

EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

NOTE: The data below represents surface water samples that were collected on Feb 10, 2014 by EPA START (Team 1). Water sample measurements are in milligrams per liter (mg/L) and/or micrograms per liter (µg/L) for these samples. The data is being compared to EPA ecological risk screening levels (ERSLs) to protect aquatic life in the surface water of the Dan River. Specific qualifiers and footnotes are listed below the summary table. These samples were collected at various locations along the river (refer to map for generalized locations). The detected concentrations in surface water are all below the EPA ERSLs with the exception of aluminum and lead. When chemical concentrations exceed the screening values it doesn't mean there will be adverse health or ecological effects, but recommends further investigation may be needed.

Analyte	Ecological Screening Standard for Surface Water Samples ¹	Smith River Bridge	Duke Boat Ramp	Hwy 700
Sample Information				
Sample ID	-	EDEN-SRB-C-SW-20140210	EDEN-DUKE-L-SW-20140210	EDEN-700-R-SW-20140210
Date	-	2/10/2014	2/10/2014	2/10/2014
Time	-	1415	1445	1340
Status	-	Validation Complete	Validation Complete	Validation Complete
Type	-	Surface Water	Surface Water	Surface Water
Dissolved metals SW6010C/6020A/7470A				
Aluminum	87 µg/L	61.0 µg/L	70.1 µg/L	67.8 µg/L
Antimony	5.6 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Arsenic	10 µg/L	4.50U µg/L	4.50U µg/L	4.50U µg/L
Barium	220 µg/L	15.0 µg/L	16.6 µg/L	18.4 µg/L
Beryllium	0.66 µg/L	1.00U µg/L	1.00U µg/L	1.00U µg/L
Boron	0.36 mg/L	0.0231J mg/L	0.128 mg/L	0.156 mg/L
Cadmium	0.1 µg/L	0.700U µg/L	0.700U µg/L	0.700U µg/L
Calcium	-	5,490 µg/L	6,480 µg/L	6,830 µg/L
Chromium	25 µg/L	2.50U µg/L	2.50U µg/L	2.50U µg/L
Cobalt	3 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Copper	3 µg/L	2.00U µg/L	2.00U µg/L	2.00U µg/L
Iron	1,000 µg/L	174 µg/L	164 µg/L	168 µg/L
Lead	0.59 µg/L	1.00U µg/L	1.00U µg/L	1.00U µg/L
Magnesium	-	2,240 µg/L	2,310 µg/L	2,360 µg/L
Manganese	200 µg/L	17.5 µg/L	16.2 µg/L	15.2 µg/L
Mercury	0.000012 mg/L	0.00020U mg/L	0.00020U mg/L	0.00020U mg/L
Molybdenum	800 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Nickel	17 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Potassium	53,000 µg/L	1,380 µg/L	1,300 µg/L	1,240 µg/L
Selenium	5 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Silver	0.06 µg/L	1.00U µg/L	1.00U µg/L	1.00U µg/L
Sodium	680,000 µg/L	5,000 µg/L	4,630 µg/L	3,970 µg/L
Thallium	0.24 µg/L	0.200U µg/L	0.200U µg/L	0.200U µg/L
Vanadium	27 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Zinc	39 µg/L	10.0U µg/L	10.0U µg/L	10.0U µg/L

**EDEN NORTH CAROLINA COAL ASH SPILL
SURFACE WATER RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Smith River Bridge		Duke Boat Ramp		Hwy 700	
Sample Information								
Sample ID	-		EDEN-SRB-C-SW-20140210		EDEN-DUKE-L-SW-20140210		EDEN-700-R-SW-20140210	
Date	-		2/10/2014		2/10/2014		2/10/2014	
Time	-		1415		1445		1340	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
Total Dissolved Solids EPA 160.1								
Total Dissolved Solids	-	-	50	mg/L	16	mg/L	32	mg/L
Total Suspended Solids EPA 160.2								
Total Suspended Solids	-	-	4.0J	mg/L	4.5J	mg/L	4.0J	mg/L
Total Metals SW6010C/6020A/7470A								
Aluminum	2,000	µg/L	157	µg/L	248	µg/L	347	µg/L
Antimony	5.6	µg/L	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Arsenic	10	µg/L	4.50U	µg/L	4.50U	µg/L	4.50U	µg/L
Barium	220	µg/L	17.1	µg/L	18.7	µg/L	22.0	µg/L
Beryllium	0.66	µg/L	1.00U	µg/L	1.00U	µg/L	1.00U	µg/L
Boron	0.36	mg/L	0.0500U	mg/L	0.124	mg/L	0.160	mg/L
Cadmium	2	µg/L	0.700U	µg/L	0.700U	µg/L	0.700U	µg/L
Calcium	-	-	5,800	µg/L	6,600	µg/L	7,200	µg/L
Chromium	29	µg/L	2.50U	µg/L	0.530J	µg/L	0.719J	µg/L
Cobalt	24	µg/L	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Copper	3	µg/L	2.00U	µg/L	2.00U	µg/L	2.00U	µg/L
Iron	2,300	µg/L	465	µg/L	478	µg/L	582	µg/L
Lead	0.6	µg/L	0.223J	µg/L	0.245J	µg/L	0.343J	µg/L
Magnesium	-	-	2,450	µg/L	2,450	µg/L	2,570	µg/L
Manganese	200	µg/L	24.9	µg/L	22.9	µg/L	23.4	µg/L
Mercury	0.000012	mg/L	0.00020U	mg/L	0.00020U	mg/L	0.00020U	mg/L
Molybdenum	-	-	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Nickel	17	µg/L	0.437J	µg/L	0.479J	µg/L	0.496J	µg/L
Potassium	53,000	µg/L	1,490	µg/L	1,350	µg/L	1,350	µg/L
Selenium	5	µg/L	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Silver	0.06	µg/L	1.00U	µg/L	1.00U	µg/L	1.00U	µg/L
Sodium	680,000	µg/L	5,480	µg/L	4,920	µg/L	4,300	µg/L
Thallium	0.24	µg/L	0.200U	µg/L	0.200U	µg/L	0.200U	µg/L
Vanadium	27	µg/L	0.910J	µg/L	0.901J	µg/L	1.23J	µg/L
Zinc	39	µg/L	10.0U	µg/L	7.00J	µg/L	10.0U	µg/L
Anions EPA 300.1								
Bromide	-	-	21J	µg/L	61	µg/L	75	µg/L
Anions SW9056A								
Bromide	-	-	1.0U	mg/L	1.0U	mg/L	1.0U	mg/L
Chloride	230	mg/L	4.8J-	mg/L	7.9	mg/L	8.3	mg/L
Sulfate	-	-	4.1	mg/L	5.0	mg/L	4.8	mg/L

EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

Analyte	Ecological Screening Standard for Surface Water Samples ¹	Smith River Bridge	Duke Boat Ramp	Hwy 700
Sample Information				
Sample ID	-	EDEN-SRB-C-SW-20140210	EDEN-DUKE-L-SW-20140210	EDEN-700-R-SW-20140210
Date	-	2/10/2014	2/10/2014	2/10/2014
Time	-	1415	1445	1340
Status	-	Validation Complete	Validation Complete	Validation Complete
Type	-	Surface Water	Surface Water	Surface Water
Wet Chemistry				
EPA 310.2/SM2340B/SW9040 C/SW9060A				
Alkalinity, Total (As CaCO ₃)	-	26.8	23.4	23.1
Hardness, Calcium/Magnesium (As CaCO ₃)	-	24.6	26.6	28.6
Organic Carbon, Dissolved	-	4.10	3.70	3.57
pH	6.5 - 9.0	7.30J	7.16J	7.08J

Notes

¹ Value obtained from the GL Tier 2 Values; National Recommended Water Quality Criteria; Suter and Tsao (1996); Reference condition for EcoRegion XI (25 percentile); NCDENR State Standards for surface water

EPA U.S. Environmental Protection Agency

J Value is estimated

J+ Value is estimated with a possible high bias

J- Value is estimated with a possible low bias

µg/L micrograms per liter

mg/L milligrams per liter

std standard

U Analyte was not detected at the listed reporting limit.

**EDEN NORTH CAROLINA COAL ASH SPILL
SURFACE WATER RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹	Hwy 880	Danville Water Intake	Hwy 58 Bridge
Sample Information				
Sample ID	-	EDEN-BH-C-SW-20140210	EDEN-DANIN-R-SW-20140210	EDEN-HW58-C-SW-20140210
Date	-	2/10/2014	2/10/2014	2/10/2014
Time	-	1305	1145	905
Status	-	Validation Complete	Validation Complete	Validation Complete
Type	-	Surface Water	Surface Water	Surface Water
Dissolved metals SW6010C/6020A/7470A				
Aluminum	87 µg/L	84.2 µg/L	95.9 µg/L	131 µg/L
Antimony	5.6 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Arsenic	10 µg/L	4.50U µg/L	4.50U µg/L	4.50U µg/L
Barium	220 µg/L	18.9 µg/L	20.8 µg/L	23.2 µg/L
Beryllium	0.66 µg/L	1.00U µg/L	1.00U µg/L	1.00U µg/L
Boron	0.36 mg/L	0.142 mg/L	0.140 mg/L	0.113 mg/L
Cadmium	0.1 µg/L	0.700U µg/L	0.700U µg/L	0.700U µg/L
Calcium	-	6,670 µg/L	6,880 µg/L	7,400 µg/L
Chromium	25 µg/L	2.50U µg/L	2.50U µg/L	2.50U µg/L
Cobalt	3 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Copper	3 µg/L	2.00U µg/L	2.00U µg/L	2.00U µg/L
Iron	1,000 µg/L	190 µg/L	222 µg/L	283 µg/L
Lead	0.59 µg/L	1.00U µg/L	1.00U µg/L	0.100J µg/L
Magnesium	-	2,360 µg/L	2,420 µg/L	2,640 µg/L
Manganese	200 µg/L	11.0 µg/L	15.3 µg/L	11.4 µg/L
Mercury	0.000012 mg/L	0.00020U mg/L	0.00020U mg/L	0.00020U mg/L
Molybdenum	800 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Nickel	17 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Potassium	53,000 µg/L	1,240 µg/L	1,290 µg/L	1,560 µg/L
Selenium	5 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Silver	0.06 µg/L	1.00U µg/L	1.00U µg/L	1.00U µg/L
Sodium	680,000 µg/L	4,200 µg/L	4,270 µg/L	7,060 µg/L
Thallium	0.24 µg/L	0.200U µg/L	0.200U µg/L	0.200U µg/L
Vanadium	27 µg/L	5.00U µg/L	5.00U µg/L	5.00U µg/L
Zinc	39 µg/L	10.0U µg/L	10.0U µg/L	10.0U µg/L

**EDEN NORTH CAROLINA COAL ASH SPILL
SURFACE WATER RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Hwy 880		Danville Water Intake		Hwy 58 Bridge	
Sample Information								
Sample ID	-		EDEN-BH-C-SW-20140210		EDEN-DANIN-R-SW-20140210		EDEN-HW58-C-SW-20140210	
Date	-		2/10/2014		2/10/2014		2/10/2014	
Time	-		1305		1145		905	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
Total Dissolved Solids EPA 160.1								
Total Dissolved Solids	-	-	17	mg/L	54	mg/L	82	mg/L
Total Suspended Solids EPA 160.2								
Total Suspended Solids	-	-	6.0	mg/L	8.0	mg/L	12.0	mg/L
Total Metals SW6010C/6020A/7470A								
Aluminum	2,000	µg/L	307	µg/L	338	µg/L	465	µg/L
Antimony	5.6	µg/L	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Arsenic	10	µg/L	4.50U	µg/L	0.570J	µg/L	0.636J	µg/L
Barium	220	µg/L	22.7	µg/L	23.8	µg/L	26.5	µg/L
Beryllium	0.66	µg/L	1.00U	µg/L	1.00U	µg/L	1.00U	µg/L
Boron	0.36	mg/L	0.144	mg/L	0.141	mg/L	0.116	mg/L
Cadmium	2	µg/L	0.700U	µg/L	0.700U	µg/L	0.200U	µg/L
Calcium	-	-	7,030	µg/L	6,520	µg/L	6,830	µg/L
Chromium	29	µg/L	0.738J	µg/L	0.602J	µg/L	0.858J	µg/L
Cobalt	24	µg/L	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Copper	3	µg/L	2.00U	µg/L	2.00U	µg/L	2.00U	µg/L
Iron	2,300	µg/L	583	µg/L	557	µg/L	778	µg/L
Lead	0.6	µg/L	0.394J	µg/L	0.484J	µg/L	0.688J	µg/L
Magnesium	-	-	2,530	µg/L	2,360	µg/L	2,500	µg/L
Manganese	200	µg/L	19.5	µg/L	19.3	µg/L	25.0	µg/L
Mercury	0.000012	mg/L	0.00020U	mg/L	0.00020U	mg/L	0.00020U	mg/L
Molybdenum	-	-	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Nickel	17	µg/L	0.533J	µg/L	0.586J	µg/L	0.726J	µg/L
Potassium	53,000	µg/L	1,360	µg/L	1,270	µg/L	1,480	µg/L
Selenium	5	µg/L	5.00U	µg/L	5.00U	µg/L	5.00U	µg/L
Silver	0.06	µg/L	1.00U	µg/L	1.00U	µg/L	1.00U	µg/L
Sodium	680,000	µg/L	4,500	µg/L	4,160	µg/L	6,590	µg/L
Thallium	0.24	µg/L	0.200U	µg/L	0.200U	µg/L	0.200U	µg/L
Vanadium	27	µg/L	1.37J	µg/L	1.55J	µg/L	2.07J	µg/L
Zinc	39	µg/L	5.46J	µg/L	10.0U	µg/L	10.0U	µg/L
Anions EPA 300.1								
Bromide	-	-	10U	µg/L	66	µg/L	84	µg/L
Anions SW9056A								
Bromide	-	-	1.0U	mg/L	1.0U	mg/L	1.0U	mg/L
Chloride	230	mg/L	7.6	mg/L	7.7	mg/L	10	mg/L
Sulfate	-	-	4.7	mg/L	4.8	mg/L	5.6	mg/L

EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

Analyte	Ecological Screening Standard for Surface Water Samples ¹	Hwy 880	Danville Water Intake	Hwy 58 Bridge
Sample Information				
Sample ID	-	EDEN-BH-C-SW-20140210	EDEN-DANIN-R-SW-20140210	EDEN-HW58-C-SW-20140210
Date	-	2/10/2014	2/10/2014	2/10/2014
Time	-	1305	1145	905
Status	-	Validation Complete	Validation Complete	Validation Complete
Type	-	Surface Water	Surface Water	Surface Water
EPA				
310.2/SM2340B/SW9040 C/SW9060A				
Wet Chemistry				
Alkalinity, Total (As CaCO ₃)	-	24.7	23.0	25.9
Hardness, Calcium/Magnesium (As CaCO ₃)	-	28.0	26.0	27.4
Organic Carbon, Dissolved	-	5.67	2.97	2.49
pH	6.5 - 9.0	7.11J	7.12J	7.06J

Notes

¹ Value obtained from the GL Tier 2 Values; National Recommended Water Quality Criteria; Suter and Tsao (1996); Reference condition for EcoRegion XI (25 percentile); NCDENR State Standards for surface water

EPA U.S. Environmental Protection Agency

J Value is estimated

J+ Value is estimated with a possible high bias

J- Value is estimated with a possible low bias

µg/L micrograms per liter

mg/L milligrams per liter

std standard

U Analyte was not detected at the listed reporting limit.

**EDEN NORTH CAROLINA COAL ASH SPILL
SURFACE WATER RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Hwy 360 Bridge		Ramble Road	
Sample Information						
Sample ID	-		EDEN-360-C-SW-20140210		EDEN-RAMBLE-R-SW-20140210	
Date	-		2/10/2014		2/10/2014	
Time	-		1037		1010	
Status	-		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water	
Dissolved metals SW6010C/6020A/7470A						
Aluminum	87	µg/L	127	µg/L	131	µg/L
Antimony	5.6	µg/L	5.00U	µg/L	5.00U	µg/L
Arsenic	10	µg/L	4.50U	µg/L	4.50U	µg/L
Barium	220	µg/L	21.1	µg/L	21.8	µg/L
Beryllium	0.66	µg/L	1.00U	µg/L	1.00U	µg/L
Boron	0.36	mg/L	0.0964	mg/L	0.103	mg/L
Cadmium	0.1	µg/L	0.700U	µg/L	0.700U	µg/L
Calcium	-	-	6,850	µg/L	7,120	µg/L
Chromium	25	µg/L	2.50U	µg/L	2.50U	µg/L
Cobalt	3	µg/L	5.00U	µg/L	5.00U	µg/L
Copper	3	µg/L	2.00U	µg/L	2.00U	µg/L
Iron	1,000	µg/L	279	µg/L	286	µg/L
Lead	0.59	µg/L	1.00U	µg/L	0.101J	µg/L
Magnesium	-	-	2,470	µg/L	2,550	µg/L
Manganese	200	µg/L	8.22	µg/L	12.7	µg/L
Mercury	0.000012	mg/L	0.00020U	mg/L	0.00020U	mg/L
Molybdenum	800	µg/L	5.00U	µg/L	5.00U	µg/L
Nickel	17	µg/L	5.00U	µg/L	5.00U	µg/L
Potassium	53,000	µg/L	1,490	µg/L	1,550	µg/L
Selenium	5	µg/L	5.00U	µg/L	5.00U	µg/L
Silver	0.06	µg/L	1.00U	µg/L	1.00U	µg/L
Sodium	680,000	µg/L	6,920	µg/L	7,780	µg/L
Thallium	0.24	µg/L	0.200U	µg/L	0.200U	µg/L
Vanadium	27	µg/L	5.00U	µg/L	5.00U	µg/L
Zinc	39	µg/L	10.0U	µg/L	10.0U	µg/L

**EDEN NORTH CAROLINA COAL ASH SPILL
SURFACE WATER RESULTS**

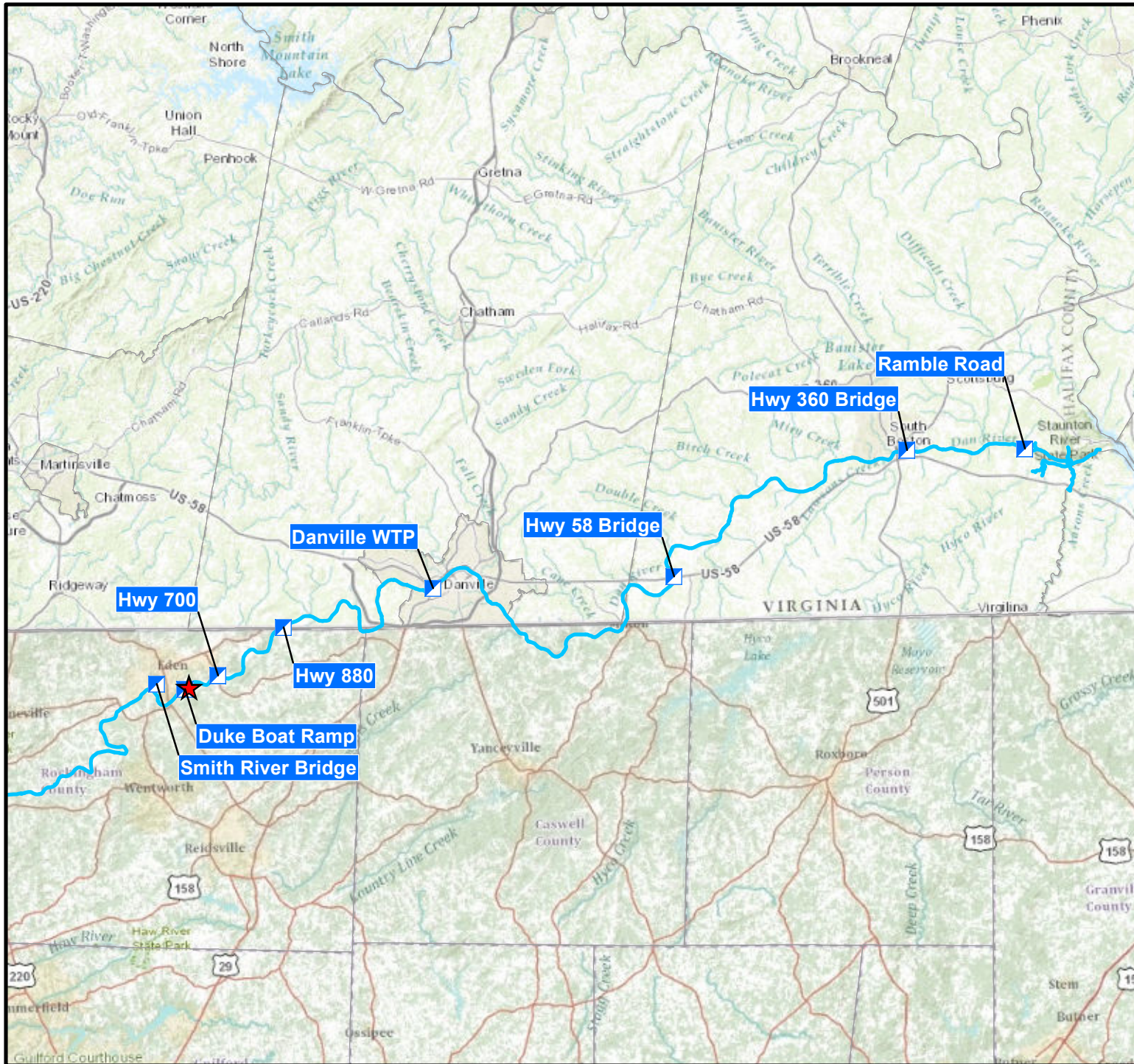
Analyte	Ecological Screening Standard for Surface Water Samples ¹		Hwy 360 Bridge		Ramble Road	
Sample Information						
Sample ID	-		EDEN-360-C-SW-20140210		EDEN-RAMBLE-R-SW-20140210	
Date	-		2/10/2014		2/10/2014	
Time	-		1037		1010	
Status	-		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water	
Total Dissolved Solids EPA 160.1						
Total Dissolved Solids	-	-	49	mg/L	58	mg/L
Total Suspended Solids EPA 160.2						
Total Suspended Solids	-	-	15.0	mg/L	15.5	mg/L
Total Metals SW6010C/6020A/7470A						
Aluminum	2,000	µg/L	667	µg/L	606	µg/L
Antimony	5.6	µg/L	5.00U	µg/L	5.00U	µg/L
Arsenic	10	µg/L	0.795J	µg/L	0.767J	µg/L
Barium	220	µg/L	28.3	µg/L	27.6	µg/L
Beryllium	0.66	µg/L	1.00U	µg/L	1.00U	µg/L
Boron	0.36	mg/L	0.103	mg/L	0.135	mg/L
Cadmium	2	µg/L	0.700U	µg/L	0.700U	µg/L
Calcium	-	-	6,950	µg/L	6,880	µg/L
Chromium	29	µg/L	1.11J	µg/L	1.07J	µg/L
Cobalt	24	µg/L	5.00U	µg/L	5.00U	µg/L
Copper	3	µg/L	2.00U	µg/L	2.00U	µg/L
Iron	2,300	µg/L	1,010	µg/L	965	µg/L
Lead	0.6	µg/L	0.966J	µg/L	0.899J	µg/L
Magnesium	-	-	2,590	µg/L	2,550	µg/L
Manganese	200	µg/L	30.1	µg/L	31.1	µg/L
Mercury	0.000012	mg/L	0.00020U	mg/L	0.00020U	mg/L
Molybdenum	-	-	5.00U	µg/L	5.00U	µg/L
Nickel	17	µg/L	0.867J	µg/L	0.797J	µg/L
Potassium	53,000	µg/L	1,590	µg/L	1,570	µg/L
Selenium	5	µg/L	5.00U	µg/L	5.00U	µg/L
Silver	0.06	µg/L	1.00U	µg/L	1.00U	µg/L
Sodium	680,000	µg/L	7,140	µg/L	7,610	µg/L
Thallium	0.24	µg/L	0.200U	µg/L	0.200U	µg/L
Vanadium	27	µg/L	2.87J	µg/L	2.72J	µg/L
Zinc	39	µg/L	9.10J	µg/L	10.0U	µg/L
Anions EPA 300.1						
Bromide	-	-	83	µg/L	104	µg/L
Anions SW9056A						
Bromide	-	-	1.0U	mg/L	1.0U	mg/L
Chloride	230	mg/L	10	mg/L	12	mg/L
Sulfate	-	-	5.7	mg/L	5.9	mg/L

EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS




Analyte	Ecological Screening Standard for Surface Water Samples ¹	Hwy 360 Bridge	Ramble Road
Sample Information			
Sample ID	-	EDEN-360-C-SW-20140210	EDEN-RAMBLE-R-SW-20140210
Date	-	2/10/2014	2/10/2014
Time	-	1037	1010
Status	-	Validation Complete	Validation Complete
Type	-	Surface Water	Surface Water
EPA			
310.2/SM2340B/SW9040 C/SW9060A			
Wet Chemistry			
Alkalinity, Total (As CaCO ₃)	-	27.1	25.1
Hardness, Calcium/Magnesium (As CaCO ₃)	-	28.0	27.7
Organic Carbon, Dissolved	-	2.98	3.40
pH	6.5 - 9.0	6.99J	7.10J

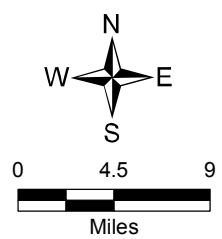
Notes

- ¹ Value obtained from the GL Tier 2 Values; National Recommended Water Quality Criteria; Suter and Tsao (1996); Reference condition for EcoRegion XI (25 percentile); NCDENR State Standards for surface water
- EPA U.S. Environmental Protection Agency
- J Value is estimated
- J+ Value is estimated with a possible high bias
- J- Value is estimated with a possible low bias
- µg/L micrograms per liter
- mg/L milligrams per liter
- std standard
- U Analyte was not detected at the listed reporting limit.



Legend

-  Approximate Spill Location
-  Surface Water Sample Location
-  Dan River



Map Source: ArcGIS Online World Map Topo, 2014

**Surface Water
Sample Locations
February 10, 2014**

