffers Temp	22.4 22.4 22.3		20.7 20.7 20.7	Date Expires	Lot #
	Instrument @ 7.0	7.03	7.00	7.00	02/10	0122JAA
	Instrument @ 10.0	10.02	10.00	9.92	02/09	0406HWW
	Instrument @ 4.0	4.02	4.00	3.95	04/10	0410JCC
☐ ORP ☐ Sulfide	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
Turbidity	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
Depth (m)	Instrument (0.0)					

Comments

Reviewed By:

Instrument Standardization

Field Standardization of Instruments

Survey KIF G.W. ALK/ACID.

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	12/4/08 @ 1420	12/4/08 @ 1455
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	Orion pH meter	E36635	Calibration Date 2/11/08
Model	250A+		Calibration Due Date 2/11/09

Field Measurements		Instrument Readings: As Found	Adjusted To	Check Final	Remarks & Additional Information	
Temp. (°C)	Instrument					
	* Hand Thermometer				* Annual Ice Pt Ck Date	
	ID #					
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	/		/		
	Instrument (D.O)					
	Instrument (% Sat.)					
Conductivity (umhos/cm) (uS/cm)	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
pH (std units) % slope of probe 98.8	Buffers Temp	20.6/20.6/20.7		20.5/20.4/20.3	Date Expires	Lot #
	Instrument @ 7.0	7.10	7.01	7.00	02/10	0122JAA
	Instrument @ 10.0	10.12	10.00	10.00	02/09	0206HWW
	Instrument @ 4.0	4.08	4.00	4.00	04/10	0410 SCC
☐ ORP ☐ Sulfide	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
	Instrument				Date Std Prepared	
	STD Temp/Conc.	/		/		
Turbidity	Instrument				Date Expires	
	Low Range	Conc of STD =			Lot #	
	Instrument				Date Expires	
	High Range	Conc of STD =			Lot #	
Depth (m)	Instrument (0.0)					

Comments

Reviewed By:

Company Name/Address

TVA - ENVAFF

(Environmental Affairs)

Alternate Billing

Cynthia Anderson

cmanders@tva.gov

Report to: **J.Mark Boggs**

E-mail to: **jmboggs@tva.gov**

Project Description: **Kingston Fossil Groundwater** — **Kingston, TN**

PHONE:865-632-6941

FAX: 865-632-6212

Client Project No. **Kingston**

Lab Project #

Collected by:**Sam Grindstaff**

Site/Facility ID# **0014D0M**

P.O.#

Collected by(signature):

Immediately Packed on Ice N___ Y_X_

Rush? (Lab MUST be Notified)

_____Same Day.....200%

_____Next Day.....100%

_____Two Day.....50%

Date Results Needed

STANDARD

Email?___No_X_Yes

FAX?__X_No___Yes

Analysis/Container/Preservative

Chain of Custody
Page_1_of_2_

Prepared by:

ENVIRONMENTAL
Science corp
12065 Lebanon Road
Mt. Juliet TN 37122
Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

CoCode (lab use only)

Template/Prelogin

Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	Inorganic Carbon (See Attached)	Metals (See Attached)	General Chemistry (See Attached)	Nitrogens (See Attached)	Suspended Solids (See Attached)	Dissolved Solids (See Attached)			Remarks/contaminant	Sample # (lab only)
KIF-C1B-1208	Grab	GW		12/4/08	11:01	6	X	X	X	X	X	X			EDD	
KIF-C3A-1208	Grab	GW		12/4/08	9:23	6	X	X	X	X	X	X			EDD	
KIF-C3B-1208	Grab	GW		12/4/08	9:05	6	X	X	X	X	X	X			EDD	
KIF-C4B-1208	Grab	GW		12/3/08	14:12	6	X	X	X	X	X	X			EDD	
KIF-C5A-1208	Grab	GW		12/3/08	11:08	6	X	X	X	X	X	X			EDD	
KIF-C5B-1208	Grab	GW		12/3/08	12:00	6	X	X	X	X	X	X			EDD	
KIF-C6B-1208	Grab	GW		12/3/08	10:36	6	X	X	X	X	X	X			EDD	
KIF-C6B-1208-DUP	Grab	GW		12/3/08	10:36	6	X	X	X	X	X	X			EDD	
KIF-CYPEQ BLANK-1208	Grab	GW		12/3/08	10:43	6	X	X	X	X	X	X			EDD	

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Remarks:

Flow_____ Other_____

Relinquisher by:(Signature	Date: 12/4/08	Time: 1356	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__	Condition (lab use only)
Relinquisher by:(Signature	Date:	Time:	Received by: (Signature)	Temp: / Bottles Received:	COC Seals Intact: ___Y ___N ___NA
Relinquisher by:(Signature	Date:	Time:	Received for lab by: (Signature)	Date: / Time:	pH Checked: NCF:

TVA-00025477

Company Name/Address

TVA - ENVAFF

(Environmental Affairs)

Alternate Billing

Cynthia Anderson

cmanders@tva.gov

Report to: J.Mark Boggs

E-mail to: jmboggs@tva.gov

Chain of Custody
Page 2 of 2

Prepared by:

ENVIRONMENTAL
Science corp
12065 Lebanon Road
Mt. Juliet TN 37122
Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

Project Description: **Kingston Fossil Groundwater** — **Kingston, TN**

PHONE:865-632-6941
FAX: 865-632-8212

Client Project No. Kingston

Lab Project #

Collected by:Sam Grindstaff

Site/Facility ID# 0014D0M

P.O.#

CoCode (lab use only)

Collected by(signature):

Immediately Packed on Ice N___ Y_X_

Rush? (Lab MUST be Notified)
_____Same Day.....200%
_____Next Day.....100%
_____Two Day.....50%

Date Results Needed
STANDARD

Email?___No_X_Yes
FAX?_X_No___Yes

Template/Prelogin

Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	Inorganic Carbon (See Attached)	Metals (See Attached)	General Chemistry (See Attached)	Nitrogens (See Attached)	Suspended Solids (See Attached)	Dissolved Solids (See Attached)			Remarks/contaminant	Sample # (lab only)
KIF-4B-1208	Grab	GW		12/2/08	13:10	6	X	X	X	X	X	X			EDD	
KIF-6A-1208	Grab	GW		12/2/08	13:29	6	X	X	X	X	X	X			EDD	
KIF-13B-1208	Grab	GW		12/2/08	10:54	6	X	X	X	X	X	X			EDD	
KIF-16A-1208	Grab	GW		12/1/08	13:19	6	X	X	X	X	X	X			EDD	
KIF-16A-1208-DUP	Grab	GW		12/1/08	13:19	6	X	X	X	X	X	X			EDD	
KIF-22-1208	Grab	GW		12/2/08	19:47	1				X					EDD	
KIF-APAEQ BLANK-1208	Grab	GW		12/2/08	9:20	6	X	X	X	X	X	X			EDD	

Analysis/Container/Preservative

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Remarks:

Flow_____ Other_____

Relinquished by:(Signature)	Date: 12/4/08	Time: 1356	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__	Condition (lab use only)
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)	Temp: / Bottles Received:	COC Seals Intact Y___ N___ NA
Relinquished by:(Signature)	Date:	Time:	Received for lab by (Signature)	Date: / Time:	pH Checked: NCF:

TVA-00025478

Laboratory Analyses Requested (KIF Groundwater)

For samplesKIF-4B, KIF-6A, KIF-13B, KIF-16A, KIF-APAEQ BLANK, KIF-G1B, KIF-G3A, KIF-G3B, KIF-G4B, KIF-G5A, KIF-G5B, KIF-G6B, KIF-GYPEQ BLANK

Aluminum, Total	Copper, Total	Non-Filterable Residue (TSS)
Ammonia as N	Filterable Residue (TDS)	Potassium, Total
Antimony, Total	Fluoride, Total	Selenium, Total
Arsenic, Total	Inorganic Carbon, Total	Silver, Total
Barium, Total	Iron, Total	Sodium, Total
Beryllium, Total	Lead, Total	Strontium, Total
Boron, Total	Magnesium, Total	Sulfate, Total
Cadmium, Total	Manganese, Total	Sulfide, Total (if sulfur odor)
Calcium, Total	Mercury, Total	Thallium, Total
Chloride, Total	Molybdenum, Total	Total Kjeldahl Nitrogen
Chromium, Total	Nickel, Total	Vanadium, Total
Cobalt, Total	Nitrate-Nitrite as N, Total	Zinc, Total

For sample KIF-22

Ammonia as N	Nitrate-Nitrite as N, Total	Total Kjeldahl Nitrogen

Was a sulfur odor detected? If yes, then request total sulfide on seperately on COC.

SURFACE WATER LEVEL MEASUREMENTS - KINGSTON FOSSIL PLANT

Date:	Survey Leader:	Measured By:
12/01/2008	SAG	WFN

Location Identifier (P84068)	Reference Point Description	Ref Point Elev (m)	staff gage reading	Dist to Wtr Surface (m) (4195)	Calc Water Surf El (m) (4189)	Remarks
RP-1	Riverward top of steel band around concrete cylinder. Located at the right end of the skimmer wall at the Intake Channel.	227.10		2.47	224.63	
RP-2A	0.55 foot mark on staff gage (top of gage = 3.34 feet) in upper wetland cell. Gage datum = 748.13 feet.(228 meters)	228.20	1.00		228.30	staff gage in feet
RP -2B	1.00 foot mark on staff gage (top of gage = 3.34 feet) in middle wetland cell. Gage datum = 745.83 feet.(227.3m)	227.63	1.50		227.76	staff gage in feet
RP-2C	Bottom of steel bar in lower wetland cell.	229.05		2.30	226.75	
RP-3	Top of pipe located at the Bottom Ash Discharge Channel.	232.64		0.37	232.27	
RP-4	0.58 foot mark on staff gage (top of gage = 6.74 feet) in old ash disposal ditch. Gage datum = 756.71 feet.(230.6m)	230.82	***	n/a		Ditch has been excavated.
RP-5	Top of I-beam located at the NE corner of pumping station platform in the Acid Chemical Pond.	233.17		1.31	231.86	
RP-6	Painted square on top of flange of steel H-beam column located on the NW corner of pumping station platform in the Copper Chemical Pond.	233.15		1.12	232.03	
RP-7	1.8' on staff gage located near catwalk in Main Ash Pond.	?	****	0.57	?	rp=3.33' on gage
RP-8	Top of I-beam support at the SE corner of pumping station platform located at the west end of the stilling pond.	230.87		0.82	230.05	
RP-9	Top of hand rail @ Coal Yard Runoff Pond.	236.07	**	n/a		rp is gone
RP-10	1.20 foot mark on staff gage (top of gage = 6.74 feet) in ditch adjacent to road near wells 14A and 14B. Gage datum = 743.30 feet.(226.6m)	226.92	*	n/a		staff gage is gone
Notes:	R.P. elevations surveyed 7/9/96. Staff gage water level calculations are based upon Gage datum information rather than the R.P. elevations.					
	* Staff gage torn down by fallen trees.					
	** RP has been destroyed, as has the structure of which it was a part.					
	*** Ditch has been excavated. Water level now is below the staff gage.					
	**** New Reference Point. Taken from the top of the staff gage (reading 3.33) located @ 10 feet onto the catwalk on the right, looking into pond.					
	No access to previous staff gage.					

GROUNDWATER LEVEL MEASUREMENTS - KINGSTON FOSSIL PLANT

Date:	Survey Leader:	Measured					
12/01/2008	SAG	WFN					
Location Identifier (P84068)	**Reference Point Description**	**Ref Point Elev (m)**	**Dist to Wtr Surface (m) (4195)**	**Calc Water Surf El (m) (4189)**	**Bottom Depth (m) (4194)**	**Installed Depth (m)**	**Remarks**
Well 4B	Top of 102mm PVC well casing	230.72	4.71	226.01	12.72	n/a	Previous R.P.=229.79
Well 6A	Top of 102mm PVC well casing	230.13	4.13	226.00	8.88	n/a	Previous R.P. = 229.27
Well 13B	Top of 51mm PVC well casing	234.85	2.42	232.43	25.68	25.94	Previous R.P. = 234.85
Well 16A	Top of 51mm PVC well casing	234.26	0.10	234.16	20.16	20.63	Previous R.P. = 234.27
Well 22	Top of 51mm PVC well casing	230.55	5.30	225.25	14.10	14.10	New well 2002

Note:Reference point elevations are taken from leveling performed on 7/9-10/96 and from previously uncomputed levels run on 10/17/89 and other previously established vertical positions. They are taken from a table transmitted from Ed Phillips to Andy Danzig 1/23/97 . This ne w data "... SUPERCEDES All Previously Released Positions." Previously used R.P. elevations are preserved in the "Remarks" column.

Installed depths are from report # WR28-1-36-115, table 3.1 (page 10)

GROUNDWATER LEVEL MEASUREMENTS - KINGSTON PENINSULA

Date:	Survey Leader:	Measured By:				
12/01/2008	SAG	WFN				
Location Identifier (P84068)	**Reference Point Description**	**Ref Point Elev (m)**	**Dist to Wtr Surface (m) (4195)**	**Calc Water Surf El (m) (4189)**	**Bottom Depth (m) (4194)**	**Remarks**
KIF-G1B	Top of 153mm casing	261.61	35.24	226.37		Open borehole
KIF-G3A	Top of 51mm casing	228.49	3.86	224.63	9.74	
KIF-G3B	Top of 51mm casing	228.71	4.09	224.62	19.19	
KIF-G4B	Top of 51mm casing	233.75	9.17	224.58	25.02	
KIF-G5A	Top of 51mm casing	231.37	6.78	224.59	8.57	
KIF-G5B	Top of 51mm casing	231.23	6.65	224.58	18.36	
KIF-G6B	Top of 51mm casing	235.82	11.25	224.57	18.19	