Groundwater Permit Correspondence (EDMS)

June 17, 2008

Mark Boggs, WT 9D-K

KINGSTON GROUNDWATER MONITORING – JUNE 2008

On June 2, 3, and 5, 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. Routine samples (mineral, metal, nutrient, and TIC) were collected from all wells except for Well 22 where a nutrient sample only was collected. Total sulfides were collected from Well 13B and a dissolved metals was collected from Well G6B. Equipment blanks were collected after Well 16A and before Well 13B for the Ash Pond Disposal Area, and after Well G4B and before Well G5A for the Gypsum Disposal Area. Duplicate samples were collected from Well 13B and G3A for the Ash Pond Disposal Area and the Gypsum Disposal Area, respectively. A portable Grundfos Rediflo 2 centrifugal pump was used for purging and sampling Well 22, G1B, G3A, G3B, G4B, G5A, G5B, and G6B. Dedicated Grundfos Rediflo centrifugal pumps were used for Wells 4B, 6A, 13B, and 16A.

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 most parameters.

Samples were hand delivered by Bill Nichols to the Knoxville mailroom and mailed to the laboratory via TVA mail courier on June 5.

Attached are fourteen Groundwater Data Field Worksheets (TVA 30066A (9-1999)), three Acidity and Alkalinity Field Worksheets (TVA 30533 (RD-BUS 4-92)), four Instrument Standardization forms (TVA 30035 (RG-ES-8-93)), fourteen Groundwater Data Field Worksheets (TVA 30066A (9-1999)), three spreadsheets 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
Linda F. Campbell, KFP 1A-KST
Matthew D. Williams, WT 9D-K (orig.)
EDMS, CEB 1B-M

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	4B 84068		08	06	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.08 4195	12.72 4194	102 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
12.37 4191	To	12.82 4190	KIF-4B-0608	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(12.72)m - (4.08)m]	x	(8.107)L/m	=	70.04 (L)	140.08 (L)	73.0 (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 →	1244	6.5	4.08	12.5						
13L	1246	6.5	—	12.5	16.2	6.7	4.3	1245	167	—
25L	1248	6.0	7.79	12.5	16.3	6.7	4.3	1240	180	—
	1250	4.0	—	12.5	16.4	6.7	4.3	1255	196	—
	1252	4.0	9.80	12.5	16.5	6.7	4.3	1261	205	—
49L	1254	4.0	—	12.5	16.7	6.7	4.3	1266	215	—
55L	1256	3.0	10.94	12.5	17.0	6.7	4.1	1271	221	—
63L	1301	1.6	12.50	12.5	16.6	6.7	4.1	1268	226	—
	—	STOP	TO LET WATER	EXCHANGE						
RESTART	1341	2.0	10.20	12.5						
	1342		10.58	12.5	16.9	6.8	1.0	1244	196	—
	1343		—	12.5	16.9	6.7	0.8	1238	163	—
	1344		11.00	12.5	17.3	6.8	0.7	1238	173	—
	1345		—	12.5	17.6	6.8	0.6	1240	176	—
10L	1346		11.24	12.5	17.7	6.8	0.6	1240	179	—

Remarks:

Reviewed By: Survey Leader — 06-05-08 Date — Project Leader — 06/16/08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1346 (ET) CT
08	06	02	

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
1346	2.0	12.5	17.7	6.8	0.6	1240	179	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	06	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)
	204		55
Time:	Time: 1533	Time:	Time: 1609
Initial:	Initial: JDH	Initial:	Initial: JDH

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): FA

TVA 30066A [2-2008]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	6A 84068		08	06	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.48 4195	8.88 4194	102 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
8.47 4191	To	8.92 4190	KIF-6A-0608	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.88)m - (3.48)m]	x	(8.007)L/m	=	43.78 (L)	87.56 (L)	47.0 (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)
120mL Begin Purge →	1059	7.0	3.48	8.6						
12L	1101	5.0	6.25	8.6	18.0	5.9	0.2	4400	139	—
22L	1103	5.0	7.90	8.6	18.3	5.9	0.2	4393	136	—
38L	1106		8.87	8.6						
	—	STOPPED PUMPING / WELL EVACUATED —								
103 RESTART	1316	2.25	6.46	8.6						
	1317	↓	—	8.6	18.6	5.8	0.9	4814	168	—
	1318		7.20	8.6	18.5	5.8	0.6	4741	165	—
	1319		—	8.6	18.5	5.8	0.5	4662	163	—
9L	1320	↓	7.44	8.6	18.5	5.8	0.5	4553	162	—

Remarks:

Reviewed By: Survey Leader — 06-05-08 Date — Project Leader — 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	06	02	1320 (ET) CT

Pump Duration: 13 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
1320	2.25	8.6	18.5	5.8	0.5	4553	162	—
	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	06	02	196		1680	
			Time:	Time: 1540	Time:	Time: 1623
			Initial:	Initial: SAG	Initial:	Initial: SAG

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

Color: LIGHT TAN

Odor: NONE

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

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Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	13B 84068		08	06	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
2.36 4195	25.68 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
22.29 4191		25.34 4190	KIF-13B-0608 KIF-13B-0608-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
[(25.68)m - (2.36)m]	x	(2.027)L/m	=	47.27 (L)	94.54 (L)	106.5 (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)
14.2 L/2 Begin Purge →	0956	7.5	2.36	10						
31.5 L	1001	6.0	8.34	10	16.7	7.6	0.2	411	-7	
56.5 L	1006	5.0	8.81	10	16.8	7.9	0.2	412	+1	
81.5 L	1011	5.0	8.95	10	16.8	8.0	0.2	406	+5	
106.5 L	1016	5.0	8.99	10	16.8	8.0	0.2	405	+8	

Remarks: DUPLICATE SAMPLES COLLECTED ; SULFIDES COLLECTED DUE TO SLIGHT SULFUR ODOR

Reviewed By: Survey Leader 06-05-08 Date — Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	06	02	1016 (ET) CT

Pump Duration: 20 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
1016	5.0	10	16.8	8.0	0.2	405	+8	—
	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	06	02		209 / 208		3 / 3
			Time:	Time: 545 / 550	Time:	Time: 1625 / 1630
			Initial:	Initial: JW / JW	Initial:	Initial: JW / 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

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

Color: NONE
Odor: NONE SLIGHT SULFUR

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

Others (list): EQ SULFIDE

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TVA-00025136

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	16A 84068		08	06	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
0.09 4195	20.16 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
16.98 4191	To	20.03 4190	KIF-16A-0608	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(20.16)m - (0.09)m] x (2.027)L/m =	40.68 (L)	81.36 (L)	83.5 (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 →	0918	10.0	0.09	6.7						
12.0L	0919	↓	1.69	6.7	16.5	7.0	0.3	332	37	—
35.5L	0922	8.5	3.19	6.7	16.5	7.1	0.2	334	36	—
51.5L	0924	8.0	4.07	6.7	16.5	7.1	0.2	339	36	—
67.5L	0926	8.0	4.61	6.7	16.5	7.1	0.2	340	37	—
83.5L	0928	8.0	5.15	6.7	16.5	7.1	0.2	340	38	—

Remarks: KIF-APAEQ BLANK-0608 COLLECT AFTER KIF-16A-0608 AND BEFORE KIF-138-0608 @ 0950.

Reviewed By: [signature] Survey Leader 06-05-08 Date [signature] Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	0928 (ET) CT
08	06	02	

Pump Duration: 10 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
0928	8.0	6.7	16.5	7.1	0.2	340	38	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	06	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)
	146		15
Time:	Time: 1556	Time:	Time: 1431
Initial:	Initial: JAH	Initial:	Initial: JAH

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]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	22 84068		08	06	02

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.27 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-22-0608	☑ 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 - (4.27)m]	x	(2.027)L/m	=	19.93 (L)	39.86 (L)	46.0L (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)
130HZ Begin Purge →	1121	3.33	4.27	6						
	1123	↓	4.37	6	21.1	6.3	0.5	287	239	—
	1125		4.37	6	21.1	6.3	0.4	286	255	—
20L	1127		4.36	6	21.1	6.3	0.3	286	263	—
	1129		4.36	6	21.1	6.3	0.3	286	266	—
	1131		4.36	6	21.1	6.3	0.3	285	272	—
40L	1133	↓	4.36	6	21.1	6.3	0.3	285	275	—

Remarks:

Reviewed By: Survey Leader 06-05-08 Date — Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1133 (ET) CT
08	06	02	

Pump Duration: 12 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
1133	3.33	6	21.1	6.3	0.3	285	275	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	06	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)
	67		48
Time:	Time: 1601	Time:	Time: 1635
Initial:	Initial: MH	Initial:	Initial: MH

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

Others (list): FR

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-00025138

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G1B 84068		08	06	05

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
35.05 4195	39.19 4194	153 4188	SAG	WFN

☐ Depth of Screen ☑ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
——— 4191		——— 4190	K1F-G1B-0608	☑ 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 - (35.05)m]	x	(18.228)L/m	=	75.46 (L)	150.92 (L)	157 (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)
300 HZ										
Begin Purge →	1006	5.0	35.05	38.0	———					———
10.0L	1008	5.0	35.50	38.0	15.8	7.5	8.4	406	326	—
20.0L	1010	5.0	35.50	38.0	15.8	7.5	8.6	389	319	—
48.0L	1015	5.6	35.85	38.0	15.9	7.5	8.7	386	306	—
77.5L	1020	5.9	36.02	38.0	15.8	7.5	9.0	376	303	—
107L	1025	5.9	36.10	38.0	15.9	7.5	8.9	383	303	—
131L	1030	4.8	36.00	38.0	16.7	7.5	8.6	407	308	—
142L	1035	2.2	35.96	38.0	17.1	7.5	8.4	413	308	—
147.5L	1037	2.75	———	38.0	16.9	7.5	8.4	414	308	—
152L	1039	2.25	35.72	38.0	16.9	7.5	8.4	413	309	—

Remarks:

Reviewed By: _____ Survey Leader 06-05-08 Date _____ Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	06	05	1039 ET CT

Pump Duration: 33 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mv)	Turbidity (NTU)
1039	2.25	38.0	16.9	7.5	8.4	413	309	—
	4193	4192	10	400	300	94	90	
		EPA 170.1	EPA 150.1	EPA 150.1	EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1

Additional Sample Data

Analyst: SA G

Date Analyzed: Year 08 Month 06 Day 05

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

Color: NONE

Odor: NONE

415	431	436	437
	214		15
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: 1258	Time:	Time: 1314
Initial:	Initial:	Initial:	Initial:

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-00025139

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G3A 84068		08	06	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
2.72 4195	9.74 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)		(m)	Sample Label	
6.6 4191	To	9.6 4190	KIF-G3A-0608-DUP KIF-G3A-0608	☑ 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 - (2.72)m] x (2.027)L/m =	14.23 (L)	28.46 (L)	47.0 ~~33.0~~ (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)
112 HZ Begin Purge →	0920	4.0	2.72	9	—	—	—	—	—	—
	0922	2.2	—	9	15.9	6.3	1.3	321	305	—
88 HZ 12.5 L	0924	2.2	4.16	9	16.1	6.5	2.2	334	296	—
	0926	2.2	3.90	9	16.3	6.6	2.4	322	292	—
20.0 L	0928	2.2	—	9	16.7	6.7	2.8	365	286	—
23.5 L	0930	2.2	3.76	9	17.0	6.7	2.9	334	287	—
27.0 L	0932	1.75	—	9	17.0	6.6	2.6	314	290	—
30.0 L	0934	1.5	3.69	9	17.1	6.6	2.6	317	290	—
33.0 L	0936	1.5	3.64	9	17.3	6.7	2.6	317	289	—
* — WHILE COLLECTING THE CUBITAINERS SAMPLE CLEARED UP —										
85 HZ RESTART	0950	1.75	3.62	9	17.1	6.7	3.3	308	297	—
	0952	1.75	3.62	9	17.1	6.7	3.0	319	293	—
40.0 L	0954	1.75	3.62	9	17.1	6.7	3.0	315	289	—
	0956	1.75	3.62	9	17.2	6.7	2.9	312	288	—
47.0 L	0958	1.75	3.62	9	17.2	6.7	2.9	312	286	—

SEE NOTE ABOVE

Remarks: * ~~COLLECT KIF-G3A-0608 & KIF-G3A-0608-DUP IN CUBITAINERS DUE TO TURBIDITY. AFTER ALLOWING TO SETTLE SAMPLE BOTTLES WERE FILLED.~~ DUPLICATES COLLECTED

Reviewed By: [signature] Survey Leader 06-05-08 Date [signature] Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date Year	Month	Day	Time
08	06	03	0958 (ET) CT

Pump Duration: ~~16~~ 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
0958 ~~0936~~	1.75 ~~1.5~~ 4193	9 4192	17.2 ~~17.3~~ 400	6.7 400	2.9 ~~2.6~~ 300	312 94	286 ~~289~~ 90	—

Additional Sample Data

Analyst: SAG

Date Analyzed Year	Month	Day
08	06	03

	415	431	436	437
		139 / 140		45 / 46
	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:		1558 / 1601		1621 / 1626
Initial:		[initials]		[initials]

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

Color: ~~FAINT~~ NONE
Odor: NONE

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

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Preliminary Groundwater Data Field Worksheet

Sheet 1 of 2

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G3B 84068		08	06	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
2.94 4195	19.19 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
12.8 4191	To	18.9 4190	KIF-G3B-0608	☑ 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 - (2.94)m]	x	(2.027)L/m	=	32.94 (L)	65.88 (L)	SEE PG 2 OF 2 4186 (L)

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)
140 mL Begin Purge →	0813	4.0	2.94	17.5						
12L	0816	4.0	7.20	17.5	15.9	7.1	3.5	441	302	—
22L	0821	2.0	10.85	17.5	16.6	7.2	4.9	435	293	—
27L	0826	1.0	12.27	17.5	17.6	7.3	4.4	436	287	—
34.5L	0831	1.5	12.80	17.5	18.4	7.4	4.5	437	281	—
	0836	0.75	13.34	17.5	17.8	7.4	3.8	429	276	—
42.0L	0841	0.75	13.63	17.5	18.3	7.4	3.0	432	276	—
53.0L	0846	2.2	14.50	17.5	16.9	7.3	2.7	491	277	—
68.0L	0851	3.0	17.10	17.5	18.8	7.4	0.5	519	261	—
*	- STOPPED PUMPING TO LET SETTLE -									
RESTART	0907	1.0	16.34	17.5						
69.0L	0908	1.0		17.5	18.9	7.6	3.2	482	249	—
70.5L	0910	0.75		17.5	18.9	7.6	3.9	467	249	—
72.0L	0912	0.75	16.85	17.5	19.3	7.6	5.7	472	252	—
	- STOPPED TO LET RECHARGE -									

Remarks: * PUMP IS DIFFICULT TO CONTROL AT LOW VOLUMES AND DEEP WELLS. STOPPED PUMPING TO ALLOW WELL TO SETTLE FROM AGITATION OF FLOW CHANGES

Reviewed By: _____ 06-05-08 Survey Leader Date _____ 06-16-08 Project Leader Date

Sample Collector:			
Sample Date			Time
Year	Month	Day	(ET) CT
Pump Duration:			min
			72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	4193 Pump Rate (L/min)	* SEE PAGE 2 OF 2					
		4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst:	SEE PG 2 OF 2			
Date Analyzed: Year / Month / Day	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)
Turbidity 1350: ☐ Clear ☑ Slightly Turbid ☐ Turbid ☐ Highly Turbid	Time:	Time:	Time:	Time:
Color:	Initial:	Initial:	Initial:	Initial:
Odor:	Bottles Required: ☐ BOD ☐ TOC ☐ COD ☐ TIC ☐ Ferrous ☐ Metals ☐ Dis. Metals ☐ Mineral ☐ Dis. Mineral ☐ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS			Others (list):

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

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Preliminary Groundwater Data Field Worksheet

Sheet 2 of 2

Project/Site	Well Number		Purge Date	Year	Month	Day
Kingston Groundwater	G3B	84068		08	06	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
12.8 (4195)	19.19 (4194)	51 (4188)	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
12.8 (4191)	To	18.9 (4190)	KIF-G3B-0608	☑ 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 - (2.94)m] x (2.027)L/m =	32.94 (L)	65.88 (L)	82.0 (L) 4186

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

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

166 Hz RESTART 154 Hz

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 →	1015	1.2	13.62	17.5						
	1017	1.2	14.18	17.5	17.7	7.5	4.6	496	255	—
	1018	1.2	—	17.5	17.8	7.6	5.1	500	252	—
	1019	1.2	14.41	17.5	17.9	7.6	5.2	511	251	—
6L	1020	1.2	—	17.5	18.2	7.6	5.6	519	251	—
	1021	1.0	14.65	17.5	18.5	7.6	6.1	536	252	—
8L	1022	1.0	—	17.5	18.8	7.6	6.7	540	253	—
	1023	1.0	14.85	17.5	19.1	7.6	6.9	546	254	—
10L	1024	1.0	14.94	17.5	19.2	7.6	7.0	547	255	—

Remarks: * COLLECTED KIF-G3B-0608 IN CUBITAINER DUE TO TURBIDITY. AFTER ALLOWING TO SETTLE, SAMPLE BOTTLES WERE FILLED.

Reviewed By: ______ Survey Leader ______ Date ______ Project Leader ______ Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1024
08	06	03	(ET) CT

Pump Duration: 52 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min) 4193	Pump Depth (m) 4192	Temp °C EPA 170.1 (10)	pH (s.u.) EPA 150.1 (400)	DO (mg/L) EPA 360.1 (300)	COND (umhos/cm) EPA 120.1 (94)	(+/-) ORP (mv) SM 2580B (90)	Turbidity (NTU) EPA 180.1
1024	1.0	17.5	19.2	7.6	7.0	547	255	—

Additional Sample Data

Analyst: SAG

Date Analyzed			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)
Year 08	Month 06	Day 03	/	177	/	14
			Time:	Time: 1607	Time:	Time: 1630
			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

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

Color: TAN

Odor: NONE

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

Others (list): FR

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 2

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G4B 84068		08	06	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
7.99 4195	25.02 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
18.8 4191	To	24.9 4190	KIF-G4B-0608	☑ 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 - (7.99)m]	x	(2.027)L/m	=	34.52 (L)	69.04 (L)	SEE PG. 2 OF 2 4186 (L)

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	1.5	7.99	19						
7.5L	1105	1.5	9.84	19	17.4	7.0	0.9	809	92	—
11.5L	1110	0.8	10.52	19	18.5	7.0	1.0	833	93	—
16.5L	1120	0.5	11.15	19	19.9	7.0	1.2	854	99	—
20.0L	1130	0.7	12.53	19	20.4	7.0	1.1	869	109	—
36.0L	1140	1.6	14.94	19	18.6	7.0	0.9	888	133	—
50.0L	1150	1.4	17.28	19	19.0	6.9	1.1	911	146	—
60.0L	1200	1.0	18.10	19.5	20.2	7.0	1.3	912	138	—
67.0L	1205	1.4	18.93	19.5	19.2	6.9	1.2	960	142	—
68.0L	1207	1.0	—	19.5	19.0	7.0	1.6	956	144	—
72.0L	1209	2.0	18.90	19.5	19.1	7.0	4.5	944	149	—
- STOP TO LET RECHARGE, WATER WAS GETTING TURBID.										—
RESTART →	1329	1.75	16.35	19.5						
	1330	1.75	17.50	19.5	18.5	7.0	2.3	857	105	—
4L	1337	1.75	—	19.5	18.7	7.0	3.6	888	119	—

Remarks: KIF-GRPEQ BLANK-0608 COLLECTED BEFORE SAMPLING WELL G5A @ 1350. AFTER WELL G4B.

Reviewed By: [signature] Survey Leader 6-05-08 Date [signature] Project Leader 06-16-08 Date

Sample Collector:		
Sample Date		Time
Year	Month Day	(ET) CT
Pump Duration:		min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	4193 Pump Rate (L/min)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
		SEE PAGE 2 OF 2						

Additional Sample Data

Analyst:	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)
SEE PAGE 2 OF 2				
Date Analyzed: Year Month Day				
Time:				
Initial:				

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

Turbidity 1350: ☐ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid
Color:
Odor:

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

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Preliminary Groundwater Data Field Worksheet

Sheet 2 of 2

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G4B 84068		08	06	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
7.99 4195	25.02 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
18.8 4191	To	24.9 4190	KIF-G4B-0608	☑ 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 - (7.99)m]	x	(2.027)L/m	=	34.52 (L)	69.04 (L)	79 (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 →	1332	1.75	—	19.5	19.0	7.1	4.6	891	123	
7L	1333	1.75	18.1	19.5	19.3	7.1	4.9	893	125	—

Remarks:

Reviewed By: [signature] Survey Leader 06-05-08 Date [signature] Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	(ET) CT
08	06	03	1333

Pump Duration: 73 min 72004
"999" = 2 days

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min) EPA 170.1	Pump Depth (m)	Temp °C EPA 150.1	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
1333	1.75	19.5	19.3	7.1	4.9	893	125	—
	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	06	03		425		54
			Time:	Time: 1613	Time:	Time: 1634
			Initial:	Initial:	Initial:	Initial:

Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Highly Turbid
Color: Colorless
Odor: None

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]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G5A 84068		08	06	03

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
5.62 4195	8.57 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
5.7 4191		8.7 4190	KIF-G5A-0608	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.57)m - (5.62)m]	x	(2.027)L/m	=	6.0 (L)	12.0 (L)	23.0 (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 →	1401	2.5	5.62	7.5						
	1402	2.5	5.63	7.5	17.3	6.8	3.2	315	216	—
7.5	1404	2.5	5.62	7.5	17.1	6.8	3.8	325	228	—
13.0	1406	2.75	5.62	7.5	17.1	6.8	4.1	328	235	—
18.0	1408	2.5	5.62	7.5	17.0	6.8	4.4	334	241	—
23.0	1410	2.5	5.62	7.5	17.0	6.8	4.5	335	243	—

Remarks:

Reviewed By: Survey Leader 06-05-08 Date Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	1410 (ET) CT
08	06	03	

Pump Duration: 9 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
1410	2.5	7.5	17.0	6.8	4.5	335	243	—
4193		4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed: Year 08 Month 06 Day 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)
Time:	Time: 1417	Time:	Time: 1638
Initial:	Initial: JH	Initial:	Initial: MH

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): EQ

TVA 30066A [2-2008]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	G58 84068		08	06	05

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
5.42 4195	18.36 4194	51 4188	SAG	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
12 4191	To	18.1 4190	KIF-G5B-0608	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(18.36)m - (5.42)m]	x	(2.027)L/m	=	26.23 (L)	52.46 (L)	69.00 (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)
13% H2 Begin Purge →	0816	2.3	5.42	15						
1.4L	0818	2.3	7.18	15	16.9	7.3	2.9	465	318	—
↓	0822	2.3	—	15	16.9	7.3	2.5	477	315	—
19.5L	0824	2.75	6.89	15	16.8	7.4	2.1	558	311	—
	0826	2.6	—	15	16.8	7.3	2.6	512	315	—
30.0L	0828	2.6	6.55	15	16.8	7.2	3.2	444	321	—
40 35.5L	0830	2.75	—	15	16.8	7.1	3.3	397	328	—
13% H2 49.0L	0835	2.7	6.24	15	16.8	7.1	3.3	383	333	—
60.0L	0840	2.2	5.98	15	17.0	7.1	3.3	373	338	—
	0842	2.25	—	15	17.0	7.1	3.3	372	339	—
11% H2 69.0L	0844	2.25	5.96	15	17.0	7.1	3.3	372	341	—

Remarks:

Reviewed By: Survey Leader 06-05-08 Date — Project Leader 06-16-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	06	05	0844 (ET) CT

Pump Duration: 28 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
0844	2.25	15	17.0	7.1	3.3	372	341	—
4193		4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed		
Year	Month	Day
08	06	05

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: 1302	Time:	Time: 1318
Initial:	Initial: MH	Initial:	Initial: MH

177 19

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

Others (list): EO

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-00025146

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
Kingston Groundwater	GGB 84068		08	06	05

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
9.99 4195	18.19 4194	51 4188	SAG	WFN

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filtration
11.9 4191	To	18.0 4190	KIF-GGB-060B	☐ Unfiltered ☐ Filtered ☑ Both; Filter Type and Size: IN-LINE 0.45 um

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(18.19)m - (9.99)m]	x	(2.027) L/m	=	16.62 (L)	33.24 (L)	38.00 (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)
140 mL	Begin Purge → 0910	2.5	9.99	15						
5L	0912	2.5	10.00	15	16.7	7.1	6.7	538	361	—
20	15L 0917	2.0	10.00	15	17.0	7.1	6.4	537	351	—
	26.5L 0922	2.3	10.00	15	17.1	7.1	6.0	532	343	—
	30.5L 0924	2.0	10.00	15	17.1	7.1	6.0	532	341	—
	34.5L 0926	2.0	10.00	15	17.2	7.1	5.9	530	339	—
137 mL	38.0L 0928	1.75	10.00	15	17.2	7.1	5.9	530	338	—

Remarks: *COLLECTED A DISSOLVED METAL, FILTERED THRU A 0.45um IN-LINE FILTER

Reviewed By: _____ Survey Leader 06-05-08 Date _____ Project Leader 06-16-08 Date

Sample Collector: WFN			
Sample Date			Time
Year 08	Month 06	Day 05	(ET) CT
Pump Duration: 18 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
0928	1.75	15	17.2	7.1	5.9	530	338	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: SAG

Date Analyzed			415	431	436	437
Year 08	Month 06	Day 05	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: 1310	Time:	Time: 1321
			Initial:	Initial: AW	Initial:	Initial: CWS

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

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-00025147

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KINGSTON GW.	6-02-08
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-4B-0608	6.9	100	10	—	—	20.4	204	—	—	5.5	55
KIF-6A-0608	5.9	100	10	—	—	19.6	196	—	—	—	—
KIF-6A-0608	5.9	50	20	—	—	—	—	—	—	84.0	1680
KIF-13B-0608	8.2	100	10	—	—	20.9	209	—	—	0.3	3
KIF-13B-0608-DUP	8.2	100	10	—	—	20.8	208	—	—	0.3	3
KIF-16A-0608	7.4	100	10	—	—	14.6	146	—	—	1.5	15
KIF-22-0608	6.4	100	10	—	—	6.7	67	—	—	4.8	48

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

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: 06-05-08

FE Proj. Eng. — Date: 06-16-08

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 (ADMDS)

TVA 20533 (REV REV 4-92)

PRELIMINARY DATA

ACIDITY AND ALKALINITY FIELD WORKSHEET

PROJECT/SITE	COLLECTION DATE
KINGSTON GROUNDWATER	6-3-08
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) ml ACID TO pH 8.3	PHENOL ALK (mg/L) (Ca CO_3)	TOTAL ml ACID TO pH 4.5	TOTAL ALK. (mg/L) (Ca CO_3)	ACIDITY TITRATION(S) ml BASE TO pH 3.7	MINERAL ACIDITY (mg/L) (Ca CO_3)	TOTAL ml BASE TO pH 8.3	CO_2 ACIDITY (mg/L) (Ca CO_3)
KIF-G3A-0608	6.7	100	10			13.9	139			4.5	45
KIF-G3A-0608-DUP	6.7	100	10			14.0	140			4.6	46
KIF-G3B-0608	7.5	100	10			17.7	177			1.4	14
KIF-G4B-0608	7.2	100	10			42.5	425			5.4	54
KIF-G5A-0608	6.9	100	10			16.8	168			3.6	36

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

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: 06-05-08

FE Proj. Eng. — Date: 06-16-08

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 (ADMIN)

TVA 30533 (REV 08 4-92)

PRELIMINARY DATA

ACIDITY AND ALKALINITY FIELD WORKSHEET

PROJECT/SITE	COLLECTION DATE	NORMALITY
Kingston Ground Water	06-05-08	ACID 0.02
SURVEY LEADER SAG		BASE 0.02
FIELD CREW WFN		

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	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-G1B-0608	7.5	100	10			21.4	214			1.5	15
KIF-G5B-0608	7.2	100	10			17.7	177			1.9	19
KIF-G6B-0608	7.1	100	10			27.4	274			3.4	34

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

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:

[signature] Survey Leader — 06-05-08 Date

[signature] FE Proj. Eng. — 06-16-08 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 (AIDMDS)

TVA 30533 (RD-BUS 4-92)

Instrument Standardization

Field Standardization of Instruments

Survey KINGSTON G.W.

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	6 12 108 @ 1522	6 12 108 @ 1640
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	ORION	E36635	Calibration Date 02/11/08
Model	pH METER 250A+		Calibration Due Date 02/11/09

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.	/		/	% Sat = %
	Instrument				
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 97.7	Buffers Temp	22.9/22.1		21.3/21.2	Date Expires / Lot #
	Instrument @ 7.0	6.90	7.00	7.07	04/10 / 0410JAA
	Instrument @ 10.0 or	9.90	10.00	10.05	02/09 / 020C HWW
	Instrument @ 4.0	3.92	4.00	4.05	08/08 / 0725GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☐ 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: SAG

NOTE: Return Instrument to calibration facility if out of tolerance (see QA manual).

TVA 30035 (2-2006) [2-2006]

Instrument Standardization

Field Standardization of Instruments

Survey: Kingston Groundwater Alk. & Acid.

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	6 13 08 @ 1537	6 13 08 @ 1640
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	Orion	E36635	Calibration Date 2/11/08
Model	pH meter 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.	/		/	% Sat = %
	Instrument				
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	22.8 / 22.2		22.0 / 21.7	Date Expires / Lot #
	Instrument @ 7.0	7.18	7.00	7.02	04/10 0410 JAA
	Instrument @ 10.0 or	10.23	10.04	10.01	11/09 1108 HAA
	Instrument @ 4.0	4.13	4.01	4.00	08/08 0725 GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☐ 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:

NOTE: Return Instrument to calibration facility if out of tolerance (see QA manual).

TVA 30035 (2-2006) [2-2006]

Instrument Standardization

Field Standardization of Instruments

Survey: Kingston G.W.

	As Found	Check Final
Standardized By	SAG	SAG
Date/Time-Begin & End	06 105108 @ 1246	06 105108 @ 1330
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	Orion	E36635	Calibration Date 02/11/08
Model	pH meter 250A+		Calibration Due Date 02/11/09

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.	/		/	% Sat = %
	Instrument				
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 98.4	Buffers Temp	23.0 / 73.2		22.0 / 72.1	Date Expires / Lot #
	Instrument @ 7.0	7.06	7.00	7.02	04/10 / 0440JAA
	Instrument @ 10.0 or	10.04	10.00	10.01	11/09 / 1108HAA
	Instrument @ 4.0	4.04	4.00	4.02	08/08 / 0725GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☐ 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: SAG

NOTE: Return Instrument to calibration facility if out of tolerance (see QA manual).

TVA 30035 (2-2006) [2-2006]

Instrument Standardization

Field Standardization of Instruments

Survey KIF GW

	As Found	Check Final
Standardized By	wfh	wfh
Date/Time-Begin & End	6/02/08 @ 0507	6/5/08 @ 1135
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)	737	735

Instrument(s)		TVA Tag Number(s) or SN	
Type	SRVY Ga	52887	Calibration Date
Model	DS5X	46106	Calibration Due Date 01/24/09

Field Measurements		Instrument Readings: As Found	Adjusted To	Check Final	Remarks & Additional Information
Temp. (°C)	Instrument	22.6		20.7	
	* Hand Thermometer	22.5		20.6	* Annual Ice Pt Ck Date
	ID # 98M100693				
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	23 / 8.26		21 / 8.58	% Sat = 98.7 %
	Instrument	8.24	—	8.7	99.8
Conductivity (umhos/cm) (uS/cm)	Instrument	501	—	499	Date Expires 05/09
	Low Range	Conc of STD = 500			Lot # 1805329
	Instrument	150	—	149	Date Expires 10/08
	High Range	Conc of STD = 150			Lot # 1710980
pH (std units) % slope of probe ____	Buffers Temp	23.6 / 24.8		23.4 / 23.0	Date Expires / Lot #
	Instrument @ 7.0	6.9	7.0	7.1	02/10 / 0122JAA
	Instrument @ 10.0 or				
	Instrument @ 4.0	4.0	—	4.6	08/08 / 0775GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☑ ORP ☐ Sulfide	Instrument	288	—	288	Date Std Prepared /
	STD Temp/Conc.	24.9 / 285		23 / 289	6-2-08 / 6-5-08
	Instrument	465	—	466	Date Std Prepared /
	STD Temp/Conc.	24.5 / 462		23 / 465	6-2-08 / 6-5-08
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: _____

NOTE: Return Instrument to calibration facility if out of tolerance (see QA manual).

TVA 30035 (2-2006) [2-2006]

GROUNDWATER LEVEL MEASUREMENTS - KINGSTON FOSSIL PLANT

Date: 06/02/2008	Survey Leader: SAG	Measured 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	4.08	226.64	12.72	n/a	Previous R.P.=229.79
Well 6A	Top of 102mm PVC well casing	230.13	3.48	226.65	8.88	n/a	Previous R.P. = 229.27
Well 13B	Top of 51mm PVC well casing	234.85	2.36	232.49	25.68	25.94	Previous R.P. = 234.85
Well 16A	Top of 51mm PVC well casing	234.26	0.09	234.17	20.16	20.63	Previous R.P. = 234.27
Well 22	Top of 51mm PVC well casing	230.55	4.27	226.28	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)

SURFACE WATER LEVEL MEASUREMENTS - KINGSTON FOSSIL PLANT

Date:	Survey Leader:	Measured By:
06/02/2008	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		1.33	225.77	
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	1.10		227.64	staff gage in feet
RP-2C	Bottom of steel bar in lower wetland cell.	229.05		2.25	226.80	
RP-3	Top of pipe located at the Bottom Ash Discharge Channel.	232.64		0.01	232.63	
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		1.86	231.31	
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		0.91	232.24	
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		0.81	230.06	
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 PENINSULA

Date:	Survey Leader:	Measured By:				
06/02/2008	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	35.05	226.56		Open borehole
KIF-G3A	Top of 51mm casing	228.49	2.72	225.77	9.74	
KIF-G3B	Top of 51mm casing	228.71	2.94	225.77	19.19	
KIF-G4B	Top of 51mm casing	233.75	7.99	225.76	25.02	
KIF-G5A	Top of 51mm casing	231.37	5.62	225.75	8.57	
KIF-G5B	Top of 51mm casing	231.23	5.42	225.81	18.36	
KIF-G6A	Top of 51mm casing	235.82	9.99	225.83	18.19	

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___

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

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	Metals (See Attached)	Minerals (See Attached)	Nutrients (See Attached)	Dissolved Metals, filtered thru 0.45 micon in-line Filter (See Attached)	Remarks/contaminant	Sample # (lab only)
KIF-4B-0608	Grab	GW		6/2/08	13:46	7	X	X	X		EDD	
KIF-6A-0608	Grab	GW		6/2/08	13:20	7	X	X	X		EDD	
KIF-13B-0608	Grab	GW		6/2/08	10:16	8	X	X	X		EDD	
KIF-13B-0608-DUP	Grab	GW		6/2/08	10:16	8	X	X	X		EDD	
KIF-16A-0608	Grab	GW		6/2/08	9:28	7	X	X	X		EDD	
KIF-22-0608	Grab	GW		6/2/08	11:33	1			X		EDD	
KIF-G1B-0608	Grab	GW		6/5/08	10:39	7	X	X	X		EDD	
KIF-G3A-0608	Grab	GW		6/3/08	9:58	7	X	X	X		EDD	
KIF-G3A-0608-DUP	Grab	GW		6/3/08	9:58	7	X	X	X		EDD	

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

pH_____ Temp_____

Remarks:

Flow_____ Other_____

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__	Condition:	(lab use only)
	6-5-08	1410				
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)	Temp:	Received:	
Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)			

Company Name/Address	Alternate Billing	Analysis/Container/Preservative	Chain of Custody Page 2 of 2
TVA - ENVAFF **(Environmental Affairs)**	Cynthia Anderson cmanders@tva.gov Report to: J.Mark Boggs E-mail to: jmboggs@tva.gov		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.#
Collected by(signature): Immediately Packed on Ice N__ Y__	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

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	Metals (See Attached)	Minerals (See Attached)	Nutrients (See Attached)	Dissolved Metals, filtered thru 0.45 micon in-line Filter (See Attached)	Remarks/contaminant	Sample # (lab only)
KIF-G3B-0608	Grab	GW		6/3/08	10:24	7	X		X		EDD	
KIF-G4B-0608	Grab	GW		6/3/08	13:33	7	X		X		EDD	
KIF-G5A-0608	Grab	GW		6/3/08	14:10	7	X		X		EDD	
KIF-G5B-0608	Grab	GW		6/5/08	8:44	7	X		X		EDD	
KIF-G6B-0608	Grab	GW		6/5/08	9:28	8	X		X	X	EDD	
KIF-APAEQ BLANK-0608	Grab	GW		6/2/08	9:50	8	X		X		EDD	
KIF-GYPEQ BLANK-0608	Grab	GW		6/3/08	13:50	8	X		X	X	EDD	

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

Remarks: Flow_____ Other_____

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__
	6-5-08	1410		
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)	Temp: Condition: (lab use only)
Relinquished by:(Signature)	Date:	Time:	Received for lab by:(Signature)	pH:

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

KIF-13B-0608
KIF-13B-0608-DUP
KIF-APAEQ BLANK-0608
ONLY

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 ● seperately on COC.

NOTE: KIF-G6B-0608
KIF-GYPEQ BLANK-0608
- COLLECTED A FILTERED SAMPLE TO BE ANALYZED FOR DISSOLVED METALS FOR CONSTITUENTS ABOVE.