

EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

NOTE: The data below represents surface water samples that were collected on June 12, 2014 by EPA START (Team 1) sampling teams. 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. 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		DRSS Boat Ramp		Hwy 700		Hwy 880	
Sample Information								
Sample ID	-		EDEN-DUKE-L-SW-20140612		EDEN-HW700-C-SW-20140612		EDEN-BHB-C-SW-20140612	
Date	-		06/12/2014		06/12/2014		06/12/2014	
Time	-		1256		1214		1125	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
Dissolved metals								
Aluminum	87	µg/L	18	µg/L	21	µg/L	21	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Barium	220	µg/L	18	µg/L	18	µg/L	18	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.11	mg/L	0.12	mg/L	0.12	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	7100	µg/L	6900	µg/L	7000	µg/L
Chromium	25	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	3	µg/L	0.13J	µg/L	0.12J	µg/L	0.4U	µg/L
Copper	3	µg/L	0.87J	µg/L	0.8J	µg/L	1.4	µg/L
Iron	1,000	µg/L	190	µg/L	200	µg/L	160	µg/L
Lead	0.59	µg/L	0.083J	µg/L	0.089J	µg/L	0.12J	µg/L
Magnesium	-	-	2600	µg/L	2600	µg/L	2600	µg/L
Manganese	200	µg/L	18	µg/L	15	µg/L	9	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	0.49J	µg/L	1U	µg/L	0.92J	µg/L
Nickel	17	µg/L	0.68J	µg/L	0.42J	µg/L	0.41J	µg/L
Potassium	53,000	µg/L	1800	µg/L	1700	µg/L	1700	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	5200	µg/L	4400	µg/L	5000	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.2J+	µg/L	1.1J+	µg/L	1.2J+	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
Total Dissolved Solids								
Total Dissolved Solids	-	-	74	mg/L	69	mg/L	71	mg/L
Total Suspended Solids								
Total Suspended Solids	-	-	14	mg/L	23	mg/L	24	mg/L

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Sample Information								
Sample ID	-		EDEN-DUKE-L-SW-20140612		EDEN-HW700-C-SW-20140612		EDEN-BHB-C-SW-20140612	
Date	-		06/12/2014		06/12/2014		06/12/2014	
Time	-		1256		1214		1125	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
Total Metals								
Aluminum	2,000	µg/L	150	µg/L	170	µg/L	180	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	0.53J	µg/L	1U	µg/L	0.49J	µg/L
Barium	220	µg/L	20	µg/L	21	µg/L	22	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.11	mg/L	0.12	mg/L	0.12	mg/L
Cadmium	2	µg/L	0.061J	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	7200	µg/L	7000	µg/L	7100	µg/L
Chromium	29	µg/L	1.1J	µg/L	2.4	µg/L	2U	µg/L
Cobalt	24	µg/L	0.29J	µg/L	0.34J	µg/L	0.34J	µg/L
Copper	3	µg/L	1.2	µg/L	1.1	µg/L	2	µg/L
Iron	2,300	µg/L	480	µg/L	510	µg/L	460	µg/L
Lead	0.6	µg/L	0.34	µg/L	0.5	µg/L	0.56	µg/L
Magnesium	-	-	2700	µg/L	2600	µg/L	2700	µg/L
Manganese	200	µg/L	36	µg/L	44	µg/L	40	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	1U	µg/L	1U	µg/L	0.72J	µg/L
Nickel	17	µg/L	0.71J	µg/L	1.3	µg/L	0.6J	µg/L
Potassium	53,000	µg/L	1800	µg/L	1700	µg/L	1800	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	5400	µg/L	4300	µg/L	5000	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.5J+	µg/L	1.7J+	µg/L	1.8J+	µg/L
Zinc	39	µg/L	3.3J	µg/L	20U	µg/L	20U	µg/L
Anions								
Bromide	-	-	55	µg/L	60	µg/L	60	µg/L
Chloride	230	mg/L	8.3	mg/L	7.6	mg/L	7.9	mg/L
Sulfate	-	-	5.5	mg/L	4.1	mg/L	4.6	mg/L
Wet Chemistry								
Alkalinity, Total (As CaCO ₃)	-	-	23	mg/L	22	mg/L	34	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	29	mg/L	28	mg/L	29	mg/L
Organic Carbon, Dissolved	-	-	1.3	mg/L	1.2	mg/L	1.4	mg/L
pH	6.5 - 9.0	SU	7.44J	SU	7.17J	SU	7.36J	SU

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

SU standard units

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		Abreu-Grogan Park Boat Dock		Hwy 58		Hwy 360	
Sample Information								
Sample ID	-		EDEN-DANIN-R-SW-20140612		EDEN-HW58-C-SW-20140612		EDEN-HW360-C-SW-20140612	
Date	-		06/12/2014		06/12/2014		06/12/2014	
Time	-		1055		0858		0944	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
Dissolved metals								
Aluminum	87	µg/L	16	µg/L	17	µg/L	13	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Barium	220	µg/L	21	µg/L	20	µg/L	23	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.15	mg/L	0.15	mg/L	0.13	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	7800	µg/L	8200	µg/L	8000	µg/L
Chromium	25	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	3	µg/L	0.17J	µg/L	0.4U	µg/L	0.4U	µg/L
Copper	3	µg/L	1	µg/L	0.92J	µg/L	0.88J	µg/L
Iron	1,000	µg/L	200	µg/L	180	µg/L	140	µg/L
Lead	0.59	µg/L	0.093J	µg/L	0.11J	µg/L	0.074J	µg/L
Magnesium	-	-	2800	µg/L	3000	µg/L	3000	µg/L
Manganese	200	µg/L	49	µg/L	4.3	µg/L	5.7	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	0.77J	µg/L	0.57J	µg/L	0.55J	µg/L
Nickel	17	µg/L	0.44J	µg/L	0.58J	µg/L	0.41J	µg/L
Potassium	53,000	µg/L	1700	µg/L	2000	µg/L	2000	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	5100	µg/L	9300	µg/L	9400	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.3J+	µg/L	1.4J+	µg/L	1.2J+	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
Total Dissolved Solids								
Total Dissolved Solids	-	-	94	mg/L	89	mg/L	110	mg/L
Total Suspended Solids								
Total Suspended Solids	-	-	16	mg/L	17	mg/L	19	mg/L

EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Abreu-Grogan Park Boat Dock		Hwy 58		Hwy 360	
Sample Information								
Sample ID	-		EDEN-DANIN-R-SW-20140612	EDEN-HW58-C-SW-20140612	EDEN-HW360-C-SW-20140612			
Date	-		06/12/2014	06/12/2014	06/12/2014			
Time	-		1055	0858	0944			
Status	-		Validation Complete	Validation Complete	Validation Complete			
Type	-		Surface Water	Surface Water	Surface Water			
Total Metals								
Aluminum	2,000	µg/L	100	µg/L	120	µg/L	90	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	0.53J	µg/L	0.47J	µg/L	1U	µg/L
Barium	220	µg/L	23	µg/L	24	µg/L	26	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.15	mg/L	0.16	mg/L	0.14	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.057J	µg/L
Calcium	-	-	7800	µg/L	8300	µg/L	8200	µg/L
Chromium	29	µg/L	1.1J	µg/L	1.3J	µg/L	2U	µg/L
Cobalt	24	µg/L	0.29J	µg/L	0.29J	µg/L	0.27J	µg/L
Copper	3	µg/L	1.4	µg/L	1.3	µg/L	1.3	µg/L
Iron	2,300	µg/L	410	µg/L	440	µg/L	390	µg/L
Lead	0.6	µg/L	0.34	µg/L	0.49	µg/L	0.42	µg/L
Magnesium	-	-	2800	µg/L	3100	µg/L	3100	µg/L
Manganese	200	µg/L	63	µg/L	37	µg/L	33	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	0.66J	µg/L	0.47J	µg/L	1U	µg/L
Nickel	17	µg/L	0.55J	µg/L	0.64J	µg/L	0.65J	µg/L
Potassium	53,000	µg/L	1700	µg/L	2000	µg/L	2100	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	5200	µg/L	9400	µg/L	9400	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.6J+	µg/L	2J+	µg/L	1.7J+	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
Anions								
Bromide	-	-	78	µg/L	160	µg/L	150	µg/L
Chloride	230	mg/L	9.4	mg/L	16	mg/L	15	mg/L
Sulfate	-	-	4.6	mg/L	5.6	mg/L	5.6	mg/L
Wet Chemistry								
Alkalinity, Total (As CaCO ₃)	-	-	28	mg/L	32	mg/L	32	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	31	mg/L	33	mg/L	33	mg/L
Organic Carbon, Dissolved	-	-	0.9J	mg/L	1.1	mg/L	1.1	mg/L
pH	6.5 - 9.0	SU	7.23J	SU	7.48J	SU	7.23J	SU

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

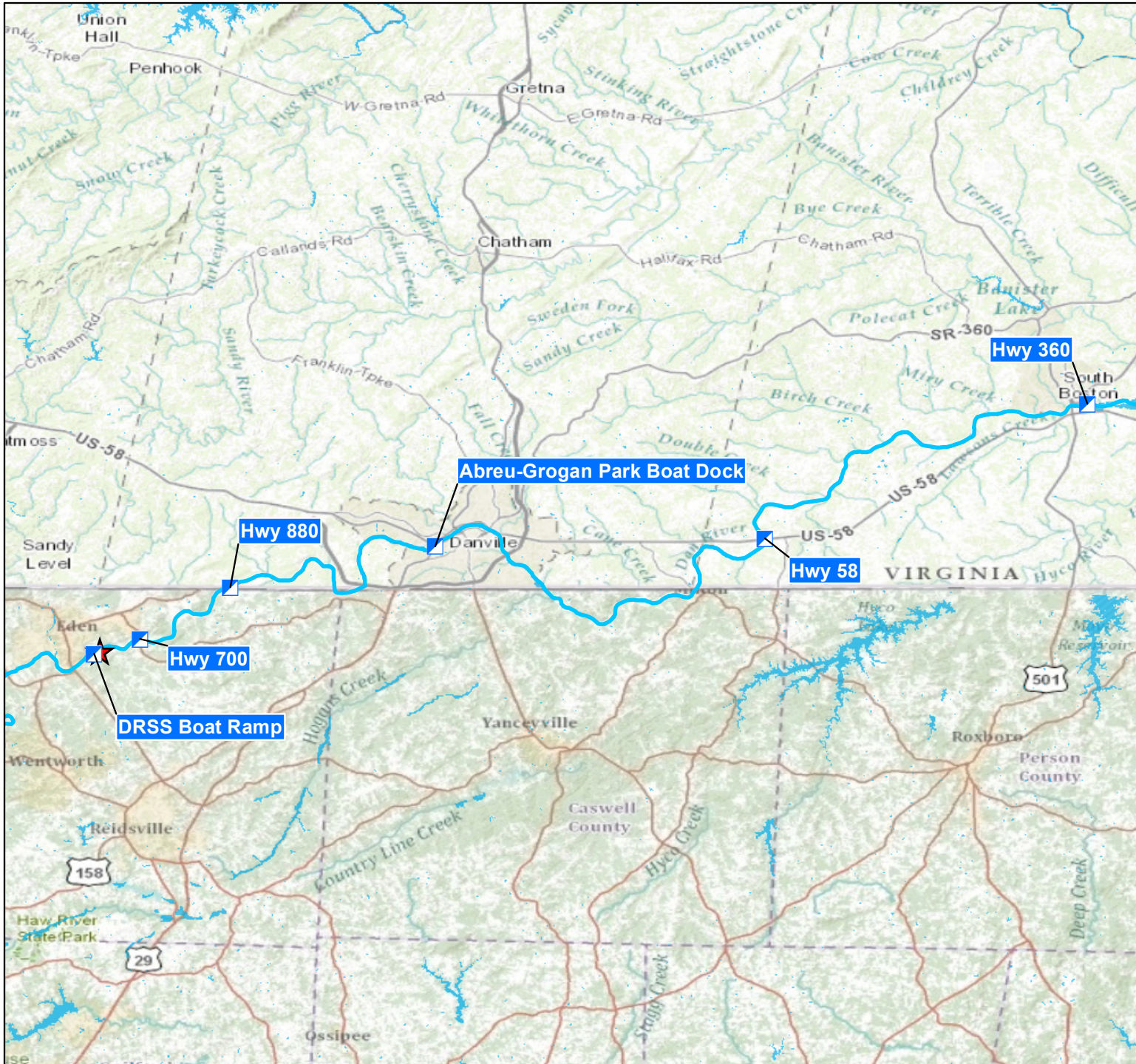
J- Value is estimated with a possible low bias

µg/L micrograms per liter



mg/L milligrams per liter

SU standard units

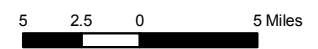
U Analyte was not detected at the listed reporting limit.



Legend


-  Approximate Spill Location
-  Surface Water Sample Location

Imagery Source:
ESRI, USGS Mapping Service, 2013



Eden Coal Ash Spill
Eden, North Carolina

Surface Water
Sample Locations
June 12, 2014



United States
Environmental
Protection Agency