

# EXTENDED NATURAL GAS ANALYSIS (\*DHA)

## MAIN PAGE

LEASE #: NAME/DESCRIP : **CHEVRON 18-444-BH  
BRADENHEAD GAS**

PROJECT NO. : **201604090** ANALYSIS NO. : **01**

COMPANY NAME : **LINN ENERGY** ANALYSIS DATE: **APRIL 18, 2016 15:05**

OFFICE / BRANCH: **PARACHUTE** SAMPLE DATE : **APRIL 14, 2016**

CUSTOMER REF: TO:

PRODUCER : EFFECTIVE DATE:

### \*\*\*FIELD DATA\*\*\*

SAMPLE CYCLE: SAMPLE TYPE: SPOT

SAMPLE PRES. : 314 psig CYLINDER NO. : 0992

LAB PRES: psig SAMPLED BY : DEREK JOHNSON

SAMPLE TEMP. : 55 °f SAMPLING COMPANY: LINN ENERGY

AMBIENT TEMP.: °f H2S BY STAIN TUBE: - ppm

H2O BY STAIN TUBE: - #/mmcf CO2 BY STAIN TUBE: - Mol %

FIELD COMMENTS:

LAB COMMENTS:

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0003	0.0005		
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.3000	0.4600	---	---
CARBON DIOXIDE	0.01	0.02	---	---
METHANE	91.37510	79.80750	---	---
ETHANE	3.8997	6.3841	1.0394	1.0451
PROPANE	2.4320	5.8385	0.6676	0.6713
I-BUTANE	0.4149	1.3129	0.1349	0.1357
N-BUTANE	0.7100	2.2467	0.2229	0.2241
I-PENTANE	0.2213	0.8683	0.0790	0.0794
N-PENTANE	0.1870	0.7346	0.0680	0.0683
HEXANES PLUS	0.4297	2.3069	0.1740	0.1744
TOTALS	100.00000	100.00000	2.3858	2.3983

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.650	14.730
BENZENE	0.0219	0.0932	LOW NET DRY REAL :	1019.1 /scf	1024.7 /scf
TOLUENE	0.0147	0.0737	NET WET REAL :	1001.3 /scf	1006.9 /scf
ETHYLBENZENE	0.0010	0.0058	HIGH GROSS DRY REAL :	1127.2 /scf	1133.3 /scf
XYLENES	0.0052	0.0300	GROSS WET REAL :	1107.5 /scf	1113.6 /scf
TOTAL BTEX	0.0428	0.2027	NET DRY REAL :	21079.5 /lb	21194.6 /lb
			GROSS DRY REAL :	23318.3 /lb	23445.6 /lb

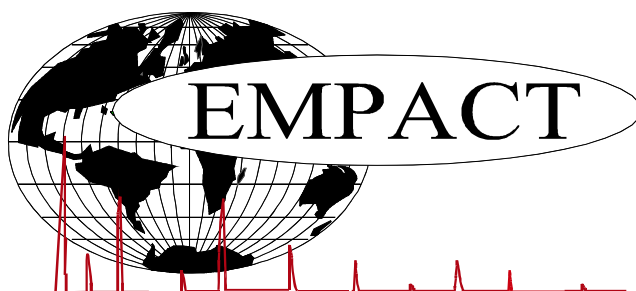
(CALC: GPA STD 2145 & TP-17 @ 14.696 & 60 F)

\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730

RELATIVE DENSITY (AIR=1): 0.6334

COMPRESSIBILITY FACTOR : 0.99741

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.



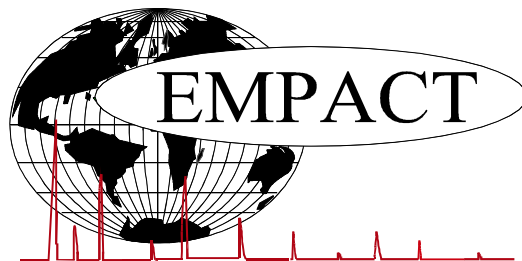
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**GLYCALC INFORMATION**

PROJECT NO. :	201604090	ANALYSIS NO. :	01
COMPANY NAME :	LINN ENERGY	ANALYSIS DATE:	APRIL 18, 2016 15:05
ACCOUNT NO. :		SAMPLE DATE :	APRIL 14, 2016
PRODUCER :		CYLINDER NO. :	0992
LEASE NO. :		SAMPLED BY :	DEREK JOHNSON
NAME/DESCRIP :	CHEVRON 18-444-BH BRADENHEAD GAS		
***FIELD DATA***		SAMPLE TEMP. :	55
SAMPLE PRES. :	314	AMBIENT TEMP.:	
COMMENTS :	SPOT		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.01	0.02
Nitrogen	0.30	0.46
Methane	91.37510	79.80750
Ethane	3.8997	6.3841
Propane	2.4320	5.8385
Isobutane	0.4149	1.3129
n-Butane	0.7100	2.2467
Isopentane	0.2133	0.8378
n-Pentane	0.1870	0.7346
Cyclopentane	0.0080	0.0305
n-Hexane	0.0487	0.2285
Cyclohexane	0.0183	0.0838
Other Hexanes	0.0922	0.4303
Heptanes	0.0719	0.3905
Methycyclohexane	0.0404	0.2160
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0219	0.0932
Toluene	0.0147	0.0737
Ethylbenzene	0.0010	0.0058
Xylenes	0.0052	0.0300
C8+ Heavies	0.1153	0.7545
<b>Subtotal</b>	<b>99.98970</b>	<b>99.97950</b>
Oxygen/Argon	0.01	0.02
Alcohols	0.0003	0.0005
<b>Total</b>	<b>100.00000</b>	<b>100.00000</b>

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**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**DHA COMPONENT LIST**

PROJECT NO. :	201604090	ANALYSIS NO. :	01
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ACCOUNT NO. :		SAMPLE DATE :	APRIL 14, 2016
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NAME/DESCRIP :	CHEVRON 18-444-BH BRADENHEAD GAS		
***FIELD DATA***		SAMPLE TEMP. :	55
SAMPLE PRES. :	314	AMBIENT TEMP.:	
COMMENTS :	SPOT		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.00	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.30	0.46	---	---
Carbon Dioxide	---	0.01	0.02	---	---
Methane	P1	91.37510	79.80750	---	---
Ethane	P2	3.8997	6.3841	1.039	1.045
Propane	P3	2.4320	5.8385	0.668	0.671
i-Butane	I4	0.4149	1.3129	0.135	0.136
Methanol	X1	0.0003	0.0005	0.000	0.000
n-Butane	P4	0.7100	2.2467	0.223	0.224
2,2-Dimethylpropane	I5	0.0010	0.0039	0.000	0.000
i-Pentane	I5	0.2123	0.8339	0.077	0.077
n-Pentane	P5	0.1870	0.7346	0.068	0.068
2,2-Dimethylbutane	I6	0.0011	0.0052	0.000	0.000
Cyclopentane	N5	0.0080	0.0305	0.002	0.002
2,3-Dimethylbutane	I6	0.0054	0.0253	0.002	0.002
2-Methylpentane	I6	0.0432	0.2027	0.018	0.018
3-Methylpentane	I6	0.0216	0.1013	0.009	0.009
n-Hexane	P6	0.0487	0.2285	0.020	0.020
Methylcyclopentane	N6	0.0209	0.0958	0.007	0.007
2,4-Dimethylpentane	I7	0.0014	0.0076	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0003	0.0016	0.000	0.000
Benzene	A6	0.0219	0.0932	0.006	0.006
3,3-Dimethylpentane	I7	0.0002	0.0011	0.000	0.000
Cyclohexane	N6	0.0183	0.0838	0.006	0.006
2-Methylhexane	I7	0.0089	0.0486	0.004	0.004
2,3-Dimethylpentane	I7	0.0054	0.0295	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0018	0.0096	0.001	0.001
3-Methylhexane	I7	0.0107	0.0584	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0035	0.0187	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0032	0.0171	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0011	0.000	0.000

1t,2-Dimethylcyclopentane	N7	0.0062	0.0332	0.003	0.003
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0278	0.1517	0.013	0.013
1c,2-Dimethylcyclopentane	N7	0.0004	0.0021	0.000	0.000
Methylcyclohexane	N7	0.0404	0.2160	0.016	0.016
2,2-Dimethylhexane	I8	0.0016	0.0100	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0018	0.0096	0.001	0.001
2,5-Dimethylhexane	I8	0.0013	0.0081	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0002	0.0013	0.000	0.000
2,4-Dimethylhexane	I8	0.0012	0.0075	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0013	0.0080	0.001	0.001
3,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0012	0.0074	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0147	0.0737	0.005	0.005
2,3-Dimethylhexane	I8	0.0013	0.0081	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0005	0.0031	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0086	0.0535	0.004	0.004
4-Methylheptane	I8	0.0026	0.0162	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0013	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0040	0.0249	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0082	0.0501	0.004	0.004
3-Ethylhexane	I8	0.0014	0.0087	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0034	0.0208	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0008	0.0049	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0006	0.0037	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0004	0.0025	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0008	0.0049	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0022	0.0135	0.001	0.001
1c,2c,3-Trimethylcyclopentane	N8	0.0003	0.0019	0.000	0.000
n-Octane	P8	0.0169	0.1051	0.009	0.009
1c,4-Dimethylcyclohexane	N8	0.0063	0.0385	0.003	0.003
i-Propylcyclopentane	I8	0.0003	0.0019	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0002	0.0014	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0003	0.0021	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0008	0.0049	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0036	0.0247	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0028	0.0196	0.001	0.001
2,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
4,4-Dimethylheptane	I9	0.0004	0.0028	0.000	0.000
Ethylcyclohexane	N8	0.0011	0.0067	0.000	0.000
n-Propylcyclopentane	N8	0.0018	0.0110	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0006	0.0041	0.000	0.000
2,5-Dimethylheptane	I9	0.0005	0.0035	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000

3,5-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
Ethylbenzene	I8	0.0010	0.0058	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0008	0.0055	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0027	0.0156	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0017	0.0098	0.001	0.001
3,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0004	0.0028	0.000	0.000
4-Ethylheptane	I9	0.0003	0.0021	0.000	0.000
4-Methyloctane	I9	0.0015	0.0105	0.001	0.001
2-Methyloctane	I9	0.0022	0.0154	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0004	0.0027	0.000	0.000
3-Ethylheptane	I9	0.0004	0.0028	0.000	0.000
3-Methyloctane	I9	0.0021	0.0147	0.001	0.001
1c,2t,4c-Trimethylcyclohexane	I9	0.0003	0.0021	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0008	0.0046	0.000	0.000
i-Butylcyclopentane	N9	0.0012	0.0082	0.001	0.001
n-Nonane	P9	0.0086	0.0601	0.005	0.005
i-Propylbenzene	A9	0.0004	0.0026	0.000	0.000
i-Propylcyclohexane	N9	0.0003	0.0021	0.000	0.000
2,2-Dimethyloctane	I10	0.0002	0.0015	0.000	0.000
2,4-Dimethyloctane	I10	0.0003	0.0023	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0006	0.0041	0.000	0.000
n-Propylbenzene	A9	0.0008	0.0052	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0015	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0003	0.0023	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0020	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0003	0.0023	0.000	0.000
1,2-Methylethylbenzene	A9	0.0004	0.0026	0.000	0.000
3-Ethylheptane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0003	0.0023	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0015	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0041	0.0286	0.002	0.002
n-Decane	P10	0.0008	0.0062	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0008	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0009	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-5-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000