




McClelland Consulting Engineers, Inc.  
ATTN: Mr. Matt Bienvenu  
Post Office Box 34087  
Little Rock, AR 72203-4087

This report contains the analytical results and supporting information for the sample submitted on January 9, 2015. Attached please find a copy of the Chain of Custody and/or other documents received. Note that any remaining sample will be discarded two weeks from the original report date unless other arrangements are made.

This report is intended for the sole use of the client listed above. Assessment of the data requires access to the entire document.

This report has been reviewed by the Laboratory Director or a qualified designee.



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John Overbey  
Laboratory Director

This document has been distributed to the following:

PDF cc: McClelland Consulting Engineers, Inc.  
ATTN: Mr. Matt Bienvenu  
mbienvenu@mcclelland-engrs.com

McClelland Consulting Engineers, Inc.  
ATTN: Mr. Dan Beranek  
dberanek@mcclelland-engrs.com



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Little Rock, AR 72203-4087

### SAMPLE INFORMATION

#### Project Description:

One (1) sludge sample(s) received on January 9, 2015

#### Receipt Details:

A Chain of Custody was provided. The samples were delivered in one (1) ice chest.

Each sample container was checked for proper labeling, including date and time sampled. Sample containers were reviewed for proper type, adequate volume, integrity, temperature, preservation, and holding times. Any exceptions are noted below:

#### Sample Identification:

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Sampled Date/Time</u>	<u>Notes</u>
186484-1	Calico Rock	07-Jan-2015	1

#### Notes:

1. Sample label was incomplete in regard to date/time of sampling

#### Qualifiers:

- H Analytical holding time exceeded regulatory requirements
- X Spiking level is invalid due to the high concentration of analyte in the spiked sample

#### Case Narrative:

Analysis of soils/sludges are reported on a dry-weight basis unless otherwise specified.

#### References:

- "Methods for Chemical Analysis of Water and Wastes", EPA/600/4-79-020 (Mar 1983) with updates and supplements EPA/600/5-91-010 (Jun 1991), EPA/600/R-92-129 (Aug 1992) and EPA/600/R-93-100 (Aug 1993).
- "Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846)", Third Edition.
- "Standard Methods for the Examination of Water and Wastewaters", (SM).
- "American Society for Testing and Materials" (ASTM).
- "Association of Analytical Chemists" (AOAC).

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**ANALYTICAL RESULTS**

AIC No. 186484-1

Sample Identification: Calico Rock 07-Jan-2015

<b>Analyte</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Qualifier</b>
<b>pH</b> EPA 9045C Prep: 12-Jan-2015 1523 by 93	<b>6.5</b> Analyzed: 12-Jan-2015 1630 by 93		<b>Units</b> Batch: W50569	<b>H</b>
<b>Electrical Conductivity</b> Mod. EPA 9050A Prep: 13-Jan-2015 1512 by 93	<b>640</b> Analyzed: 13-Jan-2015 1715 by 93	<b>2</b>	<b>umho/cm</b> Batch: W50587	
<b>Cation-Exchange Capacity</b> Mod. EPA 9080 Prep: 14-Jan-2015 0808 by 308	<b>190</b> Analyzed: 14-Jan-2015 0808 by 308	<b>0.6</b>	<b>meq/100g</b> Batch: W50595	
<b>Total Solids</b> SM 2540 G 1997 Prep: 09-Jan-2015 1459 by 302	<b>18</b> Analyzed: 12-Jan-2015 1429 by 302	<b>0.01</b>	<b>wt %</b> Batch: W50547	
<b>Ammonia as N</b> SM 4500-NH3 B,G 1997 Prep: 12-Jan-2015 1522 by 93	<b>5400</b> Analyzed: 12-Jan-2015 2032 by 93	<b>300</b>	<b>mg/Kg</b> Batch: W50568	
<b>Arsenic</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>&lt; 5</b> Analyzed: 13-Jan-2015 1922 by 311	<b>5</b>	<b>mg/Kg</b> Batch: S38072	
<b>Cadmium</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>&lt; 0.4</b> Analyzed: 13-Jan-2015 1922 by 311	<b>0.4</b>	<b>mg/Kg</b> Batch: S38072	
<b>Copper</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>170</b> Analyzed: 13-Jan-2015 1922 by 311	<b>0.6</b>	<b>mg/Kg</b> Batch: S38072	
<b>Lead</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>&lt; 4</b> Analyzed: 13-Jan-2015 1922 by 311	<b>4</b>	<b>mg/Kg</b> Batch: S38072	
<b>Magnesium</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>3600</b> Analyzed: 13-Jan-2015 1922 by 311	<b>3</b>	<b>mg/Kg</b> Batch: S38072	
<b>Nickel</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>9.3</b> Analyzed: 13-Jan-2015 1922 by 311	<b>1</b>	<b>mg/Kg</b> Batch: S38072	
<b>Phosphorus</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>11000</b> Analyzed: 13-Jan-2015 1925 by 311	<b>100</b>	<b>mg/Kg</b> Batch: S38072	
<b>Potassium</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>1700</b> Analyzed: 13-Jan-2015 1922 by 311	<b>100</b>	<b>mg/Kg</b> Batch: S38072	
<b>Selenium</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>&lt; 7</b> Analyzed: 13-Jan-2015 1922 by 311	<b>7</b>	<b>mg/Kg</b> Batch: S38072	
<b>Zinc</b> EPA 3051A, 6010C Prep: 12-Jan-2015 1233 by 313	<b>240</b> Analyzed: 13-Jan-2015 1922 by 311	<b>0.2</b>	<b>mg/Kg</b> Batch: S38072	
<b>Mercury</b> EPA 7471B Prep: 14-Jan-2015 0834 by 302	<b>0.56</b> Analyzed: 14-Jan-2015 1451 by 311	<b>0.08</b>	<b>mg/Kg</b> Batch: S38083	

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**DUPLICATE RESULTS**

Analyte	AIC No.	Result	RPD	RPD Limit	Preparation Date	Analysis Date	Dil	Qual
Total Solids	186445-3	3.3 wt %			09Jan15 1459 by 302	12Jan15 1429 by 302		
	Batch: W50547	Duplicate	3.3 wt %	1.36	10.0	09Jan15 1459 by 302	12Jan15 1429 by 302	
pH	186445-3	7.2 Units			12Jan15 1523 by 93	12Jan15 1630 by 93		H
	Batch: W50569	Duplicate	7.2 Units	0.555	5.00	12Jan15 1523 by 93	12Jan15 1630 by 93	H
Electrical Conductivity	186483-1	860 umho/cm			13Jan15 1512 by 93	13Jan15 1715 by 93		
	Batch: W50587	Duplicate	830 umho/cm	3.77	20.0	13Jan15 1513 by 93	13Jan15 1715 by 93	
Cation-Exchange Capacity	186483-1	79 meq/100g				14Jan15 0808 by 308		
	Batch: W50595	Duplicate	74 meq/100g	6.50	19.6		14Jan15 0809 by 308	

**LABORATORY CONTROL SAMPLE RESULTS**

Analyte	Spike Amount	%	Limits	RPD	Limit	Batch	Preparation Date	Analysis Date	Dil	Qual
pH	-	99.9	98.0-102			W50569	12Jan15 1523 by 93	12Jan15 1630 by 93		
Electrical Conductivity	1410 umho/cm	101	97.1-105			W50587	13Jan15 1513 by 93	13Jan15 1715 by 93		
Ammonia as N	20.0 mg/Kg	99.8	80.0-120			W50568	12Jan15 1523 by 93	12Jan15 1843 by 93		
Arsenic	500 mg/Kg	99.5	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Cadmium	500 mg/Kg	97.3	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Copper	50.0 mg/Kg	95.9	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Lead	500 mg/Kg	97.7	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Magnesium	1000 mg/Kg	99.4	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Nickel	50.0 mg/Kg	96.9	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Phosphorus	500 mg/Kg	106	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Potassium	1000 mg/Kg	97.7	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Selenium	500 mg/Kg	98.3	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Zinc	50.0 mg/Kg	94.7	85.0-115			S38072	12Jan15 1233 by 313	13Jan15 1742 by 311		
Mercury	1.25 mg/Kg	94.6	85.0-115			S38083	14Jan15 0834 by 302	14Jan15 1417 by 311		

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**MATRIX SPIKE SAMPLE RESULTS**

Analyte	Sample	Spike Amount	%	Limits	Batch	Preparation Date	Analysis Date	Dil	Qual
Ammonia as N	186445-3	20.1 mg/Kg	97.2	80.0-120	W50568	12Jan15 1523 by 93	12Jan15 2027 by 93		
	186445-3	19.5 mg/Kg	118	80.0-120	W50568	12Jan15 1523 by 93	12Jan15 2028 by 93		
	Relative Percent Difference:		0.900	25.0	W50568				
Arsenic	186454-2	498 mg/Kg	97.2	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		
	186454-2	496 mg/Kg	95.1	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		
	Relative Percent Difference:		2.16	20.0	S38072				
Cadmium	186454-2	498 mg/Kg	93.6	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		
	186454-2	496 mg/Kg	91.5	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		
	Relative Percent Difference:		2.21	20.0	S38072				
Copper	186454-2	49.8 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		X
	186454-2	49.6 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		X
	Relative Percent Difference:		2.30	20.0	S38072				
Lead	186454-2	498 mg/Kg	95.9	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		
	186454-2	496 mg/Kg	93.2	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		
	Relative Percent Difference:		2.67	20.0	S38072				
Magnesium	186454-2	995 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		X
	186454-2	992 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		X
	Relative Percent Difference:		4.95	20.0	S38072				
Nickel	186454-2	49.8 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		X
	186454-2	49.6 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		X
	Relative Percent Difference:		0.723	20.0	S38072				
Phosphorus	186454-2	498 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1750 by 311		X
	186454-2	496 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1802 by 311		X
	Relative Percent Difference:		7.17	20.0	S38072				
Potassium	186454-2	995 mg/Kg	87.7	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		
	186454-2	992 mg/Kg	84.4	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		
	Relative Percent Difference:		1.97	20.0	S38072				
Selenium	186454-2	498 mg/Kg	92.5	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		
	186454-2	496 mg/Kg	89.9	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		
	Relative Percent Difference:		2.65	20.0	S38072				
Zinc	186454-2	49.8 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1747 by 311		X
	186454-2	49.6 mg/Kg	-	75.0-125	S38072	12Jan15 1233 by 313	13Jan15 1759 by 311		X
	Relative Percent Difference:		5.67	20.0	S38072				
Mercury	186454-2	2.47 mg/Kg	112	70.0-130	S38083	14Jan15 0834 by 302	14Jan15 1421 by 311		
	186454-2	2.46 mg/Kg	88.0	70.0-130	S38083	14Jan15 0834 by 302	14Jan15 1424 by 311		
	Relative Percent Difference:		15.6	20.0	S38083				

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**LABORATORY BLANK RESULTS**

<b>Analyte</b>	<b>Result</b>	<b>RL</b>	<b>PQL</b>	<b>QC Sample</b>	<b>Preparation Date</b>	<b>Analysis Date</b>	<b>Qual</b>
Electrical Conductivity	< 2 umho/cm	2	2	W50587-1	13Jan15 1513 by 93	13Jan15 1715 by 93	
Cation-Exchange Capacity	< 0.1 meq/100g	0.1	0.1	W50595-1		14Jan15 0809 by 308	
Total Solids	< 0.01 wt %	0.01	0.01	W50547-1	09Jan15 1459 by 302	12Jan15 1429 by 302	
Ammonia as N	< 1 mg/Kg	1	1	W50568-1	12Jan15 1523 by 93	12Jan15 1842 by 93	
Arsenic	< 5 mg/Kg	5	5	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Cadmium	< 0.4 mg/Kg	0.4	0.4	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Copper	< 0.6 mg/Kg	0.6	0.6	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Lead	< 4 mg/Kg	4	4	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Magnesium	< 3 mg/Kg	3	3	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Nickel	< 1 mg/Kg	1	1	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Phosphorus	< 10 mg/Kg	10	10	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Potassium	< 100 mg/Kg	100	100	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Selenium	< 7 mg/Kg	7	7	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Zinc	< 0.2 mg/Kg	0.2	0.2	S38072-1	12Jan15 1233 by 313	13Jan15 1736 by 311	
Mercury	< 0.1 mg/Kg	0.1	0.1	S38083-1	14Jan15 0834 by 302	14Jan15 1413 by 311	



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE 1 OF 1

Client: MCE  
 Project Reference: Ric Roll  
 Project Manager: JESSICA BROWN  
 Sampled By: Calico Rock 11/7/15  
 AIC No. \_\_\_\_\_  
 Date/Time Collected: \_\_\_\_\_

ANALYSES REQUESTED	NO OF BOTTLES	SAMPLE MATRIX		NO OF BOTTLES
		WATER	SOIL	
Mercury				
Zinc				
Selenium				
Potassium				
Phosphorus				
Nickel				
Magnesium				
Lead				
Copper				
Cadmium				
Arsenic				
Ammonia as N				
Total Solids				
Cation-Exchange Capacity				
Conductivity				
Electrical				
pH				

PO No. \_\_\_\_\_

Container Type: \_\_\_\_\_  
 Preservative: \_\_\_\_\_

G = Glass  
 NO = none  
 P = Plastic  
 S = Sulfuric acid pH-2

V = VOA vials  
 N = Nitric acid pH-2

H = HCl to pH2  
 B = NaOH to pH12

T = Sodium Thiosulfate  
 Z = Zinc acetate

Retinquired By: \_\_\_\_\_ Date/Time: 11/9/15 1135  
 Retinquired By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received in Lab By: \_\_\_\_\_ Date/Time: 1-9-15 1135

Comments: \_\_\_\_\_

Field pH calibration on \_\_\_\_\_ Buffer: \_\_\_\_\_

Received Temperature C: 11.8

Remarks: \_\_\_\_\_

Carrier: \_\_\_\_\_

AIC CONTROL NO: 186484  
 AIC PROPOSAL NO: \_\_\_\_\_

Turnaround Time Requested: (Please circle)  
 NORMAL or EXPEDITED IN \_\_\_\_\_ DAYS

Expeditied results requested by: \_\_\_\_\_  
 Who should AIC contact with questions: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Report Attention to: \_\_\_\_\_  
 Report Address to: \_\_\_\_\_