

U.S. EPA National Estuary Program

Laboratory Analyses Test Results

As part of the U.S. Environmental Protection Agency (EPA) National Estuary Program (NEP), laboratory testing was recently conducted to verify the suitability of both the EMC SQUARED® Dual Component System stabilizer products for use in stabilizing dirt roads and controlling erosion from land disturbing activities in areas adjacent to sensitive coastal estuaries. The testing was part of a feasibility study for reducing erosion and non-point source pollution conducted as part of the Mobile Bay National Estuary Program. The products had been in use previously on local county roads and evaluation for the National Estuary Program project included testing in an analytical laboratory to see if soil materials treated with these products displayed any evidence of contaminants at levels of concern to the EPA. Throughout the extensive series of tests conducted no regulated parameters were detected. As indicated in the text quoted below and laboratory data¹ which follow the EMC SQUARED System Stabilizer treatments (EMC®/EMS) proved to be environmentally friendly in application.

Quoted from ANALYSIS OF ROAD MATERIALS AFTER APPLICATION

“The road materials samples were analyzed for Oil & Grease (EPA 418.1 IR), Volatile Organic Analysis according to EPA method SW846-8260b, for Polynuclear Aromatic Hydrocarbons according to EPA method SW846-8310, and total levels of metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and Zinc. The samples were also analyzed via a full Toxicity Characteristic Leaching Procedure. Based on the analysis of the soil samples obtained, the levels for test parameters in the road material samples were all below method detection limits, with the exception of total zinc, which showed up in the EMC/EMS soil sample (Sherman Road) at 10mg/Kg, as shown in Laboratory Reports provided in Appendix B. The results for the TCLP analyses were also negative. In general, no hazardous components were identified and no leachable levels of any of the test parameters were identified.

Even though this study did not investigate application quantities of the alternative road paving materials needed to serve as an asphalt replacement, it is interesting to examine these results in view of the resulting potential run-off from the freshly applied EMC/EMS treated test sections as compared to freshly applied asphalt road. A review of total levels of Oil & Grease, VOC, PAH, and total metals levels in a number of asphalt samples (data supplied by ACT Lab) revealed that asphalt can contain high levels of regulated parameters, even though asphalt is not a regulated waste when disposed of. Levels of Oil & Grease detected in new, freshly applied asphalt is in the hundreds of thousands of parts per million, while in old, weathered asphalt Oil & Grease is typically 30,000 mg/Kg or greater. And though VOCs and PAH compounds seldom show up in old asphalt, newly applied asphalt frequently contains measurable levels of many regulated VOCs and PAHs. Results for the analysis of several asphalt samples showed levels of arsenic and cadmium in the hundreds of mg/Kg range.

Effects on storm water run-off from Oil & Grease levels was available for a ship building facility, that had freshly applied asphalt pavement over approximately 30% of their yard. This ship building facility is required to obtain and analyze storm water run-off samples from seven outfalls on a monthly basis, in accordance with their NPDES permit. Their NPDES permit limit for Oil & Grease 15 mg/L. Up until the month before a new asphalt surface was applied, the facility had no violations noted on their NPDES, and the average Oil & Grease levels detected in all seven outfalls were typically less than 5mg/L, and had been that way for several years. However, after the new asphalt pavement was applied, 6 of the 7 outfalls had Oil & Grease levels exceeding their permit limit, with one outfall (adjacent to the largest asphalt paved area) showing an Oil & Grease level of 50 mg/L. For over three months (very wet months too, with a hurricane on the third month), several outfalls showed greater than 15 mg/L Oil & Grease. It was a year before the Oil & Grease levels dropped back down to below 5 mg/L for all the outfalls at that facility.

Based on the storm water samples obtained from the EMC/EMS treated test sections, Oil & Grease levels were less than 2 mg/L on the storm water sampling event immediately following the application. No regulated parameters were detected in the EMC/EMS sample. This supports the recommendations by the manufacturer, SSPCo, concerning use of these materials for replacing asphalt in sensitive environmental areas, such as through wetlands.²”

¹ Analytical Chemical Testing Laboratory, Mobile, AL, June 1999. ² ARA Report No. 0120, March 30, 1999



ANALYTICAL CHEMICAL TESTING LABORATORY, INC.

Consulting Chemists, Scientists & Engineers

ANALYTICAL REPORT

Analytical Chemical Testing Laboratory, Inc.
2869 Pleasant Valley Rd.
Mobile, AL 36606-2737

TO: MBNEP
440 Fairhope Ave
Fairhope, AL 36532

Sample ID: 99-2014-1 to -2
Project: 99-2014
Project Name: Baldwin County Dirt Roads
Sampler: W. Taylor

Date Collected: 03/15/99
Time Collected: 15:20-16:05
Date Received: 03/16/99
Time Received: 08:00
Sample Type: Soil Sample

TOTAL PETROLEUM HYDROCARBONS / OIL & GREASE

Method: EPA-418.1-IR.	Units: mg/Kg	N.D. = None Detected (less than method quantitation limit)				
Sample ID	Analyte	Results	Quan. Limit	Date	Time	Analyst

99-2014-1214-2 (EMC/EMS & Soil)	TPH	N.D.	2	03/16/98	10:05 M.	Betbeze
---------------------------------	-----	------	---	----------	----------	---------

P.O. Box 161198 • Mobile, Alabama 36616 • (334) 479-9205 • Fax (334) 478-8181

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

VOLATILE ORGANICS

ACT ID# 99-2014-2, Sample Type: EMC/EMS & Soil

Method: SW846 8260b

Units: $\mu\text{g/L}$ = micrograms per liter = parts per billion

Analyte	Results	Quan. Limit	Date	Time	Analyst
Chloromethane	ND	5	3/16/99	10:47	AC
Bromomethane	ND	5	3/16/99	10:47	AC
Vinyl Chloride	ND	5	3/16/99	10:47	AC
Chloroethane	ND	5	3/16/99	10:47	AC
Methylene chloride	ND	5	3/16/99	10:47	AC
Acetone	ND	10	3/16/99	10:47	AC
Carbon Disulfide	ND	5	3/16/99	10:47	AC
1,1-Dichloroethene	ND	5	3/16/99	10:47	AC
1,1-Dichloroethane	ND	5	3/16/99	10:47	AC
1,2-Dichloroethene, (total)	ND	5	3/16/99	10:47	AC
Chloroform	ND	5	3/16/99	10:47	AC
2-Butanone	ND	10	3/16/99	10:47	AC
1,2-Dichloroethane	ND	5	3/16/99	10:47	AC
1,1,1-Trichloroethane	ND	5	3/16/99	10:47	AC
Carbon tetrachloride	ND	5	3/16/99	10:47	AC
Bromodichloromethane	ND	5	3/16/99	10:47	AC
1,2-Dichloropropane	ND	5	3/16/99	10:47	AC
cis-1,3-Dichloropropene	ND	5	3/16/99	10:47	AC
Trichloroethene	ND	5	3/16/99	10:47	AC
Benzene	ND	5	3/16/99	10:47	AC
Dibromochloromethane	ND	5	3/16/99	10:47	AC
Bromobenzene	ND	5	3/16/99	10:47	AC
Bromochloromethane	ND	5	3/16/99	10:47	AC
Bromoform	ND	5	3/16/99	10:47	AC
Bromomethane	ND	5	3/16/99	10:47	AC
n-Butylbenzene	ND	5	3/16/99	10:47	AC
sec-Butylbenzene	ND	5	3/16/99	10:47	AC
t-Butylbenzene	ND	5	3/16/99	10:47	AC
Chlorobenzene	ND	5	3/16/99	10:47	AC
2-Chloroethylvinylether	ND	5	3/16/99	10:47	AC
Chloromethane	ND	5	3/16/99	10:47	AC
2-Chlorotoluene	ND	5	3/16/99	10:47	AC
4-Chlorotoluene	ND	10	3/16/99	10:47	AC
1,2 Dibromo-3-chloropropane	ND	10	3/16/99	10:47	AC
Dibromochloromethane	ND	5	3/16/99	10:47	AC

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

ACT ID# 99-2014-2, Sample Type: EMC/EMS & Soil

Analyte	Results	Quan. Limit	Date	Time	Analyst
1,2-Dibromoethane	ND	5	3/16/99	10:47	AC
Dibromomethane	ND	5	3/16/99	10:47	AC
Dichlorodifluoromethane	ND	5	3/16/99	10:47	AC
1,3-Dichloropropane	ND	5	3/16/99	10:47	AC
2,2-Dichloropropane	ND	5	3/16/99	10:47	AC
1,1-Dichloropropene	ND	5	3/16/99	10:47	AC
trans-1,3-Dichloropropene	ND	5	3/16/99	10:47	AC
Ethylbenzene	ND	5	3/16/99	10:47	AC
Hexachlorobutadiene	ND	5	3/16/99	10:47	AC
2-Hexanone	ND	10	3/16/99	10:47	AC
Isopropylbenzene	ND	5	3/16/99	10:47	AC
4-Isopropyltoluene	ND	5	3/16/99	10:47	AC
4-Methyl-2-pentanone	ND	10	3/16/99	10:47	AC
Napthalene	ND	5	3/16/99	10:47	AC
n-Propylbenzene	ND	5	3/16/99	10:47	AC
Styrene	ND	5	3/16/99	10:47	AC
1,1,1,2-Tetrachloroethane	ND	5	3/16/99	10:47	AC
1,1,2,2-Tetrachloroethane	ND	5	3/16/99	10:47	AC
Tetrachloroethene	ND	5	3/16/99	10:47	AC
Toluene	ND	5	3/16/99	10:47	AC
1,2,3-Trichlorobenzene	ND	5	3/16/99	10:47	AC
1,2,4-Trichlorobenzene	ND	5	3/16/99	10:47	AC
1,1,2-Trichloroethane	ND	5	3/16/99	10:47	AC
1,2,3-Trichloropropane	ND	5	3/16/99	10:47	AC
1,2,4-Trimethylbenzene	ND	5	3/16/99	10:47	AC
1,3,5-Trimethylbenzene	ND	5	3/16/99	10:47	AC
Xylenes	ND	5	3/16/99	10:47	AC
Trichlorofluoromethane	ND	5	3/16/99	10:47	AC

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

ORGANIC PARAMETERS

ACT ID# 99-2014-2, Sample Type: EMC/EMS & Soil

Analyte	Results mg/kg	Quan. Limit	Date	Time	Analyst
Napthalene	ND	0.033	4/4/98	16:35	K. Walkup
Acenaphthene	ND	0.033	4/4/98	16:35	K. Walkup
Anthracene	ND	0.022	4/4/98	16:35	K. Walkup
Fluoranthene	ND	0.007	4/4/98	16:35	K. Walkup
Fluorene	ND	0.007	4/4/98	16:35	K. Walkup
Pyrene	ND	0.009	4/4/98	16:35	K. Walkup
Benzo (a) anthracene	ND	0.0040	4/4/98	16:35	K. Walkup
Benzo (a) pyrene	ND	0.003	4/4/98	16:35	K. Walkup
Benzo (b) fluoranthene	ND	0.006	4/4/98	16:35	K. Walkup
Benzo (k) fluoranthene	ND	0.006	4/4/98	16:35	K. Walkup
Chrysene	ND	0.005	4/4/98	16:35	K. Walkup
Dibenzo (a,h) anthracene	ND	0.010	4/4/98	16:35	K. Walkup
Indeno (1,2,3-cd)pyrene	ND	0.014	4/4/98	16:35	K. Walkup
Acenaphthylene	ND	0.067	4/4/98	16:35	K. Walkup
Benzo (g,h,i) perylene	ND	0.025	4/4/98	16:35	K. Walkup
Phenanthrene	ND	0.021	4/4/98	16:35	K. Walkup

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

TOTAL METALS**SAMPLE IDENTIFICATION**

ACT ID# 99-2014-2

Sample Type: EMC/EMS & Soil

TESTS

Arsenic, Total

Barium, Total

Cadmium, Total

Chromium, Total

Lead, Total

Mercury, Total

Silver, Total

Selenium, Total

Zinc, Total

RESULTS

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

10 p.p.m.

LIMIT

0.005 p.p.m.

5.0 p.p.m.

0.01 p.p.m.

0.02 p.p.m.

0.02 p.p.m.

0.002 p.p.m.

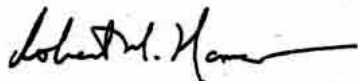
0.05 p.p.m.

0.005 p.p.m.

0.02 p.p.m.

ND = none detected

Report Approved By:



ANALYTICAL CHEMICAL TESTING LABORATORY, INC.

Robert M. Naman, Analytical Chemist, President

Member, American Institute of Chemists Reg. 15488

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

<u>SAMPLE IDENTIFICATION</u>	<u>TESTS</u>	<u>RESULTS</u>	<u>DETECTION LIMIT</u>
ACT ID# 99-2014-2	TCLP METALS:		
EMC/EMS & Soil Sample	Arsenic, TCLP	N.D.	0.005 p.p.m.
	Barium, TCLP	N.D.	5.0 p.p.m.
	Cadmium, TCLP	N.D.	0.01 p.p.m.
	Chromium, TCLP	N.D.	0.02 p.p.m.
	Lead, TCLP	N.D.	0.02 p.p.m.
	Mercury, TCLP	N.D.	0.002 p.p.m.
	Silver, TCLP	N.D.	0.05 p.p.m.
	Selenium, TCLP	N.D.	0.005 p.p.m.
	TCLP VOLATILE ORGANICS:		
	Benzene	N.D.	0.05 p.p.m.
	Carbon Tetrachloride	N.D.	0.05 p.p.m.
	Chlorobenzene	N.D.	0.05 p.p.m.
	Chloroform	N.D.	0.05 p.p.m.
	1,2-Dichloroethane	N.D.	0.05 p.p.m.
	1,1-Dichloroethene	N.D.	0.05 p.p.m.
	2-Butanone	N.D.	0.5 p.p.m.
	Tetrachloroethene	N.D.	0.05 p.p.m.
	Trichloroethene	N.D.	0.05 p.p.m.
	Vinyl Chloride	N.D.	0.1 p.p.m.
	TCLP SEMIVOLATILES:		
	2-Methylphenol	N.D.	0.1 p.p.m.
	3- & 4-Methylphenol	N.D.	0.1 p.p.m.
	3-Methy 1,4-Dichlorobenzene	N.D.	0.1 p.p.m.
	4-Methy 1,4-Dichlorobenzene	N.D.	0.1 p.p.m.
	Hexachloroethane	N.D.	0.1 p.p.m.
	Hexachlorobutadiene	N.D.	0.1 p.p.m.
	2,4-Dinitrotoluene	N.D.	0.1 p.p.m.
	Hexachlorobenzene	N.D.	0.1 p.p.m.
	Nitrobenzene	N.D.	0.1 p.p.m.
	Pentachlorophenol	N.D.	0.5 p.p.m.
	Pyridine	N.D.	0.2 p.p.m.
	2,4,5 -Trichlorophenol	N.D.	0.5 p.p.m.

N.D. = None Detected

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

SAMPLE IDENTIFICATION

ACT ID# 99-2014-2
EMC/EMS & Soil Sample

TESTS

2,4,6-Trichlorophenol
TCLP HERBICIDES:

2, 4, 5 -TP (Silvex)

2, 4, -D

TCLP PESTICIDES:

Chlordane

Endrin

Heptachlor

Heptachlor Epoxide

Lindane

Methoxychlor

Toxaphene

RESULTS

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

N.D.

LIMIT

0.5 p.p.m.

0.005 p.p.m.

0.01 p.p.m.

0.01 p.p.m.

0.001 p.p.m.

0.0005 p.p.m.

0.0005 p.p.m.

0.0005 p.p.m.

0.005 p.p.m.

0.05 p.p.m.

N.D. = None Detected

TCLP HAZARDOUS WASTE CRITERIAPARAMETERTCLP HAZARDOUS LIMITMETALS:

Arsenic, Total	5.0	p.p.m.
Barium, Total	100.0	p.p.m.
Cadmium, Total	1.0	p.p.m.
Chromium, Total	5.0	p.p.m.
Lead, Total	5.0	p.p.m.
Mercury, Total	0.2	p.p.m.
Selenium, Total	1.0	p.p.m.
Silver, Total	5.0	p.p.m.

ORGANICS:

o-Cresol	200.0	p.p.m.
m-Cresol	200.0	p.p.m.
p-Cresol	200.0	p.p.m.
Cresol	200.0	p.p.m.
Pentachlorophenol	100.0	p.p.m.
2,4,5-Trichlorophenol	400.0	p.p.m.
2,4,6-Trichlorophenol	2.0	p.p.m.
2,4-Dinitrotoluene	0.13	p.p.m.
Hexachlorobenzene	0.13	p.p.m.
Hexachlorobutadiene	0.50	p.p.m.
Hexachloroethane	3.0	p.p.m.
Nitrobenzene	2.0	p.p.m.
Pyridine	5.0	p.p.m.
Benzene	0.50	p.p.m.
Carbon Tetrachloride	0.50	p.p.m.

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>

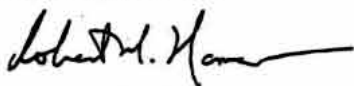
TCLP HAZARDOUS WASTE CRITERIA

<u>PARAMETER</u>	<u>TCLP HAZARDOUS LIMIT</u>
Chlorobenzene	100.0 p.p.m.
Chloroform	6.0 p.p.m.
1,4-Dichlorobenzene	7.5 p.p.m.
1,2-Dichloroethane	0.50 p.p.m.
1,1-Dichloroethene	0.70 p.p.m.
Methyl Ethyl Ketone	200.0 p.p.m.
Tetrachloroethene	0.70 p.p.m.
Trichloroethene	0.50 p.p.m.
Vinyl Chloride	0.20 p.p.m.
<u>PESTICIDES/HERBICIDES:</u>	
Endrin	0.02 p.p.m.
Lindane	0.04 p.p.m.
Chlordane	0.03 p.p.m.
Heptachlor	0.008 p.p.m.
Heptachlor Epoxide	0.008 p.p.m.
Methoxychlor	10.0 p.p.m.
Toxaphene	0.50 p.p.m.
2,4-D	10.0 p.p.m.
2,4,5-TP (Silvex)	1.0 p.p.m.

METHODS: E.P.A. 1311/8015/8020/8050/8080/8240/8270.

Standard Methods for the Examination of Water and Wastewater, 20th Ed.

Report Approved By:



ANALYTICAL CHEMICAL TESTING LABORATORY, INC.
Robert M. Naman, Analytical Chemist, President
Member, American Institute of Chemists Reg. 15488

Test Results Provided for Informational Purposes Only By:

STABILIZATION PRODUCTS LLC

Ph: (209) 383-3296 or (800) 523-9992

E-mail: info@stabilizationproducts.net Website: <http://www.stabilizationproducts.net>