



# FOUNDATION

## ENERGY MANAGEMENT, LLC

Foundation Energy Management, LLC  
16000 North Dallas Parkway, Suite 875  
Dallas, Texas 75248

March 29, 2016

Colorado Oil and Gas Corporation Commission  
1120 Lincoln Street, Suite 801  
Denver, Colorado 80203  
ATTN: Rob Young

**RE: SPILL ID# 442769**

Dear Mr. Rob Young,

Foundation Energy Management, LLC (Foundation) is submitting the sampling results for the Spill ID# 442769, Hilltop #32-5.

Below is a table that outlines what samples we took and their thresholds. Attached to this letter is the complete sampling report and a map of where the samples were taken.

Location of Sample	Depth of Sample	Tested for	Sample Taken Date	Sample Result	Table 910-1 Standard	Below Standards?
Background 1 (1366755)	0-6"	pH	3/21/2016	7.5	6-9	YES
Background 2 (1366756)	6-36"	pH	3/21/2016	8.4	6-9	YES
North 1 (1366757)	0-6"	pH	3/21/2016	7.6	6-9	YES
North 2 (1366758)	6-36"	pH	3/21/2016	7.7	6-9	YES
Middle 1 (1366759)	0-6"	pH	3/21/2016	6.9	6-9	YES
Middle 2 (1366760)	6-36"	pH	3/21/2016	8	6-9	YES
South 1 (1366761)	0-6"	pH	3/21/2016	6.5	6-9	YES
South 2 (1366762)	6-36"	pH	3/21/2016	7.3	6-9	YES
W 2nd Leaf 1 (1366763)	0-6"	pH	3/21/2016	7.7	6-9	YES
W 2nd Leaf 2 (1366764)	6-36"	pH	3/21/2016	8.4	6-9	YES
E 2nd Leaf 1 (1366765)	0-6"	pH	3/21/2016	8.4	6-9	YES
E 2nd Leaf 2 (1366766)	6-36"	pH	3/21/2016	8.4	6-9	YES

Location of Sample	Depth of Sample	Tested for	Sample Taken Date	Sample Result	Table 910-1 Standard	Below Standards?
Background 1 (1366755)	0-6"	SAR	3/21/2016	0.26	< 12	YES
Background 2 (1366756)	6-36"	SAR	3/21/2016	0.26	< 12	YES
North 1 (1366757)	0-6"	SAR	3/21/2016	0.42	< 12	YES
North 2 (1366758)	6-36"	SAR	3/21/2016	0.14	< 12	YES
Middle 1 (1366759)	0-6"	SAR	3/21/2016	0.28	< 12	YES
Middle 2 (1366760)	6-36"	SAR	3/21/2016	22.14	< 12	NO
South 1 (1366761)	0-6"	SAR	3/21/2016	3.11	< 12	YES
South 2 (1366762)	6-36"	SAR	3/21/2016	35.87	< 12	NO
W 2nd Leaf 1 (1366763)	0-6"	SAR	3/21/2016	0.46	< 12	YES
W 2nd Leaf 2 (1366764)	6-36"	SAR	3/21/2016	0.39	< 12	YES
E 2nd Leaf 1 (1366765)	0-6"	SAR	3/21/2016	3.55	< 12	YES
E 2nd Leaf 2 (1366766)	6-36"	SAR	3/21/2016	0.21	< 12	YES

### Tulsa Office

15 East 5<sup>th</sup> Street, Suite 1200  
Tulsa, Oklahoma 74103  
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Location of Sample	Depth of Sample	Tested for	Sample Taken Date	Sample Result	Table 910-1 Standard	Below Standards?
Background 1 (1366755)	0-6"	EC	3/21/2016	0.34	< 4 mmhos/cm or 2x Background	YES
Background 2 (1366756)	6-36"	EC	3/21/2016	0.48	< 4 mmhos/cm or 2x Background	YES
North 1 (1366757)	0-6"	EC	3/21/2016	0.32	< 4 mmhos/cm or 2x Background	YES
North 2 (1366758)	6-36"	EC	3/21/2016	0.34	< 4 mmhos/cm or 2x Background	YES
Middle 1 (1366759)	0-6"	EC	3/21/2016	0.16	< 4 mmhos/cm or 2x Background	YES
Middle 2 (1366760)	6-36"	EC	3/21/2016	1.38	< 4 mmhos/cm or 2x Background	YES
South 1 (1366761)	0-6"	EC	3/21/2016	0.34	< 4 mmhos/cm or 2x Background	YES
South 2 (1366762)	6-36"	EC	3/21/2016	3.06	< 4 mmhos/cm or 2x Background	YES
W 2nd Leaf 1 (1366763)	0-6"	EC	3/21/2016	0.58	< 4 mmhos/cm or 2x Background	YES
W 2nd Leaf 2 (1366764)	6-36"	EC	3/21/2016	0.64	< 4 mmhos/cm or 2x Background	YES
E 2nd Leaf 1 (1366765)	0-6"	EC	3/21/2016	0.28	< 4 mmhos/cm or 2x Background	YES
E 2nd Leaf 2 (1366766)	6-36"	EC	3/21/2016	0.34	< 4 mmhos/cm or 2x Background	YES

Please contact me at (918) 526-5591 or [cohair@foundationenergy.com](mailto:cohair@foundationenergy.com) if you have any questions.

Regards,

Caitlin O'Hair  
HSE/Regulatory Tech

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700 West D Street / PO Box 370 / McCook, Nebraska 69001  
Office: 308-345-3670 / FAX: 308-345-7880  
[www.AmAgLab.com](http://www.AmAgLab.com)

DATE REPORTED: 03/28/2016

SOIL TEST RESULTS																			
LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH		LIME REC T/A 60% ECCE		EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA)		PHOSPHORUS						
				1 : 1 Soil	Buffer Woodruff	Legume	Non Legume				P1 ppm	Bicarb ppm	P2 ppm	M2 ppm	M3 ppm				
1366755	HILLTOP 32 5	BACKGROUND	0-6	7.5				N	0.34										
1366756	HILLTOP 32 5	BACKGROUND	6-36	8.4				H	0.48										
1366757	HILLTOP 32 5	NORTH	0-6	7.6				N	0.32										
1366758	HILLTOP 32 5	NORTH	6-36	7.7				N	0.34										
1366759	HILLTOP 32 5	MIDDLE	0-6	6.9				N	0.16										
1366760	HILLTOP 32 5	MIDDLE	6-36	8.0				N	1.38										
LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable)				DTPA				BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION							
		K ppm	Ca ppm	Mg ppm	Na ppm	Zn ppm	Fe ppm	Mn ppm	Cu ppm			BASE	H	Ca	Mg	K	Na		
1366755										0.2									
1366756										0.2									
1366757										0.1									
1366758										0.2									
1366759										0.1									
1366760										1.2									
LAB NUMBER	SOLUBLE (SAT. EXT.)			SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS				CHLORIDE		EXCH NH4-N		ALUMINUM ppm	TOTAL N %			
	Ca me/L	Mg me/L	Na me/L				SAND %	SILT %	CLAY %	SOIL TEXTURE	ppm	lbs/A	ppm	lbs/A					
1366755	2.78	0.58	0.34	0.28	1	0.0													
1366756	2.29	0.40	0.30	0.26	1	0.0													
1366757	2.50	0.76	0.54	0.42	1	0.0													
1366758	2.01	0.47	0.16	0.14	1	0.0													
1366759	2.54	5.80	0.57	0.28	1	0.0													
1366760	1.60	0.66	23.54	22.14	32	2.3													
SUGGESTED FERTILIZER RECOMMENDATIONS																			
LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A				
1366755	HILLTOP 32 5	BACKGROUND																	
1366757	HILLTOP 32 5	NORTH																	
1366759	HILLTOP 32 5	MIDDLE																	
Analysis By: American Agricultural Lab      Recommendations By: American Agricultural Lab      Electronically Approved by: Kevin Grooms																			

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NAME: FOUNDATION ENERGY

DATE RECEIVED: 03/21/2016

DATE REPORTED: 03/28/2016

SOIL TEST RESULTS																			
LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH		LIME REC T/A 60% ECCE		EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA)		PHOSPHORUS						
				1 : 1 Soil	Buffer Woodruff	Legume	Non Legume				ppm	lbs/A	P1 ppm	Bicarb ppm	P2 ppm	M2 ppm	M3 ppm		
1366761	HILLTOP 32 5	SOUTH	0-6	6.5				N	0.34										
1366762	HILLTOP 32 5	SOUTH	6-36	7.3				N	3.06										
1366763	HILLTOP 32 5	W 2ND LEAF	0-6	7.7				H	0.58										
1366764	HILLTOP 32 5	W 2ND LEAF	6-36	8.4				H	0.64										
1366765	HILLTOP 32 5	E 2ND LEAF	0-6	8.4				L	0.28										
1366766	HILLTOP 32 5	E 2ND LEAF	6-36	8.4				H	0.34										
LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable)				DTPA				BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION							
		K ppm	Ca ppm	Mg ppm	Na ppm	Zn ppm	Fe ppm	Mn ppm	Cu ppm			BASE	H	Ca	Mg	K	Na		
1366761										0.1									
1366762										2.7									
1366763										0.2									
1366764										0.2									
1366765										0.2									
1366766										0.1									
LAB NUMBER	SOLUBLE (SAT. EXT.)			SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS				CHLORIDE		EXCH. NH4-N		ALUMINUM ppm	TOTAL N %			
	Ca me/L	Mg me/L	Na me/L				SAND %	SILT %	CLAY %	SOIL TEXTURE	ppm	lbs/A	ppm	lbs/A					
1366761	1.65	0.71	3.38	3.11	3	0.0													
1366762	4.66	1.41	62.49	35.87	52	3.9													
1366763	4.86	0.79	0.80	0.48	1	0.0													
1366764	4.08	0.77	0.60	0.39	1	0.0													
1366765	0.68	0.21	2.37	3.55	4	0.0													
1366766	2.54	0.49	0.26	0.21	1	0.0													
SUGGESTED FERTILIZER RECOMMENDATIONS																			
LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A				
1366761	HILLTOP 32 5	SOUTH																	
1366763	HILLTOP 32 5	W 2ND LEAF																	
1366765	HILLTOP 32 5	E 2ND LEAF																	
Analysis By: American Agricultural Lab      Recommendations By: American Agricultural Lab      Electronically Approved by: Kevin Grooms																			

Hilltop 32-5  
leak 1 and 2

