

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

NOTE: The data below represents sediment-water interface samples that were collected on June 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 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 <sup>1</sup>		Transect FWS 4A Right Descending		Transect FWS 4B Left Descending		Transect EPA 02 Right Descending	
<b>Sample Information</b>								
Sample ID	-		EDEN-FWS4A-R-BW-20140602		EDEN-FWS4B-L-BW-20140602		EDEN-EPA02-R-BW-20140602	
Date	-		6/2/2014		6/2/2014		6/2/2014	
Time	-		1140		1315		1445	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Dissolved metals</b>								
Aluminum	87	µg/L	17	µg/L	23	µg/L	18	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	0.51J	µg/L	0.69J	µg/L	0.5J	µg/L
Barium	220	µg/L	19J-	µg/L	22J-	µg/L	20J-	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.17	mg/L	0.18	mg/L	0.17	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	8000	µg/L	8100	µg/L	8200	µg/L
Chromium	25	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	3	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Copper	3	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Iron	1,000	µg/L	140	µg/L	200	µg/L	170	µg/L
Lead	0.59	µg/L	0.3U	µg/L	0.08J	µg/L	0.3U	µg/L
Magnesium	-	-	2900	µg/L	2900	µg/L	3000	µg/L
Manganese	200	µg/L	14	µg/L	23	µg/L	34	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	0.45J	µg/L	0.72J	µg/L	0.5J	µg/L
Nickel	17	µg/L	1U	µg/L	0.68J	µg/L	1U	µg/L
Potassium	53,000	µg/L	1700	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	5100	µg/L	5000	µg/L	4800	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1	µg/L	1.2	µg/L	0.93J	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
<b>Total Dissolved Solids</b>								
Total Dissolved Solids	-	-	89	mg/L	67	mg/L	87	mg/L
<b>Total Suspended Solids</b>								
Total Suspended Solids	-	-	6	mg/L	44	mg/L	11	mg/L

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Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		Transect FWS 4A Right Descending		Transect FWS 4B Left Descending		Transect EPA 02 Right Descending	
<b>Sample Information</b>								
Sample ID	-		EDEN-FWS4A-R-BW-20140602		EDEN-FWS4B-L-BW-20140602		EDEN-EPA02-R-BW-20140602	
Date	-		6/2/2014		6/2/2014		6/2/2014	
Time	-		1140		1315		1445	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Total Metals</b>								
Aluminum	2,000	µg/L	87	µg/L	160	µg/L	88	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L	1.2J+	µg/L	1U	µg/L
Barium	220	µg/L	22	µg/L	28	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	0.17	mg/L	0.18	mg/L	0.17	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	8200	µg/L	8400	µg/L	8400	µg/L
Chromium	29	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	24	µg/L	0.21J	µg/L	0.5	µg/L	0.27J	µg/L
Copper	3	µg/L	1U	µg/L	1.1	µg/L	0.54J	µg/L
Iron	2,300	µg/L	370	µg/L	570	µg/L	470	µg/L
Lead	0.6	µg/L	0.21J	µg/L	0.68	µg/L	0.27J	µg/L
Magnesium	-	-	3000	µg/L	3000	µg/L	3000	µg/L
Manganese	200	µg/L	41	µg/L	88	µg/L	63	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	1U	µg/L	0.61J	µg/L	1U	µg/L
Nickel	17	µg/L	1U	µg/L	0.62J	µg/L	0.44J	µg/L
Potassium	53,000	µg/L	1700	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	5000	µg/L	5100	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	1.6J+	µg/L	2.3J+	µg/L	1.6J+	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
<b>Anions</b>								
Bromide	-	-	88	µg/L	90	µg/L	88	µg/L
Chloride	230	mg/L	10	mg/L	10	mg/L	10	mg/L
Sulfate	-	-	5	mg/L	5	mg/L	5	mg/L
<b>Wet Chemistry</b>								
Alkalinity, Total (As CaCO <sub>3</sub> )	-	-	26	mg/L	21	mg/L	25	mg/L
Hardness, Calcium/Magnesium (As CaCO <sub>3</sub> )	-	-	33	mg/L	33	mg/L	33	mg/L
Organic Carbon, Dissolved	-	-	0.89J	mg/L	0.89J	mg/L	0.99J	mg/L
pH	6.5 - 9.0	SU	7.44J	SU	7.37J	SU	7.55J	SU

Notes

<sup>1</sup> 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  
SEDIMENT-WATER INTERFACE RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		Transect EPA 09 Left Descending		Transect EPA 10 Left Descending		Transect EPA 11 Right Descending	
<b>Sample Information</b>								
Sample ID	-		EDEN-EPA09-L-BW-20140602		EDEN-EPA10-L-BW-20140602		EDEN-EPA11-R-BW-20140602	
Date	-		6/2/2014		6/2/2014		6/2/2014	
Time	-		1010		1200		1300	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Dissolved metals</b>								
Aluminum	87	µg/L	29	µg/L	110J	µg/L	28	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	0.56J	µg/L	0.45J	µg/L	0.43J	µg/L
Barium	220	µg/L	26J-	µg/L	23J-	µg/L	26J-	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.12	mg/L	0.1U	mg/L	0.13	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.091J	µg/L	0.057J	µg/L
Calcium	-	-	8500	µg/L	5300	µg/L	8100	µg/L
Chromium	25	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	3	µg/L	0.4U	µg/L	0.4U	µg/L	0.15J	µg/L
Copper	3	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Iron	1,000	µg/L	170	µg/L	570	µg/L	220	µg/L
Lead	0.59	µg/L	0.097J	µg/L	0.2J	µg/L	0.11J	µg/L
Magnesium	-	-	3100	µg/L	2300	µg/L	3000	µg/L
Manganese	200	µg/L	6.4	µg/L	38	µg/L	79	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	0.59J	µg/L	1U	µg/L	0.56J	µg/L
Nickel	17	µg/L	0.48J	µg/L	1U	µg/L	1U	µg/L
Potassium	53,000	µg/L	2100	µg/L	2200	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	11000	µg/L	5400	µg/L	9900	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.1	µg/L	1.1	µg/L	1.5	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
<b>Total Dissolved Solids</b>								
Total Dissolved Solids	-	-	92	mg/L	74	mg/L	73	mg/L
<b>Total Suspended Solids</b>								
Total Suspended Solids	-	-	19	mg/L	14	mg/L	18	mg/L

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

Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		Transect EPA 09 Left Descending		Transect EPA 10 Left Descending		Transect EPA 11 Right Descending	
<b>Sample Information</b>								
Sample ID	-		EDEN-EPA09-L-BW-20140602		EDEN-EPA10-L-BW-20140602		EDEN-EPA11-R-BW-20140602	
Date	-		6/2/2014		6/2/2014		6/2/2014	
Time	-		1010		1200		1300	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Total Metals</b>								
Aluminum	2,000	µg/L	160	µg/L	96J	µg/L	110	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	32	µg/L	29	µg/L	32	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.12	mg/L	0.1U	mg/L	0.13	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	8900	µg/L	5600	µg/L	8500	µg/L
Chromium	29	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	24	µg/L	0.47	µg/L	0.34J	µg/L	0.42	µg/L
Copper	3	µg/L	1	µg/L	1U	µg/L	0.68J	µg/L
Iron	2,300	µg/L	610	µg/L	860	µg/L	550	µg/L
Lead	0.6	µg/L	0.67	µg/L	0.44	µg/L	0.46	µg/L
Magnesium	-	-	3200	µg/L	2400	µg/L	3100	µg/L
Manganese	200	µg/L	72	µg/L	190	µg/L	140	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	0.53J	µg/L
Nickel	17	µg/L	0.71J	µg/L	0.43J	µg/L	0.56J	µg/L
Potassium	53,000	µg/L	2100	µg/L	2200	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	12000	µg/L	5600	µg/L	10000	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	2.3J+	µg/L	1.4J+	µg/L	2.6J+	µg/L
Zinc	39	µg/L	5.2J	µg/L	20U	µg/L	20U	µg/L
<b>Anions</b>								
Bromide	-	-	180	µg/L	24	µg/L	160	µg/L
Chloride	230	mg/L	17	mg/L	4	mg/L	16	mg/L
Sulfate	-	-	6.1	mg/L	2.7	mg/L	6	mg/L
<b>Wet Chemistry</b>								
Alkalinity, Total (As CaCO <sub>3</sub> )	-	-	24	mg/L	24	mg/L	26	mg/L
Hardness, Calcium/Magnesium (As CaCO <sub>3</sub> )	-	-	36	mg/L	24	mg/L	34	mg/L
Organic Carbon, Dissolved	-	-	1.3	mg/L	2.1	mg/L	1.4	mg/L
pH	6.5 - 9.0	SU	7.13J	SU	7.27J	SU	7.39J	SU

Notes

<sup>1</sup> 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

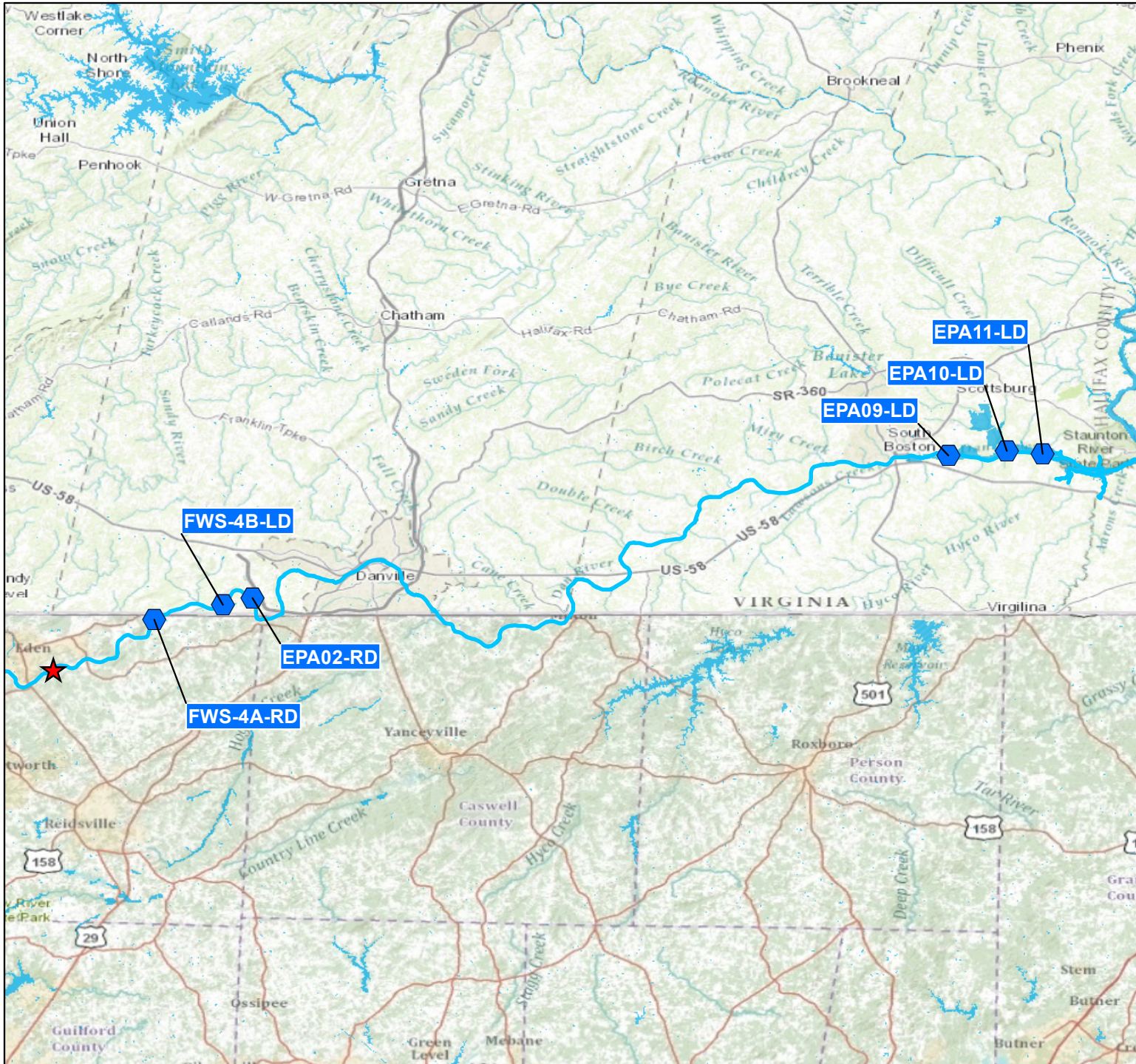
J- Value is estimated with a possible low bias

µg/L micrograms per liter



mg/L milligrams per liter

SU standard units

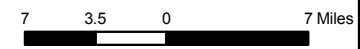
U Analyte was not detected at the listed reporting limit.



Legend

-  Approximate Spill Location
-  Sediment-Water Interface Sample Location

Imagery Source:  
ESRI, USGS Mapping Service, 2013



Eden Coal Ash Spill  
Eden, North Carolina

Sediment-Water Interface  
Sample Locations  
June 02, 2014

