



NSRP Panel Project Final Report

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Removal of Metals from Shipyard Storm Water Runoff

Submitted By:

Brian Ketchum, PE
Justin Bates
Environmental Compliance Services, Inc.

Brian McVey
Kevin Kowalewski
Huntington Ingalls Industries - Ingalls Shipbuilding

Wayne Holt
BAE Systems Mobile

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1.0 EXECUTIVE SUMMARY

Storm water pollution has been a National Enforcement Initiative for the U.S. Environmental Protection Agency since 2008, and has led to more stringent storm water permitting requirements for shipyards, which commonly encounter high concentrations of heavy metals in storm water effluent. Heavy metals are common at shipyards as a result of metalwork operations that are commonly conducted (metal grinding, polishing, fabricating, blasting, and welding) and the application of coatings containing heavy metals such as marine grade paints, corrosion inhibitors, and anti-foulant. Recent studies have been conducted on filtration systems designed to remove metals and other contaminants from large and intermittent volumes of storm water. These systems require a substantial initial investment, have high operating and maintenance costs, and require a relatively large footprint. Water-front shipyards tend to be large-scale industrial operations with minimal available space for such a system. The primary intent of this project was to find an alternative solution for reducing concentrations of heavy metals in shipyard storm water runoff.

Baseline sampling was performed to determine background constituent levels at four (4) storm water test locations. Two (2) test locations were selected at each of the participating shipyards – Huntington Ingalls Inc., Ingalls Shipbuilding Division, Pascagoula Operations (Ingalls) and BAE Systems, Mobile Shipyard (BAE). The results of the baseline sampling were used to determine the amount of adsorbent polymer sponge media (MetalZorb™ Type M) needed for each test location.

After the baseline sampling, the adsorbent sponge media was deployed into filtration units using manufacturer recommendations and baseline sampling data at the four test locations. Samples for four (4) storm water events of pre- and post-filtered storm water were taken to determine the actual adsorption or removal and efficiency for each sampling event. Initial adsorption or removal efficiency at the test location where flow rates and adsorbent polymer media contact time were controlled, was 93.33% and 91.30% for Copper (Cu) and Zinc (Zn) respectively.

The results show that reductions in Total Suspended Solids (TSS) generally correspond to reductions in heavy metals in storm water, and the adsorption or removal efficiency of the MetalZorb™ media degrades linearly over time. At the conclusion of the storm water testing events, the adsorbent sponge media was analyzed utilizing a toxicity characteristic leaching procedure (TCLP) analysis to confirm that the spent media is not characterized as a hazardous waste.

This report concludes with issues presented during the life of the project, recommendations on filtration unit deployment, and conclusions based on analytical testing results.

2.0 INTRODUCTION

2.1 Technology Review

The adsorbent material utilized during this project was MetalZorb™ Type M adsorbent polymer sponge media. The sponge is an open-celled cellulose sponge that contains a water-insoluble chelating polyamide for the selective removal of heavy metals in both the cationic and anionic states. The sponge is highly porous to process high flow rates and promote high rates of adsorption. While the material has a high rate of collection efficiency for heavy metals, it has a low affinity for alkali and alkaline earth metals (Na⁺, K⁺, Mg⁺⁺, and Ca⁺⁺), which is essential to effectively treat natural waters.

MetalZorb™ (formerly known as Forager™ Sponge technology) was developed by Dynaphore, Inc. in the late 1990's to remove heavy metals from groundwater at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund sites. At these sites, heavy metal concentrations were reduced by up to 97%. The technology was later sold to Cleanway Environmental Partners who now market the technology as MetalZorb™. Compared to a standard filtration system, the sponge system requires less initial capital investment and site preparation, has substantially lower operating and maintenance costs, and requires less technical expertise to deploy and maintain.

2.2 Project Overview

This project investigated the effectiveness of MetalZorb™ at decreasing heavy metal concentrations at four (4) storm water test locations. Two (2) test locations were selected at each participant shipyard, Ingalls and BAE. The locations selected are representative of areas at the majority of NSRP participant shipyards. Filtration units were constructed using adsorbent polymer sponges and heavy duty nylon filtration bags/socks for three (3) of the four (4) test locations. The Ingalls Slurry Pit location utilized a filtration test apparatus to filter storm water.

The project also investigated the impact of the MetalZorb™ media on other commonly regulated non-metal constituents: pH and Total Suspended Solids (TSS). Sample events were separated by a minimum of two (2) weeks to ensure different storm events were sampled and to assess product degradation.

3.0 PROJECT IMPLEMENTATION

3.1 Site Evaluations

The adsorbent media manufacturer recommended that the media would be most effective in areas with low flow rates of storm water and where effluent contact time with the adsorbent material would be maximized. The areas selected also had to be representative of locations common in the majority of shipyards. Based on these criteria, the locations selected for the project are detailed below:

3.1.1 Ingalls – Plate Laydown Yard

The plate laydown yard was selected due to the large amount of stored material exposed to storm water. The drainage area for this sample location was approximately 2.6 acres. Primary heavy metal contributing activities in the area are the horizontal storage of steel plates that are coated with pre-construction primer, containing high levels of Zinc. Rain that falls on the plate laydown yard flows south to an east-flowing drainage ditch prior to entering a drop drain, discharging to the facility main drainage system. One of the concerns with this location included the amount of water that would be required to trigger a sampling event. This was due to the large amount of highly permeable soils and a lack of impervious surfaces in the area. This also led to an initial concern with high levels of TSS due to the loose nature of the soils that were present in the area. An aerial view of the drainage area has been provided as Figure 1.



Figure 1. Aerial of Plate Laydown Yard

3.1.2 Ingalls – Slurry Pit

The slurry pit was selected due to the expected high concentrations of heavy metals present as a result of blasting pre-construction primer off of steel in the area. The slurry blasting pit is a 1.19 acre area with a berm around the perimeter to prevent any water generated from slurry blasting from being discharged. Typically the pit is cleaned of grit prior to a storm event, and storm water is then discharged from the pit. For this project, storm water was contained in the pit, and then transferred to a large holding tank so it could be pumped through a filtration apparatus prior to discharge. This test location was ideal to

determine actual removal efficiencies without variables of concern at the other test locations, such as: multiple influent locations, delay between pre- and post- control sampler triggering, and storm water infiltration post control. An aerial view of the slurry pit is provided in Figure 2 below.



Figure 2. Aerial of Slurry Pit

3.1.3 BAE – Machine Shop

The majority of facility drainage at BAE occurs in a series of underground area drains. The machine shop location was selected because the drain line is not connected to any other drainage system and the pre-control sampler initiated the line. The drainage area for the location was estimated to be approximately 5.13 acres. Activities in the area included material storage and maintenance activities (i.e., welding, metal fabricating, etc.). The initial drain was located at the southwestern corner of the machine shop and the drain line extended to the east along an east-west facility road. The post-control sampler was located southeast of the machine shop. Rain falling on the northern sections of the drainage area flows south to one of the area drains on the drain line. Rain falling on the southern sections flows north to one of the area drains on the drain line. The drainage line is composed of ten (10) area drains that flow east and ultimately discharge from the property via a northwestern flowing underground drainage line. It was initially estimated that TSS levels from this area could potentially be elevated due to the amount of loose non-vegetated soils in the vicinity. An aerial view of this location has been provided as Figure 3.

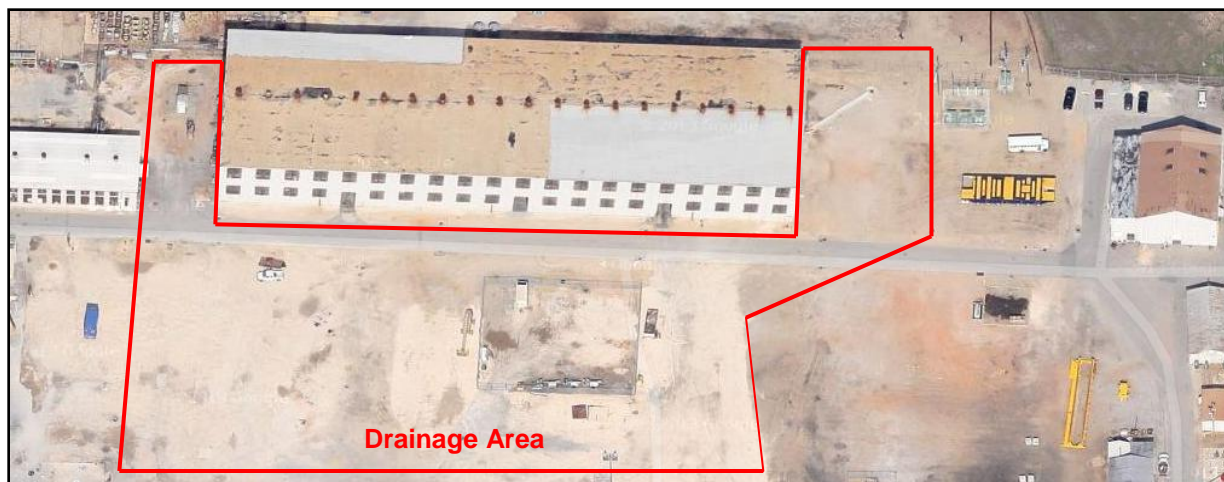


Figure 3. Aerial of Machine Shop

3.1.4 BAE – Crane Track

The crane track location was selected on a similar basis as the machine shop. The drainage system that was selected for this location was located along the northern crane track in the fabrication/new construction area of the shipyard. The drainage area for this location was estimated at approximately 4.82 acres. The initial drain in the line is located on the eastern end of a road that runs east-west just north of the northern crane track. Activities conducted in the area primarily consist of metalworking tasks that occur during shipyard repair and new construction projects (i.e., metal cutting, grinding, welding, etc.). The selected line originally consisted of nine (9) area drains that drain west and are ultimately discharged from the facility along the western dock area. During baseline sampling of the location, one of the samplers was struck by a facility vehicle and had to be relocated further up the line to prevent further damage; therefore, the project continued with eight (8) area drains in the drain line. Due to the majority this area being composed of impervious material, flow rates were expected to be high. Initial concerns for this location were primarily a lack of sufficient contact time to provide adequate filtration of storm water. An aerial photograph of this location has been provided as Figure 4.



Figure 4. Aerial of Crane Track

A table depicting the results of the site evaluations has been provided as Table 1 below.

Shipyards	Location	Drainage Area	Activities/Areas of Concern	Initial Concerns
Ingalls	Plate Laydown Yard	2.61 Acres	<input type="checkbox"/> Steel plate storage <input type="checkbox"/> Zinc based pre-construction primer	<input type="checkbox"/> Highly permeable soils would require large precipitation events to generate runoff <input type="checkbox"/> Elevated TSS (loose soils)
	Slurry Pit	1.19 Acres	<input type="checkbox"/> Coating removal	<input type="checkbox"/> High levels of heavy metals (blasting of metals and pre-construction primer) <input type="checkbox"/> Elevated TSS (spent abrasive media)
BAE	Machine Shop	5.13 Acres	<input type="checkbox"/> Metal working activities (welding, cutting, grinding, etc.)	<input type="checkbox"/> Elevated TSS from loose soils
	Crane Track	4.82 Acres	<input type="checkbox"/> Metal working activities (welding, cutting, grinding, etc.)	<input type="checkbox"/> Elevated flow rates from high amount of impervious surfaces

Table 1. Summary of Site Evaluations

3.2 Baseline Sampling

Once site evaluations were conducted and testing locations were selected, each site was sampled for baseline during two (2) rain events to determine the concentration of each constituent at the pre- and post-control sampler locations prior to installing any controls. Baseline concentrations were used to evaluate adsorbent material needs. Also, baseline sampling was utilized to determine if there were any relationships between the pre- and post-control sampler locations that might be important to note during the controlled sampling events. Baseline sampling was conducted utilizing WS700 Global Water Automatic Composite Samplers at all locations other than the Ingalls slurry pit. Baseline sampling for the slurry pit was conducted utilizing grab samples to establish baseline constituent levels of heavy metals that would later be used to determine the amount of adsorbent needed for the testing apparatus. Baseline sampling at Ingalls began on February 7, 2013 and was concluded on April 12, 2013. Baseline sampling at BAE began on February 8, 2013 and was concluded on April 11, 2013. Analytical results for baseline sampling have been provided in Tables 2-5.

Ingalls Plate Laydown Yard					
Sample Description	Date	Precipitation	Criteria	Analytical Results	
				Pre-control	Post-control
		(in)		(mg/L)	(mg/L)
Baseline Sample #1	2/7/2013	1.49	pH	7.5	8
			TSS	1.0	8.4
			Copper	0.0026	0.014
			Zinc	0.24	0.19
Baseline Sample #2	2/25/2013	2.77	pH	8.3	7.4
			TSS	320.0	2.4
			Copper	0.074	0.0027
			Zinc	0.98	0.27

Table 2. Baseline Sampling Results for Ingalls Plate Laydown Yard

The plate laydown yard saw large fluctuations in analytical results between the pre- and post-control sampler locations. There is a detailed discussion of these issues in Section 4.0, but due to several issues presented by this location it was difficult to determine any relationship between the pre- and post-control sample locations. As seen in the data analysis performed in Section 3.5, this trend continued after control implementation as well.

Ingalls Slurry Pit					
Sample Description	Date	Precipitation	Criteria	Analytical Results	
				Pre-control	Post-control
		(in)		(mg/L)	(mg/L)
Baseline Sample #1	2/25/2013	2.77	pH	7.0	7.4
			TSS	21.0	7.8
			Copper	0.027	0.022
			Zinc	1.4	1.1
Baseline Sample #2	4/12/2013	1.02	pH	7.3	7.2
			TSS	110.0	5.5
			Copper	0.048	0.018
			Zinc	4.4	0.64

Table 3. Baseline Sampling Results for Ingalls Slurry Pit

Baseline sampling of the slurry pit was primarily conducted to determine the levels of constituents that were present in the slurry pit. It was confirmed during baseline sampling that Zinc levels at this location were significantly higher than any other location sampled during the life of the project. A maximum observed analytical result of 4.4 mg/L was observed during the April 12, 2012 baseline sampling event. The manufacturer used the testing results to determine the amount of material used in the testing apparatus.

BAE Machine Shop					
Sample Description	Date	Precipitation	Criteria	Analytical Results	
				Pre-control	Post-control
		(in)		(mg/L)	(mg/L)
Baseline Sample #1	2/8/2013	1.75	pH	8.2	8.6
			TSS	42	300
			Copper	0.14	0.20
			Zinc	0.21	0.34
Baseline Sample #2	2/27/2013	2.97	pH	8.5	8.4
			TSS	300	72
			Copper	0.23	0.23
			Zinc	0.40	0.41

Table 4. Baseline Sampling Results for BAE Machine Shop

Baseline sampling of the Machine Shop revealed that during each event, heavy metal concentrations generally increased between the pre- and post-control sampler locations. This result was expected as baseline sampling was conducted at the first drain inlet in the line and the last drain inlet prior to discharging from the facility; therefore, there are multiple points of entry between the samplers that are not accounted for during each sampling event. Since we are unable to determine the amount of metals that enter the drain line after the pre-control sample location, it was noted at the beginning of the project that it will be difficult to obtain precise removal efficiencies without quantifying the amount of influx and/or reduction taking place at each individual inlet.

BAE Crane Track					
Sample Description	Date	Precipitation	Criteria	Analytical Results	
				Pre-control	Post-control
		(in)		(mg/L)	(mg/L)
Baseline Sample #1	2/8/2013	1.75	pH	7.6	7.4
			TSS	2.6	23.0
			Copper	0.026	0.053
			Zinc	0.066	0.093
Baseline Sample #2	4/11/2013	2.97	pH	7.8	8.2
			TSS	64.0	91.0
			Copper	0.17	0.39
			Zinc	0.38	1.00

Table 5. Baseline Sampling Results for BAE Crane Track

Baseline sampling at the crane track location revealed the same relationship between the pre- and post-control sampler locations that was noted at the machine shop location. During each baseline event, a

significant increase in heavy metal concentrations was observed during each sampling event. Similar to the BAE machine shop location, there are multiple points of entry between the pre- and post-control sampler locations that would allow for heavy metals to infiltrate the line after the initial drain inlet. Also, similar to the machine shop, we were unable to determine the amount of metals that enter the drain line after the pre-control sample location, and it was noted at the beginning of the project that it will be difficult to obtain precise removal efficiencies without quantifying the amount of influx and/or reduction taking place at each individual inlet.

3.3 Control Installation

After baseline sampling was conducted, controls were implemented at each of the four (4) test locations. Based on the site evaluations and the restrictions that each location presented, control installation took place as detailed below.

3.3.1 Ingalls – Plate Laydown Yard

Controls for the plate laydown yard were deployed in the drainage ditch that runs along the southern edge of the yard in the form of ten (10) 10' adsorbent boom filtration units that were folded in half and placed diagonally in the drainage ditch. One (1) 10' boom was also placed parallel to the drainage wall to ensure that water that bypassed the booms along the wall encountered the adsorbent material prior to discharge. Approximately 25 cubic feet of material was utilized to fill the booms at this location. Each boom measured approximately eight (8) inches in diameter with a two (2) inch weighted baffle that was filled with pea gravel to prevent the boom from washing out during a large rain event. A picture showing the installation of the adsorbent boom filtration units, a cross section of the drainage ditch, and a plan view of the pre- and post-control sampler locations are provided as Figure 5, 6, and 7, respectively.

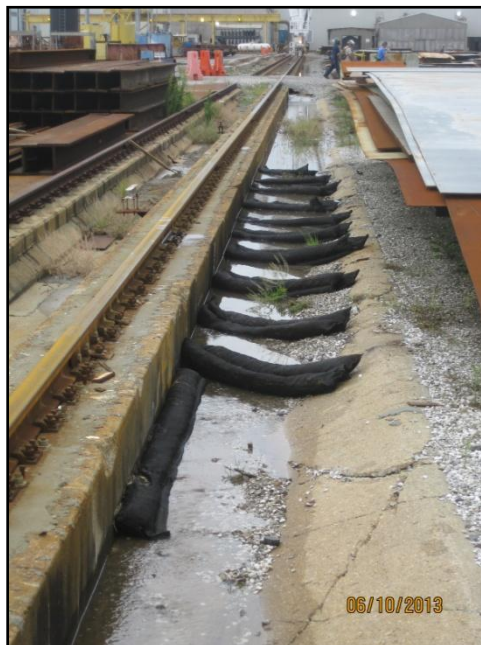


Figure 5. Ingalls Plate Laydown Yard Controls

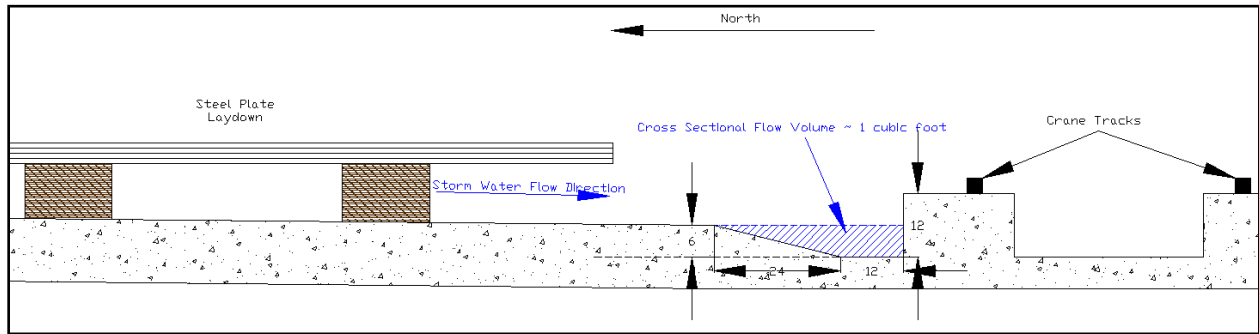


Figure 6. Cross Section of Plate Laydown Yard Drainage Ditch

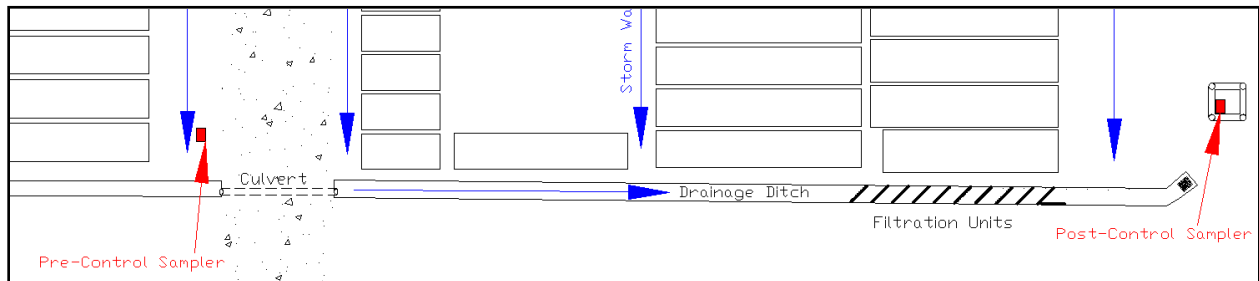


Figure 7. Plan View of Ingalls Plate laydown Yard

3.3.2 Ingalls – Slurry Pit

Control installation for the slurry pit had to be constructed in such way as to not interfere with production that takes place at this location. The facility eliminated the consideration of using gravity drained adsorbent boom filtration units over concern that storm water could become backed up in the area. Due to these considerations, a control system that allowed for a sample to be pumped from the pit into a holding tank prior to being filtered was required. To accommodate these requirements, a 50 gallon per minute (gpm) diaphragm pump was utilized to pump approximately 1,000 gallons of storm water from the pit into a temporary holding tank. Once 1,000 gallons had been pumped from the pit, the tank was immediately connected to and discharged through the testing apparatus at a flow rate of approximately 10 gpm. The testing apparatus was loaded with 1.5 cubic feet of adsorbent based on manufacturer recommendation. A photo showing the diaphragm pump, temporary holding tank, and testing apparatus is provided as Figure 8.



Figure 8. Slurry Pit Apparatus

3.3.3 BAE – Machine Shop & Crane Track

Control installation at both of the BAE sample locations was conducted in the same manner. Due to the concerns of BAE representatives, ECS was asked to install all filtration materials below the drain grates to prevent vehicles from striking and damaging the filtration units. Filtration units were sized to fit below each drain grate and were constructed of heavy duty nylon mesh and marine grade stitching. The units were stitched once down the middle to create a dual “baffle” bag to ensure that the adsorbent did not relocate to the center of the bag during a storm event. The bags were fastened to the bottom of the grates utilizing heavy-duty nylon straps. Approximately 20 cubic feet of material was utilized at this location. A plan view of the control installation method for the BAE Machine Shop and Crane Track are provided in Figures 9 and 10, respectively. A drawing of the subsurface control installation methodology is provided as Figure 11.

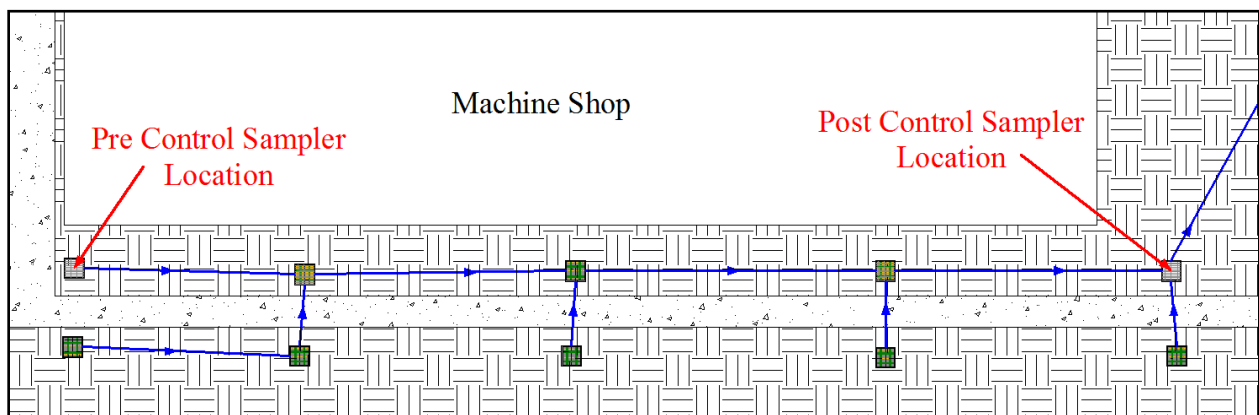


Figure 9. Plan View and Flow Diagram for Control Installation at Machine Shop

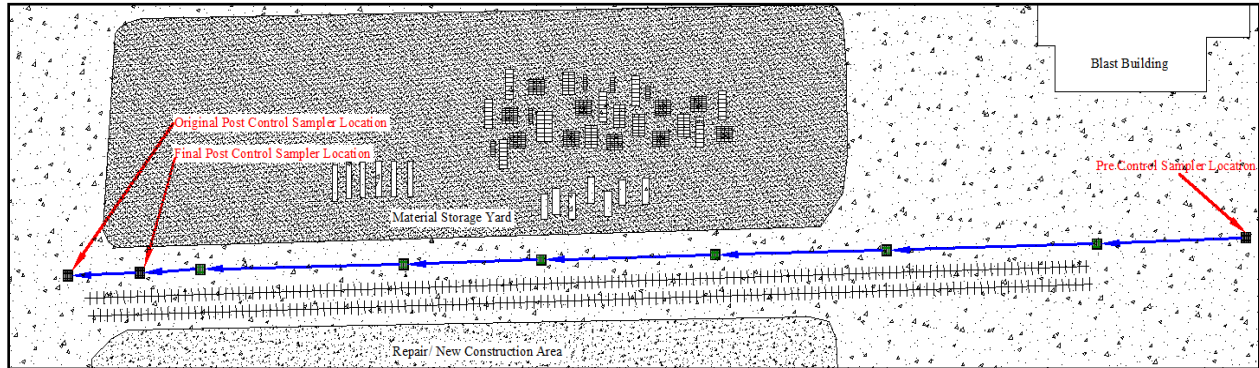


Figure 10. Plan View and Flow Diagram for Control Installation at Crane Track

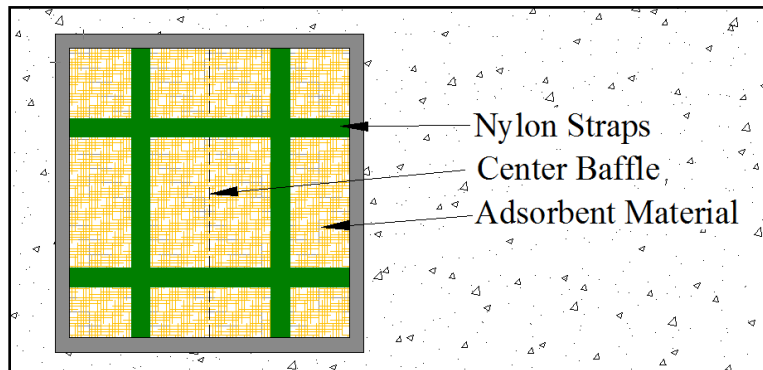


Figure 11. Plan View of BAE Control Installation

3.4 Controlled Sampling

Controlled sampling was conducted in the same manner as baseline sampling at all locations other than the Ingalls slurry pit. Four (4) controlled samples were taken at each test location following the installation of controls. Each sample was separated by at least two (2) weeks after the previous sampling result, to ensure samples were collected from separate rain events and to assess product degradation. The slurry pit utilized a test apparatus to filter storm water from the temporary holding tank. The testing apparatus was equipped with sample ports that allowed for simultaneous sampling of pre- and post-control storm water. Samples were pulled simultaneously via grab samples at each sample port. All other locations were sampled utilizing the same Global Water WS700 automatic samplers that were utilized in the baseline sampling. The automatic samplers were set to take grab samples during each rain event. Dual triggering was required during each rain event from a sensor situated in the channel of flow, and a rain sensor to ensure that adequate rain had occurred during the rain event. The rain sensors were set to trigger on a 0.25" rain event. Analytical results for each test location and analysis of the analytical data is further detailed in Section 3.5.

3.5 Data Analysis

All of the data collected during the project was reviewed to determine removal efficiencies, data trends, and the useful life of the adsorbent material. A copy of the analytical results obtained from each test location for baseline and controlled sampling have been provided in Appendix A. Each test location is discussed further below.

3.5.1 Ingalls – Plate Laydown Yard

Analytical results from the plate laydown yard were not uniform over the course of the project. Following the February 25, 2013 baseline sampling event, it was discovered that a large portion (approximately 190' in length) of the drainage ditch receives storm water past the pre-control sampler, potentially leading to storm water being received but not quantified by the pre-control analytical results. A photograph depicting this issue has been provided as Figure 12. Also, differences between the flow profiles prior to sample collection were present at the pre- and post-control sampler locations. The 12" culvert that was utilized as the pre-control sampler location was crushed under the road. As a result, ponding occurred on the western side of the culvert, where the pickup tube was located. This resulted in lower flow rates and allowed for settling to occur at the pre-control sampler location. However, the flow profile at the post-control sample location was significantly more turbulent and allowed for mixing to occur directly adjacent to the pickup tube for the post-control sampler. A photograph detailing the flow profile at the post control sampler is provided as Figure 13. Last, the post-control sampler received a sufficient depth to trigger sampling (approximately 0.5") faster than the pre-control sampler during smaller rain events and lower flow rates; therefore, there is a possibility that the pre- and post-control samplers were triggered at different times during sampling events. These issues are believed to have led to the erratic results from the plate laydown yard location.



Figure 12. View of Plate Laydown Yard During Discharge Event



Figure 13. Post Control Sample Location Flow Profile

As discussed above, the results from the plate laydown yard are difficult to predict degradation estimates or accurate removal efficiencies. The issues noted from this sample location have been addressed in the follow-up project “*Control Technology Comparison for Contaminant Removal from Shipyard Storm Water Runoff.*” Table 6 below details the analytical results from the controlled sampling events at the plate laydown yard. No discernible data trends were able to be made from this location due to the issues previously mentioned and the low number of samples collected (4 total). Figures 14, 15, and 16 are graphical representations of the reductions that were obtained over the life of the project for TSS, Copper, and Zinc.

Ingalls Plate Laydown Yard					
Sample Description	Date	Criteria	Analytical Results		% Reduction
			Pre-control	Post-control	
			(mg/L)	(mg/L)	
Sample #1	5/2/2013	pH	8.1	8.0	1.23%
		TSS	420	3.5	99.17%
		Copper	0.076	0.079	-3.95%
		Zinc	0.74	0.32	56.76%
Sample #2	6/10/2013	pH	8.1	8.0	1.23%
		TSS	67	60	10.45%
		Copper	0.078	0.032	58.97%
		Zinc	0.38	0.42	-10.53%
Sample #3	7/11/2013	pH	8.1	8.0	1.23%
		TSS	210	20	90.48%
		Copper	0.058	0.053	8.62%
		Zinc	0.67	0.46	31.34%
Sample #4	10/3/2013	pH	8.2	8.3	-1.22%
		TSS	84	67	20.24%
		Copper	0.038	0.200	-426.32%
		Zinc	0.37	0.69	-86.49%

Table 6. Analytical Results for Ingalls – Plate Laydown Yard

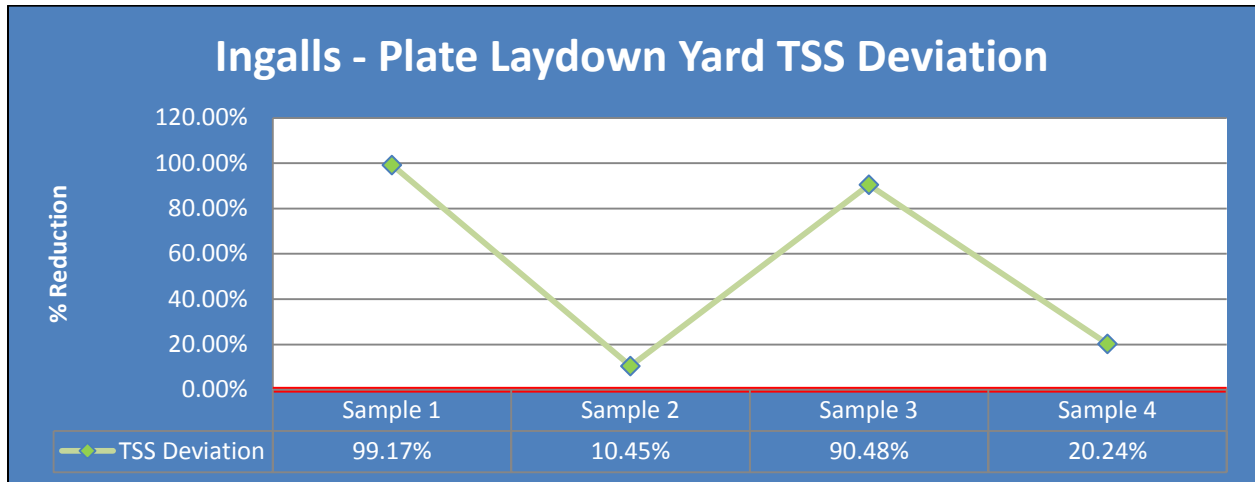


Figure 14. TSS Reduction – Ingalls Plate Laydown Yard

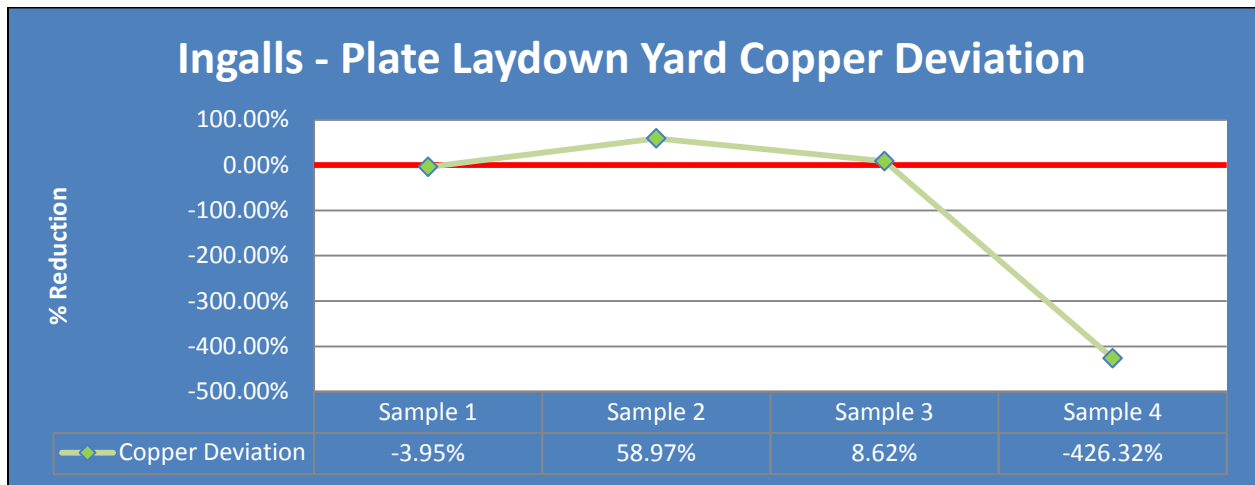


Figure 15. Copper Reduction – Ingalls Plate Laydown Yard

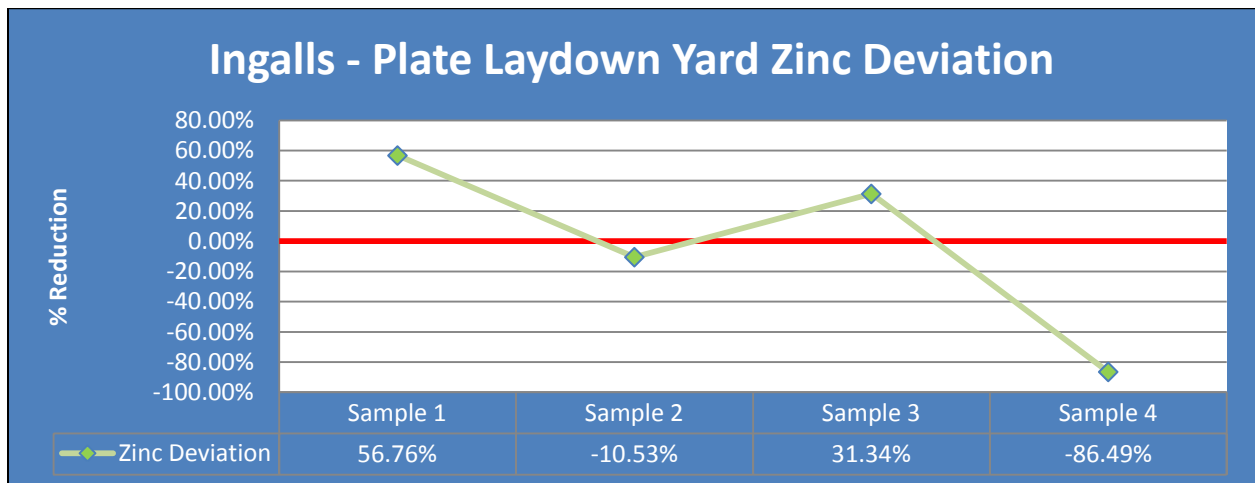


Figure 16. Zinc Reduction – Ingalls Plate Laydown Yard

3.5.2 Ingalls – Slurry Pit

Sampling at the slurry pit was conducted in a way to minimize and/or eliminate the variables that were experienced during the project at the other test locations. This allowed for data more representative of site conditions. The reductions for TSS, Copper, and Zinc averaged 83.80%, 73.37%, and 67.66%, respectively. The adsorbent degraded at an average rate of 13.97% and 12.38% during each discharge event for Copper and Zinc, respectively. It is also important to note that the concentration of Zinc obtained from samples at the slurry pit were up to ten (10) times greater than any other location sampled during the project. During each discharge event approximately 1,000 gallons of water was discharged through the test apparatus that was loaded with 1.5 cubic feet of adsorbent material. Table 7 details the analytical results from the controlled sampling at the slurry pit. A graphical representation of the reductions achieved for each constituent are detailed in Figures 17-19 below.

Ingalls Slurry Pit					
Sample Description	Date	Criteria	Analytical Results		% Reduction
			Pre-control	Post-control	
			(mg/L)	(mg/L)	
Sample #1	6/10/2013	pH	7.8	7.2	7.69%
		TSS	68	3.2	95.29%
		Copper	0.18	0.012	93.33%
		Zinc	2.3	0.2	91.30%
Sample #2	7/8/2013	pH	7.4	7.3	1.35%
		TSS	140	20	85.71%
		Copper	0.23	0.044	80.87%
		Zinc	5.4	1.7	68.52%
Sample #3	8/2/2013	pH	6.9	7.4	-7.25%
		TSS	49	13	73.47%
		Copper	0.14	0.045	67.86%
		Zinc	1.8	0.78	56.67%
Sample #4	10/4/2013	pH	7.3	7.4	-1.37%
		TSS	27	5.2	80.74%
		Copper	0.035	0.017	51.43%
		Zinc	1.2	0.55	54.17%

Table 7. Analytical Results for Ingalls – Slurry Pit

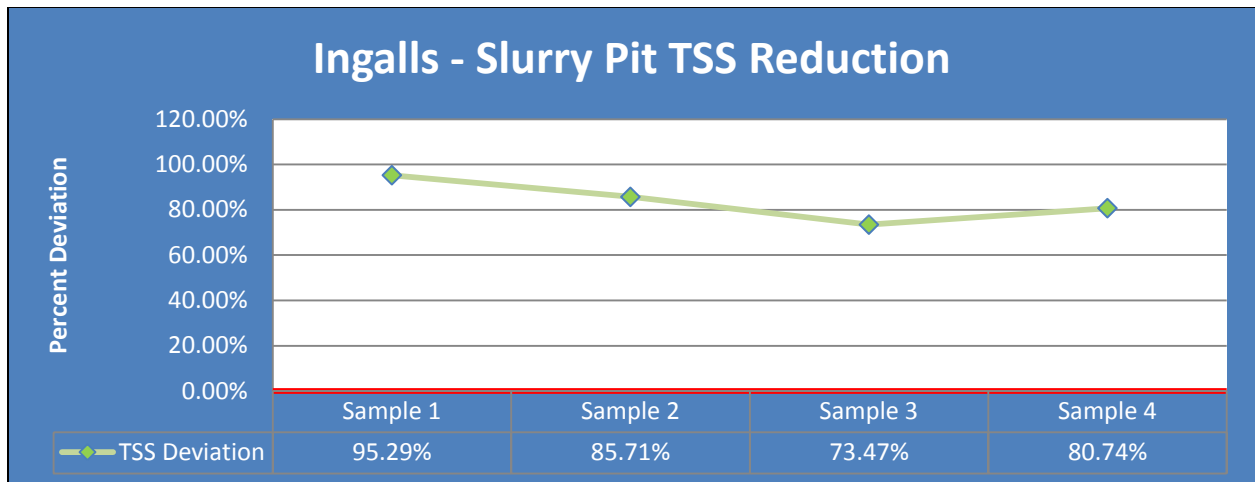


Figure 17. TSS Reduction – Ingalls Slurry Pit

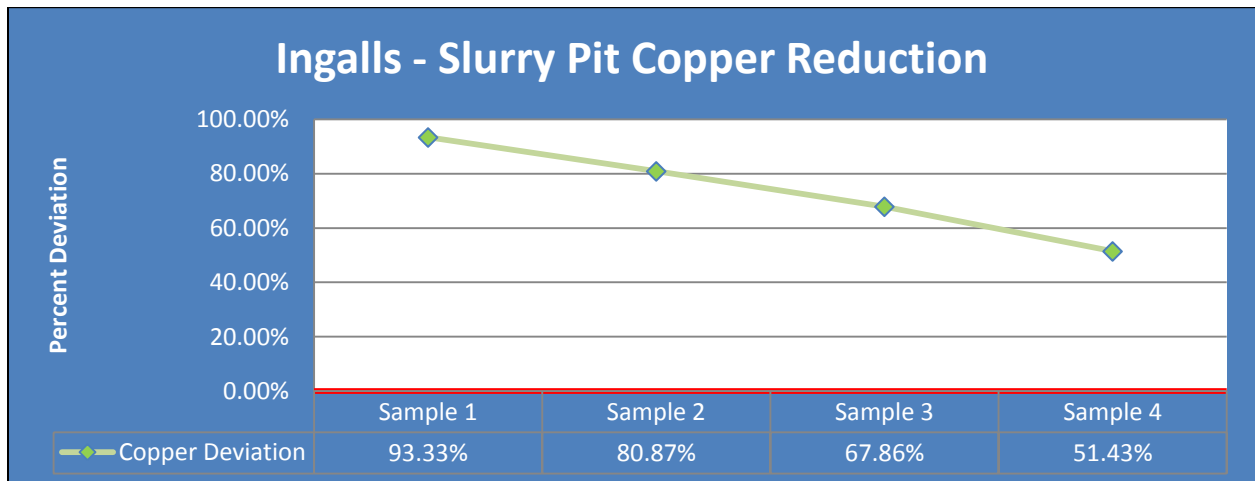


Figure 18. Copper Reduction – Ingalls Slurry Pit

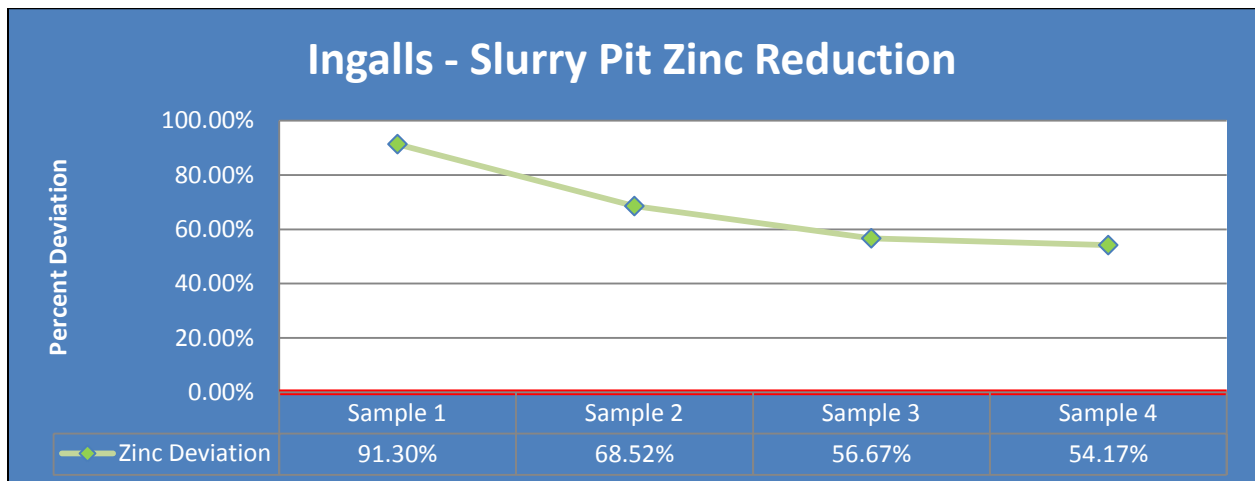


Figure 19. Zinc Reduction – Ingalls Slurry Pit

3.5.3 BAE – Machine Shop

During sample #1, the TSS spiked at the effluent sampler and recorded an increase of 780% between the pre- and post-control sampler locations. This was believed to have been caused by construction activities that were noted during control installation at the site. Approximately 10 feet from the effluent sampler a non-vegetated area was being stabilized with new off-site soil. Due to the grade of the site, only the effluent sampler would have received storm water runoff from this location. As discussed in Section 3.2, baseline sampling at the machine shop showed that heavy metals increased between the pre- and post-control sampler locations. Following installation of control units, there were reductions recorded during each sampling event. However, based on the baseline sampling results, it is believed that reduction efficiencies from this location were artificially lowered due to the pre-control sampler not being able to quantify the amount of heavy metals entering the drain system after the pre-control sampler but prior to the post-control sampler. Neglecting these issues, the average reduction efficiency was 37.8%, 34.81%, and 41.31% for TSS, Copper, and Zinc, respectively. Table 8 details the analytical results from the controlled sampling at the machine shop. Graphical representations of the reduction trends are included as Figures 20-22.

BAE Machine Shop					
Sample Description	Date	Criteria	Analytical Results		% Reduction
			Pre-control	Post-control	
			(mg/L)	(mg/L)	
Sample #1	5/2/2013	pH	8	8.6	-7.50%
		TSS	42	370	-780.95%
		Copper	0.27	0.17	37.04%
		Zinc	0.62	0.3	51.61%
Sample #2	6/10/2013	pH	7.4	6.8	8.11%
		TSS	540	260	51.85%
		Copper	0.32	0.21	34.38%
		Zinc	0.55	0.38	30.91%
Sample #3	7/11/2013	pH	8.3	8.3	0.00%
		TSS	350	240	31.43%
		Copper	0.2	0.16	20.00%
		Zinc	0.4	0.32	20.00%
Sample #4	10/3/2013	pH	8.2	8.3	-1.22%
		TSS	140	100	28.57%
		Copper	0.46	0.24	47.83%
		Zinc	1.1	0.41	62.73%

Table 8. Analytical Results for BAE – Machine Shop

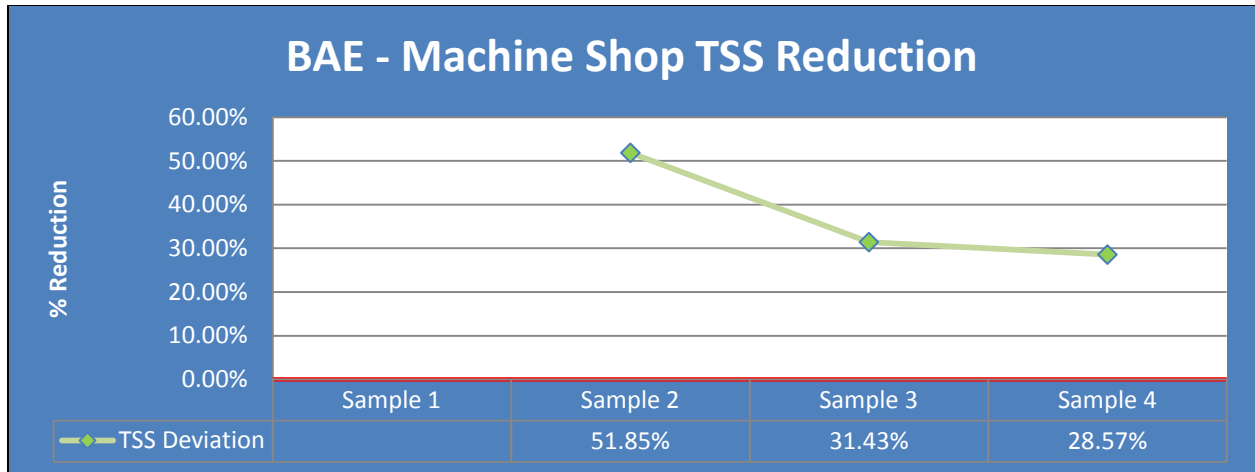


Figure 20. TSS Reduction – BAE Machine Shop

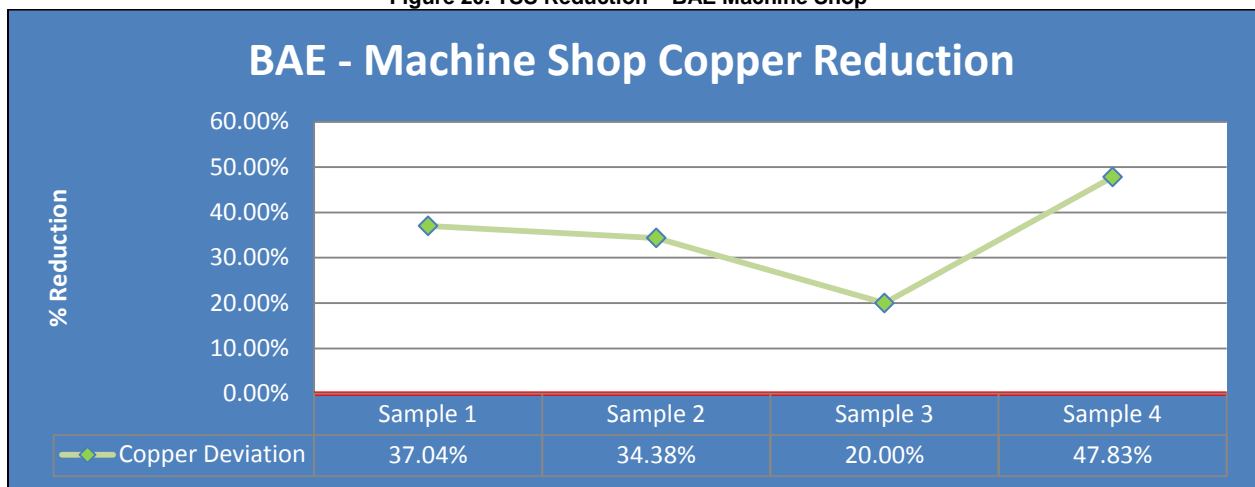


Figure 21. Copper Reduction – BAE Machine Shop

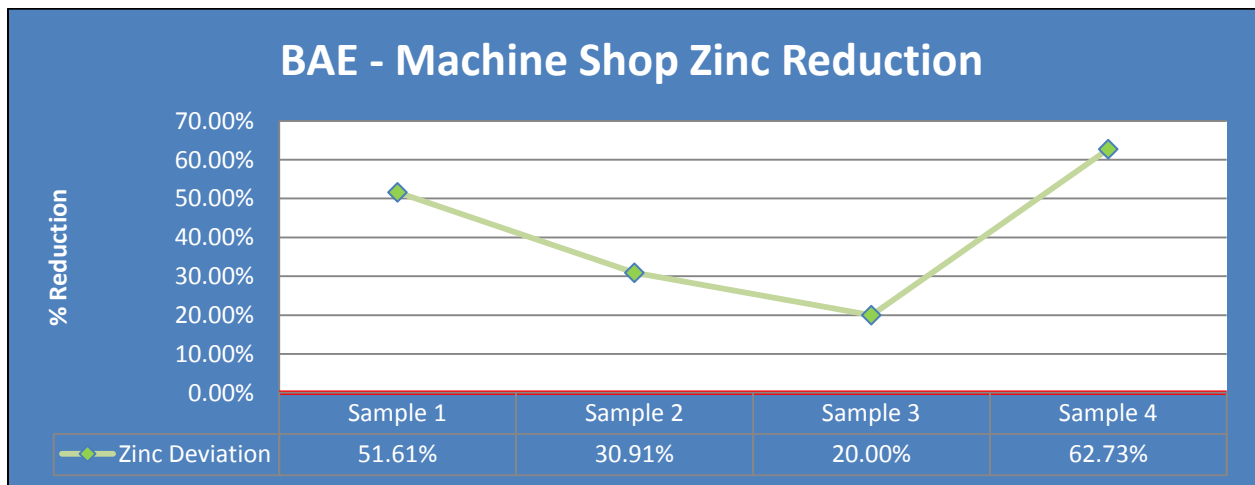


Figure 22. Zinc Reduction – BAE Machine Shop

3.5.4 BAE – Crane Track

Similar to the baseline sampling that was conducted at the BAE machine shop, a spike in TSS was recorded during Sample #2, but no site conditions during installation were recorded to attribute to the increase in TSS at that location. However, since there is a general correlation between TSS and metals, it is possible that non-metal-laden sediment infiltrated the drain line past the pre-control sampler location. As a result, this increase has been removed from the analytical data for the graphical representation of the TSS reduction efficiency. Similar to the machine shop, baseline sampling at the crane track also showed that heavy metals increased between the pre- and post-control sampler locations. Therefore, it is believed that reduction efficiencies from this location were artificially lowered due to the pre-control sampler not being able to quantify the amount of heavy metals entering the drain line past the initial drain. However, even when neglecting these differences an average reduction efficiency of 74.27%, 45.99%, and 42.73% were achieved for TSS, Copper, and Zinc, respectively. Table 9 details the analytical results from the controlled sampling at the crane track. Graphical representations of the reduction trends are included as Figures 23-25.

BAE Crane Track					
Sample Description	Date	Criteria	Analytical Results		% Reduction
			Pre-control	Post-control	
			(mg/L)	(mg/L)	
Pre/Post Control Sample #1 (Plate Laydown Yard Only)	5/2/2013	pH	8.1	8.1	0.00%
		TSS	260	40	84.62%
		Copper	0.36	0.23	36.11%
		Zinc	0.59	0.48	18.64%
Pre/Post Control Sample #2 (Plate Laydown Yard)	6/10/2013	pH	7.7	7.5	2.60%
		TSS	29	50	-72.41%
		Copper	0.22	0.12	45.45%
		Zinc	0.59	0.29	50.85%
Pre/Post Control Sample #3 (Laydown Yard Only)	7/11/2013	pH	7.5	8.0	-6.67%
		TSS	110	33	70.00%
		Copper	0.210	0.085	59.52%
		Zinc	0.57	0.20	64.91%
Pre/Post Control Sample #4	10/3/2013	pH	8.1	7.8	3.70%
		TSS	110	35	68.18%
		Copper	0.28	0.16	42.86%
		Zinc	0.63	0.40	36.51%

Table 9. Analytical Results for Ingalls – Slurry Pit

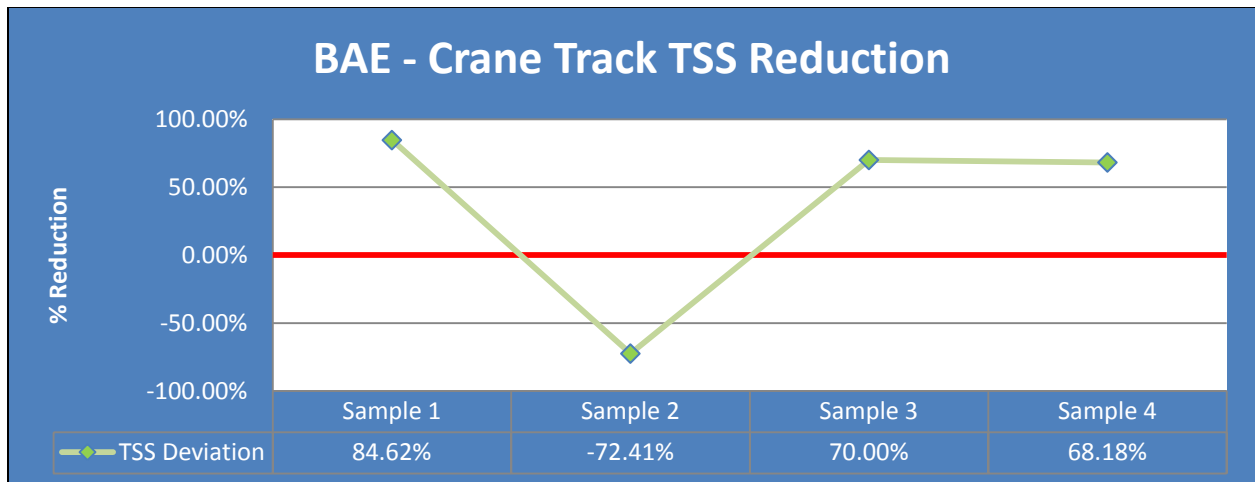


Figure 23. TSS Reduction – BAE Crane Track

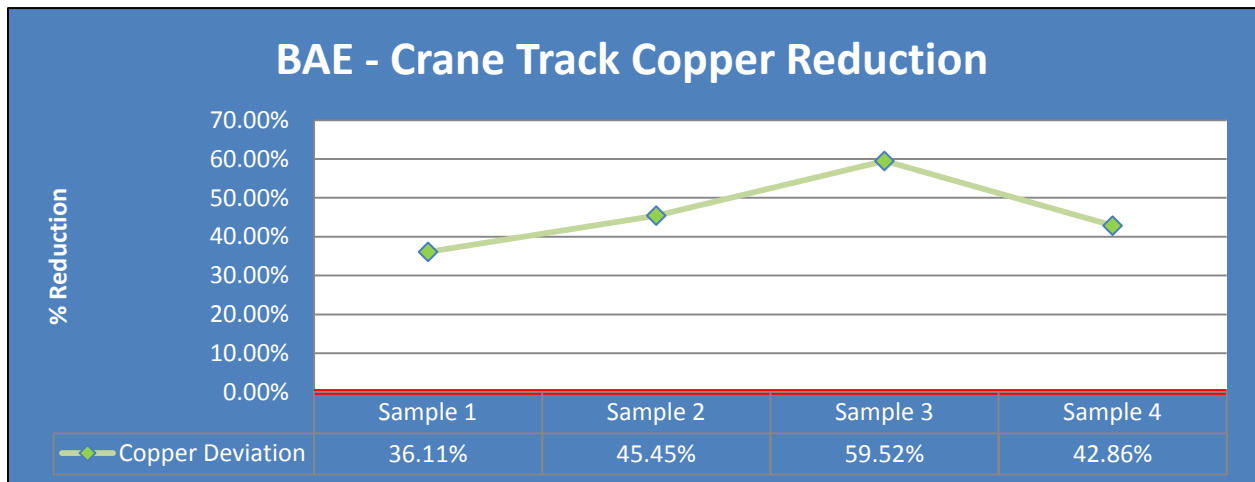


Figure 24. Copper Reduction – BAE Crane Track

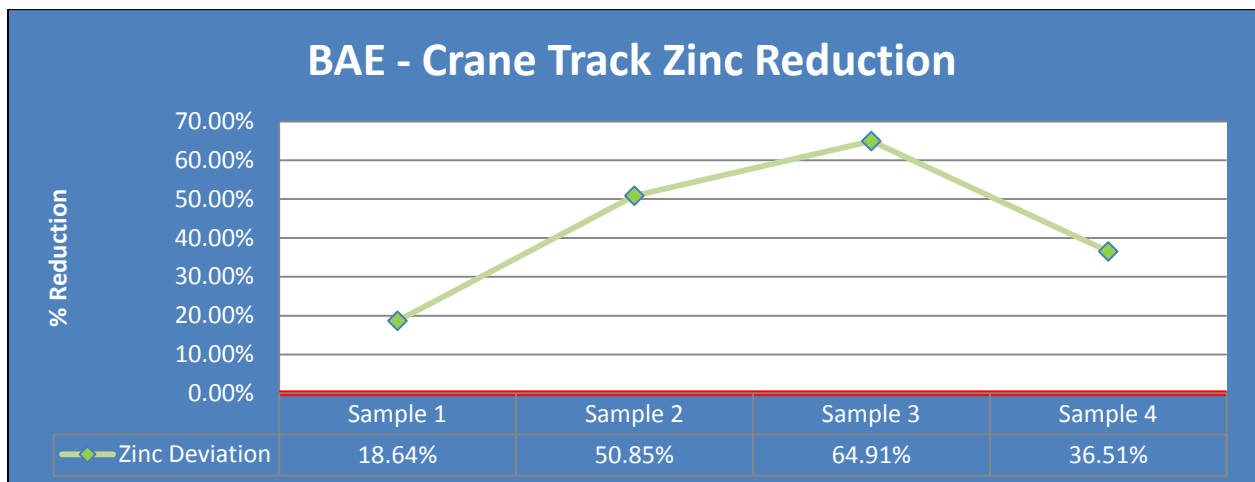


Figure 25. Zinc Reduction – BAE Crane Track

3.6 Disposal Requirements

After controlled sampling was finalized, ECS wanted to confirm manufacturer's guarantees that the material will not be classified as a hazardous waste after the polymer is spent. A full Toxic Chemical Leaching Potential (TCLP) test was performed on the filtration unit media obtained from the slurry pit (source of highest concentrations). The analytical results indicated that the material was not classified as a characteristic waste and the spent adsorbent is also not a listed waste; therefore, spent adsorbent material can be disposed of as a solid waste. A copy of the TCLP analysis has been provided as Appendix B.

4.0 PROJECT COMPLICATIONS AND ISSUES

During the course of the project, several complications and issues were encountered that hindered the progress and/or impacted the results that were obtained from the project. Each issue encountered is discussed below:

- ❑ Lead time on the automatic sampling equipment took nearly a month longer than originally quoted during the planning phase of the project. Two samplers were delivered after two (2) weeks and the remaining four (4) samplers were delivered after three (3) weeks. This put some sample points behind by up to three (3) weeks during the beginning of the project.
- ❑ During the initial baseline sampling event at the Ingalls plate laydown yard, it was discovered that the rain gauges were improperly sealed and would not hold water. As a result, the gauges were removed and reinstalled approximately one (1) week later. A photograph showing one of the faulty rain gauges has been provided as Figure 26.



Figure 26. Faulty seal on Rain Gauge

- ❑ On February 26, 2013, the effluent sampler at the BAE location was struck by a facility vehicle and damaged. The damaged sampler was retrieved on February 27, 2013 and re-installed on March 1, 2013. A photograph showing the damaged sampler after retrieval has been provided as Figure 27.



Figure 27. Damaged Effluent Sampler

- ❑ During control installation at the Ingalls plate laydown yard, it was determined that the mesh fabric was too fine for the amount of loose sediment in the drainage area. As a result, the adsorbent material was removed and a larger mesh was ordered and delivered the following week. A photograph depicting the difference between the two materials has been provided as Figure 28.



Figure 28. Old Mesh (On Left) and New Mesh (On Right)

- ❑ During the control installation event for the machine shop and crane track at BAE, representatives from BAE requested additional stitching for the filtration units to ensure that they would be durable enough to withstand the amount of expected water flow. The units were removed, re-stitched, and replaced three (3) days later.
- ❑ On July 25, 2013, ECS personnel discovered the battery in the crane track effluent sampler had malfunctioned and was no longer holding a charge. It is believed that the battery may have been

submerged in water after being struck by a vehicle. The battery was replaced the day the malfunction was discovered.

- During four (4) instances, Ingalls representatives reported that testing equipment at the slurry pit had been moved prior to a storm event. During these events, sampling at the slurry pit was delayed until the equipment had been re-located to the test location.

5.0 CONCLUSIONS AND RECOMMENDATIONS

One of the objectives of the project was to analyze the data to determine overall reduction efficiencies for each constituent at each individual test location. However, we also wanted to analyze the data as a whole to determine if any discernible trends were present throughout the entire project. Upon analysis of the entire set of data from each location, there appeared to be a general relationship or correlation between the amount of TSS removed and the amount of heavy metals removed. Therefore, it is believed that to some extent, TSS reductions may play a significant role in reducing the amount of total recoverable metals that are present in the effluent samples. This trend is most obvious when comparing the TSS reduction rates against heavy metal reduction rates at the slurry pit, but also shows in the BAE sample results. A graph depicting the relationship between heavy metal reduction rates for the slurry pit and TSS reduction rates is provided in Figure 29. As can be seen from the figure, the reduction rates of TSS and heavy metals were degrading at nearly a constant rate. As a product of this finding, ECS submitted a White Paper to propose testing simple mechanical filtration units as well as other “designer” adsorbent materials in a follow up storm water project. The mechanical filtration units would result in significant cost saving potential if proven to be effective.

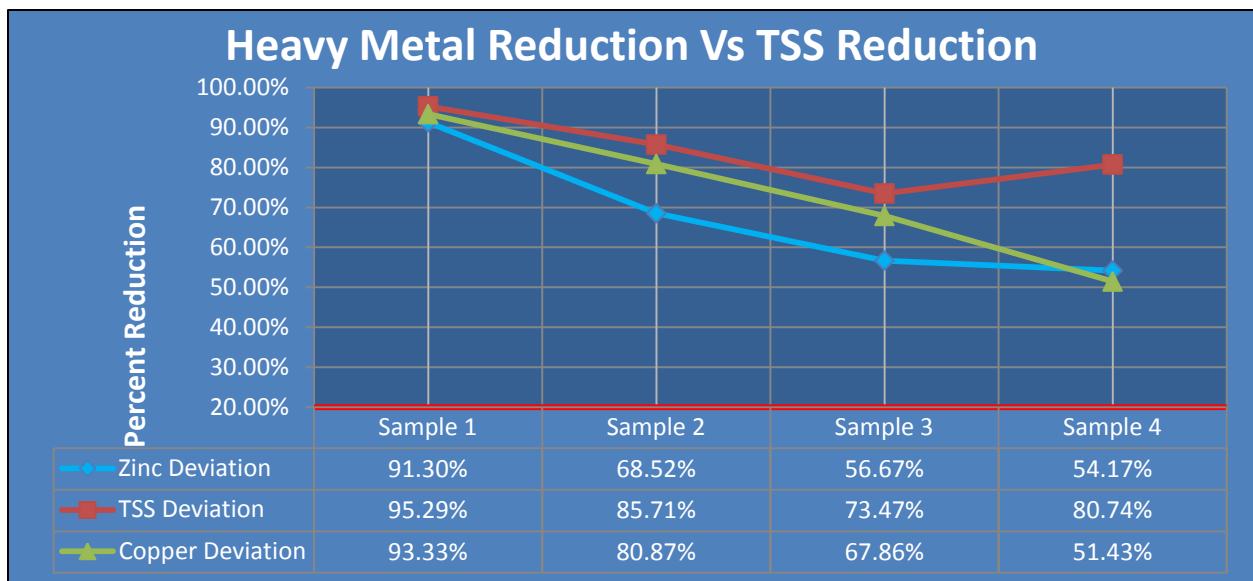


Figure 29. Heavy Metal Reduction Vs. TSS Reduction - Ingalls Slurry Pit

It was also noted during the project that abrasive blasting operations should be evaluated as potential sites to deploy control devices. The levels of Zinc present in the samples were significantly higher (as much as ten (10) times higher) than the other sampled locations. A graph representing the pre-control heavy metal concentrations at each test location is provided as Figure 30. Finally, it is recommended that site or area sampling be conducted facility-wide to determine the concentrations so that controls and specific areas can be targeted to provide the highest level of control with the lowest cost.

Pre-Control Heavy Metal Sampling Results

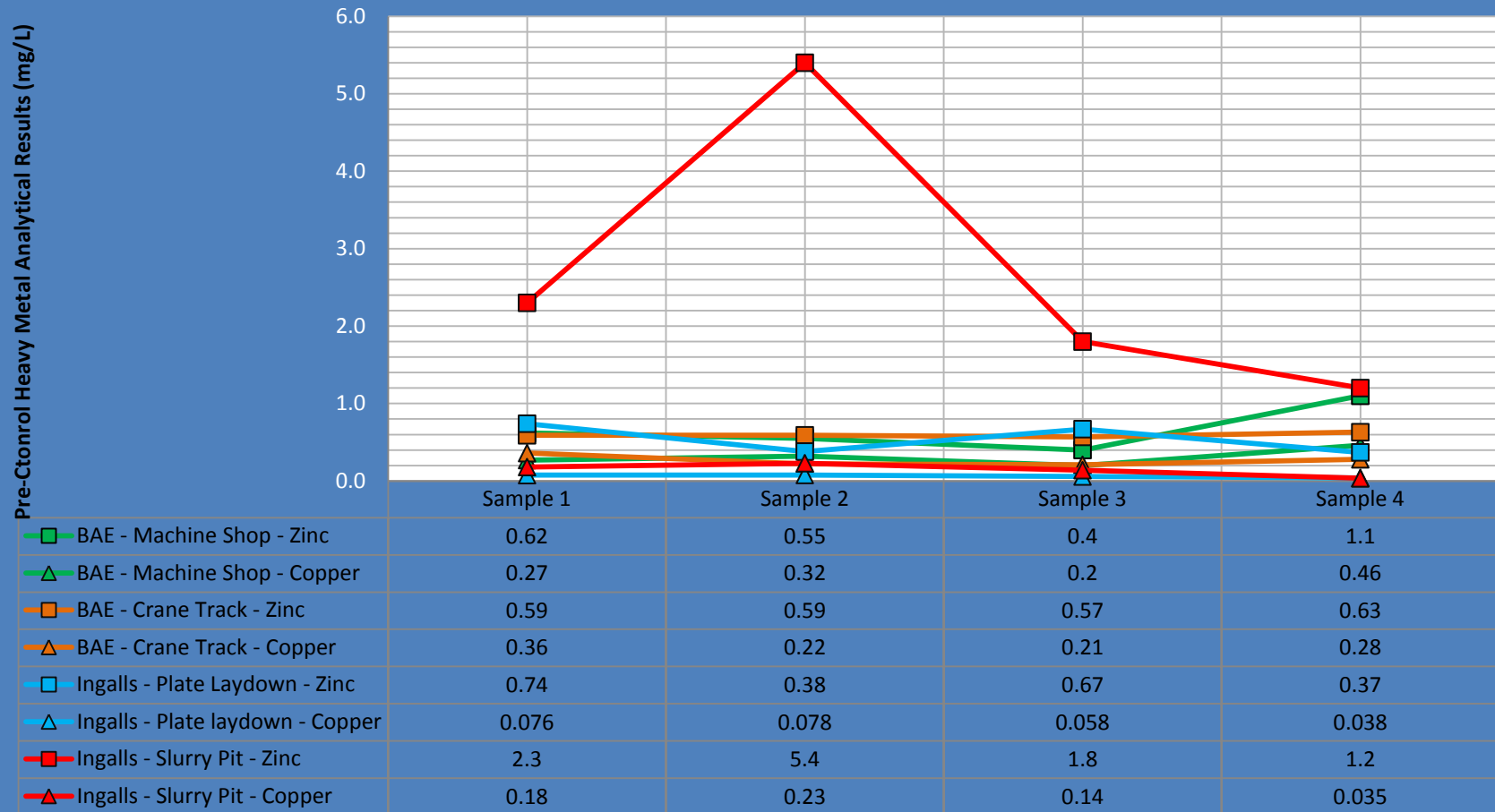


Figure 30. Pre Control Heavy Metal Sampling Results.

APPENDICES

APPENDIX A

ANALYTICAL RESULTS



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Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Thursday February 14, 2013

Report Number: L619434

Samples Received: 02/08/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

February 14, 2013

Date Received : February 08, 2013
 Description : HIO Site
 Sample ID : HIO1E
 Collected By : Justin Bates
 Collection Date : 02/07/13 11:44

ESC Sample # : L619434-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	4500H+ B-2011	02/14/13	1
Suspended Solids	8.4	1.0	mg/l	2540 D-2011	02/14/13	1
Copper	0.014	0.0010	mg/l	200.8	02/13/13	1
Zinc	0.19	0.010	mg/l	200.8	02/13/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

February 14, 2013

Date Received : February 08, 2013
 Description : HIO Site
 Sample ID : HIO1I
 Collected By : Justin Bates
 Collection Date : 02/07/13 11:37

ESC Sample # : L619434-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.5		su	4500H+ B-2011	02/14/13	1
Suspended Solids	1.0	1.0	mg/l	2540 D-2011	02/14/13	1
Copper	0.0026	0.0010	mg/l	200.8	02/13/13	1
Zinc	0.24	0.010	mg/l	200.8	02/13/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:

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 L619434-02 (PH) - 7.5@19.0c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L619434-01	WG636730	SAMP	pH	R2542097	T8
L619434-02	WG636730	SAMP	pH	R2542097	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance Services
P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1



12065 Lebanon Road
Mt. Juliet, TN 37122

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Phone: (615) 758-5858
Fax: (615) 758-5859

K228

Report to: **Mr. Justin Bates** Email: **jbates@envirocomp.net**

Project Description: **HIO Site** City/State Collected: **Tasachula, MS**
Lab Project #: **ENVCOMTMS-HIO**

Phone: **(662) 840-5945** Client Project #: **ENVCOMTMS-HIO**
FAX: **ENVCOMTMS-HIO**

Collected by (print): **Justin Bates** Site/Facility ID#: **ENVCOMTMS-HIO**
P.O.#:

Collected by (signature): *[Signature]* **Rush? (Lab MUST Be Notified)**
___ Same Day 200% Date Results Needed
___ Next Day 100% Email? ___No Yes
___ Two Day 50% FAX? ___No ___Yes
___ Three Day 25% No. of Cntrs

Immediately Packed on Ice N ___ Y

Acctnum: **ENVCOMTMS** (lab use only)
Template/Prelogin **T83743/P415476**
Cooler #: **JB 12/19**
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mlHDPE-NoPres	PH 125mlHDPE-NoPres	TSS IL-HDPE NoPres									
HIO1E	Grab	WW	N/A	2/7/13	11:44	3	X	X	X									
HIO1I	Grab	WW	N/A	2/7/13	11:37	3	X	X	X									
HIO2E		WW				3	X	X	X									
HIO2I		WW				3	X	X	X									

Remarks/Contaminant Sample # (lab only)
L619434 -01
-02

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 2/7/13	Time: 5:00	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only) OK MS
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 4°C Bottles Received: 6	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 2/8/13 Time: 0900	pH Checked: L2 NCF:

541347373059



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Monday March 04, 2013

Report Number: L622160

Samples Received: 02/27/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

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FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

March 04, 2013

Date Received : February 27, 2013
 Description : HIO Site
 Sample ID : HIO1E
 Collected By : Justin Bates
 Collection Date : 02/25/13 14:25

ESC Sample # : L622160-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	02/28/13	1
Suspended Solids	2.4	1.0	mg/l	2540 D-2011	03/04/13	1
Copper	0.0027	0.0010	mg/l	200.8	03/01/13	1
Zinc	0.27	0.010	mg/l	200.8	03/01/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

March 04, 2013

Date Received : February 27, 2013
 Description : HIO Site
 Sample ID : HIO1I
 Collected By : Justin Bates
 Collection Date : 02/25/13 14:09

ESC Sample # : L622160-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.3		su	4500H+ B-2011	02/28/13	1
Suspended Solids	320	1.0	mg/l	2540 D-2011	03/04/13	1
Copper	0.074	0.0010	mg/l	200.8	03/01/13	1
Zinc	0.98	0.020	mg/l	200.8	03/01/13	2

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

March 04, 2013

Date Received : February 27, 2013
 Description : HIO Site
 Sample ID : HIO2I
 Collected By : Justin Bates
 Collection Date : 02/25/13 15:10

ESC Sample # : L622160-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	02/28/13	1
Suspended Solids	7.8	1.0	mg/l	2540 D-2011	03/04/13	1
Copper	0.022	0.0010	mg/l	200.8	03/01/13	1
Zinc	1.1	0.020	mg/l	200.8	03/01/13	2

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:

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 L622160-03 (PH) - 7.4@20.1c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

March 04, 2013

Date Received : February 27, 2013
 Description : HIO Site
 Sample ID : HIO2E
 Collected By : Justin Bates
 Collection Date : 02/25/13 15:15

ESC Sample # : L622160-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.0		su	4500H+ B-2011	02/28/13	1
Suspended Solids	21.	1.0	mg/l	2540 D-2011	03/04/13	1
Copper	0.027	0.0010	mg/l	200.8	03/01/13	1
Zinc	1.4	0.020	mg/l	200.8	03/01/13	2

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.
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Reported: 03/04/13 13:02 Printed: 03/04/13 13:18
 L622160-04 (PH) - 7.0@19.3c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L622160-01	WG638720	SAMP	pH	R2562677	T8
L622160-02	WG638720	SAMP	pH	R2562677	T8
L622160-03	WG638720	SAMP	pH	R2562677	T8
L622160-04	WG638720	SAMP	pH	R2562677	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

G094

Chain of Custody

Page 1 of 1



L.A.B S.C.I.E.N.C.E.S

12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Report to: **Mr. Justin Bates** Email: **jbates@envirocomp.net**

Project Description: **HIO Site** City/State Collected: **Pascagoula / MS**

Phone: **(662) 840-5945** Client Project #: Lab Project #: **ENVCOMTMS-HIO**

Collected by (print): **Justin Bates** Site/Facility ID#: P.O.#:

Collected by (signature): *[Signature]* **Rush? (Lab MUST Be Notified)**
 ___ Same Day 200%
 ___ Next Day 100%
 ___ Two Day 50%
 ___ Three Day 25%
 Date Results Needed
 Email? ___ No Yes
 FAX? ___ No ___ Yes
 No. of Cntrs

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs
HIO1E		WW		2/25/13	2:25 PM	3
HIO1I		WW		2/25/13	2:09 PM	3
HIO2KI		WW		2/25/13	3:10 PM	3
HIO2AE		WW		2/25/13	3:15 PM	3

Metals 500ml HDPE-HNO3 < 2	PH 125ml HDPE-NoPres	TSS 1L-HDPE NoPres				
----------------------------	----------------------	--------------------	--	--	--	--

Acctnum: **ENVCOMTMS** (lab use only)
 Template/Prelogin: **T83743 P420869**
 Cooler #: **2-18**
 Shipped Via: **FedEX Ground**

Remarks/Contaminant	Sample # (lab only)
	L622160-01
	02
	03
	04

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 2/25/13	Time: 5:20 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input checked="" type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only) 11
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 7.2 Bottles Received: 12	COC Seal Intact: Y N NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 2/27/13 Time: 0900	pH Checked: 22 NCF:

5547 0231 603X



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Mt. Juliet, TN 37122
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Wednesday April 24, 2013

Report Number: L630548

Samples Received: 04/13/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

April 24, 2013

Date Received : April 13, 2013
 Description : HIO Site
 Sample ID : HIO2E
 Collected By : Justin Bates
 Collection Date : 04/12/13 08:52

ESC Sample # : L630548-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.2		su	4500H+ B-2011	04/17/13	1
Suspended Solids	5.5	1.0	mg/l	2540 D-2011	04/18/13	1
Copper	0.018	0.0010	mg/l	200.8	04/24/13	1
Zinc	0.64	0.010	mg/l	200.8	04/24/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 04/24/13 11:52 Printed: 04/24/13 11:53
 L630548-01 (PH) - 7.2@20.7c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

April 24, 2013

Date Received : April 13, 2013
 Description : HIO Site
 Sample ID : HIO2I
 Collected By : Justin Bates
 Collection Date : 04/12/13 08:41

ESC Sample # : L630548-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.3		su	4500H+ B-2011	04/17/13	1
Suspended Solids	110	1.0	mg/l	2540 D-2011	04/18/13	1
Copper	0.048	0.0010	mg/l	200.8	04/24/13	1
Zinc	4.4	0.050	mg/l	200.8	04/24/13	5

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 04/24/13 11:52 Printed: 04/24/13 11:53
 L630548-02 (PH) - 7.3@21.2c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L630548-01	WG656564	SAMP	pH	R2623060	T8
L630548-02	WG657030	SAMP	Zinc	R2634460	V
	WG656564	SAMP	pH	R2623060	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.
V	(ESC) - Additional QC Info: The sample concentration is too high to evaluate accurate spike recoveries.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services
P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

D051



L.A.B S.C.I.E.N.C.E.S

12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Report to: **Mr. Justin Bates**

Email: **jbates@envirocomp.net**

Project Description: **HIO Site**

City/State Collected: **Pascagoula, MS**
Lab Project #: **ENVCOMTMS-HIO**

Phone: **(662) 840-5945**
FAX:

Client Project #:

Collected by (print): **Justin Bates**

Site/Facility ID#:

P.O.#:

Collected by (signature): *[Signature]*

Rush? (Lab MUST Be Notified)

- Same Day 200%
- Next Day 100%
- Two Day 50%
- Three Day 25%

Date Results Needed

Email? No Yes
FAX? No Yes

No. of Cntrs

Immediately Packed on Ice N Y

Acctnum: **ENVCOMTMS** (lab use only)
Template/Prelogin: **T83743/P426641**
Cooler #: **49 mo**
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mIHDPE-HNO3	PH 125mIHDPE-NoPres	TSS 1L-HDPE NoPres							Remarks/Contaminant	Sample # (lab only)
HIO1E	grab	WW	-	4/12/13		3	X	X	X								
HIO1I	grab	WW	-	4/12/13		3	X	X	X								
HIO2E	grab	WW		4/12/13	8:52 AM	3	X	X	X								638548-01
HIO2I	grab	WW		4/12/13	8:41 AM	3	X	X	X								02

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

5577 0238 1177

Relinquished by: (Signature) <i>[Signature]</i>	Date: 4/12/13	Time: 5:00 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only) MS
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 30 Bottles Received: 6	COC Seal Intact: Y N NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 4/13/13 Time: 0900	pH Checked: 6.2 NCF:



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Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Friday May 17, 2013

Report Number: L634893


Samples Received: 05/09/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:


Jared Willis, ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

May 17, 2013

Date Received : May 09, 2013
 Description : HIO Site
 Sample ID : HIO1E
 Collected By : Justin Bates
 Collection Date : 05/02/13 00:00

ESC Sample # : L634893-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	4500H+ B-2011	05/15/13	1
Suspended Solids	35.	2.5	mg/l	2540 D-2011	05/13/13	1
Copper	0.079	0.0010	mg/l	200.8	05/16/13	1
Zinc	0.32	0.010	mg/l	200.8	05/16/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 05/17/13 18:46 Printed: 05/17/13 18:47
 L634893-01 (PH) - 8.0@22.0c



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Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

May 17, 2013

Date Received : May 09, 2013
 Description : HIO Site
 Sample ID : HIO1I
 Collected By : Justin Bates
 Collection Date : 05/02/13 00:00

ESC Sample # : L634893-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.1		su	4500H+ B-2011	05/15/13	1
Suspended Solids	420	2.5	mg/l	2540 D-2011	05/13/13	1
Copper	0.076	0.0010	mg/l	200.8	05/16/13	1
Zinc	0.74	0.010	mg/l	200.8	05/16/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 05/17/13 18:46 Printed: 05/17/13 18:47
 L634893-02 (PH) - 8.1@21.9c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L634893-01	WG661305	SAMP	pH	R2670881	T8
	WG660578	SAMP	Suspended Solids	R2665920	Q
L634893-02	WG661305	SAMP	pH	R2670881	T8
	WG660578	SAMP	Suspended Solids	R2665920	J3Q

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.
Q	(ESC) Sample held beyond the accepted holding time.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

Page ___ of ___



12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Report to: **Mr. Justin Bates**

Email: **jbates@envirocomp.net**

Project Description: **HIO Site**

City/State Collected: **Pascagoula, MS**

Phone: **(662) 840-5945**
FAX:

Client Project #:

Lab Project #: **ENVCOMTMS-HIO**

Collected by (print): **Justin Bates**

Site/Facility ID#:

P.O. #: **—**

Collected by (signature): *[Signature]*
Immediately Packed on Ice N Y

Rush? (Lab MUST Be Notified)

Same Day 200%
 Next Day 100%
 Two Day 50%
 Three Day 25%

Date Results Needed

Email? No Yes
FAX? No Yes

No. of Cntrs

Metals 500ml HDPE-HNO3 <2

PH 125ml HDPE-NoPres

TSS 1L HDPE NoPres

Acctnum: **ENVCOMTMS** (lab use only)
Template/Prelogin: **T83743/P427237**
Cooler #: **4-18-13 6K**
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500ml HDPE-HNO3 <2	PH 125ml HDPE-NoPres	TSS 1L HDPE NoPres				
HIO1E	Grab	WW				3	X	X	X				
HIO1I	Grab	WW				3	X	X	X				
HIO2E	—	WW	—	—	—	3	X	X	X				
HIO2I	—	WW	—	—	—	3	X	X	X				

Remarks/Contaminant Sample # (lab only)
L 631893-01

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

5547 0239 2818

Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/2/13	Time: 4:30 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 11.3°C	Bottles Received: 6
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for Lab by: (Signature) <i>[Signature]</i>	Date: 5-6-13	Time: 9:30
				pH Checked: <2	NCF: <i>[Signature]</i>



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Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Thursday June 20, 2013

Report Number: L640608

Samples Received: 06/11/13

Client Project:

Description: Sample L1-2 LZ 1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 20, 2013

Date Received : June 11, 2013
 Description : Sample L1-2 LZ 1
 Sample ID : HI01E
 Collected By : Justin Bates
 Collection Date : 06/10/13 14:28

ESC Sample # : L640608-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.1		su	4500H+ B-2011	06/13/13	1
Suspended Solids	67.	2.5	mg/l	2540 D-2011	06/14/13	1
Copper	0.078	0.0010	mg/l	200.8	06/19/13	1
Zinc	0.38	0.010	mg/l	200.8	06/19/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/20/13 09:19 Printed: 06/20/13 09:19
 L640608-01 (PH) - 8.1 @ 22.4c



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 Mt. Juliet, TN 37122
 (615) 758-5858
 1-800-767-5859
 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 20, 2013

Date Received : June 11, 2013
 Description : Sample L1-2 LZ 1
 Sample ID : HI01I
 Collected By : Justin Bates
 Collection Date : 06/10/13 14:15

ESC Sample # : L640608-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	4500H+ B-2011	06/13/13	1
Suspended Solids	60.	2.5	mg/l	2540 D-2011	06/14/13	1
Copper	0.032	0.0010	mg/l	200.8	06/19/13	1
Zinc	0.42	0.010	mg/l	200.8	06/19/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/20/13 09:19 Printed: 06/20/13 09:20
 L640608-02 (PH) - 8.0 @ 23.4c



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 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 20, 2013

Date Received : June 11, 2013
 Description : Sample L1-2 LZ 1
 Sample ID : HI02E
 Collected By : Justin Bates
 Collection Date : 06/10/13 13:28

ESC Sample # : L640608-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.2		su	4500H+ B-2011	06/13/13	1
Suspended Solids	3.2	2.5	mg/l	2540 D-2011	06/14/13	1
Copper	0.012	0.0010	mg/l	200.8	06/19/13	1
Zinc	0.20	0.010	mg/l	200.8	06/19/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/20/13 09:19 Printed: 06/20/13 09:20
 L640608-03 (PH) - 7.2 @ 22.6c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 20, 2013

Date Received : June 11, 2013
 Description : Sample L1-2 LZ 1
 Sample ID : HI02I
 Collected By : Justin Bates
 Collection Date : 06/10/13 13:28

ESC Sample # : L640608-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.8		su	4500H+ B-2011	06/13/13	1
Suspended Solids	68.	2.5	mg/l	2540 D-2011	06/14/13	1
Copper	0.18	0.0010	mg/l	200.8	06/19/13	1
Zinc	2.3	0.050	mg/l	200.8	06/19/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/20/13 09:19 Printed: 06/20/13 09:20
 L640608-04 (PH) - 7.8 @ 23.6c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L640608-01	WG666307	SAMP	pH	R2706740	T8
L640608-02	WG666307	SAMP	pH	R2706740	T8
L640608-03	WG666307	SAMP	pH	R2706740	T8
L640608-04	WG666307	SAMP	pH	R2706740	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services
 P.O. Box 356
 Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
 P.O. Box 356
 Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

Page ___ of ___

H111



1206S Lebanon Road
 Mt. Juliet, TN 37122

Phone: (800) 767-5859
 Phone: (615) 758-5858
 Fax: (615) 758-5859

Report to: **Mr. Justin Bates**

Email: **jbates@envirocomp.net**

Project Description: **Sample L1-#2 LZ-#1**

City/State Collected: **Pascagoula, MS**

Phone: (662) 840-5945
 FAX:

Client Project #:

Lab Project #
ENVCOMTMS-BAE

Collected by (print): **Justin Bates**

Site/Facility ID#:

P.O.#:

Collected by (signature): *[Signature]*
 Immediately Packed on Ice N Y

Rush? (Lab MUST Be Notified)
 ___ Same Day200%
 ___ Next Day 100%
 ___ Two Day50%
 ___ Three Day25%

Date Results Needed
 Email? ___No Yes
 FAX? ___No ___Yes
 No. of Cntrs

Metals 500ml HDPE-HNO3 < 2

PH 125ml HDPE-NoPres

TSS 1L-HDPE NoPres

Acctnum: **ENVCOMTMS** (lab use only)
 Template/Prelogin: **T83746 P426642**
 Cooler #: **4-9 MB**
 Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500ml HDPE-HNO3 < 2	PH 125ml HDPE-NoPres	TSS 1L-HDPE NoPres				
BAE01E H101E	grab	WW	-	6/10/13	8:28pm	3	X	X	X				
BAE01H H101I	grab	WW	-	6/10/13	2:15pm	3	X	X	X				
BAE02E H102E	grab	WW	-	6/10/13	1:28pm	3	X	X	X				
BAE02H H102I	grab	WW	-	6/10/13	1:28pm	3	X	X	X				

Remarks/Contaminant Sample # (lab only)
 L640602-01
 02
 03
 04

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 6/10/13	Time: 4:15PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input checked="" type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: <i>[Signature]</i> (lab use only) SR
Relinquished by: (Signature) <i>[Signature]</i>	Date: 6/10/13	Time: 5:10PM	Received by: (Signature) <i>[Signature]</i>	Temp: 2.4°C	Bottles Received: 12
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 6-11-13	Time: 0930
				pH Checked: 02	NCF:



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Friday July 19, 2013

Report Number: L645370

Samples Received: 07/09/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 19, 2013

Date Received : July 09, 2013
 Description : HIO Site
 Sample ID : HIO2E
 Collected By : David Gundlach
 Collection Date : 07/08/13 11:11

ESC Sample # : L645370-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.3		su	4500H+ B-2011	07/15/13	1
Suspended Solids	20.	2.5	mg/l	2540 D-2011	07/11/13	1
Copper	0.044	0.0010	mg/l	200.8	07/18/13	1
Zinc	1.7	0.020	mg/l	200.8	07/18/13	2

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 07/19/13 07:23 Printed: 07/19/13 07:24
 L645370-01 (PH) - 7.3@20.5c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 19, 2013

Date Received : July 09, 2013
 Description : HIO Site
 Sample ID : HIO2I
 Collected By : David Gundlach
 Collection Date : 07/08/13 11:11

ESC Sample # : L645370-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	07/15/13	1
Suspended Solids	140	2.5	mg/l	2540 D-2011	07/11/13	1
Copper	0.23	0.0010	mg/l	200.8	07/18/13	1
Zinc	5.4	0.10	mg/l	200.8	07/18/13	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 07/19/13 07:23 Printed: 07/19/13 07:24
 L645370-02 (PH) - 7.4@21.3c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L645370-01	WG671767	SAMP	pH	R2744304	T8
L645370-02	WG671767	SAMP	pH	R2744304	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356

Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356

Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

Page ___ of ___



L.A.B S.C.I.E.N.C.E.S

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Mt. Juliet, TN 37122

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Phone: (615) 758-5858
Fax: (615) 758-5859

H087

Report to: **Mr. Justin Bates**

Email: **jbates@envirocomp.net**

Project Description: **HIO Site**

City/State Collected: **Pascagoula, MS**

Phone: **(662) 840-5945**

Client Project #:

Lab Project #

FAX:

ENVCOMTMS-HIO

Collected by (print):

David Landlach

Site/Facility ID#:

P.O.#:

Collected by (signature):

[Signature]

Rush? (Lab MUST Be Notified)

___ Same Day200%
___ Next Day100%
___ Two Day50%
___ Three Day25%

Date Results Needed

Email? ___No Yes
FAX? ___No ___Yes

No. of Cntrs

Metals 500mlHDPE-HNO3 ✓

PH 125mlHDPE-NoPres

TSS 1L-HDPE NoPres

Acctnum: **ENVCOMTMS** (lab use only)
Template/Prelogin: **T83743/P434613**
Cooler #: *6-24 M*
Shipped Via: **FedEX Ground**

Remarks/Contaminant Sample # (lab only)

645370-01
al

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mlHDPE-HNO3	PH 125mlHDPE-NoPres	TSS 1L-HDPE NoPres				
HIO1E	—	WW	—	—	—	3	X	X	X				
HIO1H	—	WW	—	—	—	3	X	X	X				
HIO2E	Grab	WW	—	7-8-13	11:11 AM	3	X	X	X				
HIO2I	Grab	WW	—	7-8-13	11:11 AM	3	X	X	X				

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

554702487263

Relinquished by: (Signature) <i>[Signature]</i>	Date: 7-8-13	Time: 5:30 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only) <i>[Signature]</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 31.0	Bottles Received: 6
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 7/6/13	Time: 0900
				pH Checked: 12	NCF:



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Wednesday July 24, 2013

Report Number: L646309

Samples Received: 07/12/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 24, 2013

Date Received : July 12, 2013
 Description : HIO Site
 Sample ID : HIO1E
 Collected By : David Gundlach
 Collection Date : 07/11/13 15:45

ESC Sample # : L646309-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	4500H+ B-2011	07/19/13	1
Suspended Solids	20.	2.5	mg/l	2540 D-2011	07/17/13	1
Copper	0.053	0.0010	mg/l	200.8	07/19/13	1
Zinc	0.46	0.010	mg/l	200.8	07/23/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 07/24/13 11:14 Printed: 07/24/13 11:14
 L646309-01 (PH) - 8.0@14.9c



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Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 24, 2013

Date Received : July 12, 2013
 Description : HIO Site
 Sample ID : HIO1I
 Collected By : David Gundlach
 Collection Date : 07/11/13 15:55

ESC Sample # : L646309-02
 Site ID :
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.1		su	4500H+ B-2011	07/19/13	1
Suspended Solids	210	2.5	mg/l	2540 D-2011	07/17/13	1
Copper	0.058	0.0010	mg/l	200.8	07/19/13	1
Zinc	0.67	0.010	mg/l	200.8	07/23/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
 This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 07/24/13 11:14 Printed: 07/24/13 11:14
 L646309-02 (PH) - 8.1@13.5c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L646309-01	WG672677	SAMP	pH	R2750961	T8
L646309-02	WG672677	SAMP	pH	R2750961	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

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- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356

Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356

Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1



L.A.B S.C.I.E.N.C.E.S

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Mt. Juliet, TN 37122

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Phone: (615) 758-5858
Fax: (615) 758-5859

E159

Report to: **Mr. Justin Bates**
Email: **jbates@envirocomp.net**

Project Description: **HIO Site**
City/State Collected: **Pascagoula, MS**

Phone: **(662) 840-5945**
FAX: _____
Client Project #: _____
Lab Project #: **ENVCOMTMS-HIO**

Collected by (print): **David Kundlach**
Site/Facility ID#: _____
P.O.#: _____

Collected by (signature): *[Signature]*
Immediately Packed on Ice N ___ Y **X**
Rush? (Lab MUST Be Notified)
 ___ Same Day 200%
 ___ Next Day 100%
 ___ Two Day 50%
 ___ Three Day 25%
 Date Results Needed: _____
 Email? ___No **X**Yes
 FAX? ___No ___Yes
 No. of Cntrs: _____

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mLHDPE-HNO3 <2	PH 125mLHDPE-NoPres	TSS 1L-HDPE NoPres
HIO1E	grab	WW	—	7.11.13	3:45 PM	3	X	X	X
HIO1I	grab	WW	—	7.11.13	3:55 PM	3	X	X	X
HIO2E		WW	—	—	—	3	X	X	X
HIO2I		WW	—	—	—	3	X	X	X

Acctnum: **ENVCOMTMS** (lab use only)
 Template/Prelogin: **T83743 P434614**
 Cooler #: **6/24**
 Shipped Via: **FedEX Ground**

Remarks/Contaminant Sample # (lab only)
L646309-01
-02

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

Remarks: _____
 pH _____ Temp _____
 Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 7.11.13	Time: 5:00 PM	Received by: (Signature) _____	5547 0248 7741	Samples returned via: <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS <input type="checkbox"/> Courier	Condition: OK (lab use only)
Relinquished by: (Signature) _____	Date: _____	Time: _____	Received by: (Signature) _____	Temp: 3.2	Bottles Received: 6	COC Seal Intact: ___ Y ___ N NA
Relinquished by: (Signature) _____	Date: _____	Time: _____	Received for lab by: (Signature) <i>[Signature]</i>	Date: 7-12-13	Time: 0930	pH Checked: <2



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Tax I.D. 62-0814289

Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Monday August 12, 2013

Report Number: L650062

Samples Received: 08/05/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

August 12, 2013

Date Received : August 05, 2013
 Description : HIO Site L2-S3
 Sample ID : HIO2E
 Collected By : Justin Bates
 Collection Date : 08/02/13 12:15

ESC Sample # : L650062-01
 Site ID :
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	08/12/13	1
Suspended Solids	13.	2.5	mg/l	2540 D-2011	08/07/13	1
Copper	0.045	0.0010	mg/l	200.8	08/05/13	1
Zinc	0.78	0.010	mg/l	200.8	08/05/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 08/12/13 12:44 Printed: 08/12/13 12:44
 L650062-01 (PH) - 7.4@17.8c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

August 12, 2013

Date Received : August 05, 2013
 Description : HIO Site L2-S3
 Sample ID : HIO2I
 Collected By : Justin Bates
 Collection Date : 08/02/13 12:15

ESC Sample # : L650062-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	6.9		su	4500H+ B-2011	08/12/13	1
Suspended Solids	49.	2.5	mg/l	2540 D-2011	08/07/13	1
Copper	0.14	0.0010	mg/l	200.8	08/05/13	1
Zinc	1.8	0.050	mg/l	200.8	08/06/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/12/13 12:44 Printed: 08/12/13 12:44
 L650062-02 (PH) - 6.9@21.4c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L650062-01	WG676334	SAMP	pH	R2776820	T8
L650062-02	WG676334	SAMP	pH	R2776820	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance Services

2113 Government Street Ste B3
Ocean Springs, MS 39564

Billing Information:
P.O. Box 356
Sherman, MS 38869

Report to:
Mr. Justin Bates

Email To:
jbates@envirocomp.net

Project Description: **HIO Site L2-S3**

City/State Collected: **Pascagoula, MS**

Phone: **228-872-2528**
Fax:

Client Project #

Lab Project #
ENVCOMTMS-HIO

Collected by (print):
Justin Bates
Collected by (signature):
[Signature]

Site/Facility ID #

P.O. #

Immediately Packed on Ice N Y

Rush? (Lab MUST Be Notified)
 Same Day200%
 Next Day100%
 Two Day50%
 Three Day25%

Date Results Needed

Email? No Yes
 FAX? No Yes

No. of Cntrs

Analysis / Container / Preservative

Chain of Custody Page ___ of ___



YOUR LAB OF CHOICE

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Phone: 800-767-5859
Fax: 615-758-5859



L# **L650062**

Table #

Acctnum: **ENVCOMTMS**

Template: **T83743**

Prelogin: **P437319**

TSR: **034 - Craig Cothron**

PB: **7-24-13 GRC**

Shipped Via: **FedEx Ground**

Rem./Contaminant Sample # (lab only)

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Metals 500mIHDPE-HNO3 L2	PH 125mIHDPE-NoPres	TSS 1L-HDPE NoPres								
HIO1E	grab	WW	-	8/2/13	-	3	X	X	X								
HIO1I	grab	WW	-	-	-	3	X	X	X								
HIO2E	grab	WW	-	8/2/13	12:15pm	3	X	X	X								col
HIO2I	grab	WW	-	8/2/13	12:15pm	3	X	X	X								-03

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Remarks: **5704 6053 045**

Flow _____ Other _____

Hold #

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Samples returned via: UPS

Condition: (lab use only)

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Temp: °C Bottles Received:

COC Seal Intact: Y N NA

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

Date: Time:

pH Checked: NCF:

[Signatures]

8/2/13

5:50PM

[Signature]

FedEx Courier _____
 3.22 6
 8-5-13 930

OK
 pH Checked: **CC**



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Wednesday October 09, 2013

Report Number: L661658

Samples Received: 10/05/13

Client Project:

Description: HIO Site

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

October 09, 2013

Date Received : October 05, 2013
 Description : HIO Site
 Sample ID : HIO1E
 Collected By : Justin Bates
 Collection Date : 10/03/13 06:30

ESC Sample # : L661658-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.3		su	4500H+ B-2011	10/09/13	1
Suspended Solids	67.	2.5	mg/l	2540 D-2011	10/08/13	1
Copper	0.20	0.0010	mg/l	200.8	10/08/13	1
Zinc	0.69	0.010	mg/l	200.8	10/08/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 10/09/13 17:50 Printed: 10/09/13 17:51
 L661658-01 (PH) - 8.3@21.2c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

October 09, 2013

Date Received : October 05, 2013
 Description : HIO Site
 Sample ID : HIO1I
 Collected By : Justin Bates
 Collection Date : 10/03/13 06:30

ESC Sample # : L661658-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.2		su	4500H+ B-2011	10/09/13	1
Suspended Solids	84.	2.5	mg/l	2540 D-2011	10/08/13	1
Copper	0.038	0.0010	mg/l	200.8	10/08/13	1
Zinc	0.37	0.010	mg/l	200.8	10/08/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 10/09/13 17:50 Printed: 10/09/13 17:51
 L661658-02 (PH) - 8.2@20.8c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

October 09, 2013

Date Received : October 05, 2013
 Description : HIO Site
 Sample ID : HIO2E
 Collected By : Justin Bates
 Collection Date : 10/04/13 13:42

ESC Sample # : L661658-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	10/09/13	1
Suspended Solids	5.2	2.5	mg/l	2540 D-2011	10/08/13	1
Copper	0.017	0.0010	mg/l	200.8	10/08/13	1
Zinc	0.55	0.010	mg/l	200.8	10/08/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 10/09/13 17:50 Printed: 10/09/13 17:51
 L661658-03 (PH) - 7.4@21.7c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

October 09, 2013

Date Received : October 05, 2013
 Description : HIO Site
 Sample ID : HIO2I
 Collected By : Justin Bates
 Collection Date : 10/04/13 13:42

ESC Sample # : L661658-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.3		su	4500H+ B-2011	10/09/13	1
Suspended Solids	27.	2.5	mg/l	2540 D-2011	10/08/13	1
Copper	0.035	0.0010	mg/l	200.8	10/08/13	1
Zinc	1.2	0.050	mg/l	200.8	10/08/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 10/09/13 17:50 Printed: 10/09/13 17:51
 L661658-04 (PH) - 7.3@21.4c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L661658-01	WG685705	SAMP	Copper	R2837776	J6
	WG685705	SAMP	Zinc	R2837776	V
	WG685975	SAMP	pH	R2838337	T8
L661658-02	WG685975	SAMP	pH	R2838337	T8
L661658-03	WG685975	SAMP	pH	R2838337	T8
L661658-04	WG685975	SAMP	pH	R2838337	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.
V	(ESC) - Additional QC Info: The sample concentration is too high to evaluate accurate spike recoveries.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance Services

2113 Government Street Ste B3
Ocean Springs, MS 39564

Billing Information:

P.O. Box 356
Sherman, MS 38869

Report to:
Mr. Justin Bates

Email To:
jbates@envirocomp.net

Project
Description: **HIO Site**

City/State
Collected: *Passapatanz, MS*

Phone: **228-872-2528**
Fax:

Client Project #

Lab Project #
ENVCOMTMS-HIO

Collected by (print):
Justin Bates

Site/Facility ID #

P.O. #

Collected by (signature):
[Signature]

Rush? (Lab MUST Be Notified)
 ___ Same Day200%
 ___ Next Day100%
 Two Day50%
 ___ Three Day25%

Date Results Needed

Email? ___ No Yes
 FAX? ___ No ___ Yes

Immediately
 Packed on Ice N ___ Y

No. of
 Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Metals 500mLHDPE-HNO3	PH 125mLHDPE-NoPres	TSS 1L-HDPE NoPres	Analysis / Container / Preservative				Chain of Custody Page 2 of 2
HIO1E	grab	WW	-	10/3/13	6:30 PM	3	X	X	X					 12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859 L # <i>LG61659</i> B025 Acctnum: ENVCOMTMS Template: T83743 Prelogin: P437318 TSR: 034 - Craig Cothron PB: <i>7-24-1362</i> Shipped Via: FedEX Ground
HIO1I	grab	WW	-	10/3/13	6:30 PM	3	X	X	X					
HIO2E	grab	WW	-	10/4/13	1:42 PM	3	X	X	X					
HIO2I	grab	WW	-	10/4/13	1:42 PM	3	X	X	X					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Remarks:

5704100530390

Flow _____ Other _____

Hold #

Relinquished by: (Signature)
[Signature]

Date:

10/4/13

Time:

4:30 PM

Received by: (Signature)
[Signature]

Samples returned via: UPS

FedEx Courier _____

Condition: (lab use only)

MS OK

Relinquished by: (Signature)
[Signature]

Date:

Time:

Received by: (Signature)
[Signature]

Temp: °C Bottles Received:

32 12

COC Seal Intact: ___ Y ___ N ___ NA

Relinquished by: (Signature)
[Signature]

Date:

Time:

Received for lab by: (Signature)
[Signature]

Date: Time:

10/5/13 0900

pH Checked:

< 2

NCF:



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Friday February 15, 2013

Report Number: L619620

Samples Received: 02/09/13

Client Project:

Description: BAE - Baseline #1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

February 15, 2013

Date Received : February 09, 2013
 Description : BAE - Baseline #1
 Sample ID : BAE01E
 Collected By : Justin Bates
 Collection Date : 02/08/13 13:11

ESC Sample # : L619620-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.6		su	4500H+ B-2011	02/15/13	1
Suspended Solids	300	1.0	mg/l	2540 D-2011	02/15/13	1
Copper	0.20	0.0010	mg/l	200.8	02/13/13	1
Zinc	0.34	0.010	mg/l	200.8	02/13/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 02/15/13 15:30 Printed: 02/15/13 15:30
 L619620-01 (PH) - 8.6@18.3c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

February 15, 2013

Date Received : February 09, 2013
 Description : BAE - Baseline #1
 Sample ID : BAE01I
 Collected By : Justin Bates
 Collection Date : 02/08/13 13:00

ESC Sample # : L619620-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.2		su	4500H+ B-2011	02/15/13	1
Suspended Solids	42.	1.0	mg/l	2540 D-2011	02/15/13	1
Copper	0.14	0.0010	mg/l	200.8	02/13/13	1
Zinc	0.21	0.010	mg/l	200.8	02/13/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.
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Reported: 02/15/13 15:30 Printed: 02/15/13 15:30
 L619620-02 (PH) - 8.2@18.1c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

February 15, 2013

Date Received : February 09, 2013
 Description : BAE - Baseline #1
 Sample ID : BAE02E
 Collected By : Justin Bates
 Collection Date : 02/08/13 13:15

ESC Sample # : L619620-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	02/15/13	1
Suspended Solids	23.	1.0	mg/l	2540 D-2011	02/15/13	1
Copper	0.053	0.0010	mg/l	200.8	02/13/13	1
Zinc	0.093	0.010	mg/l	200.8	02/13/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.
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Reported: 02/15/13 15:30 Printed: 02/15/13 15:30
 L619620-03 (PH) - 7.4@18.3c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

February 15, 2013

Date Received : February 09, 2013
 Description : BAE - Baseline #1
 Sample ID : BAE02I
 Collected By : Justin Bates
 Collection Date : 02/08/13 13:22

ESC Sample # : L619620-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.6		su	4500H+ B-2011	02/15/13	1
Suspended Solids	2.6	1.0	mg/l	2540 D-2011	02/15/13	1
Copper	0.026	0.0010	mg/l	200.8	02/13/13	1
Zinc	0.066	0.010	mg/l	200.8	02/13/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 02/15/13 15:30 Printed: 02/15/13 15:30
 L619620-04 (PH) - 7.6@18.3c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L619620-01	WG636921	SAMP	pH	R2544397	T8
L619620-02	WG636921	SAMP	pH	R2544397	T8
L619620-03	WG636921	SAMP	pH	R2544397	T8
L619620-04	WG636921	SAMP	pH	R2544397	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
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- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

Page ___ of ___



12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

F040

Report to: **Mr. Justin Bates** Email: **jbates@envirocomp.net**

Project Description: **BAE - Baseline #1** City/State Collected: _____

Phone: **(662) 840-5945** Client Project #: _____ Lab Project #: **ENVCOMTMS-BAE**

FAX: _____ Site/Facility ID#: _____ P.O.#: _____

Collected by (print): **Justin Bates** Rush? (Lab MUST Be Notified)
 Collected by (signature): *[Signature]* Same Day 200%
 Immediately Packed on Ice N ___ Y Next Day 100%
 Date Results Needed: _____ Email? ___ No Yes
 FAX? ___ No ___ Yes No. of Cntrs: _____

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mlHDPE-HNO3	PH 125mlHDPE-NoPres	TSS 1L-HDPE NoPres		Remarks/Contaminant	Sample # (lab only)
BAEO1E	grab	WW	N/A	2/8/13	1:11pm	3	X	X	X			619620 01
BAEO1I	grab	WW	N/A	2/8/13	1:00pm	3	X	X	X			-02
BAEO2E	grab	WW	N/A	2/8/13	1:18pm	3	X	X	X			-03
BAEO2I	grab	WW	N/A	2/8/13	1:22pm	3	X	X	X			-04

Acctnum: **ENVCOMTMS** (lab use only)
 Template/Prelogin: **T83746 P415478**
 Cooler #: **JB 12/19**
 Shipped Via: **FedEX Ground**

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

5413 4737 3140

pH _____ Temp _____

Remarks: _____ Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 2/8/13	Time: 5:05PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS <input type="checkbox"/> Courier	Condition: OW TO (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date: _____	Time: _____	Received by: (Signature) <i>[Signature]</i>	Temp: 3.4°C Bottles Received: 12	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date: _____	Time: _____	Received for lab by: (Signature) <i>[Signature]</i>	Date: 2-9-13 Time: 0930	pH Checked: CA NCF: _____



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Tax I.D. 62-0814289

Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Thursday March 07, 2013

Report Number: L622367

Samples Received: 02/28/13

Client Project:

Description: SLRA

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

March 07, 2013

Date Received : February 28, 2013
 Description : SLRA
 Sample ID : BAE01E
 Collected By : Justin Bates
 Collection Date : 02/27/13 14:15

ESC Sample # : L622367-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.4		su	4500H+ B-2011	03/01/13	1
Suspended Solids	72.	1.0	mg/l	2540 D-2011	03/07/13	1
Copper	0.23	0.0010	mg/l	200.8	03/05/13	1
Zinc	0.41	0.010	mg/l	200.8	03/05/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 03/07/13 10:10 Printed: 03/07/13 11:51
 L622367-01 (PH) - 8.4@18.3c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

March 07, 2013

Date Received : February 28, 2013
 Description : SLRA
 Sample ID : BAE01I
 Collected By : Justin Bates
 Collection Date : 02/27/13 14:22

ESC Sample # : L622367-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.5		su	4500H+ B-2011	03/01/13	1
Suspended Solids	300	1.0	mg/l	2540 D-2011	03/07/13	1
Copper	0.23	0.0010	mg/l	200.8	03/05/13	1
Zinc	0.40	0.010	mg/l	200.8	03/05/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 03/07/13 10:10 Printed: 03/07/13 11:51
 L622367-02 (PH) - 8.5@17.9c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L622367-01	WG638884	SAMP	pH	R2564317	T8
L622367-02	WG638884	SAMP	pH	R2564317	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody
Page ___ of ___



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Fax: (615) 758-5859
B152

Report to: **Mr. Justin Bates**

Email: **jbates@envirocomp.net**

Project Description: **SCRA**

City/State Collected: **Mobile/AL**

Phone: (662) 840-5945
FAX:

Client Project #:

Lab Project #
ENVCOMTMS-BAE

Collected by (print): **Justin Bates**

Site/Facility ID#:

P.O.#:

Collected by (signature): *[Signature]*
Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)

___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___ No Yes
FAX? ___ No ___ Yes

No. of Cntrs

Metals 500mlHDPE-HNO3
PH 125mlHDPE-NoPres
TSS 1L-HDPE NoPres

Acctnum: **ENVCOMTMS** (lab use only)
Template/Prelogin: **T83746 P420868**
Cooler #: **2-18 mg**
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mlHDPE-HNO3	PH 125mlHDPE-NoPres	TSS 1L-HDPE NoPres	Remarks/Contaminant	Sample # (lab only)
BAEO1E	grab	WW		2/27/13	2:15	3	X	X	X		L62236701
BAEO1I	grab	WW		2/27/13	2:22	3	X	X	X		02
BAEO2E	—	WW				3	X	X	X		
BAEO2I	—	WW				3	X	X	X		

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 2/27/13	Time: 5:40	Received by: (Signature) <i>[Signature]</i>	5547 0231 604	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only) OK SF
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature)		Temp: 3.4	Bottles Received: 6
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>		Date: 2/28/13	Time: 0900
					pH Checked: L2	NCF:



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Justin Bates
Environmental Compliance Services
P.O. Box 356
Sherman, MS 38869

Report Summary

Sunday April 21, 2013

Report Number: L630656

Samples Received: 04/13/13

Client Project:

Description: Line 2 BL 2

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

T. Alan Harvill , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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Est. 1970

REPORT OF ANALYSIS

Justin Bates
 Environmental Compliance Services
 P.O. Box 356
 Sherman, MS 38869

April 21, 2013

Date Received : April 13, 2013
 Description : Line 2 BL 2
 Sample ID : BAEOZI
 Collected By : Justin Bates
 Collection Date : 04/11/13 08:06

ESC Sample # : L630656-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.2		su	4500H+ B-2011	04/17/13	1
Suspended Solids	91.	1.0	mg/l	2540 D-2011	04/18/13	1
Copper	0.39	0.020	mg/l	200.7	04/19/13	1
Zinc	1.0	0.030	mg/l	200.7	04/19/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:

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Reported: 04/21/13 21:59 Printed: 04/21/13 21:59
 L630656-01 (PH) - 8.2@21.7c



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REPORT OF ANALYSIS

Justin Bates
 Environmental Compliance Services
 P.O. Box 356
 Sherman, MS 38869

April 21, 2013

Date Received : April 13, 2013
 Description : Line 2 BL 2
 Sample ID : BAEOZE
 Collected By : Justin Bates
 Collection Date : 04/11/13 08:11

ESC Sample # : L630656-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.8		su	4500H+ B-2011	04/17/13	1
Suspended Solids	64.	1.0	mg/l	2540 D-2011	04/18/13	1
Copper	0.17	0.020	mg/l	200.7	04/19/13	1
Zinc	0.38	0.030	mg/l	200.7	04/19/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:

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Reported: 04/21/13 21:59 Printed: 04/21/13 21:59
 L630656-02 (PH) - 7.8@21.5c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L630656-01	WG656564	SAMP	pH	R2623060	T8
L630656-02	WG656564	SAMP	pH	R2623060	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

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- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

ELS, Inc P.O. Box 356 Sherman, MS 38869		Mr Brian Ketchum P.O. Box 356 Sherman, MS 38869		Report to: Justin Bates Email to: dbates@envirocomp.net				
Project Description: Line #2 BL #2		City/State Collected: Mobile, AL		1159 Metals 50ml HDPE - HND3 <2 PH - 125ml HDPE - No Pms TSS 1L HDPE - No Pms				
Phone: 602-877-5454 602-8405445		Client Project #: ESC Key:						
FAX: 602-877-5454		Site/Facility ID#: P.O.#:						
Collected by: Justin Bates		Collected by (signature): <i>[Signature]</i>		Date Results Needed:				
Immediately Packed on Ice: <input checked="" type="checkbox"/>		Rush? (Lab MUST Be Notified)		Email? <input type="checkbox"/> No <input type="checkbox"/> Yes				
		Same Day 200%		FAX? <input type="checkbox"/> No <input type="checkbox"/> Yes				
		Next Day 100%		No of Cntrs: 3				
		Two Day 50%						
Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	Remarks/Contaminant	Sample # (lab only)
BAEOZI	grab	ww	-	4/11/13	8:06AM	3	630656	
BAEOZE	grab	ww	-	4/11/13	8:11AM	3		

Page ___ of ___

ESC
 L-A-B S-C-I-E-N-C-E-S
 12065 Lebanon Road
 Mt. Juliet, TN 37122

 Phone: (800) 767-5859
 Phone: (615) 758-5858
 Fax: (615) 758-5859

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____ pH _____ Temp _____

Remarks: _____ Flow: **SS47 0238 666** Other: _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 4/12/13	Time: 5:00	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only) TD
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.1°C	Bottles Received: 6
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 4/13/13	Time: 9:00
				pH Checked: cc	NCF: <input checked="" type="checkbox"/>



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Tax I.D. 62-0814289

Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Friday June 21, 2013

Report Number: L639158

Samples Received: 06/04/13

Client Project:

Description: Line1-Sample2 Line2-Sample 1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 21, 2013

Date Received : June 04, 2013
 Description : Line1-Sample2 Line2-Sample 1
 Sample ID : BAE01E
 Collected By : David Gundlach
 Collection Date : 06/03/13 15:50

ESC Sample # : L639158-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.6		su	4500H+ B-2011	06/06/13	1
Suspended Solids	370	2.5	mg/l	2540 D-2011	06/07/13	1
Copper	0.17	0.0010	mg/l	200.8	06/21/13	1
Zinc	0.30	0.010	mg/l	200.8	06/21/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 06/21/13 16:52 Printed: 06/21/13 16:52
 L639158-01 (PH) - 8.6@21.6c



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Tax I.D. 62-0814289

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 21, 2013

Date Received : June 04, 2013
 Description : Line1-Sample2 Line2-Sample 1
 Sample ID : BAE01I
 Collected By : David Gundlach
 Collection Date : 06/03/13 16:10

ESC Sample # : L639158-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	4500H+ B-2011	06/06/13	1
Suspended Solids	42.	2.5	mg/l	2540 D-2011	06/07/13	1
Copper	0.27	0.0010	mg/l	200.8	06/21/13	1
Zinc	0.62	0.010	mg/l	200.8	06/21/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
 This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 06/21/13 16:52 Printed: 06/21/13 16:52
 L639158-02 (PH) - 8.0@21.3c



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 (615) 758-5858
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 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 21, 2013

Date Received : June 04, 2013
 Description : Line1-Sample2 Line2-Sample 1
 Sample ID : BAE02E
 Collected By : David Gundlach
 Collection Date : 06/03/13 15:40

ESC Sample # : L639158-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.1		su	4500H+ B-2011	06/06/13	1
Suspended Solids	40.	2.5	mg/l	2540 D-2011	06/07/13	1
Copper	0.23	0.0010	mg/l	200.8	06/21/13	1
Zinc	0.48	0.010	mg/l	200.8	06/21/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 06/21/13 16:52 Printed: 06/21/13 16:52
 L639158-03 (PH) - 8.1@21.5c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

June 21, 2013

Date Received : June 04, 2013
 Description : Line1-Sample2 Line2-Sample 1
 Sample ID : BAE02I
 Collected By : David Gundlach
 Collection Date : 06/03/13 16:00

ESC Sample # : L639158-04
 Site ID :
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.1		su	4500H+ B-2011	06/06/13	1
Suspended Solids	260	2.5	mg/l	2540 D-2011	06/07/13	1
Copper	0.36	0.0010	mg/l	200.8	06/21/13	1
Zinc	0.59	0.010	mg/l	200.8	06/21/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 06/21/13 16:52 Printed: 06/21/13 16:52
 L639158-04 (PH) - 8.1@21.3c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L639158-01	WG664944	SAMP	pH	R2697521	T8
L639158-02	WG664944	SAMP	pH	R2697521	T8
L639158-03	WG664944	SAMP	pH	R2697521	T8
L639158-04	WG664944	SAMP	pH	R2697521	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services

P.O. Box 356

Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356

Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

B218

Page 1 of 1



L.A.B S.C.I.E.N.C.E.S

12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Report to: **Mr. Justin Bates**

Email: **jbates@envirocomp.net**

Project Description: **Line 1 - Sample 2 Line 2 - Sample 1**

City/State Collected: **Mobile/AL**

Phone: **(662) 840-5945**
FAX:

Client Project #:

Lab Project #:
ENVCOMTMS-BAE

Collected by (print): **David Gundlach**

Site/Facility ID#:

P.O.#:

Collected by (signature): *[Signature]*

Rush? (Lab MUST Be Notified)

Date Results Needed

Same Day 200%
 Next Day 100%
 Two Day 50%
 Three Day 25%

Email? No Yes
FAX? No Yes

No. of Cntrs

Metals: 500mlHDPE-HNO3 2

PH 125mlHDPE-NoPres

TSS 1L-HDPE NoPres

Acctnum: **ENVCOMTMS** (lab use only)
Template/Prelogin: **T83746 P427234**
Cooler #: **418136K**
Shipped Via: **FedEX Ground**

Remarks/Contaminant Sample # (lab only)

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals: 500mlHDPE-HNO3	PH 125mlHDPE-NoPres	TSS 1L-HDPE NoPres				
BAEO1E	Grab	WW	-	6/3/13	3:50 PM	3	X	X	X				
BAEO1I	Grab	WW	-	6/3/13	4:10 PM	3	X	X	X				
BAEO2E	Grab	WW	-	6/3/13	3:40 PM	3	X	X	X				
BAEO2I	Grab	WW	-	6/3/13	4:00 PM	3	X	X	X				

L639158-01
-02
-03
-04

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Remarks: _____ Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 6-3-2013	Time: 5:45 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input checked="" type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____	Condition: OK (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 3.3°C	Bottles Received: 12
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 6-4-13	Time: 2900
				pH Checked: L2	NCF: _____

554702392759



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Monday July 15, 2013

Report Number: L643175

Samples Received: 06/25/13

Client Project:

Description: BAE L1-S3- L2-S2

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

This report may not be reproduced, except in full, without written approval from ESC Lab Sciences. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 15, 2013

Date Received : June 25, 2013
 Description : BAE L1-S3- L2-S2
 Sample ID : BAE1E
 Collected By : David Gundlach
 Collection Date : 06/24/13 15:20

ESC Sample # : L643175-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	6.8		su	4500H+ B-2011	07/01/13	1
Suspended Solids	260	2.5	mg/l	2540 D-2011	06/28/13	1
Copper	0.21	0.020	mg/l	200.7	07/04/13	1
Zinc	0.38	0.030	mg/l	200.7	07/04/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
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Reported: 07/15/13 14:59 Printed: 07/15/13 15:44
 L643175-01 (PH) - 6.8@20.3c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 15, 2013

Date Received : June 25, 2013
 Description : BAE L1-S3- L2-S2
 Sample ID : BAE1I
 Collected By : David Gundlach
 Collection Date : 06/24/13 15:15

ESC Sample # : L643175-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.4		su	4500H+ B-2011	07/01/13	1
Suspended Solids	540	2.5	mg/l	2540 D-2011	06/28/13	1
Copper	0.32	0.020	mg/l	200.7	07/04/13	1
Zinc	0.55	0.030	mg/l	200.7	07/04/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 07/15/13 14:59 Printed: 07/15/13 15:44
 L643175-02 (PH) - 7.4@20.5c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 15, 2013

Date Received : June 25, 2013
 Description : BAE L1-S3- L2-S2
 Sample ID : BAE2E
 Collected By : David Gundlach
 Collection Date : 06/24/13 15:25

ESC Sample # : L643175-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.5		su	4500H+ B-2011	07/01/13	1
Suspended Solids	50.	2.5	mg/l	2540 D-2011	06/28/13	1
Copper	0.12	0.020	mg/l	200.7	07/04/13	1
Zinc	0.29	0.030	mg/l	200.7	07/04/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:
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Reported: 07/15/13 14:59 Printed: 07/15/13 15:44
 L643175-03 (PH) - 7.5@21.0c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 15, 2013

Date Received : June 25, 2013
 Description : BAE L1-S3- L2-S2
 Sample ID : BAE2I
 Collected By : David Gundlach
 Collection Date : 06/24/13 15:30

ESC Sample # : L643175-04
 Site ID :
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.7		su	4500H+ B-2011	07/01/13	1
Suspended Solids	29.	2.5	mg/l	2540 D-2011	07/01/13	1
Copper	0.22	0.020	mg/l	200.7	07/04/13	1
Zinc	0.59	0.030	mg/l	200.7	07/04/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
 This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 07/15/13 14:59 Printed: 07/15/13 15:44
 L643175-04 (PH) - 7.7@20.7c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L643175-01	WG669638	SAMP	pH	R2729280	T8
L643175-02	WG669638	SAMP	pH	R2729280	T8
	WG669010	SAMP	Suspended Solids	R2726741	J3
L643175-03	WG669638	SAMP	pH	R2729280	T8
L643175-04	WG669638	SAMP	pH	R2729280	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance Services
P.O. Box 356
Sherman, MS 38869

Billing Information:
Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Report to: Justin Bates

Email to: jbbates@envirocomp.net

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1



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Fax: (615) 758-5859

F078

CoCode (lab use only)
Template/Prelogin
Shipped Via:

Project Description: BAE L1-S3 L2-S2
City/State Collected: Mobile, AL

Phone: 662 840-5945
Client Project #: ESC Key: ENVOCOMTMS-BAE

FAX: Collected by: David Gundlach
Site/Facility ID#: P.O.#:

Collected by (signature): *[Signature]*
Rush? (Lab MUST Be Notified)
___ Same Day.....200%
___ Next Day..... 100%
___ Two Day.....50%
___ Three Day..... 25%

Date Results Needed:
Email? ___No Yes
FAX? ___No ___Yes

Immediately Packed on Ice N Y

Metals 500ml HDPE - No Pres	PH 125ml HDPE - No Pres	TSS 1L HDPE - No Pres	

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals	PH	TSS	Remarks/Contaminant	Sample # (lab only)
BAE1E	Grab	WW		6/24/13	3:20 PM	3	X	X	X	L643175	01
BAE1I	Grab	WW		6/24/13	3:15 PM	3	X	X	X		02
BAE2E	Grab	WW		6/24/13	3:25 PM	3	X	X	X		03
BAE2I	Grab	WW		6/24/13	3:30 PM	3	X	X	X		04

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Flow _____ Other _____

Relinquished by: (Signature) *[Signature]* Date: 6/24/13 Time: 5:00

Received by: (Signature) _____

Samples returned via: UPS FedEx Courier _____

Condition: (lab use only) *of TD*

Temp: 31.0 Bottles Received: 12

CoC Seals Intact: ___ Y ___ N NA

Relinquished by: (Signature) _____ Date: _____ Time: _____

Received for lab by: (Signature) *[Signature]* Date: 6/25/13 Time: 0930

pH Checked: 6.2 NCF: _____



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Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Wednesday July 24, 2013

Report Number: L646352

Samples Received: 07/12/13

Client Project:

Description: BAE Site / L1 Sample 4 - L2 Sample 3

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 24, 2013

Date Received : July 12, 2013
 Description : BAE Site / L1 Sample 4 - L2 Sample 3
 Sample ID : BAE01E
 Collected By : David Gundlach
 Collection Date : 07/11/13 11:05

ESC Sample # : L646352-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.3		su	4500H+ B-2011	07/19/13	1
Suspended Solids	240	2.5	mg/l	2540 D-2011	07/17/13	1
Copper	0.16	0.0010	mg/l	200.8	07/19/13	1
Zinc	0.32	0.010	mg/l	200.8	07/23/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 Note:
 The reported analytical results relate only to the sample submitted.
 This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 07/24/13 11:14 Printed: 07/24/13 11:14
 L646352-01 (PH) - 8.3@15.8c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 24, 2013

Date Received : July 12, 2013
 Description : BAE Site / L1 Sample 4 - L2 Sample 3
 Sample ID : BAE01I
 Collected By : David Gundlach
 Collection Date : 07/11/13 10:40

ESC Sample # : L646352-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.3		su	4500H+ B-2011	07/19/13	1
Suspended Solids	350	2.5	mg/l	2540 D-2011	07/17/13	1
Copper	0.20	0.0010	mg/l	200.8	07/19/13	1
Zinc	0.40	0.010	mg/l	200.8	07/23/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 07/24/13 11:14 Printed: 07/24/13 11:14
 L646352-02 (PH) - 8.3@16.5c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 24, 2013

Date Received : July 12, 2013
 Description : BAE Site / L1 Sample 4 - L2 Sample 3
 Sample ID : BAE02E
 Collected By : David Gundlach
 Collection Date : 07/11/13 10:15

ESC Sample # : L646352-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	4500H+ B-2011	07/19/13	1
Suspended Solids	33.	2.5	mg/l	2540 D-2011	07/17/13	1
Copper	0.085	0.0010	mg/l	200.8	07/19/13	1
Zinc	0.20	0.010	mg/l	200.8	07/23/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 07/24/13 11:14 Printed: 07/24/13 11:14
 L646352-03 (PH) - 8.0@17.7c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

July 24, 2013

Date Received : July 12, 2013
 Description : BAE Site / L1 Sample 4 - L2 Sample 3
 Sample ID : BAE02I
 Collected By : David Gundlach
 Collection Date : 07/11/13 11:20

ESC Sample # : L646352-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.5		su	4500H+ B-2011	07/19/13	1
Suspended Solids	110	2.5	mg/l	2540 D-2011	07/17/13	1
Copper	0.21	0.0050	mg/l	200.8	07/19/13	5
Zinc	0.57	0.010	mg/l	200.8	07/23/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 07/24/13 11:14 Printed: 07/24/13 11:14
 L646352-04 (PH) - 7.5@17.1c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L646352-01	WG672677	SAMP	pH	R2750961	T8
L646352-02	WG672677	SAMP	pH	R2750961	T8
L646352-03	WG672677	SAMP	pH	R2750961	T8
L646352-04	WG672677	SAMP	pH	R2750961	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance

Services
P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356

Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

Page 1 of 1



L · A · B · S · C · I · E · N · C · E · S

12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

A232

Report to: **Mr. Justin Bates** Email: **jbates@envirocomp.net**

Project Description: **BAE Site / L1 sample 4 - L2 sample 3** City/State Collected: **Mobile, AL**

Phone: **(662) 840-5945** Client Project #: Lab Project #: **ENVCOMTMS-BAE**

Collected by (print): **David Brundloch** Site/Facility ID#: P.O.#:

Collected by (signature): *[Signature]* **Rush? (Lab MUST Be Notified)**
 ___ Same Day 200%
 ___ Next Day 100%
 ___ Two Day 50%
 ___ Three Day 25%
 Date Results Needed: _____
 Email? ___ No Yes
 FAX? ___ No ___ Yes
 No. of Cntrs: _____

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mlHDPE-HNO3	PH 125mlHDPE-NoPres	TSS IL-HDPE NoPres					Remarks/Contaminant	Sample # (lab only)
BAE01E	Grab	WW		7.11.13	11:05 AM	3	X	X	X					L646352	-01
BAE01I	Grab	WW		7.11.13	10:40 AM	3	X	X	X						-02
BAE02E	Grab	WW		7.11.13	10:15 AM	3	X	X	X						-03
BAE02I	Grab	WW		7.11.13	11:20 AM	3	X	X	X						-04

Acctnum: **ENVCOMTMS** (lab use only)
 Template/Prelogin: **T83746/P434611**
 Cooler #: **4-24 MS**
 Shipped Via: **FedEX Ground**

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

Remarks: **BAE02I and BAE01E are in one cooler and BAE01I and BAE02E are in the other cooler**

pH _____ Temp _____
 Flow _____ Other _____

5547 0048 7720

Relinquished by: (Signature) <i>[Signature]</i>	Date: 7.11.13	Time: 5:00 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS <input type="checkbox"/> Courier	Condition: (lab use only) OK
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 3.2°C Bottles Received: 12	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) MLow	Date: 7-12-13 Time: 0930	pH Checked: < 7 NCF:



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Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Wednesday August 07, 2013

Report Number: L649321

Samples Received: 07/31/13

Client Project:

Description: BAE L1 S4

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

August 07, 2013

Date Received : July 31, 2013
 Description : BAE L1 S4
 Sample ID : BAE01E
 Collected By : Justin Bates
 Collection Date : 07/30/13 06:55

ESC Sample # : L649321-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.3		su	4500H+ B-2011	08/07/13	1
Suspended Solids	100	2.5	mg/l	2540 D-2011	08/02/13	1
Copper	0.24	0.0010	mg/l	200.8	08/06/13	1
Zinc	0.41	0.010	mg/l	200.8	08/06/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/07/13 13:52 Printed: 08/07/13 13:53
 L649321-01 (PH) - 8.3@17.3c



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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

August 07, 2013

Date Received : July 31, 2013
 Description : BAE L1 S4
 Sample ID : BAE01I
 Collected By : Justin Bates
 Collection Date : 07/30/13 16:55

ESC Sample # : L649321-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.2		su	4500H+ B-2011	08/07/13	1
Suspended Solids	140	2.5	mg/l	2540 D-2011	08/02/13	1
Copper	0.46	0.0010	mg/l	200.8	08/06/13	1
Zinc	1.1	0.050	mg/l	200.8	08/06/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/07/13 13:52 Printed: 08/07/13 13:53
 L649321-02 (PH) - 8.2@17.6c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L649321-01	WG675624	SAMP	pH	R2771240	T8
L649321-02	WG675624	SAMP	pH	R2771240	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

Billing Information:
 P.O. Box 356
 Sherman, MS 38869

Report to:
 Mr. Justin Bates

Email To:
 jlbates@envirocomp.net

Project Description: **BAE L1 S4**

City/State Collected: **Mobile, AL**

Phone: **228-872-2528**

Client Project #

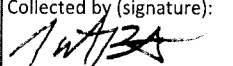
Lab Project #
ENVCOMTMS-BAE

Fax:

Collected by (print):
Justin Bates

Site/Facility ID #

P.O. #

Collected by (signature):


Rush? (Lab MUST Be Notified)
 ___ Same Day200%
 ___ Next Day100%
 ___ Two Day50%
 ___ Three Day25%

Date Results Needed
 Email? ___ No **X** Yes
 FAX? ___ No ___ Yes

Immediately Packed on Ice N ___ Y **✓**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative		
							Metals 500mIHDPE-HNO3 L2	PH 125mIHDPE-NoPres	TSS 1L-HDPE NoPres
BAE01E	grab	WW	-	7/30/13	4:55 PM	3	X	X	X
BAE01I	grab	WW	-	7/30/13	4:55 PM	3	X	X	X
BAE02E	-	WW	-	-	-	3	X	X	X
BAE02I	-	WW	-	-	-	3	X	X	X

Chain of Custody Page ___ of ___



L.A.B S.C.I.E.N.C.E.S

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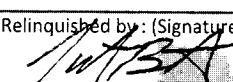

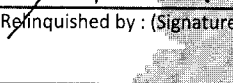

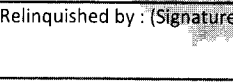
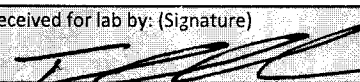


L# **649321**

Tablet **C127**
 Acctnum: **ENVCOMTMS**
 Template: **T83746**
 Prelogin: **P437320**
 TSR: **034 - Craig Cothron**
 PB: **7-24-136**
 Shipped Via: **FedEX Ground**

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____ pH _____ Temp _____

Remarks: _____ Flow _____ Other _____ Hold # _____

Relinquished by: (Signature) 	Date: 7/30/13 PM	Time: 5:55 PM	Received by: (Signature) 	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____	Condition: (lab use only) JR
Relinquished by: (Signature) 	Date:	Time:	Received by: (Signature) 	Temp: 3.6 °C Bottles Received: 6	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) 	Date:	Time:	Received for lab by: (Signature) 	Date: 7/31/13 Time: 0900	pH Checked: L2 NCF: _____



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Est. 1970

Mr. Justin Bates
Environmental Compliance Services
2113 Government Street Ste B3
Ocean Springs, MS 39564

Report Summary

Thursday August 08, 2013

Report Number: L650001

Samples Received: 08/03/13

Client Project:

Description: LZ-S4

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Craig Cothron , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

August 08, 2013

Date Received : August 03, 2013
 Description : LZ-S4
 Sample ID : BAE02E
 Collected By : Justin Bates
 Collection Date : 08/02/13 09:15

ESC Sample # : L650001-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.1		su	4500H+ B-2011	08/08/13	1
Suspended Solids	110	2.5	mg/l	2540 D-2011	08/07/13	1
Copper	0.28	0.0010	mg/l	200.8	08/05/13	1
Zinc	0.63	0.010	mg/l	200.8	08/05/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/08/13 13:43 Printed: 08/08/13 13:49
 L650001-01 (PH) - 8.1@21.1c



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Est. 1970

REPORT OF ANALYSIS

Mr. Justin Bates
 Environmental Compliance Services
 2113 Government Street Ste B3
 Ocean Springs, MS 39564

August 08, 2013

Date Received : August 03, 2013
 Description : LZ-S4
 Sample ID : BAE02I
 Collected By : Justin Bates
 Collection Date : 08/02/13 09:15

ESC Sample # : L650001-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	7.8		su	4500H+ B-2011	08/08/13	1
Suspended Solids	35.	2.5	mg/l	2540 D-2011	08/07/13	1
Copper	0.16	0.0010	mg/l	200.8	08/05/13	1
Zinc	0.40	0.010	mg/l	200.8	08/05/13	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.
 This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 08/08/13 13:43 Printed: 08/08/13 13:49
 L650001-02 (PH) - 7.8@20.6c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L650001-01	WG675839	SAMP	pH	R2773084	T8
L650001-02	WG675839	SAMP	pH	R2773084	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

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- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Environmental Compliance Services
P.O. Box 356
Sherman, MS 38869

Billing information:

Mr. Brian Ketchum
P.O. Box 356
Sherman, MS 38869

Analysis/Container/Preservative

Chain of Custody

Page ___ of ___



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Mt. Juliet, TN 37122

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Phone: (615) 758-5858
Fax: (615) 758-5859

J191

Report to: **Mr. Justin Bates** Email: **jbates@envirocomp.net**

Project Description: **LZ-54** City/State Collected: **Mobile, AL**

Phone: (662) 840-5945 Client Project #: **ENVCOMTMS-BAE**

FAX: Site/Facility ID#: P.O.#:

Collected by (print): **Justin Bates**

Collected by (signature): *[Signature]*

Immediately Packed on Ice N Y

Rush? (Lab MUST Be Notified)

Same Day200%
Next Day100%
Two Day50%
Three Day25%

Date Results Needed

Email? No Yes
FAX? No Yes

No. of Cntrs

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Metals 500mlHDPE-HNO3	PH 125mlHDPE-NoPres	TSS 1L-HDPE NoPres	Remarks/Contaminant	Sample # (lab only)
BAE01E	—	WW	—	—	—	3	X	X	X		
BAE01I	—	WW	—	—	—	3	X	X	X		
BAE02E	grab	WW	—	8/7/13	9:15 AM	3	X	X	X		664 6650 001-01
BAE02I	grab	WW	—	8/2/13	9:15 AM	3	X	X	X		

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

5547 6248 7719

Relinquished by: (Signature) <i>[Signature]</i>	Date: 8/3/13	Time: 5:50 PM	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only) <i>[Signature]</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 31 Bottles Received: 6	COC Seal Intact: ___ Y ___ N ___ NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 8-3-13 Time: 0930	pH Checked: <2 NCF:

APPENDIX B

TCLP ANALYSIS



12065 Lebanon Rd.
Mt. Juliet, TN 37122
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1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Brian Ketchum
Environmental Compliance Services
P.O. Box 356
Sherman, MS 38869

Report Summary

Thursday October 24, 2013

Report Number: L663940

Samples Received: 10/18/13

Client Project:

Description: TCLP - Ingalls Slurry Pit

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

T. Alan Harvill , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

October 24, 2013

Mr. Brian Ketchum
 Environmental Compliance Services
 P.O. Box 356
 Sherman, MS 38869

ESC Sample # : L663940-01

Date Received : October 18, 2013
 Description : TCLP - Ingalls Slurry Pit

Site ID :

Sample ID : SAMPLE 1

Project :

Collected By : Justin Bates
 Collection Date : 10/15/13 14:00

Parameter	Result	Det. Limit	Units	Limit	Method	Date/Time	By	Dil
TCLP Extraction	-				1311	10/20/13 0714	MVE	1
Mercury	BDL	0.0010	mg/l	0.20	7470A	10/22/13 1128	CHM	1
Arsenic	BDL	0.050	mg/l	5.0	6010B	10/24/13 0358	JBC	1
Barium	0.46	0.15	mg/l	100	6010B	10/24/13 0358	JBC	1
Cadmium	BDL	0.050	mg/l	1.0	6010B	10/24/13 0358	JBC	1
Chromium	BDL	0.050	mg/l	5.0	6010B	10/24/13 0358	JBC	1
Lead	BDL	0.050	mg/l	5.0	6010B	10/24/13 0358	JBC	1
Selenium	BDL	0.050	mg/l	1.0	6010B	10/24/13 0358	JBC	1
Silver	BDL	0.050	mg/l	5.0	6010B	10/24/13 0358	JBC	1
TCLP ZHE Extraction	-				1311	10/20/13 0714	MVE	1
TCLP Volatiles								
Benzene	BDL	0.050	mg/l	0.50	8260B	10/20/13 2109	RB	1
Carbon tetrachloride	BDL	0.050	mg/l	0.50	8260B	10/20/13 2109	RB	1
Chlorobenzene	BDL	0.050	mg/l	100	8260B	10/20/13 2109	RB	1
Chloroform	BDL	0.25	mg/l	6.0	8260B	10/20/13 2109	RB	1
1,2-Dichloroethane	BDL	0.050	mg/l	0.50	8260B	10/20/13 2109	RB	1
1,1-Dichloroethene	BDL	0.050	mg/l	0.70	8260B	10/20/13 2109	RB	1
2-Butanone (MEK)	BDL	0.50	mg/l	200	8260B	10/20/13 2109	RB	1
Tetrachloroethene	BDL	0.050	mg/l	0.70	8260B	10/20/13 2109	RB	1
Trichloroethene	BDL	0.050	mg/l	0.50	8260B	10/20/13 2109	RB	1
Vinyl chloride	BDL	0.050	mg/l	0.20	8260B	10/20/13 2109	RB	1
Surrogate Recovery								
Toluene-d8	104.		% Rec.	114.	8260B	10/20/13 2109	RB	1
Dibromofluoromethane	110.		% Rec.	125.	8260B	10/20/13 2109	RB	1
a,a,a-Trifluorotoluene	98.0		% Rec.	114.	8260B	10/20/13 2109	RB	1
4-Bromofluorobenzene	101.		% Rec.	128.	8260B	10/20/13 2109	RB	1
TCLP Pesticides								
Chlordane	BDL	0.0050	mg/l	0.030	8081A	10/21/13 1910	CBB	1
Endrin	BDL	0.0050	mg/l	0.020	8081A	10/21/13 1910	CBB	1
Heptachlor	BDL	0.0050	mg/l	0.0080	8081A	10/21/13 1910	CBB	1
Lindane	BDL	0.0050	mg/l	0.40	8081A	10/21/13 1910	CBB	1
Methoxychlor	BDL	0.0050	mg/l	10.	8081A	10/21/13 1910	CBB	1
Toxaphene	BDL	0.010	mg/l	0.50	8081A	10/21/13 1910	CBB	1
Surrogate Recovery								
Decachlorobiphenyl	82.1		% Rec.	123.	8081A	10/21/13 1910	CBB	1
Tetrachloro-m-xylene	64.7		% Rec.	114.	8081A	10/21/13 1910	CBB	1
TCLP Herbicides								



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Est. 1970

REPORT OF ANALYSIS

October 24, 2013

Mr. Brian Ketchum
 Environmental Compliance Services
 P.O. Box 356
 Sherman, MS 38869

ESC Sample # : L663940-01

Date Received : October 18, 2013
 Description : TCLP - Ingalls Slurry Pit

Site ID :

Sample ID : SAMPLE 1

Project :

Collected By : Justin Bates
 Collection Date : 10/15/13 14:00

Parameter	Result	Det. Limit	Units	Limit	Method	Date/Time	By	Dil
2,4,5-TP (Silvex)	BDL	0.0020	mg/l	1.0	8151A	10/23/13 2258	KLM	1
2,4-D	BDL	0.0020	mg/l	10.	8151A	10/23/13 2258	KLM	1
Surrogate Recovery								
2,4-Dichlorophenyl Acetic Acid	100.		% Rec.		8151A	10/23/13 2258	KLM	1
TCLP Semi-Volatiles								
1,4-Dichlorobenzene	BDL	0.10	mg/l	7.5	8270C	10/23/13 0723	KMF	1
2,4-Dinitrotoluene	BDL	0.10	mg/l	0.13	8270C	10/23/13 0723	KMF	1
Hexachlorobenzene	BDL	0.10	mg/l	0.13	8270C	10/23/13 0723	KMF	1
Hexachloro-1,3-butadiene	BDL	0.10	mg/l	0.50	8270C	10/23/13 0723	KMF	1
Hexachloroethane	BDL	0.10	mg/l	3.0	8270C	10/23/13 0723	KMF	1
Nitrobenzene	BDL	0.10	mg/l	2.0	8270C	10/23/13 0723	KMF	1
Pyridine	BDL	0.10	mg/l	5.0	8270C	10/23/13 0723	KMF	1
3&4-Methyl Phenol	BDL	0.10	mg/l	400	8270C	10/23/13 0723	KMF	1
2-Methylphenol	BDL	0.10	mg/l	200	8270C	10/23/13 0723	KMF	1
Pentachlorophenol	BDL	0.10	mg/l	100	8270C	10/23/13 0723	KMF	1
2,4,5-Trichlorophenol	BDL	0.10	mg/l	400	8270C	10/23/13 0723	KMF	1
2,4,6-Trichlorophenol	BDL	0.10	mg/l	2.0	8270C	10/23/13 0723	KMF	1
Surrogate Recovery								
2-Fluorophenol	32.7		% Rec.	87.0	8270C	10/23/13 0723	KMF	1
Phenol-d5	23.2		% Rec.	67.0	8270C	10/23/13 0723	KMF	1
Nitrobenzene-d5	56.8		% Rec.	120.	8270C	10/23/13 0723	KMF	1
2-Fluorobiphenyl	65.0		% Rec.	122.	8270C	10/23/13 0723	KMF	1
2,4,6-Tribromophenol	60.5		% Rec.	148.	8270C	10/23/13 0723	KMF	1
p-Terphenyl-d14	64.5		% Rec.	149.	8270C	10/23/13 0723	KMF	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Limit - Maximum Contaminant Level as established by the US EPA

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 10/24/13 19:26 Printed: 10/24/13 19:26

Company Name/Address:
ECS, Inc.
 P.O. Box 356
 Sherman MS, 38869

Billing Information:
Mr. Brian Ketchum
 P.O. Box 356
 Sherman MS, 38869


Analysis / Container / Preservative

Chain of Custody Page ___ of ___



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 Mount Juliet, TN 37122
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 Phone: 800-767-5859
 Fax: 615-758-5859



Report to:
Brian Ketchum

Email To:
bates@envirocomp.net

Project Description:
TCLP - Ingalls Slurry Pit

City/State Collected:
Pascagoula, MS

Phone: **228-840-5945**
 Fax:


Client Project #

Lab Project #

Collected by (print):
Justin Bates

Site/Facility ID #

P.O. #

Collected by (signature):

 Immediately
 Packed on Ice N ___ Y

Rush? (Lab MUST Be Notified)
 ___ Same Day200%
 ___ Next Day100%
 ___ Two Day50%
 ___ Three Day25%

Date Results Needed
 Email? ___ No Yes
 FAX? No ___ Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TCLP VOC	TCLP SVOC	TCLP Pesticides	TCLP Herbicides	TCLP RCRA 8 Metals							
Sample 1	Grab	Other	-	10/15/2013	2:00 p.m.	1	X	X	X	X	X							

L# **L663940**

Table #

Acctnum: **ENVCOMTMS**

Template: **T83743**

Prelogin: **P437318**

TSR: **034-Craig Cothran**

PB:

Shipped Via:




Rem./Contaminant

Sample # (lab only)

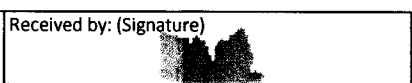


-01

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____
 Flow _____ Other _____

Relinquished by: (Signature)

 Relinquished by: (Signature)

 Relinquished by: (Signature)


Date: **10/16/13**
 Time: **9:00am**
 Date: _____
 Time: _____
 Date: _____
 Time: _____

Received by: (Signature)

 Received by: (Signature)

 Received for lab by: (Signature)


Samples returned via: UPS
 FedEx Courier _____
 Temp: **3.1°C**
 Bottles Received: **1 Bag**
 Date: **10/17/13**
 Time: **2:00**

Hold #

Condition: (lab use only)
OK PK

CDC Seal Intact: **Y** **N** **NA**

pH Checked: _____
 NCF: _____

OK

OK