

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT-WATER INTERFACE RESULTS

NOTE: The data below represents sediment-water interface samples that were collected on April 2, 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 sediment-water interface are all below the EPA ERSLs with the exception of lead. EPA typically screens the water concentrations using total metals samples, because this is a conservative practice for screening. Because lead was not detected above screening levels in any of the samples of the dissolved fraction of water (i.e., samples that were filtered to remove particulates), therefore there is no threat of toxicity from lead to aquatic organisms. 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		Transect EPA 11 Right Descending		Transect EPA 12 Left Descending		Transect EPA 13 Left Descending	
Sample Information								
Sample ID	-		EDEN-EPA11-R-BW-20140402		EDEN-EPA12-L-BW-20140402		EDEN-EPA13-L-BW-20140402	
Date	-		04/02/2014		04/02/2014		04/02/2014	
Time	-		1003		1205		1450	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Water Quality Monitoring								
Temperature	-		12.1	°C	13	°C	11.5	°C
Dissolved Oxygen	<6	mg/L	10.7	mg/L	10.6	mg/L	10.2	mg/L
Specific Conductance	-		0.119	mS/cm	0.091	mS/cm	0.1	mS/cm
pH	6.5 - 9.0	std	8.2	std	7.6	std	7	std
Turbidity	50	NTU	10	NTU	18	NTU	56	NTU
Dissolved metals								
Aluminum	87	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Antimony	5.6	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Arsenic	10	µg/L	0.199J	µg/L	0.148J	µg/L	0.168J	µg/L
Barium	220	µg/L	18.6	µg/L	19.4	µg/L	19.2	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L	0.65U	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.129U	mg/L	0.0701U	mg/L	0.0713U	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	7,050	µg/L	6,660	µg/L	6,780	µg/L
Chromium	25	µg/L	0.156J	µg/L	0.12J	µg/L	0.122J	µg/L
Cobalt	3	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Copper	3	µg/L	2U	µg/L	0.52J	µg/L	0.21J	µg/L
Iron	1,000	µg/L	209	µg/L	247	µg/L	264	µg/L
Lead	0.59	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Magnesium	-	-	2,840J	µg/L	2,670J	µg/L	2,770J	µg/L
Manganese	200	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Nickel	17	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Potassium	53,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.05U	µg/L	0.05U	µg/L	0.05U	µg/L
Sodium	680,000	µg/L	7,960	µg/L	7,280	µg/L	6,720	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	0.395J	µg/L	0.342J	µg/L	0.428J	µg/L
Zinc	39	µg/L	10U	µg/L	9.99J	µg/L	10U	µg/L

**EDEN NORTH CAROLINA COAL ASH SPILL
SEDIMENT-WATER INTERFACE RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 11 Right Descending		Transect EPA 12 Left Descending		Transect EPA 13 Left Descending	
Sample Information								
Sample ID	-		EDEN-EPA11-R-BW-20140402		EDEN-EPA12-L-BW-20140402		EDEN-EPA13-L-BW-20140402	
Date	-		04/02/2014		04/02/2014		04/02/2014	
Time	-		1003		1205		1450	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Total Dissolved Solids								
Total Dissolved Solids	-	-	81	mg/L	80	mg/L	80	mg/L
Total Suspended Solids								
Total Suspended Solids	-	-	5	mg/L	2.5J	mg/L	34	mg/L
Total Metals								
Aluminum	2,000	µg/L	402	µg/L	156	µg/L	388	µg/L
Antimony	5.6	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Arsenic	10	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Barium	220	µg/L	25.4	µg/L	24.2	µg/L	26.4	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L	0.65U	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.103U	mg/L	0.0707U	mg/L	0.0765U	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,990	µg/L	6,690	µg/L	7,000	µg/L
Chromium	29	µg/L	2.5U	µg/L	2.5U	µg/L	2.5U	µg/L
Cobalt	24	µg/L	0.46J	µg/L	0.27J	µg/L	0.48J	µg/L
Copper	3	µg/L	1.27J	µg/L	1.07J	µg/L	2.26	µg/L
Iron	2,300	µg/L	1,300	µg/L	873	µg/L	1,630	µg/L
Lead	0.6	µg/L	0.617	µg/L	0.334J	µg/L	0.708	µg/L
Magnesium	-	-	2,860J	µg/L	2,660J	µg/L	2,890J	µg/L
Manganese	200	µg/L	47.5	µg/L	43.8	µg/L	76.4	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	5U	µg/L	5U	µg/L	5U	µg/L
Nickel	17	µg/L	0.552J	µg/L	0.391J	µg/L	0.468J	µg/L
Potassium	53,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.05U	µg/L	0.05U	µg/L	0.05U	µg/L
Sodium	680,000	µg/L	8,150	µg/L	7,700	µg/L	7,380	µg/L
Thallium	0.24	µg/L	0.2UJ	µg/L	0.222UJ	µg/L	0.2UJ	µg/L
Vanadium	27	µg/L	2.05J	µg/L	1.34J	µg/L	2.14J	µg/L
Zinc	39	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Anions								
Bromide	-	-	1U	mg/L	1U	mg/L	1U	mg/L
Chloride	230	mg/L	12.1	mg/L	10.5	mg/L	9.57	mg/L
Sulfate	-	-	8.52	mg/L	5.48	mg/L	5.84	mg/L

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT-WATER INTERFACE RESULTS

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 11 Right Descending		Transect EPA 12 Left Descending		Transect EPA 13 Left Descending	
Sample Information								
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Date	-		04/02/2014		04/02/2014		04/02/2014	
Time	-		1003		1205		1450	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Wet Chemistry								
Alkalinity, Total (As CaCO ₃)	-	-	21.1	mg/L	21.8	mg/L	21.9	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	29.2	mg/L	27.7	mg/L	29.4	mg/L
Organic Carbon, Dissolved	-	-	2.18	mg/L	2.78	mg/L	3.45	mg/L
pH	6.5 - 9.0		std	6.85J	std	7.14J	std	7.35J

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

°C degrees Celsius

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

mS/cm milliSiemens per centimeter

NTU Nephelometric turbidity units

std standard

U Analyte was not detected at the listed reporting limit.

**EDEN NORTH CAROLINA COAL ASH SPILL
SEDIMENT-WATER INTERFACE RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 14 Mid-Channel	
Sample Information				
Sample ID	-		EDEN-EPA14-R-UP-BW-20140402	
Date	-		04/02/2014	
Time	-		1700	
Status	-		Validation Complete	
Type	-		Sediment-Water Interface	
Water Quality Monitoring				
Temperature	-		18.2	°C
Dissolved Oxygen	<6	mg/L	11.1	mg/L
Specific Conductance	-		0.122	mS/cm
pH	6.5 - 9.0	std	7.9	std
Turbidity	50	NTU	11	NTU
Dissolved metals				
Aluminum	87	µg/L	10U	µg/L
Antimony	5.6	µg/L	5U	µg/L
Arsenic	10	µg/L	0.158J	µg/L
Barium	220	µg/L	20.3	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.0883U	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L
Calcium	-	-	9,490	µg/L
Chromium	25	µg/L	0.105J	µg/L
Cobalt	3	µg/L	5U	µg/L
Copper	3	µg/L	0.361J	µg/L
Iron	1,000	µg/L	124	µg/L
Lead	0.59	µg/L	0.5U	µg/L
Magnesium	-	-	3,840J	µg/L
Manganese	200	µg/L	5U	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	5U	µg/L
Nickel	17	µg/L	5U	µg/L
Potassium	53,000	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.05U	µg/L
Sodium	680,000	µg/L	6,450	µg/L
Thallium	0.24	µg/L	0.2U	µg/L
Vanadium	27	µg/L	0.333J	µg/L
Zinc	39	µg/L	10U	µg/L

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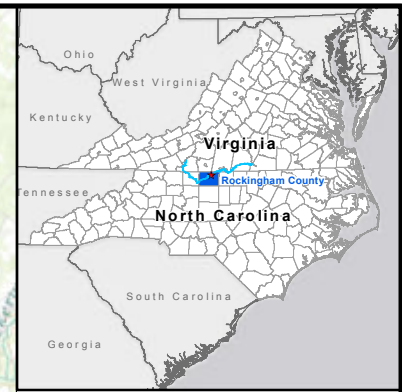
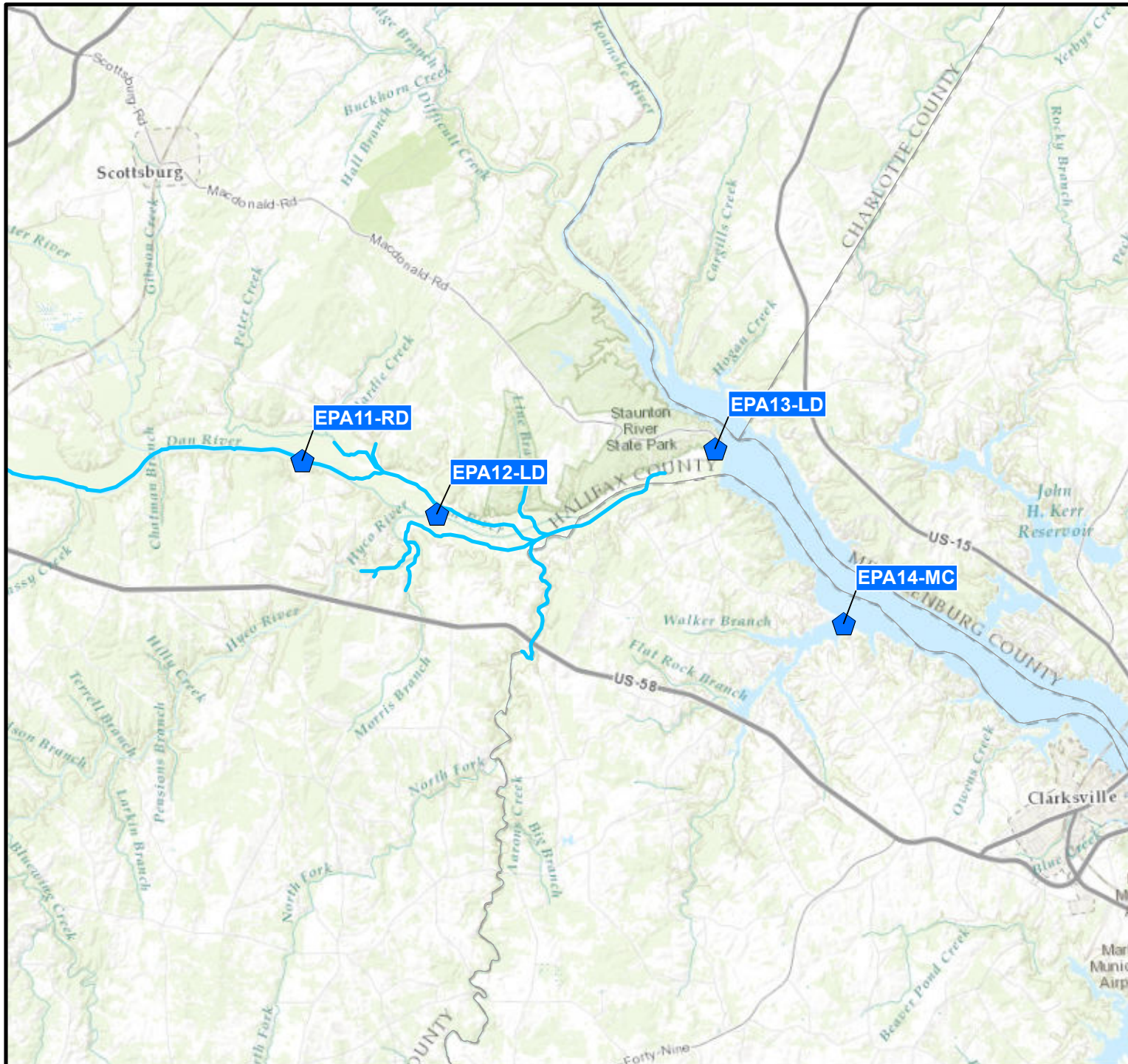
Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 14 Mid-Channel	
Sample Information				
Sample ID	-		EDEN-EPA14-R-UP-BW-20140402	
Date	-		04/02/2014	
Time	-		1700	
Status	-		Validation Complete	
Type	-		Sediment-Water Interface	
Total Dissolved Solids				
Total Dissolved Solids	-	-	102	mg/L
Total Suspended Solids				
Total Suspended Solids	-	-	11.5	mg/L
Total Metals				
Aluminum	2,000	µg/L	173	µg/L
Antimony	5.6	µg/L	5U	µg/L
Arsenic	10	µg/L	4.5U	µg/L
Barium	220	µg/L	28.2	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.0843U	mg/L
Cadmium	2	µg/L	0.1U	µg/L
Calcium	-	-	9,360	µg/L
Chromium	29	µg/L	2.5U	µg/L
Cobalt	24	µg/L	0.271J	µg/L
Copper	3	µg/L	0.967J	µg/L
Iron	2,300	µg/L	909	µg/L
Lead	0.6	µg/L	0.361J	µg/L
Magnesium	-	-	3,770J	µg/L
Manganese	200	µg/L	61.3	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L
Molybdenum	-	-	5U	µg/L
Nickel	17	µg/L	0.568J	µg/L
Potassium	53,000	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.05U	µg/L
Sodium	680,000	µg/L	6,590	µg/L
Thallium	0.24	µg/L	0.2UJ	µg/L
Vanadium	27	µg/L	1.26J	µg/L
Zinc	39	µg/L	10U	µg/L
Anions				
Bromide	-	-	1U	mg/L
Chloride	230	mg/L	10.8	mg/L
Sulfate	-	-	7.35	mg/L

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT-WATER INTERFACE RESULTS




Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 14 Mid-Channel	
Sample Information				
Sample ID	-		EDEN-EPA14-R-UP-BW-20140402	
Date	-		04/02/2014	
Time	-		1700	
Status	-		Validation Complete	
Type	-		Sediment-Water Interface	
Wet Chemistry				
Alkalinity, Total (As CaCO ₃)	-	-	29.8	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	38.9	mg/L
Organic Carbon, Dissolved	-	-	3.22	mg/L
pH	6.5 - 9.0	std	7.29J	std

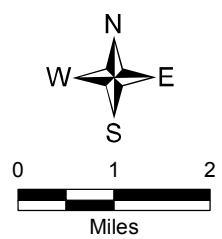
Notes

- 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
- °C degrees Celsius
- 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
- mS/cm milliSiemens per centimeter
- NTU Nephelometric turbidity units
- std standard
- U Analyte was not detected at the listed reporting limit.



Legend

-  Approximate Spill Location
-  Sediment-Water Interface Sample Location
-  Dan River



Map Source: ArcGIS Online World Map Topo, 2014

**Sediment-Water Interface
Sample Locations
April 2, 2014**

