

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT RESULTS

NOTE: The data below represents sediment samples that were collected on May 7, 2014 by EPA START Team 1. Sediment sample measurements are in milligrams per kilogram (mg/kg). The data is being compared to ecological risk screening levels (ERSLs) to protect aquatic life in the sediments 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 are all below the ERSLs with the exception of aluminum, barium, and iron. There were no exceedances of human health screening criteria for sediment. 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 Standards for Sediment ²		Transect DUKE 1A Left Descending		Transect DUKE 1H Right Descending		Transect FWS 2B Right Descending	
Sample Information								
Sample ID	-		EDEN-DUKE1A-L-SD-20140507		EDEN-DUKE1H-R-SD-20140507		EDEN-FWS2B-R-SD-20140507	
Date	-		05/07/2014		05/07/2014		05/07/2014	
Time	-		0954		1050		1152	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment		Sediment		Sediment	
Total Metals								
Aluminum	3,200 (bkg)	mg/kg	3,300	mg/Kg	9,100	mg/Kg	3,300	mg/Kg
Antimony	2 ^a	mg/kg	1.4U	mg/Kg	1.6U	mg/Kg	1.4U	mg/Kg
Arsenic	9.8	mg/kg	2.7U	mg/Kg	2.6J	mg/Kg	2.7U	mg/Kg
Barium	60 ^b	mg/kg	33J+	mg/Kg	92J+	mg/Kg	31J+	mg/Kg
Beryllium	-	-	0.19J	mg/Kg	0.6J	mg/Kg	0.2J	mg/Kg
Boron	-	-	13U	mg/Kg	15U	mg/Kg	14U	mg/Kg
Cadmium	0.99	mg/kg	0.071U	mg/Kg	0.034J	mg/Kg	0.069U	mg/Kg
Calcium	-	-	370	mg/Kg	1,000	mg/Kg	350	mg/Kg
Chromium	43.4	mg/kg	9.6	mg/Kg	20	mg/Kg	11	mg/Kg
Cobalt	50	mg/kg	3.1	mg/Kg	7	mg/Kg	3.3	mg/Kg
Copper	31.6	mg/kg	3J	mg/Kg	9.8	mg/Kg	3.5	mg/Kg
Iron	6,800 (bkg)	mg/kg	6,200	mg/Kg	15,000	mg/Kg	6,700	mg/Kg
Lead	35.8	mg/kg	2.7	mg/Kg	7.2	mg/Kg	3.2	mg/Kg
Magnesium	-	-	1,100	mg/Kg	2,600	mg/Kg	950	mg/Kg
Manganese	460 ^c	mg/kg	120J	mg/Kg	330J	mg/Kg	140J	mg/Kg
Mercury	0.18	mg/kg	0.028U	mg/Kg	0.023J	mg/Kg	0.028U	mg/Kg
Molybdenum	-	-	1.3U	mg/Kg	1.5U	mg/Kg	1.4U	mg/Kg
Nickel	22.7	mg/kg	3.4J	mg/Kg	8.7	mg/Kg	3.7J	mg/Kg
Potassium	-	-	890	mg/Kg	2,000	mg/Kg	720	mg/Kg
Selenium	2 ^d	mg/kg	0.71U	mg/Kg	1.6	mg/Kg	0.39J	mg/Kg
Silver	0.733	mg/kg	0.14U	mg/Kg	0.16U	mg/Kg	0.14U	mg/Kg
Sodium	-	-	270U	mg/Kg	300U	mg/Kg	270U	mg/Kg
Thallium	-	mg/kg	0.065J	mg/Kg	0.19	mg/Kg	0.067J	mg/Kg
Vanadium	57 ^e	mg/kg	12	mg/Kg	27	mg/Kg	13	mg/Kg
Zinc	121	mg/kg	15J	mg/Kg	35J	mg/Kg	14J	mg/Kg
Physical Properties								
Percent Ash	-	-	ND	%	2	%	ND	%

Notes

² MacDonald, D.D.; Ingersoll, C.G.; Smorong, D.E.; Lindskoog, R.A.; Sloane, G; and T. Biernacki. 2003. Development and Evaluation of Numerical Sediment Quality Assessment Guidelines for Florida Inland Waters. Florida Department of Environmental Protection, Tallahassee, FL. Development and Evaluation of

^a The screening value for antimony is from Long, Edward R., and Lee G. Morgan. 1991. The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52.

^b The screening value for barium was the probable effect level (PEL) instead of the threshold effect level (TEL) because the TEL was below background

^c Sediment screening values for manganese and vanadium come

^d The screening value for selenium is from Region 3 after

^e Cadmium from diet

^f Chromium (VI)

^g Methyl Mercury

^h Thallium Chloride

% Percent

EPA U.S. Environmental Protection Agency

J Value is estimated

J+ Value is estimated with a possible high bias

mg/kg milligrams per kilogram

ND No fly ash detected at a PLM reporting limit of 1 percent

PLM Polarized light microscopy

U Analyte was not detected at the listed reporting limit.

UJ Analyte was not detected at the listed reporting limit, which is an estimated quantitation.

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT RESULTS

Analyte	Transect FWS 3A Left Descending		Transect EPA 01 Mid-Chanel	
Sample Information				
Sample ID	EDEN-FWS3A-L-SD-20140507		EDEN-EPA01-C-SD-20140507	
Date	05/07/2014		05/07/2014	
Time	1310		1410	
Status	Validation Complete		Validation Complete	
Type	Sediment		Sediment	
Total Metals				
Aluminum	5,700	mg/Kg	6,000	mg/Kg
Antimony	1.5U	mg/Kg	1.5U	mg/Kg
Arsenic	1.1J	mg/Kg	1.7J	mg/Kg
Barium	54J+	mg/Kg	53J+	mg/Kg
Beryllium	0.33J	mg/Kg	0.34J	mg/Kg
Boron	14U	mg/Kg	15U	mg/Kg
Cadmium	0.019J	mg/Kg	0.022J	mg/Kg
Calcium	470	mg/Kg	570	mg/Kg
Chromium	14	mg/Kg	14	mg/Kg
Cobalt	4.9	mg/Kg	5.1	mg/Kg
Copper	5.8	mg/Kg	5.9	mg/Kg
Iron	10,000	mg/Kg	9,800	mg/Kg
Lead	4.7	mg/Kg	5.1	mg/Kg
Magnesium	1,700	mg/Kg	1,600	mg/Kg
Manganese	150J	mg/Kg	210J	mg/Kg
Mercury	0.012J	mg/Kg	0.012J	mg/Kg
Molybdenum	1.4U	mg/Kg	1.5U	mg/Kg
Nickel	5.7	mg/Kg	5.5J	mg/Kg
Potassium	1,300	mg/Kg	1,200	mg/Kg
Selenium	0.88	mg/Kg	0.77	mg/Kg
Silver	0.15U	mg/Kg	0.15U	mg/Kg
Sodium	280U	mg/Kg	300U	mg/Kg
Thallium	0.15	mg/Kg	0.1J	mg/Kg
Vanadium	18	mg/Kg	18	mg/Kg
Zinc	24J	mg/Kg	24J	mg/Kg
Physical Properties				
Percent Ash	ND	%	ND	%

Notes

² MacDonald, D.D.; Ingersoll, C.G.; Smorc Development and Evaluation of Numerical Waters. Florida Department of Environmer

^a The screening value for antimony is from Biological Effects of Sediment-Sorbed Cor NOAA Technical Memorandum NOS OM

^b The screening value for barium was the p (PEL) instead of the threshold effect level (TEL was below background

^c Sediment screening values for manganese

^d The screening value for selenium is from

^e Cadmium from diet

^f Chromium (VI)

^g Methyl Mercury

^h Thallium Chloride

% Percent

EPA U.S. Environmental Prot

J Value is estimated

J+ Value is estimated with a

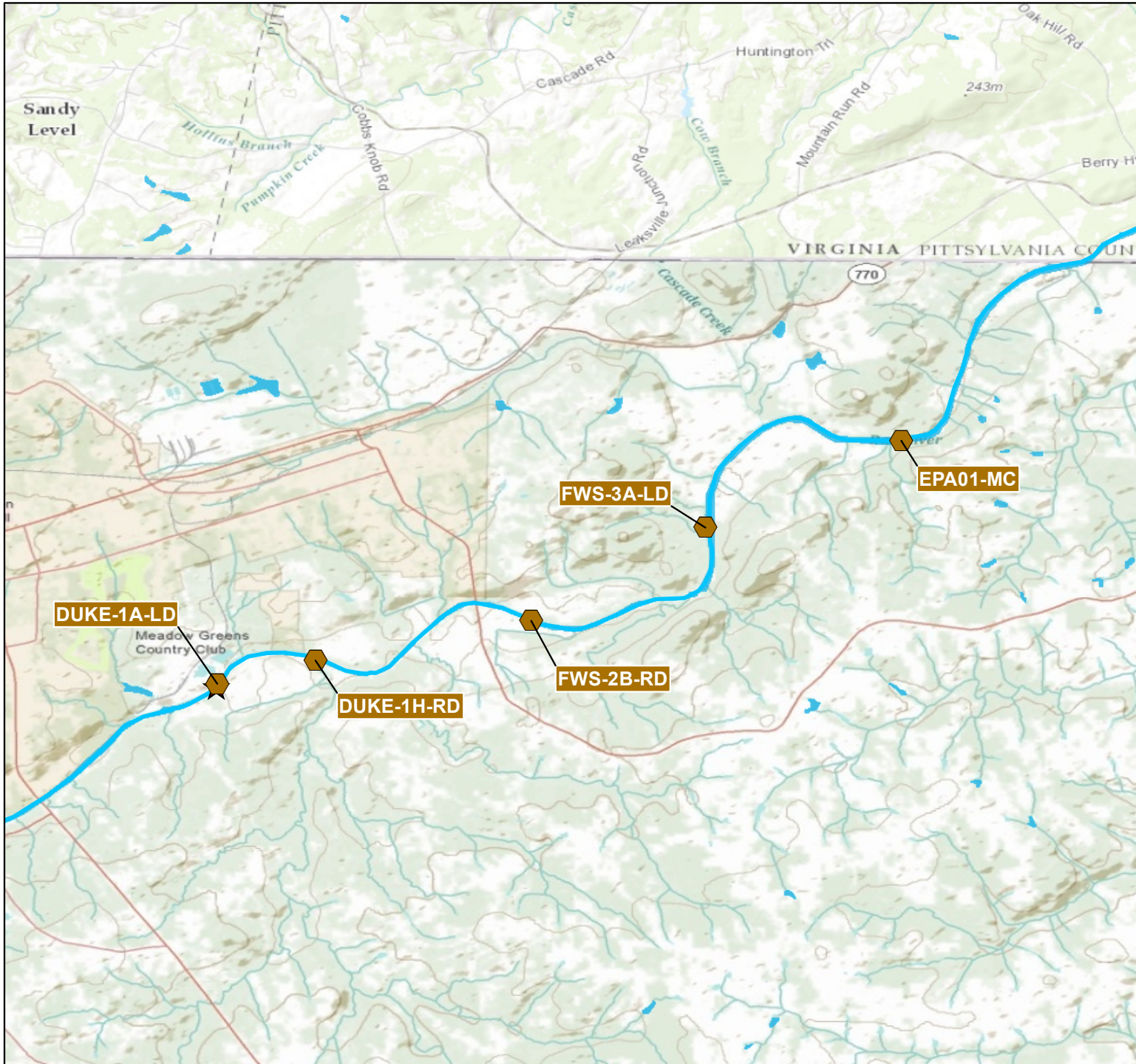
mg/kg milligrams per kilogram

ND No fly ash detected at a l



PLM Polarized light microscop

U Analyte was not detectec

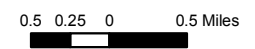
UJ Analyte was not detectec which is an estimated qu



Legend

-  Approximate Spill Location
-  Sediment Sample Location

Imagery Source:
ESRI, USGS Mapping Service, 2013



Eden Coal Ash Spill
Eden, North Carolina

Sediment
Sample Locations
May 07, 2014

