

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT-WATER INTERFACE RESULTS

NOTE: The data below represents sediment-water interface samples that were collected on November 3, 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. 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 FWS 4B Left Descending		Transect FWS 4B Left Descending		Transect FWS SFI4 Left Descending	
Sample Information								
Sample ID	-		EDEN-FWS4B-L-BW-20141103		EDEN-FWS4B-L-BW-20141103-DUP		EDEN-FWSSFI4-L-BW-20141103	
Date	-		11/03/2014		11/03/2014		11/03/2014	
Time	-		09:40		09:45		13:20	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Dissolved metals								
Aluminum	87	µg/L	21	µg/L	19	µg/L	17	µg/L
Antimony	5.6	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Arsenic	10	µg/L	0.73 J	µg/L	0.64 J	µg/L	1 U	µg/L
Barium	220	µg/L	18	µg/L	18	µg/L	18	µg/L
Beryllium	0.66	µg/L	0.4 U	µg/L	0.4 U	µg/L	0.4 U	µg/L
Boron	0.36	mg/L	0.14	mg/L	0.14	mg/L	0.11	mg/L
Cadmium	0.1	µg/L	0.1 U	µg/L	0.1 U	µg/L	0.1 U	µg/L
Calcium	-	-	7,000	µg/L	7,000	µg/L	7,000	µg/L
Chromium	25	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Cobalt	3	µg/L	0.4 U	µg/L	0.4 U	µg/L	0.4 U	µg/L
Copper	3	µg/L	0.66 J	µg/L	0.66 J	µg/L	0.57 J	µg/L
Iron	1,000	µg/L	190	µg/L	200	µg/L	200	µg/L
Lead	0.59	µg/L	0.082 J	µg/L	0.062 J	µg/L	0.064 J	µg/L
Magnesium	-	-	2,800	µg/L	2,800	µg/L	2,800	µg/L
Manganese	200	µg/L	2.5 U	µg/L	2.5 U	µg/L	2.5 U	µg/L
Mercury	0.000012	mg/L	0.0002 U	mg/L	0.0002 U	mg/L	0.0002 U	mg/L
Molybdenum	800	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Nickel	17	µg/L	1 U	µg/L	1 U	µg/L	0.53 J	µg/L
Potassium	53,000	µg/L	2,100	µg/L	2,100	µg/L	2,100	µg/L
Selenium	5	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Silver	0.06	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Sodium	680,000	µg/L	4,700	µg/L	4,800	µg/L	5,200	µg/L
Thallium	0.24	µg/L	0.2 U	µg/L	0.2 U	µg/L	0.2 U	µg/L
Vanadium	27	µg/L	1 U	µg/L	1 U	µg/L	1.1 J+	µg/L
Zinc	39	µg/L	20 U	µg/L	20 U	µg/L	20 U	µg/L
Total Dissolved Solids								
Total Dissolved Solids	-	-	65	mg/L	69	mg/L	62	mg/L
Total Suspended Solids								
Total Suspended Solids	-	-	6	mg/L	6	mg/L	6	mg/L

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Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect FWS 4B Left Descending		Transect FWS 4B Left Descending		Transect FWS SF14 Left Descending	
Sample Information								
Sample ID			EDEN-FWS4B-L-BW-20141103		EDEN-FWS4B-L-BW-20141103-DUP		EDEN-FWSSFI4-L-BW-20141103	
Date			11/03/2014		11/03/2014		11/03/2014	
Time			09:40		09:45		13:20	
Status			Validation Complete		Validation Complete		Validation Complete	
Type			Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Total Metals								
Aluminum	2,000	µg/L	94 J	µg/L	65 J	µg/L	75	µg/L
Antimony	5.6	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Arsenic	10	µg/L	0.42 J	µg/L	0.5 J	µg/L	1 U	µg/L
Barium	220	µg/L	22	µg/L	21	µg/L	21	µg/L
Beryllium	0.66	µg/L	0.4 U	µg/L	0.4 U	µg/L	0.4 U	µg/L
Boron	0.36	mg/L	0.14	mg/L	0.14	mg/L	0.12	mg/L
Cadmium	2	µg/L	0.1 U	µg/L	0.1 U	µg/L	0.1 U	µg/L
Calcium	-	-	7,400	µg/L	7,200	µg/L	7,500	µg/L
Chromium	29	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Cobalt	24	µg/L	0.18 J	µg/L	0.13 J	µg/L	0.15 J	µg/L
Copper	3	µg/L	1	µg/L	0.91 J	µg/L	0.88 J	µg/L
Iron	2,300	µg/L	450	µg/L	390	µg/L	410	µg/L
Lead	0.6	µg/L	0.25 J	µg/L	0.17 J	µg/L	0.19 J	µg/L
Magnesium	-	-	2,900	µg/L	2,800	µg/L	3,000	µg/L
Manganese	200	µg/L	41	µg/L	31	µg/L	28	µg/L
Mercury	0.000012	mg/L	0.0002 U	mg/L	0.0002 U	mg/L	0.0002 U	mg/L
Molybdenum	-	-	1 U	µg/L	1 U	µg/L	1 U	µg/L
Nickel	17	µg/L	0.44 J	µg/L	0.45 J	µg/L	0.5 J	µg/L
Potassium	53,000	µg/L	2,200	µg/L	2,100	µg/L	2,200	µg/L
Selenium	5	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Silver	0.06	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Sodium	680,000	µg/L	4,900	µg/L	4,900	µg/L	5,400	µg/L
Thallium	0.24	µg/L	0.2 U	µg/L	0.2 U	µg/L	0.2 U	µg/L
Vanadium	27	µg/L	1.2 J+	µg/L	1.2 J+	µg/L	1.3 J+	µg/L
Zinc	39	µg/L	20 U	µg/L	20 U	µg/L	20 U	µg/L
Anions								
Bromide	-	-	74	µg/L	70	µg/L	66	µg/L
Chloride	230	mg/L	8.6	mg/L	8.6	mg/L	8	mg/L
Sulfate	-	-	3.6	mg/L	3.6	mg/L	3.7	mg/L
Wet Chemistry								
Alkalinity, Total (As CaCO ₃)	-	-	27	mg/L	28	mg/L	29	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	31	mg/L	29	mg/L	31	mg/L
Organic Carbon, Dissolved	-	-	1.8	mg/L	1.9	mg/L	2	mg/L
pH	6.5 - 9.0		SU	7.37 J	SU	7.34 J	SU	7.36 J

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
- µg/L micrograms per liter
- mg/L milligrams per liter
- SU standard units
- U Analyte was not detected at the listed reporting limit.

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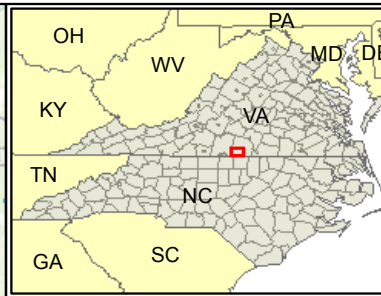
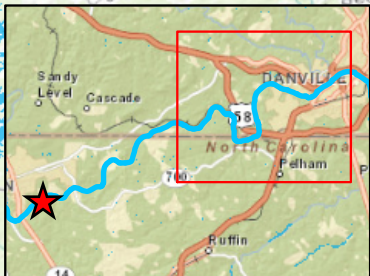
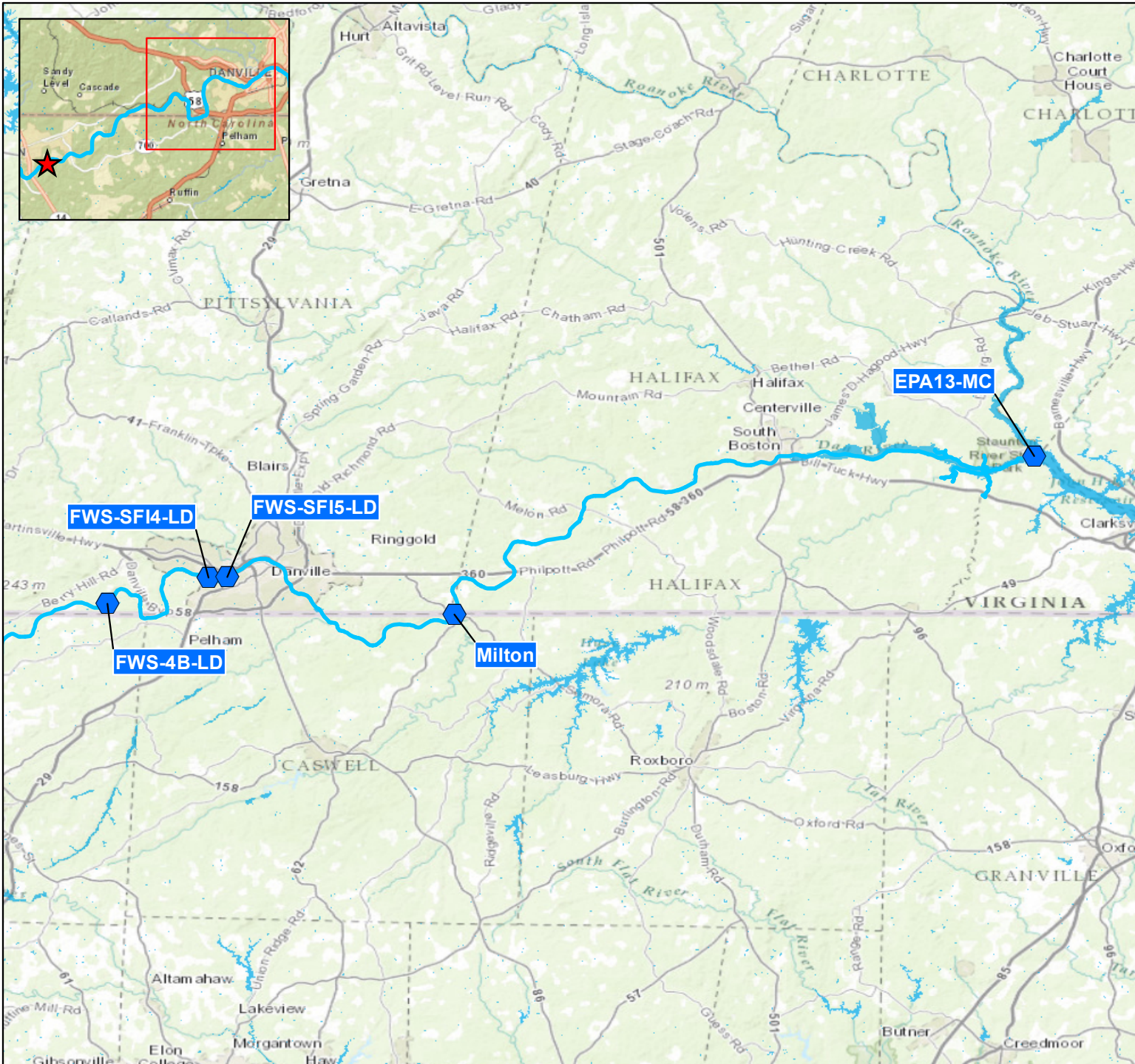
Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect FWS SF15 Left Descending		Transect Milton Left Descending		Transect EPA 13 Mid-Channel	
Sample Information								
Sample ID			EDEN-FWSSF15-L-BW-20141103		EDEN-MILTON-L-BW-20141103		EDEN-EPA13-C-BW-20141103	
Date			11/03/2014		11/03/2014		11/03/2014	
Time			14:20		12:50		10:25	
Status			Validation Complete		Validation Complete		Validation Complete	
Type			Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Dissolved metals								
Aluminum	87	µg/L	17	µg/L	19	µg/L	81	µg/L
Antimony	5.6	µg/L	1 U	µg/L	1 U	µg/L	0.51 J	µg/L
Arsenic	10	µg/L	0.65 J	µg/L	0.65 J	µg/L	0.78 J	µg/L
Barium	220	µg/L	19	µg/L	20	µg/L	27	µg/L
Beryllium	0.66	µg/L	0.4 U	µg/L	0.4 U	µg/L	0.4 U	µg/L
Boron	0.36	mg/L	0.11	mg/L	0.11	mg/L	0.075 J	mg/L
Cadmium	0.1	µg/L	0.1 U	µg/L	0.1 U	µg/L	0.1 U	µg/L
Calcium	-	-	7,100	µg/L	7,700	µg/L	9,200	µg/L
Chromium	25	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Cobalt	3	µg/L	0.4 U	µg/L	0.4 U	µg/L	0.4 U	µg/L
Copper	3	µg/L	0.7 J	µg/L	0.92 J	µg/L	0.78 J	µg/L
Iron	1,000	µg/L	210	µg/L	210	µg/L	290	µg/L
Lead	0.59	µg/L	0.3 U	µg/L	0.15 J	µg/L	0.21 J	µg/L
Magnesium	-	-	2,800	µg/L	3,000	µg/L	3,800	µg/L
Manganese	200	µg/L	2.5 U	µg/L	2.5 U	µg/L	34	µg/L
Mercury	0.000012	mg/L	0.0002 U	mg/L	0.0002 U	mg/L	0.0002 U	mg/L
Molybdenum	800	µg/L	1 U	µg/L	0.46 J	µg/L	0.48 J	µg/L
Nickel	17	µg/L	0.6 J	µg/L	0.55 J	µg/L	0.53 J	µg/L
Potassium	53,000	µg/L	2,100	µg/L	2,400	µg/L	2,500	µg/L
Selenium	5	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Silver	0.06	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Sodium	680,000	µg/L	5,400	µg/L	12,000	µg/L	8,600	µg/L
Thallium	0.24	µg/L	0.2 U	µg/L	0.13 J	µg/L	0.2 U	µg/L
Vanadium	27	µg/L	1.1 J+	µg/L	1.1 J+	µg/L	1.5 J+	µg/L
Zinc	39	µg/L	20 U	µg/L	20 U	µg/L	20 U	µg/L
Total Dissolved Solids								
Total Dissolved Solids	-	-	62	mg/L	82	mg/L	88	mg/L
Total Suspended Solids								
Total Suspended Solids	-	-	5.5	mg/L	5 U	mg/L	28	mg/L

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Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect FWS SF15 Left Descending		Transect Milton Left Descending		Transect EPA 13 Mid-Channel	
Sample Information								
Sample ID			EDEN-FWSSF15-L-BW-20141103		EDEN-MILTON-L-BW-20141103		EDEN-EPA13-C-BW-20141103	
Date			11/03/2014		11/03/2014		11/03/2014	
Time			14:20		12:50		10:25	
Status			Validation Complete		Validation Complete		Validation Complete	
Type			Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Total Metals								
Aluminum	2,000	µg/L	67	µg/L	63	µg/L	240	µg/L
Antimony	5.6	µg/L	1 U	µg/L	1 U	µg/L	0.49 J	µg/L
Arsenic	10	µg/L	0.63 J	µg/L	0.54 J	µg/L	0.63 J	µg/L
Barium	220	µg/L	19	µg/L	21	µg/L	35	µg/L
Beryllium	0.66	µg/L	0.4 U	µg/L	0.4 U	µg/L	0.4 U	µg/L
Boron	0.36	mg/L	0.11	mg/L	0.11	mg/L	0.073 J	mg/L
Cadmium	2	µg/L	0.1 U	µg/L	0.1 U	µg/L	0.1 U	µg/L
Calcium	-	-	7,300	µg/L	7,700	µg/L	9,100	µg/L
Chromium	29	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Cobalt	24	µg/L	0.14 J	µg/L	0.14 J	µg/L	0.56	µg/L
Copper	3	µg/L	0.91 J	µg/L	0.91 J	µg/L	1.3	µg/L
Iron	2,300	µg/L	400	µg/L	400	µg/L	860	µg/L
Lead	0.6	µg/L	0.18 J	µg/L	0.22 J	µg/L	0.87	µg/L
Magnesium	-	-	2,900	µg/L	3,000	µg/L	3,700	µg/L
Manganese	200	µg/L	30	µg/L	24	µg/L	150	µg/L
Mercury	0.000012	mg/L	0.0002 U	mg/L	0.0002 U	mg/L	0.0002 U	mg/L
Molybdenum	-	-	1 U	µg/L	1 U	µg/L	1 U	µg/L
Nickel	17	µg/L	0.53 J	µg/L	0.55 J	µg/L	0.91 J	µg/L
Potassium	53,000	µg/L	2,100	µg/L	2,400	µg/L	2,400	µg/L
Selenium	5	µg/L	2 U	µg/L	2 U	µg/L	2 U	µg/L
Silver	0.06	µg/L	1 U	µg/L	1 U	µg/L	1 U	µg/L
Sodium	680,000	µg/L	5,500	µg/L	12,000	µg/L	8,500	µg/L
Thallium	0.24	µg/L	0.2 U	µg/L	0.17 J	µg/L	0.2 U	µg/L
Vanadium	27	µg/L	1.3 J+	µg/L	1.3 J+	µg/L	2.5 J+	µg/L
Zinc	39	µg/L	3.7 J	µg/L	20 U	µg/L	4.7 J	µg/L
Anions								
Bromide	-	-	62	µg/L	170	µg/L	100	µg/L
Chloride	230	mg/L	8.1	mg/L	19	mg/L	13	mg/L
Sulfate	-	-	3.8	mg/L	4.5	mg/L	5.3	mg/L
Wet Chemistry								
Alkalinity, Total (As CaCO ₃)	-	-	29	mg/L	32	mg/L	38	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	30	mg/L	31	mg/L	38	mg/L
Organic Carbon, Dissolved	-	-	1.8	mg/L	1.8	mg/L	2	mg/L
pH	6.5 - 9.0		SU	7.45 J	SU	7.45 J	SU	7.53 J

Notes

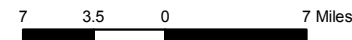
- ¹ Value obtained from the GL Tier 2 Values; National Recommended Water Quality Criteria; Suter and Tsao (1996); Reference condition for EcoRegion XI (25 percentile); NCDENR State Standards for surface water
- EPA U.S. Environmental Protection Agency
- J Value is estimated
- J+ Value is estimated with a possible high bias
- 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
November 03, 2014

