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February 5, 2018

Report No: E18-019

Steve Davis, MPA
County Administrator
Effingham County

[912-754-2111](tel:912-754-2111)
sdavis@effinghamcounty.org

Re: Limited Phase II ESA
Circulating Fluidized Bed Combustion (CFBC) Ash Roads
Random Sampling of Roadway Material
Effingham County, Georgia

Subject: Contamination Analyses: Total (RCRA) Metals, (TCLP) (RCRA) Metals,
(pH) (Corosivity) and Percent Moisture

Dear Steve:

In keeping with our communication and discussions of January 2018, please find the attached analytical results from the Limited Phase II Contamination Investigation within randomly selected Effingham County (CFBC) ash covered roadways. This investigation was completed by our Senior Environmental technician, Ralph Perez on January 23, 2018 and January 24, 2018 under the direction of Donald Martin, Jr., Environmental Professional and Joseph F. Whitaker, PE.

Please note, the (CFBC) ash used to cover these roadways is different than common coal ash. The (CFBC) ash is primarily a by-product of a treatment process which reduces pollutants from air emissions. The (CFBC) ash mostly consists of lime and calcium sulfate. Furthermore, the material has a (GA DOT) specification for use as a graded aggregate in Section 815.2.04 (A)(2)(b). As such, the (GA DOT) recognizes its usage as a base material.

This Limited Phase II investigation included the making of twenty (20) shallow cores in order to collect the (CFBC) "ash" material from the top six inches ($\pm 6"$) below grade along randomly selected roadways from the provided list as furnished by your office.

Following the collection of each of the twenty (20) samples, the collected ash material samples were containerized on site, packed in ice under a strict chain of custody, and shipped to Analytical Environmental Services, Inc., an approved and accredited (US EPA) laboratory within the State of Georgia/South Carolina.

Circulating Fluidized Bed Combustion (CFBC) Ash Roads
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These samples were then be chemically analyzed for the presence of Total (RCRA) Metals including Mercury using methodology (EPA SW6010D / SW7473), Toxicity Characteristic Leaching Procedure (TCLP) (RCRA) Metals including Mercury using (EPA SW1311/6010C // SW1311/7470A) and finally for corrosivity (pH) using (EPA SW9045D) methodology.

It should be noted that the Toxicity Characteristic Leaching Procedure (TCLP) (SW1311) is used to determine if a leachate of a waste material meets the definition of Environmental Protection Toxicity (EPT) carrying a hazardous waste code as defined under RCRA (40 CFR Part 261) of D004 through D0052.

In selecting the criteria for roadway selection, we were requested to perform fifteen (15) random borings on fifteen different roadways and five (5) borings from the same roadway. Using the list of provided roadways throughout Effingham County, one (1) boring and sample collection was completed within three (3) different roadways within each of the five (5) county districts. Then the remaining five (5) borings and samples were collected from a randomly selected roadway within the county.

The collection points, roadways, districts and approximate locations are noted below as follows:

Boring	Roadway/District	Appx. House Location	Lane Position
B-1	Hester Road / 1	@ # 432 & #420	Outbound
B-2	Old Oak Road / 1	@ # 226	Inbound
B-3	Conaway Road / 1	@ # 62	Outbound
B-4	Exley Loop / 2	@ # 159	Inbound
B-5	Center Drive / 2	@ # 278	Outbound
B-6	Golden Drive / 2	@ Golden & Pine	Outbound
B-7	Bird Road / 3	@ # 126	Inbound
B-8	Corinth Church Road / 3	@ # 293	Outbound
B-9	Burton Rahn Road / 3	@ Roadway End	Inbound
B-10	Webb Road / 4	@ # 895	Inbound
B-11	Zettler Road / 4	N/A	Outbound
B-12	Beebe Road / 4	@ # 371	Inbound
B-13	Colonial Drive / 5	@ # 160	Inbound
B-14	Caroni Drive / 5	@ # 398	Outbound
B-15	Abercorn Road / 5	@ # 270	Inbound
B-16	Old Dixie Highway South	@ # 5076	Inbound
B-17	Old Dixie Highway South	@ # 5161	Inbound
B-18	Old Dixie Highway South	@ # 5434	Inbound
B-19	Old Dixie Highway South	@ # 5511	Inbound
B-20	Old Dixie Highway South	@ # 5691	Inbound

Upon receipt of the analytical results, the following constituents were identified as follows. Please note the following abbreviations within the tables below:

- (TCLP) Toxicity Characteristic Leaching Procedure
(T) Total Metals
(BRL) Below Reporting Limits of the requested analyses / methodology
(MCL) Maximum Contamination Limits

TABLE 1 – Boring Location (B-1) through (B-10):

Constituents	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	MCL
TCLP Mercury	BRL	0.2									
TCLP Arsenic	BRL	5.0									
TCLP Barium	BRL	100.0									
TCLP Cadmium	BRL	1.0									
TCLP Chromium	BRL	5.0									
TCLP Lead	BRL	5.0									
TCLP Selenium	BRL	1.0									
TCLP Silver	BRL	5.0									
(T) Arsenic	BRL	41.0									
(T) Barium	32.4	41.3	46.3	29.3	18.5	24.9	23.4	16.9	29.3	25.4	500.0
(T) Cadmium	BRL	39.0									
(T) Chromium	6.73	10.0	6.40	11.4	8.57	8.54	10.3	10.3	11.9	8.13	1200.0
(T) Lead	BRL	400.0									
(T) Selenium	BRL	36.0									
(T) Silver	BRL	10.0									
(T) Mercury	BRL	17.0									
Percent (%) Moisture	30.4	36.7	26.2	32.9	31.8	29.3	32.7	31.1	37.8	30.4	N/A
pH (Units)	11.6	12.3	12.2	12.2	12.3	12.4	12.3	11.8	12.0	12.0	N/A

PLEASE NOTE: Any and all (TCLP) results expressed in mg/L. Any and all Total Metals (T) expressed in Mg/Kg.
Any and all (pH) expressed in (pH) Units.

Upon receipt of the analytical results, the following constituents were identified as follows. Please note the following abbreviations within the tables below:

(TCLP)	Toxicity Characteristic Leaching Procedure
(T)	Total Metals
(BRL)	Below Reporting Limits of the requested analyses / methodology
(MCL)	Maximum Contamination Limits

TABLE 1 – Boring Location (B-1) through (B-10):

Constituents	B-11	B-12	B-13	B-14	B-15	B-16	B-17	B-18	B-19	B-20	MCL
TCLP Mercury	BRL	0.2									
TCLP Arsenic	BRL	5.0									
TCLP Barium	BRL	100.0									
TCLP Cadmium	BRL	1.0									
TCLP Chromium	BRL	5.0									
TCLP Lead	BRL	5.0									
TCLP Selenium	BRL	1.0									
TCLP Silver	BRL	5.0									
(T) Arsenic	BRL		BRL	41.0							
(T) Barium	37.1	29.6	35.2	45.4	46.1	24.6	23.4	24.4	31.6	48.2	500.0
(T) Cadmium	BRL	39.0									
(T) Chromium	11.2	10.6	14.6	12.6	10.3	12.2	10.3	9.28	12.1	19.2	1200.0
(T) Lead	BRL	400.0									
(T) Selenium	BRL	36.0									
(T) Silver	BRL	10.0									
(T) Mercury	BRL	17.0									
Percent (%) Moisture	34.0	32.0	34.4	31.5	36.2	31.8	32.9	27.6	32.4	34.4	N/A
pH (Units)	12.1	12.0	12.1	12.2	12.2	12.2	12.2	12.1	12.3	12.4	N/A

PLEASE NOTE: Any and all (TCLP) results expressed in mg/L. Any and all Total Metals (T) expressed in Mg/Kg.
Any and all (pH) expressed in (pH) Units.

From the analytical results as shown above, none of the detected constituents of Barium or Chromium were found to exceed the allowable Maximum Contamination Limits (MCL's) for any of the analytes as published by the (US EPA) "List of Hazardous Substances and Reportable Quantities as reported within (40 CFR Part 302, Table 302.4) for Total Metals in Soils and as published by the United States Environmental Protection Agency (US EPA) for the Toxicity Characteristic Leaching Procedure (TCLP).

For discussion purposes, (pH) Units as expressed within this report are based on the Standard Representative (pH) Scale of 0.0 (acidic) to 14.0 (alkaline) with (± 7.0) being neutral, or that of pure water.

The (pH) of the collected samples was found to range on the order of common household compounds such as soapy water, ammonia and bleach.

We believe we have prepared this report in accordance with the applicable standard of care necessary and scope of work as requested. It is possible, however, for unknown and/or hidden site conditions to exist that were not revealed during an inspection. Please note this report only encompasses the type of material actually tested and/or evaluated, and does not warrant nor guarantee that the entire site is homogeneous in nature.

The individuals listed within this report are responsible for conducting and preparation of this report. We declare that to the best of our professional judgment and belief, we meet the definition of Environmental professional as defined in 312.10 of 40 CFR 312 and we have the specific qualifications based on education, training and experience to assess a property of the nature, history and setting of the subject property.

If you have any questions, please do not hesitate to call.

Respectfully submitted,
Whitaker Laboratory, Inc.



Joseph F. Whitaker, P.E.
V.P., Project Engineer



Donald Martin, Jr.
Environmental Professional

