Bill Barrett Corporation

Emission Evaluation Project Report Amendment

Black Tail Ridge and Lake Canyon Agreement Areas

Consent Decree- Civil Action NO. 2:09-CV-330-TS

Submitted February 1, 2012

Corrected and reissued March 23, 2012

Table of Contents

Section **Page**

Table of Contents i
1.0 Introduction 1
2.0 Project Objectives 1
3.0 Site Selection Methodology 1
4.0 Field Testing 2
4.1 Vapor Testing 2
4.2 Oil Sampling 3
4.3 Analytical Methods 3
5.0 Comparison of Monitored Data to Modeled Data 3
6.0 Potential Emmission Reduction Measures 5
6.1 Fugitive Equipment Leaks 5
6.2 Tank Emissions 6

Tables

Table 1 RKI Eagle 2 Specifications
Table 2 Summary of Measured Tank Vapor Data and E&P Tanks Output
Table 3
Table 4 Summary of Annual Savings
Table 5 Summary of Cost Effectiveness of VRU Systems

Attachments

Attachment A Condensate (Oil) Tank Analyses
Attachment B Condensate Tank Flow Meter Data and Calculations
Attachment C E&P Tanks Output
Attachment D Cost Effectiveness Calculations

1.0 Introduction

Section IX of the Consent Decree, effective on November 13, 2009, requires Bill Barrett Corporation (BBC), to evaluate uncontrolled emissions at a well head (production) facility in the Lake Creek (LC) Agreement Area and a second production facility in the Black Trail Ridge (BTR) Agreement Area. Emissions to be quantified and characterized include volatile organic compounds (VOC) and hazardous air pollutants (HAP). HAPs include BTEX (benzene, toluene, ethylbenzene and xylenes) and normal hexane. An initial report was submitted on October 31, 2011 which included the tank vapor emission evaluation results for one facility in the LC area and fugitive emission evaluation results for two other facilities, one each in BTR and the LC areas. As referenced in the initial report, there were operational upsets during the initial BTR facility tank vapor measurement test and BBC requested an extension to re-evaluate tank vapors at this location. BBC also committed to evaluate tank vapors at an additional BTR facility and submitted the report as agreed with EPA by February 1, 2012. The February 1, 2012 report was further revised and reissued March 22, 2012 to correct data in Section 6.0 Table 4. This report covers the re-evaluation of tank vapors at the 13-26-36 BTR, and the additional tank vapor evaluation at the 16-26-36 BTR. BBC is also including an update to the E&P Tanks data for the 14X 22-46 DLB that was previously submitted in the October 31, 2011 report. In addition, this report identifies potential mitigation measures.

2.0 Project Objectives

This emissions evaluation followed the protocol approved by EPA and facilities selected were discussed with EPA prior to start of the test program. The purpose of the evaluation was to quantify emissions of VOC and HAPS at representative production facilities in the BTR Tribal Agreement Area through direct measurement of actual emissions and compare results to emissions projected using existing agency accepted estimation tools. The emissions included flashing, working and breathing losses from oil tanks at two production facilities. Please note that the term oil as used in this document is consistent with the common field term for the liquid product produced by these wells, although per the Consent Decree definitions it is considered a condensate. The CD requirement also requires an analysis of the economic and technical feasibility of employing emission reduction strategies which includes a review of EPA Gas Star Program technologies.

At both locations, volumes of flashing, working and breathing losses from oil tanks were measured and compositions analyzed. Modeled or factored emissions were based on actual operating conditions and oil and natural gas physical characteristics and composition.

3.0 Site Selection Methodology

The oil produced in BTR and LC is paraffinic and is commonly referred to as either a black or yellow wax with pour points between 100 - 110 °F. BBC selected facilities from each area for the initial testing primarily on the basis of period of operation, equipment configuration, operating conditions and production volumes as previously discussed in the report submitted October 31, 2011. The objective of the testing was to provide emission estimates calibrated to representative wells at the higher ends of the production range realized for wells in the

Agreement Area.

4.0 Field Testing

4.1 Vapor Testing

Oil tank vapors were quantified and sampled in order to characterize emissions associated with flashing, working and breathing activities. Two monitoring events, each 24 hours in length, were conducted at each facility. The events at the 13-26-36 BTR started on December 14, 2011 and the events at the 16-26-36 BTR started on December 20, 2011.

A calibrated gas meter and a composite sampler were installed in the vapor line at the inlet to the combustor (between the outlet of the selected tank vent and enclosed flare). To ensure all gaseous emissions from the oil tanks were directed through the test equipment, the piping systems were screened for leaks by EMPACT Analytical prior to starting the tests. The screening was performed with a portable gas monitor RKI Eagle 2 and followed U.S. EPA Method 21 measurement procedures. RKI Eagle 2 is a portable, battery-powered organic gas monitor that conformed to Method 21. This analyzer uses a catalytic oxidation sensor and photoionization detector (PID) and displays the measured vapor concentration in parts-per-million by volume (ppmv).

Key analyzer specifications are provided below in Table 1:

Table 1 RKI Eagle 2 Specifications

Accuracy	± 2.5% of leak definition at 200 ppm or greater.
Dynamic Range	0 to 50,000 ppm methane.
Minimum Detectable Level	5 ppm of methane.
Response Time	Less than 30 seconds for 90% of final value, using 10,000 ppm of methane.
Sample Flow Rate	0.7 to 1.0 liter/minute nominal.

The PID arrived from the manufacturer calibrated for a leak detection value of 10,000 ppm methane with the next calibration due in 85 days. EMPACT monitored with the PID all valves, connections and fittings associated with the test equipment following U.S. EPA Method 21 equipment screening procedures. Based upon a leak definition of 10,000 ppm, EMPACT confirmed that the piping systems at both test facilities were leak-free prior to testing and after loadout and gauging activities.

The calibrated gas meter recorded flow based on pressure differential over the 24 hour run period. The composite sampler was programed to pull samples every approximately 10 seconds while the flow meter recorded flow. No samples were pulled while there was no flow through the meter. The samples were collected in an evacuated stainless natural gas cylinder for storage prior to analysis. Each of the four 24 hour runs, two at each site, was conducted this way. The oil tank vapor flow data is summarized in Table 2. The detailed flow meter data and calculations are compiled in Attachment B.

4.2 Oil Sampling

Immediately after emission vent testing described in 4.1.1, oil samples were pulled and sent to the analytical laboratory for analysis for input into the E&P Tanks software. Pressurized liquid samples were collected upstream of the tank at the sample point on the dump line off the separator using a piston cylinder sample container and a grab sample of the sales oil was collected from the oil storage tank.

4.3 Analytical Methods

Speciated hydrocarbon vapor concentrations were determined by analyzing the composite samples from vent testing (Sec 4.1.1). The gas samples were extracted from the cylinders and analyzed with a GC equipped with current software per ASTM D6730.

The spot pressurized liquid samples collected at the sample point on the dump line of the separator (Sec 4.1.2) were also analyzed for speciated hydrocarbon concentrations. Pressurized liquid samples were analyzed with a GC equipped with current software per ASTM D6730.

The spot samples of sales oil from the tank were analyzed for RVP and API gravity. There were difficulties with the RVP analyses due to the paraffinic content of the oil. The following equation was used in place of a sales oil RVP measurement: (0.179 x API gravity sakes oil)-1.699 (Colorado PS Memo 05-01 March 7, 2005).

The analytical vent gas results were used to determine the amount of VOC and HAP constituents in the vent gas. The analytical results of the pressurized liquids and sales oil liquids were used as input into E&P Tanks software. Copies of the analytical results are in Attachment A. Emission estimates are summarized in Table.

5.0 Comparison of Monitored Data to Modeled Data

E&P Tanks model and actual operating conditions inputs include:

- oil throughput;
- separator pressures and temperatures;
- representative tank temperature
- ambient pressure;
- pressurized oil decanes (C10 plus) specific gravity and molecular weight;
- sales oil Reid Vapor Pressure (RVP); and
- API gravity.

Since the tanks in this area are heated and the oil temperature is thermostatically maintained, actual conditions are not properly represented by E&P tanks software if ambient outdoor temperature is used as the input. A tank oil temperature of 160 degrees F is maintained in the field and therefore input to simulate the heating of the tanks. The output of the E&P Tanks software runs are in Attachment C. Table 2 provides the summary E&P Tanks output.

TABLE 2. Summary of Measured Tank Vapor Data and E&P Tanks Output

Facility	Run	Parameter	Measured value*	E&P Tanks output	% Difference Measured vs. Modeled
13-26-36 BTR	1	Flow (MSCFD)	0.085	0.173	104%
	1	VOC (lb/hr)	0.133	0.810	509%
	1	HAPs (lb/hr)	0.007	0.189	2600%
	2	Flow (MSCFD)	0.885	0.142	84%
	2	VOC (lb/hr)	1.849	0.666	64%
	2	HAPs (lb/hr)	0.193	0.158	18%
16-26-36 BTR	1	Flow (MSCFD)	2.004	0.113	94%
	1	VOC (lb/hr)	9.002	0.503	94%
	1	HAPs (lb/hr)	1.761	0.123	71%
	2	Flow (MSCFD)	2.146	0.126	94%
	2	VOC (lb/hr)	9.730	0.563	94%
	2	HAPs (lb/hr)	1.903	0.139	93%

* Sample analyses contained oxygen and nitrogen which indicates air was part of the volume measured.

There was significant variability between Run 1 and Run 2 for the BTR 13-26-36 well. BBC has reviewed the operating conditions and test results and this variability remains unexplained. Test data for other runs is in reasonable agreement with modeled estimates.

E&P tanks were re run for the 14X-22-46 DLB since the results presented in the report submitted October 31, 2011 were modeled using ambient temperatures instead of the tank oil temperature of 160 degree F, The revised E&P Tanks data is presented in table 3 copies of the runs are in Attachment C.

TABLE 3. Revised 14x-22-46 DLB E&P Tanks Data

Facility	Run	Parameter	Measured value*	E&P Tanks output	% Difference Measured vs. Modeled
	1	Flow (MSCFD)	0.0	0.099	NA
	1	VOC (lb/hr)	0.0	0.551	NA
	1	HAPs (lb/hr)	0.0	0.139	NA
	2	Flow (MSCFD)	0.060	0.142	137%
	2	VOC (lb/hr)	0.269	0.791	194%
	2	HAPs (lb/hr)	0.054	0.201	272%

The previous E&P Tank runs using ambient temperature projected in zero emissions for both runs at 14x-22-46 DLB. The use of elevated tank oil temperature in the model resulted in projected emissions much greater than that measured.

6.0 Potential Emission Reduction Measures

A review of technologies currently catalogued by the EPA Gas Star Program for reducing fugitive leaks and condensate tank emissions was conducted. Based on the type of equipment located at these facilities and the results of the emission evaluation, the following technologies were identified as potentially applicable:

- Fugitive inspection and repair program using optical imaging
- Tank best management practices such as closing thief and other tank hatches, installing low emission hatches and maintaining valves in leak-free condition.
- Installation of VRU's to capture tank vapor

6.1 Fugitive Equipment Leaks

BBC performed an analysis via the EPA Natural Gas Star Program for mitigating fugitive leaks. This evaluation indicates that the potential gas and monetary savings of finding and fixing leaks can be quite substantial if no leak detection and repair program is currently in place. The potential for net monetary savings can be enhanced if a leak inspection and repair program can be conducted in a manner that is cost effective and not labor intensive. Monitoring utilizing a hand held gas monitor that is conducted on every component at Natural Gas Processing Plants is not feasible for a field with numerous facilities dispersed over hundreds of miles. Optical imaging devices reduce the time to screen a facility for leaks and allow for efficient inspections at more facilities dispersed over large areas. In addition, screening could identify potential areas of concern (e.g chronic leakers) that can be monitored more frequently by field personnel. This monitoring, if conducted in house would require purchase or lease of imaging device(s) and training of personnel.

As part of the consent decree, BBC already conducts a leak check program. The current program does not involve the use of an optical imaging device. In spite of that program, the optical survey of 10 sites detected 26 leaks.

A cost benefit analysis was performed based on the detected leaks and the forward looking 3-year average (Jan 2012 – Dec 2014) gas price of $3.40 per million British thermal unit (MMBtu) from the Colorado Interstate Gas Index as published by the Platt's Inside FERC Gas Market Report. Since not all repaired leaks result in gas that would otherwise be sent to sales, results are presented below for two scenarios: 1) repaired leaks that result in gas to sales (presented as the value of saved gas) and 2) repaired leaks that are combusted in heaters as fuel or in combustors as waste gas and are presented in tons per year (tpy). The savings are summarized in Table 4

TABLE 4. Summary of Annual Savings

Scenario	Approximate Average Gas Recovered (CFM/Leak)	Average Annual Savings of Recovered Gas ($/Leak or tpy/Leak)	Annual Savings of Recovered Gas ($/10 sites or tpy/10 sites)
Gas to Sales (8 leaks)	1.35[(1)]	$2,815[(2)]	$22,517[(2)]
Waste Gas to Combustion (11 leaks)	0.16	0.18 tpy	2.02 tpy

[(1)]Average of 7 leaks from typical well equipment is 012CFM if the compressor engine PRV leak of 10 CFM is excluded..

[(2)]Based on average of 1164 Btu/scf of sales gas for leaking sites.

According to EPA Partner Reported Opportunities (PRO) Fact Sheet No. 902, Conduct DI&M at Remote Sites, the contract cost of conducting a leak detection survey using optical imaging methods cost approximately $200 per facility when multiple remote facilities are surveyed at one time. Recent quotes from a 3rd party provider of optical camera leak inspection programs indicate that cost is currently in the range of $400 to $600 per facility depending upon the remoteness of field facilities. Based on the assumptions listed above using Fact sheet costs, one survey per year at 10 sites and assuming no additional capital costs for repairs the approximate annual cost is $4,000 to $6,000. The annual savings significantly exceed the cost of an optical leak check program.

The annual savings in Table 4 is an incremental savings over and above the savings provided by the current leak check program using visual, auditory, and olfactory methods. Therefore, the cost effectiveness of an optical imaging survey is likely to change if used in place of the current program, gas prices significantly increase, or additional wells are added to field in close proximity to existing wells thus reducing the survey cost per well.

6.2 Tank Emissions

BBC received quotes for two types of VRU systems from two different vendors. The combustor would remain as a backup to the VRU during downtime, therefore the VRU would be installed in addition to the combustor rather than in place of the combustor. As a result, there is no fuel savings associated with the combustor pilot.

Flowgenix provided a lease quote for their FX8 VRU, a Boss Industries rotary screw compressor package, driven by a GM 3.0L industrial natural gas engine and controlled by the Flogistix PLC system.

COMM Engineering quoted an Educator Vapor Recovery Unit (EVRU™). The EVRU™ is a non-mechanical eductor (or jet pump) that recovers vent gas by using high-pressure motive gas to entrain hydrocarbon vapors from low-pressure sources. EVRU™ operates on the Venturi principle as its core element which allows for consistent operation regardless of variability of tank vapor volumes. COMM Engineering stated it was not economical to install a VRU with the measured flow rates but provided a limited quote for this evaluation.

Table 5 provides a summary of the cost effectiveness of installing and operating a VRU system at the 16-26-36 BTR, the site with the highest measured emissions. The higher emission Run was used in the analysis. Calculations can be found in Attachment D.

TABLE 5. Summary of Cost Effectiveness of VRU Systems

Total Installed Capital Cost	Total Annualized Cost	Annual Value of Recovered gas	Cost per Ton VOC Recovered
$137,500 - $272,250	$23,532 - $39,800	$7,925	$13,698 - $23,347

Based on the results of the Cost Effectiveness analysis, installation of a VRU system on these tanks is not economically feasible.

Attachment A

EMPACT

PROJECT NO: 201112122
COMPANY NAME: BILL BARRETT CORP

COMMENTS: 1L GLASS #1
SPOT; NO PROBE
LIGHT BROWN

ANALYSIS NO.: 01
ANALYSIS DATE: JANUARY 6, 2012
SAMPLE DATE: DECEMBER 16, 2011
SAMPLED BY: GALE MCENDREE
EMPACT

TEST PROCEDURE / METHOD: API GRAVITY

DESCRIPTION:	API GRAVITY @ 60/60
13-26-36 BTR; BTR FIELD TANK BATTERY #83089 130 DEGREES	42.1

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

PROJECT NO:	201112122	ANALYSIS NO.:	01
COMPANY NAME:	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 6, 2012
		SAMPLE DATE:	DECEMBER 16, 2011
COMMENTS:	1L GLASS #1 SPOT; NO PROBE LIGHT BROWN	SAMPLED BY:	GALE MCENDREE EMPACT

TEST PROCEDURE / METHOD: REID VAPOR PRESSURE (ASTM D-323)

DESCRIPTION:	REID VAPOR PRESSURE
13-26-36 BTR; BTR FIELD TANK BATTERY #83089 130 DEGREES	*

*Sample did not meet requirements of method, because it was not a liquid at 100 deg. F.

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201112122	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 16, 2011
PRODUCER :		CYLINDER NO. :	27834
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD SEPARATOR		
FIELD DATA		SAMPLE TEMP. :	162
SAMPLE PRES. :	74	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	MOLE %	MASS %	VOL %
NITROGEN (AIR)	0.0099	0.0021	0.0020
CARBON DIOXIDE	0.0028	0.0009	0.0008
METHANE	0.2565	0.0310	0.0778
ETHANE	0.1312	0.0297	0.0628
PROPANE	0.1905	0.0633	0.0940
I-BUTANE	0.0876	0.0384	0.0514
N-BUTANE	0.3004	0.1316	0.1697
I-PENTANE	0.2331	0.1268	0.1547
N-PENTANE	0.2147	0.1168	0.1393
HEXANES PLUS	98.5733	99.4594	99.2475
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	MOLE%	MASS%
BENZENE	1.4009	0.8250
TOLUENE	3.6792	2.5558
ETHYLBENZENE	0.4116	0.3295
XYLENE	2.9418	2.3547
TOTAL BTEX	8.4335	6.0650

(CALC: GPA STD 2145-94 & TP-17 @14.696 & 60 F)

	TOTAL SAMPLE	C6+ FRACTION	
Specific Gravity (H2O=1) =	0.753	0.7546	60/60
API Gravity =	56.42	56.02	60/60
Molecular Weight =	132.64	134.134	
Absolute Density =	6.28	6.29	LBS/GAL
Heating Value Liq. Idl Gas=	126522	127201	BTU/GAL
Vapor/Liquid =	18.17	18.07	CUFT/GAL
Vapor Pressure =	15.80	1.28	PSIA @100 F

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

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBLITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBLITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201112122	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 16, 2011
PRODUCER :		CYLINDER NO. :	27834
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD SEPARATOR		
FIELD DATA		SAMPLE TEMP. :	162
SAMPLE PRES. :	74	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0028		0.0009		0.0008	
NITROGEN (AIR)	0.0099		0.0021		0.0020	
METHANE	0.2565		0.0310		0.0778	
ETHANE	0.1312		0.0297		0.0628	
PROPANE	0.1905		0.0633		0.0940	
I-BUTANE	0.0876		0.0384		0.0514	
N-BUTANE	0.3004		0.1316		0.1697	
I-PENTANE	0.2331		0.1268		0.1547	
N-PENTANE	0.2147		0.1168		0.1393	
CYCLOPENTANE (N-C5)	0.4653		0.2460		0.2436	
N-HEXANE	6.0435		3.9277		4.4550	
CYCLOHEXANE (OTHER C6)	1.9586		1.2427		1.1942	
OTHER HEXANES	6.9298		4.4741		4.9250	
OTHER HEPTANES	10.4751		7.8902		8.5163	
METHYLCYCLOHEXANE (OTHER C7)	3.7721		2.7924		2.7136	
2,2,4 TRIMETHYLPENTANE	0.2899		0.2146		0.2144	
BENZENE	1.4009		0.8250		0.7035	
TOLUENE	3.6792		2.5558		2.2009	
ETHYLBENZENE	0.4116		0.3295		0.2837	
XYLENES	2.9418		2.3547		2.0325	
OTHER OCTANES	12.2752		10.5504		10.9320	
OCTANES PLUS	—	63.8488	—	75.5055	—	74.2954
NONANES	10.6080		10.1641		10.2109	
DECANES PLUS	37.3223		51.8922		50.6219	
SUB TOTAL	100.0000		100.0000		100.0000	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	56.42	60/60
Vapor Pressure	=	15.80	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	184.42	
Average Specific Gravity of Decanes plus	=	0.7690	

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201112122	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 16, 2011
PRODUCER :		CYLINDER NO. :	27834
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD SEPARATOR		
FIELD DATA		SAMPLE TEMP. :	162
SAMPLE PRES. :	74	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
NITROGEN		0.0099	0.0021	0.0020
CARBON DIOXIDE		0.0028	0.0009	0.0008
	C1	0.2665	0.0310	0.0778
	C2	0.1312	0.0297	0.0628
	C3	0.1905	0.0633	0.0940
	C4	0.3880	0.1700	0.2211
	C5	0.9131	0.4896	0.5376
	C6	16.3328	10.4695	11.2777
	C7	17.9264	13.2384	13.4308
	C8	15.9185	13.4492	13.4626
	C9	10.6080	10.1641	10.2109
	C10	8.0292	8.4335	8.3053
	C11	5.4723	6.2751	6.0557
	C12	4.4322	5.5015	5.4137
	C13	2.9952	4.1214	4.0584
	C14	4.1995	6.2812	6.1951
	C15	4.6510	7.4485	7.2620
	C16	3.3004	5.6344	5.4578
	C17	1.7589	3.1888	3.0793
	C18	1.3348	2.5611	2.4859
	C19	0.5458	1.1049	1.0571
	C20	0.3405	0.7253	0.6901
	C21	0.1322	0.2956	0.2798
	C22	0.0771	0.1806	0.1703
	C23	0.0172	0.0421	0.0396
	C24	0.0106	0.0271	0.0254
	C25	0.0076	0.0202	0.0189
	C26	0.0068	0.0186	0.0175
	C27	0.0056	0.0161	0.0150
	C28	0.0054	0.0161	0.0150
	C29	0.0000	0.0000	0.0000
	C30+	0.0000	0.0000	0.0000
	Total	100.0000	100.0000	100.0000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201112122	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 16, 2011
PRODUCER :		CYLINDER NO. :	27834
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD SEPARATOR		
FIELD DATA		SAMPLE TEMP. :	162
SAMPLE PRES. :	74	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL. %
Nitrogen		0.0099	0.0021	0.0020
Carbon Dioxide		0.0028	0.0009	0.0008
Methane	P1	0.2565	0.0310	0.0778
Ethane	P2	0.1312	0.0297	0.0628
Propane	P3	0.1905	0.0633	0.0940
I-Butane	I4	0.0876	0.0384	0.0514
n-Butane	P4	0.3004	0.1316	0.1697
2,2-Dimethylpropane	I5	0.0606	0.0330	0.0416
I-Pentane	I5	0.1725	0.0938	0.1131
n-Pentane	P5	0.2147	0.1168	0.1393
2,2-Dimethylbutane	I6	0.1067	0.0693	0.0798
Cyclopentane	N5	0.4653	0.2460	0.2436
2,3-Dimethylbutane	I6	0.4539	0.2949	0.3329
2-Methylpentane	I6	2.9520	1.9180	2.1953
3-Methylpentane	I6	1.5550	1.0103	1.1371
n-Hexane	P6	6.0435	3.9277	4.4550
2,2-Dimethylpentane	I7	0.0663	0.0501	0.0553
Methylcyclopentane	N6	1.8622	1.1816	1.1799
2,4-Dimethylpentane	I7	0.1863	0.1407	0.1566
Benzene	A6	1.4009	0.8250	0.7035
3,3-Dimethylpentane	I7	0.0798	0.0603	0.0652
Cyclohexane	N6	1.9586	1.2427	1.1942
2-Methylhexane	I7	0.9813	0.7413	0.8179
2,3-Dimethylpentane	I7	0.3548	0.2680	0.2873
1,1-Dimethylcyclopentane	N7	0.2464	0.1824	0.1809
3-Methylhexane	I7	1.1609	0.8770	0.9530
1c,3-Dimethylcyclopentane	N7	0.3253	0.2408	0.2419
1t,3-Dimethylcyclopentane	N7	0.2899	0.2146	0.2144
3-Ethylpentane	I7	0.0745	0.0563	0.0602
1t,2-Dimethylcyclopentane	N7	0.4978	0.3685	0.3669
2,2,4-Trimethylpentane	I8	0.0186	0.0160	0.0172
n-Heptane	P7	6.0530	4.5726	5.0020
1c,2-Dimethylcyclopentane	N7	0.0278	0.0206	0.0200
Methylcyclohexane	N7	3.7721	2.7924	2.7136
2,2-Dimethylhexane	I8	0.1912	0.1647	0.1771

Ethylcyclopentane	N7	0.1310	0.0970	0.0947
2,5-Dimethylhexane	I8	0.1134	0.0977	0.1053
2,2,3-Trimethylpentane	I8	0.0101	0.0087	0.0091
2,4-Dimethylhexane	I8	0.1563	0.1346	0.1444
1c,2t,4-Trimethylcyclopentane	N8	0.1616	0.1367	0.1340
3,3-Dimethylhexane	I8	0.0623	0.0537	0.0566
2,3,4-Trimethylpentane	I8	0.0303	0.0261	0.0271
2,3,3-Trimethylpentane	I8	0.0203	0.0175	0.0180
Toluene	A7	3.6792	2.5558	2.2009
2,3-Dimethylhexane	I8	0.1140	0.0982	0.1032
2-Methyl-3-ethylpentane	I8	0.0425	0.0366	0.0381
2-Methylheptane	I8	1.3451	1.1584	1.2395
4-Methylheptane	I8	0.4079	0.3513	0.3688
3-Methyl-3-ethylpentane	I8	0.0664	0.0572	0.0589
3,4-Dimethylhexane	I8	0.0394	0.0339	0.0352
1c,2c,4-Trimethylcyclopentane	N8	0.0261	0.0221	0.0214
1c,3-Dimethylcyclohexane	N8	0.0277	0.0234	0.0229
3-Methylheptane	I8	0.7506	0.6464	0.6857
1c,2t,3-Trimethylcyclopentane	N8	0.8461	0.7158	0.6954
3-Ethylhexane	I8	0.0692	0.0596	0.0626
1t,4-Dimethylcyclohexane	N8	0.5461	0.4620	0.4535
1,1-Dimethylcyclohexane	N8	0.1893	0.1601	0.1535
3c-Ethylmethylcyclopentane	N8	0.0286	0.0242	0.0236
3t-Ethylmethylcyclopentane	N8	0.0659	0.0558	0.0545
2t-Ethylmethylcyclopentane	N8	0.0573	0.0485	0.0472
1,1-Methylethylcyclopentane	N8	0.0844	0.0714	0.0684
2,2,4-Trimethylhexane	I9	0.0116	0.0112	0.0117
1t,2-Dimethylcyclohexane	N8	0.3625	0.3067	0.2959
1t,3-Dimethylcyclohexane	N8	0.0078	0.0066	0.0063
n-Octane	P8	5.3869	4.6220	4.9222
1c,4-Dimethylcyclohexane	N8	0.0439	0.0371	0.0355
i-Propylcyclopentane	I8	0.1121	0.0948	0.0914
2,4,4-Trimethylhexane	I9	0.0539	0.0521	0.0540
2,2,3,4-Tetramethylpentane	I9	0.0440	0.0425	0.0442
2,3,4-Trimethylhexane	I9	0.0617	0.0597	0.0619
1c,2-Dimethylcyclohexane	N8	0.1396	0.1181	0.1111
2,3,5-Trimethylhexane	I9	0.0396	0.0383	0.0397
2,2-Dimethylheptane	I9	0.0123	0.0119	0.0125
1,1,4-Trimethylcyclohexane	N9	0.5327	0.5070	0.4917
2,2,3-Trimethylhexane	I9	0.5205	0.5033	0.5165
2,4-Dimethylheptane	I9	0.0249	0.0241	0.0252
4,4-Dimethylheptane	I9	0.0653	0.0631	0.0660
Ethylcyclohexane	N8	0.6654	0.5629	0.5350
n-Propylcyclopentane	N8	0.3296	0.2788	0.2687
1c,3c,5-Trimethylcyclohexane	N9	0.0682	0.0649	0.0629
3,3-Dimethylheptane	I9	0.0197	0.0191	0.0199
3,5-Dimethylheptane	I9	0.0472	0.0456	0.0476
1,1,3-Trimethylcyclohexane	N9	0.0436	0.0415	0.0402
Ethylbenzene	A8	0.4116	0.3295	0.2837
1c,2t,4t-Trimethylcyclohexane	N9	0.0697	0.0663	0.0631
2,3-Dimethylheptane	I9	0.0158	0.0153	0.0158
1,3-Dimethylbenzene (m-Xylene)	A8	1.7091	1.3680	1.1847
1,4-Dimethylbenzene (p-Xylene)	A8	0.5779	0.4626	0.4019
3,4-Dimethylheptane	I9	0.0673	0.0651	0.0666
3,4-Dimethylheptane (2)	I9	0.0585	0.0566	0.0579
4-Ethylheptane	I9	0.0496	0.0480	0.0502
4-Methyloctane	I9	0.2258	0.2183	0.2267
2-Methyloctane	I9	0.4029	0.3896	0.4087
3-Ethylheptane	I9	0.1006	0.0973	0.1002
3-Methyloctane	I9	0.4287	0.4145	0.4305
3,3-Diethylpentane	I9	0.0474	0.0458	0.0454
1c,2t,3-Trimethylcyclohexane	N9	0.0254	0.0242	0.0230
1,1,2-Trimethylcyclohexane	N9	0.0107	0.0102	0.0097
1,2-Dimethylbenzene (o-Xylene)	A8	0.6548	0.5241	0.4459
i-Butylcyclopentane	N9	0.2233	0.2125	0.2037
UnknownC8s	U8	0.0666	0.0574	0.0611
n-Nonane	P9	4.5465	4.3964	4.5855

1,1-Methylethylcyclohexane	N9	0.1138	0.1100	0.1151
i-Propylbenzene	A9	0.1627	0.1474	0.1278
i-Propylcyclohexane	N9	0.1490	0.1418	0.1324
2,2-Dimethyloctane	I10	0.0552	0.0592	0.0599
2,4-Dimethyloctane	I10	0.0984	0.1056	0.1069
2,6-Dimethyloctane	I10	0.0306	0.0328	0.0343
2,5-Dimethyloctane	I10	0.0224	0.0240	0.0243
n-Butylcyclopentane	N9	0.2221	0.2349	0.2201
3,3-Dimethyloctane	I10	0.0932	0.1000	0.1013
n-Propylbenzene	A9	0.3623	0.3283	0.2847
3,6-Dimethyloctane	I10	0.1290	0.1384	0.1401
3-Methyl-5-ethylheptane	I10	0.1144	0.1106	0.1141
1,3-Methylethylbenzene	A9	0.2221	0.2013	0.1731
1,4-Methylethylbenzene	A9	0.1683	0.1525	0.1311
1,3,5-Trimethylbenzene	A9	0.2528	0.2291	0.1984
2,3-Dimethyloctane	I10	0.0609	0.0653	0.0661
5-Methylnonane	I10	0.1958	0.2100	0.2146
1,2-Methylethylbenzene	A9	0.2693	0.2440	0.2087
2-Methylnonane	I10	0.0595	0.0638	0.0657
3-Ethyloctane	I10	0.0473	0.0507	0.0513
3-Methylnonane	I10	0.1546	0.1658	0.1692
1,2,4-Trimethylbenzene	A9	0.0211	0.0191	0.0163
t-Butylbenzene	A10	0.5903	0.5973	0.5165
i-Butylcyclohexane	N10	0.1069	0.1131	0.1043
1t-Methyl-2-n-propylcyclohexane	I10	0.0734	0.0710	0.0732
i-Butylbenzene	A10	0.0302	0.0306	0.0269
sec-Butylbenzene	A10	0.0190	0.0192	0.0167
UnknownC9s	U9	0.7179	0.6942	0.7241
n-Decane	P10	3.5491	3.8070	3.9039
1,2,3-Trimethylbenzene	A9	0.1292	0.1171	0.0981
1,3-Methyl-i-propylbenzene	A10	0.0333	0.0302	0.0258
1,4-Methyl-i-propylbenzene	A10	0.0639	0.0579	0.0495
Sec-Butylcyclohexane	N10	0.2135	0.2258	0.2080
1,2-Methyl-i-propylbenzene	A10	0.1393	0.1410	0.1205
3-Ethylnonane	I10	0.0248	0.0266	0.0274
1,3-Diethylbenzene	A10	0.0458	0.0463	0.0401
1,3-Methyl-n-propylbenzene	A10	0.0327	0.0331	0.0288
1,4-Diethylbenzene	A10	0.1046	0.1058	0.0920
1,4-Methyl-n-propylbenzene	A10	0.0290	0.0293	0.0256
n-Butylbenzene	A10	0.0410	0.0415	0.0361
1,3-Dimethyl-5-ethylbenzene	A10	0.0390	0.0395	0.0342
1,2-Diethylbenzene	A10	0.0532	0.0538	0.0458
1,2-Methyl-n-propylbenzene	A10	0.0468	0.0474	0.0406
1,4-Dimethyl-2-ethylbenzene	A10	0.0523	0.0529	0.0452
1,3-Dimethyl-4-ethylbenzene	A10	0.0294	0.0297	0.0254
1,2-Dimethyl-4-ethylbenzene	A10	0.1386	0.1403	0.1202
1,3-Dimethyl-2-ethylbenzene	A10	0.0867	0.0877	0.0738
1t,2c,4-Trimethylcyclopentane	A10	0.1416	0.1198	0.1200
1,2-Dimethyl-3-ethylbenzene	A10	0.0632	0.0640	0.0537
1,2-Ethyl-i-propylbenzene	A10	0.0266	0.0269	0.0230
1,4-Methyl-t-butylbenzene	A11	0.0804	0.0814	0.0696
UnknownC10s	U10	1.0659	1.1434	1.1725
n-Undecane	P11	3.3947	4.0005	4.0455
1,4-Ethyl-i-propylbenzene	A11	0.0178	0.0180	0.0154
1,2,4,5-Tetramethylbenzene	A11	0.0597	0.0604	0.0511
1,2-Methyl-n-butylbenzene	A11	0.0570	0.0577	0.0493
1,2,3,5-Tetramethylbenzene	A11	0.1208	0.1222	0.1028
5-Methylindan	A11	0.0666	0.0855	0.0855
1,2-Ethyl-n-propylbenzene	A11	0.0695	0.0703	0.0601
2-Methylindan	A11	0.0314	0.0403	0.0403
1,3-Methyl-n-butylbenzene	A11	0.0368	0.0372	0.0318
1,3-Di-i-propylbenzene	A11	0.0290	0.0293	0.0250
sec-Pentylbenzene	A11	0.0545	0.0551	0.0471
n-Pentylbenzene	A11	0.0298	0.0333	0.0291
1t-M-2-(4MP)cyclopentane	P12	0.0098	0.0126	0.0128
1,2-Di-n-propylbenzene	A11	0.0463	0.0468	0.0400
1,4-Di-i-propylbenzene	A11	0.0762	0.0771	0.0659

Tetrahydronaphthalene	A10	0.0185	0.0187	0.0160
t-Decahydronaphthalene	A10	0.0398	0.0403	0.0344
Naphthalene	A10	0.0695	0.0672	0.0574
1,4-Ethyl-t-butylbenzene	A11	0.0353	0.0357	0.0305
UnknownC11s	U11	0.6252	0.7368	0.7451
n-Dodecane	P12	3.4070	4.3754	4.3760
1,3-Di-n-propylbenzene	A12	0.1788	0.1809	0.1546
1,3,5-Triethylbenzene	A12	0.0936	0.0848	0.0734
1,2,4-Triethylbenzene	A12	0.2351	0.2130	0.1821
1,4-Methyl-n-pentylbenzene	A12	0.0449	0.0454	0.0388
n-Hexylbenzene	A12	0.0858	0.1050	0.0917
1,2,3,4,5-Pentamethylbenzene	A13	0.1104	0.1117	0.0955
2-Methylnaphthalene	A11	0.1295	0.1388	0.1186
1-Methylnaphthalene	A11	0.5118	0.5487	0.4030
UnknownC12s	U12	0.3772	0.4844	0.4845
n-Tridecane	P13	2.3350	3.2455	3.2076
UnknownC13s	U13	0.5498	0.7642	0.7553
n-Tetradecane	P14	1.7263	2.5820	2.5466
UnknownC14s	U14	2.4732	3.6992	3.6485
n-Pentadecane	P15	1.5582	2.4954	2.4329
UnknownC15s	U15	3.0928	4.9531	4.8291
n-Hexadecane	P16	1.2916	2.2050	2.1359
UnknownC16s	U16	2.0088	3.4294	3.3219
n-Heptadecane	P17	0.7802	1.4145	1.3859
UnknownC17s	U17	0.9787	1.7743	1.7134
n-Octadecane	P18	0.3628	0.6961	0.6702
UnknownC18s	U18	0.9720	1.8650	1.7957
n-Nonadecane	P19	0.1815	0.3674	0.3515
UnknownC19s	U19	0.3643	0.7375	0.7056
n-Eicosane	P20	0.1114	0.2373	0.2258
UnknownC20s	U20	0.2291	0.4880	0.4643
n-Heneicosane	P21	0.0595	0.1330	0.1259
UnknownC21s	U21	0.0727	0.1626	0.1539
n-Docosane	P22	0.0513	0.1201	0.1133
UnknownC22s	U22	0.0258	0.0604	0.0570
n-Tricosane	P23	0.0172	0.0421	0.0396
n-Tetracosane	P24	0.0106	0.0271	0.0254
n-Pentacosane	P25	0.0076	0.0202	0.0189
n-Hexacosane	P26	0.0068	0.0188	0.0175
n-Heptacosane	P27	0.0056	0.0161	0.0150
n-Octacosane	P28	0.0054	0.0161	0.0150
TOTAL		100.0000	100.0000	100.0000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201112122	ANALYSIS NO. :	03
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 14, 2011 - 9:00 A.M.
PRODUCER :		CYLINDER NO. :	899
LEASE NO. :	13-26-36	SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD VAPOR GAS #1; 1ST 24 HOUR TEST		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; OFF: DECEMBER 15, 2011 - 9:00 A.M.		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0008	0.0018		
OXYGEN/ARGON	4.96	5.02	—	—
NITROGEN	18.77	16.63	—	—
CARBON DIOXIDE	0.65	0.90	—	—
METHANE	37.57990	19.06340	—	—
ETHANE	12.5343	11.9173	3.3521	3.3704
PROPANE	10.5843	14.7576	2.9151	2.9310
I-BUTANE	2.3801	4.3742	0.7789	0.7831
N-BUTANE	5.5044	10.1161	1.7352	1.7447
I-PENTANE	2.2193	5.0560	0.8040	0.8084
N-PENTANE	2.4331	5.5507	0.8821	0.8870
HEXANES PLUS	2.3838	6.6129	0.9531	0.9583
TOTALS	100.00000	100.00000	11.4205	11.4829

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.1255	0.3100
TOLUENE	0.0235	0.0685
ETHYLBENZENE	0.0003	0.0010
XYLENES	0.0023	0.0077
TOTAL BTEX	0.1516	0.3872

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1307.1 /scf	1314.2 /scf
	NET WET REAL :	1284.3 /scf	1291.4 /scf
HIGH	GROSS DRY REAL :	1427.1 /scf	1434.9 /scf
	GROSS WET REAL :	1402.2 /scf	1409.9 /scf
	NET DRY REAL :	15697.3 /lb	15783.0 /lb
	GROSS DRY REAL :	17139.7 /lb	17233.3 /lb

RELATIVE DENSITY (AIR=1):	1.0912
COMPRESSIBILITY FACTOR :	0.99445

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

**DETAILED HYDROCARBON ANALYSIS/NJ 1993 ; ASTM D6730*

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201112122	ANALYSIS NO. :	03
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 14, 2011 - 9:00 A.M.
PRODUCER :		CYLINDER NO. :	899
LEASE NO. :	13-26-36	SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD VAPOR GAS #1; 1ST 24 HOUR TEST		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; OFF: DECEMBER 15, 2011 - 9:00 A.M.		

Componet	Mole %	Wt %
Carbon Dioxide	0.65	0.80
Nitrogen	18.77	16.63
Methane	37.57990	19.06340
Ethane	12.5343	11.9173
Propane	10.5843	14.7576
Isobutane	2.3801	4.3742
n-Butane	5.5044	10.1161
Isopentane	2.1098	4.8132
n-Pentane	2.4331	5.5507
Cyclopentane	0.1095	0.2428
n-Hexane	0.7430	2.0246
Cyclohexane	0.1331	0.3542
Other Hexanes	1.0133	2.7507
Heptanes	0.2623	0.8282
Methycyclohexane	0.0516	0.1602
2,2,4 Trimethylpentane	0.0001	0.0003
Benzene	0.1255	0.3100
Toluene	0.0235	0.0685
Ethylbenzene	0.0003	0.0010
Xylenes	0.0023	0.0077
C8+ Heavies	0.0288	0.1075
Subtotal	95.03920	94.97820
Oxygen/Argon	4.96	5.02
Alcohols	0.0008	0.0018
Total	100.00000	100.00000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201112122	ANALYSIS NO. :	03
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 14, 2011 - 9:00 A.M.
PRODUCER :		CYLINDER NO. :	899
LEASE NO. :	13-26-36	SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD VAPOR GAS #1; 1ST 24 HOUR TEST		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; OFF: DECEMBER 15, 2011 - 9:00 A.M.		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Oxygen/Argon	—	4.96	5.02	—	—
Nitrogen	—	18.77	16.63	—	—
Carbon Dioxide	—	0.65	0.90	—	—
Methane	P1	37.57990	19.06340	—	—
Ethane	P2	12.5343	11.9173	3.352	3.370
Propane	P3	10.5843	14.7576	2.915	2.931
i-Butane	I4	2.3801	4.3742	0.779	0.783
n-Butane	P4	5.5042	10.1157	1.735	1.745
2,2-Dimethylpropane	I5	0.0208	0.0475	0.008	0.008
i-Pentane	I5	2.0890	4.7657	0.764	0.768
Acetone	X3	0.0002	0.0004	0.000	0.000
UnknownC4s	U4	0.0002	0.0004	0.000	0.000
n-Pentane	P5	2.4328	5.5500	0.882	0.887
t-Butanol	X4	0.0005	0.0012	0.000	0.000
2,2-Dimethylbutane	I6	0.0318	0.0866	0.013	0.013
Cyclopentane	N5	0.1095	0.2428	0.032	0.032
2,3-Dimethylbutane	I6	0.0744	0.2027	0.030	0.030
2-Methylpentane	I6	0.4984	1.3581	0.207	0.208
i-Butanol	X4	0.0001	0.0002	0.000	0.000
3-Methylpentane	I6	0.2474	0.6741	0.101	0.102
UnknownC5s	U5	0.0003	0.0007	0.000	0.000
n-Hexane	P6	0.7430	2.0246	0.306	0.307
2,2-Dimethylpentane	I7	0.0090	0.0285	0.004	0.004
Methylcyclopentane	N6	0.1611	0.4287	0.057	0.058
2,4-Dimethylpentane	I7	0.0138	0.0437	0.006	0.006
2,2,3-Trimethylbutane	I7	0.0016	0.0051	0.001	0.001
Benzene	A6	0.1255	0.3100	0.035	0.035
3,3-Dimethylpentane	I7	0.0034	0.0108	0.002	0.002
Cyclohexane	N6	0.1331	0.3542	0.045	0.045
2-Methylhexane	I7	0.0457	0.1448	0.021	0.021
2,3-Dimethylpentane	I7	0.0131	0.0415	0.006	0.006
1,1-Dimethylcyclopentane	N7	0.0099	0.0307	0.004	0.004
3-Methylhexane	I7	0.0408	0.1293	0.019	0.019
1c,3-Dimethylcyclopentane	N7	0.0098	0.0304	0.005	0.005
1t,3-Dimethylcyclopentane	N7	0.0085	0.0264	0.004	0.004
3-Ethylpentane	I7	0.0023	0.0073	0.001	0.001

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

1t,2-Dimethylcyclopentane	N7	0.0134	0.0416	0.006	0.006
2,2,4-Trimethylpentane	I8	0.0001	0.0003	0.000	0.000
UnknownC6s	U6	0.0002	0.0005	0.000	0.000
n-Heptane	P7	0.0889	0.2817	0.041	0.041
1c,2-Dimethylcyclopentane	N7	0.0005	0.0015	0.000	0.000
Methylcyclohexane	N7	0.0516	0.1602	0.021	0.021
2,2-Dimethylhexane	I8	0.0022	0.0079	0.001	0.001
Ethylcyclopentane	N7	0.0013	0.0040	0.001	0.001
2,5-Dimethylhexane	I8	0.0009	0.0033	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0003	0.000	0.000
2,4-Dimethylhexane	I8	0.0011	0.0040	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0010	0.0035	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0014	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0007	0.0025	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0003	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0003	0.000	0.000
Toluene	A7	0.0235	0.0685	0.008	0.008
2,3-Dimethylhexane	I8	0.0004	0.0014	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0003	0.0011	0.000	0.000
2-Methylheptane	I8	0.0030	0.0108	0.002	0.002
4-Methylheptane	I8	0.0008	0.0029	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0003	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0003	0.000	0.000
3-Methylheptane	I8	0.0016	0.0058	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0020	0.0071	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0003	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0008	0.0028	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0004	0.0014	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0003	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0003	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0003	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0006	0.0021	0.000	0.000
UnknownC7s	U7	0.0003	0.0009	0.000	0.000
n-Octane	P8	0.0036	0.0130	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0003	0.0011	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0003	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0002	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0006	0.0024	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0003	0.0012	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0011	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0007	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
Ethylbenzene	I8	0.0003	0.0010	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0014	0.0047	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0005	0.0017	0.000	0.000
4-Methyloctane	I9	0.0002	0.0008	0.000	0.000
2-Methyloctane	I9	0.0002	0.0008	0.000	0.000
3-Methyloctane	I9	0.0002	0.0008	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0004	0.0013	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0004	0.000	0.000
UnknownC8s	U8	0.0001	0.0003	0.000	0.000
n-Nonane	P9	0.0007	0.0028	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0004	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0004	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0008	0.000	0.000
5-Methylnonane	I10	0.0001	0.0004	0.000	0.000

1,2-Methylethylbenzene	A9	0.0001	0.0004	0.000	0.000
3-Methylnonane	I10	0.0001	0.0004	0.000	0.000
i-Butylbenzene	A10	0.0002	0.0008	0.000	0.000
UnknownC9s	U9	0.0002	0.0008	0.000	0.000
n-Decane	P10	0.0003	0.0014	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0004	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0004	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0005	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Dimethyl-2-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0005	0.000	0.000
UnknownC10s	U10	0.0003	0.0014	0.000	0.000
n-Undecane	P11	0.0003	0.0015	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0001	0.0004	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0005	0.000	0.000
UnknownC11s	U11	0.0001	0.0005	0.000	0.000
n-Dodecane	P12	0.0002	0.0011	0.000	0.000
1-Methylnaphthalene	A11	0.0001	0.0004	0.000	0.000
n-Tridecane	P13	0.0002	0.0012	0.000	0.000
n-Tetradecane	P14	0.0001	0.0006	0.000	0.000
TOTAL		100.00000	100.00000	11.4205	11.4829

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.1255	0.3100
TOLUENE	0.0235	0.0885
ETHYLBENZENE	0.0003	0.0010
XYLENES	0.0023	0.0077
TOTAL BTEX	0.1516	0.3872

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1307.1 /scf	1314.2 /scf
	NET WET REAL :	1284.3 /scf	1291.4 /scf
HIGH	GROSS DRY REAL :	1427.1 /scf	1434.9 /scf
	GROSS WET REAL :	1402.2 /scf	1409.9 /scf
	NET DRY REAL :	15697.3 /lb	15783.0 /lb
	GROSS DRY REAL :	17139.7 /lb	17233.3 /lb

RELATIVE DENSITY (AIR=1): 1.0912
COMPRESSIBILITY FACTOR : 0.99445

(CALC: GPA STD 2145 & TP-17 @14.696 & 60 F)
(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201112122	ANALYSIS NO. :	04
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 15, 2011 - 9:00 A.M.
PRODUCER :		CYLINDER NO. :	1010
LEASE NO. :	13-26-36	SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD VAPOR GAS #2; 2ND 24 HOUR TEST		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; OFF:DECEMBER 16, 2011 - 9:00 A.M.		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0014	0.0028		
OXYGEN/ARGON	5.15	4.35	—	—
NITROGEN	19.15	14.17	—	—
CARBON DIOXIDE	0.48	0.56	—	—
METHANE	29.29340	12.41200	—	—
ETHANE	10.1402	8.0527	2.7162	2.7310
PROPANE	10.0428	11.6957	2.7714	2.7866
I-BUTANE	2.7382	4.2032	0.8977	0.9026
N-BUTANE	7.0522	10.8254	2.2262	2.2383
I-PENTANE	3.7225	7.0790	1.3455	1.3529
N-PENTANE	4.5892	8.7447	1.6659	1.6750
HEXANES PLUS	7.6401	17.9045	3.0874	3.1042
TOTALS	100.00000	100.00000	14.7103	14.7906

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.3826	0.7893
TOLUENE	0.1068	0.2599
ETHYLBENZENE	0.0011	0.0031
XYLENES	0.0092	0.0257
TOTAL BTEX	0.4997	1.0780

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1613.1 /scf	1621.9 /scf
	NET WET REAL :	1584.9 /scf	1593.7 /scf
HIGH	GROSS DRY REAL :	1753.9 /scf	1763.5 /scf
	GROSS WET REAL :	1723.2 /scf	1732.9 /scf
	NET DRY REAL :	16187.7 /lb	16276.1 /lb
	GROSS DRY REAL :	17605.6 /lb	17701.7 /lb
	RELATIVE DENSITY (AIR=1):		1.3065
	COMPRESSIBILITY FACTOR :		0.99276

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

(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201112122	ANALYSIS NO. :	04
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 15, 2011 - 9:00 A.M.
PRODUCER :		CYLINDER NO. :	1010
LEASE NO. :	13-26-36	SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD VAPOR GAS #2; 2ND 24 HOUR TEST		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; OFF:DECEMBER 16, 2011 - 9:00 A.M.		

Componet	Mole %	Wt %
Carbon Dioxide	0.48	0.56
Nitrogen	19.15	14.17
Methane	29.29340	12.41200
Ethane	10.1402	8.0527
Propane	10.0428	11.6957
Isobutane	2.7382	4.2032
n-Butane	7.0522	10.8254
Isopentane	3.4579	6.5889
n-Pentane	4.5892	8.7447
Cyclopentane	0.2646	0.4901
n-Hexane	2.2971	5.2281
Cyclohexane	0.4763	1.0587
Other Hexanes	2.7943	6.3322
Heptanes	1.1720	3.0914
Methycyclohexane	0.2483	0.6439
2,2,4 Trimethylpentane	0.0005	0.0015
Benzene	0.3826	0.7893
Toluene	0.1068	0.2599
Ethylbenzene	0.0011	0.0031
Xylenes	0.0092	0.0257
C8+ Heavies	0.1519	0.4707
Subtotal	94.84860	95.64720
Oxygen/Argon	5.15	4.35
Alcohols	0.0014	0.0028
Total	100.00000	100.00000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201112122	ANALYSIS NO. :	04
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 15, 2011 - 9:00 A.M.
PRODUCER :		CYLINDER NO. :	1010
LEASE NO. :	13-26-36	SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	13-26-36 BTR; BTR FIELD VAPOR GAS #2; 2ND 24 HOUR TEST		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; PROBE; OFF:DECEMBER 16, 2011 - 9:00 A.M.		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Oxygen/Argon	—	5.15	4.35	—	—
Nitrogen	—	19.15	14.17	—	—
Carbon Dioxide	—	0.48	0.56	—	—
Methane	P1	29.29340	12.41200	—	—
Ethane	P2	10.1402	8.0527	2.716	2.731
Propane	P3	10.0428	11.6957	2.771	2.787
i-Butane	I4	2.7382	4.2032	0.898	0.903
n-Butane	P4	7.0517	10.8246	2.226	2.238
2,2-Dimethylpropane	I5	0.0270	0.0514	0.010	0.010
i-Pentane	I5	3.4309	6.5375	1.257	1.264
UnknownC4s	U4	0.0005	0.0008	0.000	0.000
n-Pentane	P5	4.5890	8.7443	1.666	1.675
t-Butanol	X4	0.0009	0.0018	0.000	0.000
2,2-Dimethylbutane	I6	0.0699	0.1591	0.029	0.029
Cyclopentane	N5	0.2646	0.4901	0.078	0.079
2,3-Dimethylbutane	I6	0.1874	0.4265	0.077	0.078
2-Methylpentane	I6	1.3242	3.0139	0.550	0.553
i-Butanol	X4	0.0005	0.0010	0.000	0.000
3-Methylpentane	I6	0.6930	1.5773	0.283	0.285
UnknownC5s	U5	0.0002	0.0004	0.000	0.000
n-Hexane	P6	2.2971	5.2281	0.946	0.951
2,2-Dimethylpentane	I7	0.0313	0.0828	0.015	0.015
Methylcyclopentane	N6	0.5195	1.1547	0.184	0.185
2,4-Dimethylpentane	I7	0.0503	0.1331	0.024	0.024
2,2,3-Trimethylbutane	I7	0.0057	0.0151	0.003	0.003
Benzene	A6	0.3826	0.7893	0.107	0.108
3,3-Dimethylpentane	I7	0.0130	0.0344	0.006	0.006
Cyclohexane	N6	0.4763	1.0587	0.163	0.164
2-Methylhexane	I7	0.1984	0.5250	0.092	0.093
2,3-Dimethylpentane	I7	0.0554	0.1466	0.025	0.025
1,1-Dimethylcyclopentane	N7	0.0403	0.1045	0.016	0.016
3-Methylhexane	I7	0.1814	0.4801	0.083	0.084
1c,3-Dimethylcyclopentane	N7	0.0423	0.1097	0.019	0.019
1t,3-Dimethylcyclopentane	N7	0.0374	0.0970	0.017	0.017
3-Ethylpentane	I7	0.0102	0.0270	0.005	0.005
1t,2-Dimethylcyclopentane	N7	0.0588	0.1525	0.027	0.027

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

2,2,4-Trimethylpentane	I8	0.0005	0.0015	0.000	0.000
UnknownC6s	U6	0.0003	0.0007	0.000	0.000
n-Heptane	P7	0.4376	1.1580	0.202	0.203
1c,2-Dimethylcyclopentane	N7	0.0031	0.0080	0.001	0.001
Methylcyclohexane	N7	0.2483	0.6439	0.100	0.101
2,2-Dimethylhexane	I8	0.0116	0.0350	0.005	0.005
Ethylcyclopentane	N7	0.0065	0.0168	0.003	0.003
2,5-Dimethylhexane	I8	0.0050	0.0151	0.003	0.003
2,2,3-Trimethylpentane	I8	0.0003	0.0009	0.000	0.000
2,4-Dimethylhexane	I8	0.0060	0.0181	0.003	0.003
1c,2t,4-Trimethylcyclopentane	N8	0.0055	0.0163	0.003	0.003
3,3-Dimethylhexane	I8	0.0019	0.0057	0.001	0.001
1t,2c,4-Trimethylcyclopentane	N8	0.0041	0.0121	0.002	0.002
2,3,4-Trimethylpentane	I8	0.0005	0.0015	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0003	0.0009	0.000	0.000
Toluene	A7	0.1068	0.2599	0.036	0.036
2,3-Dimethylhexane	I8	0.0024	0.0072	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0018	0.0054	0.001	0.001
2-Methylheptane	I8	0.0180	0.0543	0.009	0.009
4-Methylheptane	I8	0.0045	0.0136	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0004	0.0012	0.000	0.000
3,4-Dimethylhexane	I8	0.0004	0.0012	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0003	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0002	0.0006	0.000	0.000
3-Methylheptane	I8	0.0095	0.0287	0.005	0.005
1c,2t,3-Trimethylcyclopentane	N8	0.0120	0.0356	0.006	0.006
3-Ethylhexane	I8	0.0003	0.0009	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0048	0.0142	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0023	0.0068	0.001	0.001
3c-Ethylmethylcyclopentane	N8	0.0002	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0005	0.0015	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0004	0.0012	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0007	0.0021	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0002	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0036	0.0107	0.002	0.002
UnknownC7s	U7	0.0003	0.0008	0.000	0.000
n-Octane	P8	0.0210	0.0634	0.011	0.011
1c,4-Dimethylcyclohexane	N8	0.0021	0.0062	0.001	0.001
i-Propylcyclopentane	I8	0.0003	0.0009	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0003	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0003	0.0010	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0008	0.0024	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0036	0.0120	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0015	0.0051	0.001	0.001
2,4-Dimethylheptane	I9	0.0005	0.0017	0.000	0.000
4,4-Dimethylheptane	I9	0.0002	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0018	0.0053	0.001	0.001
n-Propylcyclopentane	N8	0.0010	0.0030	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0002	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0004	0.0013	0.000	0.000
Ethylbenzene	I8	0.0011	0.0031	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0006	0.0020	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0003	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0054	0.0151	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0024	0.0067	0.001	0.001
3,4-Dimethylheptane	I9	0.0002	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0004	0.0013	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0007	0.000	0.000
4-Methyloctane	I9	0.0007	0.0024	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0003	0.000	0.000

3-Ethylheptane	I9	0.0003	0.0010	0.000	0.000
3-Methyloctane	I9	0.0008	0.0027	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0014	0.0039	0.001	0.001
i-Butylcyclopentane	N9	0.0007	0.0023	0.000	0.000
UnknownC8s	U8	0.0003	0.0009	0.000	0.000
n-Nonane	P9	0.0028	0.0095	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0004	0.0013	0.000	0.000
i-Propylbenzene	A9	0.0003	0.0009	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0004	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0005	0.0017	0.000	0.000
n-Propylbenzene	A9	0.0004	0.0013	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0002	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0006	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0003	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0004	0.0013	0.000	0.000
5-Methylnonane	I10	0.0002	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0003	0.0009	0.000	0.000
3-Methylnonane	I10	0.0002	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0005	0.0018	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0004	0.000	0.000
UnknownC9s	U9	0.0026	0.0088	0.001	0.001
n-Decane	P10	0.0008	0.0030	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0003	0.0009	0.000	0.000
Sec-Butylcyclohexane	A10	0.0003	0.0011	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0003	0.000	0.000
1,4-Dimethyl-2-ethylbenzene	A10	0.0002	0.0007	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0002	0.0007	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0003	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0004	0.000	0.000
UnknownC10s	U10	0.0008	0.0030	0.000	0.000
n-Undecane	P11	0.0009	0.0037	0.001	0.001
UnknownC11s	U11	0.0001	0.0004	0.000	0.000
n-Dodecane	P12	0.0009	0.0040	0.001	0.001
1,2,4-Triethylbenzene	A12	0.0001	0.0004	0.000	0.000
n-Tridecane	P13	0.0007	0.0034	0.001	0.001
UnknownC13s	U13	0.0004	0.0019	0.000	0.000
n-Tetradecane	P14	0.0002	0.0011	0.000	0.000
n-Pentadecane	P15	0.0001	0.0005	0.000	0.000
n-Hexadecane	P16	0.0001	0.0006	0.000	0.000
n-Heptadecane	P17	0.0001	0.0006	0.000	0.000
TOTAL		100.00000	100.00000	14.7103	14.7906

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.3826	0.7893
TOLUENE	0.1088	0.2599
ETHYLBENZENE	0.0011	0.0031
XYLENES	0.0092	0.0257
TOTAL BTEX	0.4997	1.0780

	BTU @	14.650	14.730
LOW	NET DRY REAL :	1613.1 /scf	1621.9 /scf
	NET WET REAL :	1584.9 /scf	1593.7 /scf
HIGH	GROSS DRY REAL :	1753.9 /scf	1763.5 /scf
	GROSS WET REAL :	1723.2 /scf	1732.9 /scf
	NET DRY REAL :	16187.7 /lb	16276.1 /lb
	GROSS DRY REAL :	17605.6 /lb	17701.7 /lb

RELATIVE DENSITY (AIR=1): 1.3065
COMPRESSIBILITY FACTOR : 0.99276

(CALC: GPA STD 2145 & TP-17 @14.696 & 60 F)
(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730
THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF ITS APPLICATION

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

EMPACT

PROJECT NO:	201105128	ANALYSIS NO.:	01
COMPANY NAME:	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 5, 2012
		SAMPLE DATE:	DECEMBER 22, 2011
COMMENTS:	1L GLASS SPOT; NO PROBE BROWN	SAMPLED BY:	GALE MCENDREE EMPACT

TEST PROCEDURE / METHOD: API GRAVITY

DESCRIPTION:	API GRAVITY @ 60/60
16-26-36 BTR @ 10:35 A.M. BTR FIELD; TANK BATTERY #83353 166 DEGREES	42.1

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT Analytical Systems, Inc. 365 South Main St. Brighton, CO. 80601 (303) 637-0150

PROJECT NO:	201105128	ANALYSIS NO.:	01
COMPANY NAME:	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 5, 2012
		SAMPLE DATE:	DECEMBER 22, 2011
COMMENTS:	1L GLASS SPOT; NO PROBE BROWN	SAMPLED BY:	GALE MCENDREE EMPACT

TEST PROCEDURE / METHOD: REID VAPOR PRESSURE (ASTM D-323)

DESCRIPTION:	REID VAPOR PRESSURE
16-26-36 BTR @ 10:35 A.M. BTR FIELD; TANK BATTERY #83353 166 DEGREES	*

***Sample did not meet requirements of method, because it was not a liquid at 100 deg. F.**

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201105128	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 22, 2011
PRODUCER :		CYLINDER NO. :	17868
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	16-26-36 BTR @ 10:25 A.M. BTR FIELD; SEPARATOR		EMPACT
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE EMISSION TEST 12-20, 21, 22-11		

COMPONENT	MOLE %	MASS %	VOL. %
NITROGEN (AIR)	0.0000	0.0000	0.0000
CARBON DIOXIDE	0.0098	0.0032	0.0029
METHANE	0.2166	0.0261	0.0656
ETHANE	0.1074	0.0243	0.0514
PROPANE	0.1562	0.0518	0.0770
I-BUTANE	0.0707	0.0309	0.0414
N-BUTANE	0.2527	0.1105	0.1426
I-PENTANE	0.1393	0.0756	0.0912
N-PENTANE	0.2116	0.1148	0.1371
HEXANES PLUS	98.8357	99.5628	99.3908
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	MOLE%	MASS%
BENZENE	2.0277	1.1913
TOLUENE	3.5495	2.4599
ETHYLBENZENE	0.3121	0.2492
XYLENE	3.2596	2.6030
TOTAL BTEX	9.1489	6.5034

(CALC: GPA STD 2145-94 & TP-17 @14.696 & 60 F)

	TOTAL SAMPLE	C6+ FRACTION	
Specific Gravity (H2O=1) =	0.754	0.755	60/60
API Gravity =	56.17	55.92	60/60
Molecular Weight =	132.95	134.217	
Absolute Density =	6.29	6.3	LBS/GAL
Heating Value Liq. Idl Gas=	126884	127435	BTU/GAL
Vapor/Liquid =	18.13	18.04	CUFT/GAL
Vapor Pressure =	13.47	1.24	PSIA @100 F

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) : ASTM D6730*

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBLITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBLITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201105128	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 22, 2011
PRODUCER :		CYLINDER NO. :	17868
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	16-26-36 BTR @ 10:25 A.M. BTR FIELD; SEPARATOR		EMPACT
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE EMISSION TEST 12-20, 21, 22-11		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0098		0.0032		0.0029	
NITROGEN (AIR)	0.0000		0.0000		0.0000	
METHANE	0.2166		0.0261		0.0656	
ETHANE	0.1074		0.0243		0.0514	
PROPANE	0.1562		0.0518		0.0770	
I-BUTANE	0.0707		0.0309		0.0414	
N-BUTANE	0.2527		0.1105		0.1426	
I-PENTANE	0.1393		0.0756		0.0912	
N-PENTANE	0.2116		0.1148		0.1371	
CYCLOPENTANE (N-C5)	0.4457		0.2351		0.2331	
N-HEXANE	5.5826		3.6186		4.1095	
CYCLOHEXANE (OTHER C6)	1.7054		1.0795		1.0386	
OTHER HEXANES	6.8724		4.4225		4.8487	
OTHER HEPTANES	11.1670		8.3944		9.0890	
METHYLCYCLOHEXANE (OTHER C7)	2.9189		2.1557		2.0974	
2,2,4 TRIMETHYLPENTANE	0.2472		0.1826		0.1827	
BENZENE	2.0277		1.1913		1.0170	
TOLUENE	3.5495		2.4599		2.1208	
ETHYLBENZENE	0.3121		0.2492		0.2148	
XYLENES	3.2596		2.6030		2.2513	
OTHER OCTANES	9.9867		8.5670		8.8960	
OCTANES PLUS	—	64.5665	—	76.0058	—	74.8367
NONANES	9.1413		8.7523		8.8298	
DECANES PLUS	41.6196		55.6517		54.4621	
SUB TOTAL	100.0000		100.0000		100.0000	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	56.17 60/60	
Vapor Pressure	=	13.47 PSIA & 100 F	
Average Molecular Weight of Decanes plus	=	177.78	
Average Specific Gravity of Decanes plus	=	0.7710	

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201105128	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 22, 2011
PRODUCER :		CYLINDER NO. :	17868
LEASE NO. :		SAMPLED BY :	GALE MCENDREE EMPACT
NAME/DESCRIP :	16-26-36 BTR @ 10:25 A.M. BTR FIELD; SEPARATOR		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE EMISSION TEST 12-20, 21, 22-11		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
NITROGEN		0.0000	0.0000	0.0000
CARBON DIOXIDE		0.0098	0.0032	0.0029
	C1	0.2166	0.0261	0.0656
	C2	0.1074	0.0243	0.0514
	C3	0.1562	0.0516	0.0770
	C4	0.3234	0.1414	0.1840
	C5	0.7966	0.4255	0.4614
	C6	16.1881	10.3119	11.0138
	C7	17.6354	13.0100	13.3072
	C8	13.8056	11.6016	11.5448
	C9	9.1413	8.7523	8.6298
	C10	8.8934	9.3196	9.1327
	C11	7.4779	8.5254	8.2941
	C12	6.1483	7.6782	7.5814
	C13	5.6510	7.7751	7.6716
	C14	5.1165	7.6347	7.5391
	C15	3.2711	5.2262	5.1014
	C16	1.8102	3.0831	2.9900
	C17	0.8738	1.5804	1.5280
	C18	0.9487	1.8160	1.7506
	C19	0.7945	1.6046	1.5370
	C20	0.3026	0.6430	0.6126
	C21	0.1901	0.4240	0.4019
	C22	0.0863	0.2016	0.1904
	C23	0.0255	0.0622	0.0588
	C24	0.0174	0.0443	0.0418
	C25	0.0060	0.0159	0.0149
	C26	0.0063	0.0174	0.0162
	C27	0.0000	0.0000	0.0000
	C28	0.0000	0.0000	0.0000
	C29	0.0000	0.0000	0.0000
	C30+	0.0000	0.0000	0.0000
	Total	100.0000	100.0000	100.0000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201105128	ANALYSIS NO. :	02
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 22, 2011
PRODUCER :		CYLINDER NO. :	17868
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	16-26-36 BTR @ 10:25 A.M. BTR FIELD; SEPARATOR		EMPACT
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE EMISSION TEST 12-20, 21, 22-11		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Carbon Dioxide		0.0098	0.0032	0.0029
Methane	P1	0.2166	0.0261	0.0656
Ethane	P2	0.1074	0.0243	0.0514
Propane	P3	0.1562	0.0518	0.0770
I-Butane	I4	0.0707	0.0309	0.0414
n-Butane	P4	0.2527	0.1105	0.1426
I-Pentane	I5	0.1393	0.0756	0.0912
n-Pentane	P5	0.2116	0.1148	0.1371
Cyclopentane	N5	0.4457	0.2351	0.2331
2,3-Dimethylbutane	I6	0.3906	0.2532	0.2861
2-Methylpentane	I6	2.7928	1.8103	2.0745
3-Methylpentane	I6	1.5755	1.0212	1.1507
n-Hexane	P6	5.5826	3.6186	4.1095
2,2-Dimethylpentane	I7	0.1938	0.1461	0.1615
Methylcyclopentane	N6	2.1135	1.3378	1.3374
2,4-Dimethylpentane	I7	0.5583	0.4208	0.4689
Benzene	A6	2.0277	1.1913	1.0170
3,3-Dimethylpentane	I7	0.1229	0.0926	0.1003
Cyclohexane	N6	1.7054	1.0795	1.0386
2-Methylhexane	I7	0.9973	0.7516	0.8302
2,3-Dimethylpentane	I7	0.4348	0.3277	0.3517
1,1-Dimethylcyclopentane	N7	0.3074	0.2270	0.2254
3-Methylhexane	I7	1.2296	0.9267	1.0082
1c,3-Dimethylcyclopentane	N7	0.3203	0.2365	0.2378
1t,3-Dimethylcyclopentane	N7	0.2472	0.1826	0.1827
3-Ethylpentane	I7	0.0587	0.0442	0.0473
1t,2-Dimethylcyclopentane	N7	0.3718	0.2746	0.2737
2,2,4-Trimethylpentane	I8	0.0495	0.0425	0.0458
n-Heptane	P7	6.1412	4.6283	5.0689
1c,2-Dimethylcyclopentane	N7	0.0547	0.0404	0.0392
Methylcyclohexane	N7	2.9189	2.1557	2.0974
2,2-Dimethylhexane	I8	0.2609	0.2242	0.2414
Ethylcyclopentane	N7	0.1290	0.0953	0.0932
2,5-Dimethylhexane	I8	0.1452	0.1247	0.1346
2,4-Dimethylhexane	I8	0.1187	0.1020	0.1096

1c,2t,4-Trimethylcyclopentane	N8	0.1258	0.1062	0.1042
3,3-Dimethylhexane	I8	0.0796	0.0684	0.0722
Toluene	A7	3.5495	2.4599	2.1208
2,3-Dimethylhexane	I8	0.1724	0.1481	0.1559
2-Methyl-3-ethylpentane	I8	0.0593	0.0509	0.0530
2-Methylheptane	I8	1.0196	0.8760	0.9385
4-Methylheptane	I8	0.3870	0.3325	0.3476
3-Methyl-3-ethylpentane	I8	0.0795	0.0683	0.0704
3,4-Dimethylhexane	I8	0.0531	0.0456	0.0475
3-Methylheptane	I8	0.6727	0.5780	0.6139
1c,2t,3-Trimethylcyclopentane	N8	0.6291	0.5309	0.5164
3-Ethylhexane	I8	0.1118	0.0961	0.1010
1t,4-Dimethylcyclohexane	N8	0.3510	0.2962	0.2911
1,1-Dimethylcyclohexane	N8	0.1000	0.0844	0.0810
3t-Ethylmethylcyclopentane	N8	0.0468	0.0395	0.0386
1,1-Methylethylcyclopentane	N8	0.0615	0.0519	0.0498
1t,2-Dimethylcyclohexane	N8	0.1994	0.1683	0.1626
n-Octane	P8	4.1937	3.6031	3.8417
1c,4-Dimethylcyclohexane	N8	0.6594	0.5565	0.5328
1c,2-Dimethylcyclohexane	N8	0.1524	0.1286	0.1211
1,1,4-Trimethylcyclohexane	N9	0.4123	0.3915	0.3802
2,2,3-Trimethylhexane	I9	0.2705	0.2609	0.2681
4,4-Dimethylheptane	I9	0.0667	0.0643	0.0673
Ethylcyclohexane	N8	0.3361	0.2837	0.2700
n-Propylcyclopentane	N8	0.1694	0.1430	0.1380
1,1,3-Trimethylcyclohexane	N9	0.0474	0.0450	0.0437
Ethylbenzene	A8	0.3121	0.2492	0.2148
1c,2t,4t-Trimethylcyclohexane	N9	0.1105	0.1049	0.0999
2,3-Dimethylheptane	I9	0.0519	0.0501	0.0517
1,3-Dimethylbenzene (m-Xylene)	A8	1.6630	1.3280	1.1514
1,4-Dimethylbenzene (p-Xylene)	A8	0.9642	0.7700	0.6697
3,4-Dimethylheptane	I9	0.2754	0.2657	0.2723
3,4-Dimethylheptane (2)	I9	0.1966	0.1897	0.1944
4-Ethylheptane	I9	0.1039	0.1002	0.1049
4-Methyloctane	I9	0.2017	0.1946	0.2024
2-Methyloctane	I9	0.3582	0.3456	0.3629
3-Ethylheptane	I9	0.0603	0.0582	0.0600
3-Methyloctane	I9	0.4533	0.4373	0.4547
1,2-Dimethylbenzene (o-Xylene)	A8	0.6324	0.5050	0.4302
i-Butylcyclopentane	N9	0.1834	0.1741	0.1671
n-Nonane	P9	3.6484	3.5196	3.6753
1,1-Methylethylcyclohexane	N9	0.4684	0.4519	0.4733
2,4-Dimethyloctane	I10	0.0943	0.1009	0.1023
n-Butylcyclopentane	N9	0.2469	0.2605	0.2444
3,3-Dimethyloctane	I10	0.1373	0.1469	0.1490
n-Propylbenzene	A9	0.2747	0.2483	0.2155
3,6-Dimethyloctane	I10	0.1178	0.1261	0.1278
3-Methyl-5-ethylheptane	I10	0.0937	0.0904	0.0934
1,3-Methylethylbenzene	A9	0.2170	0.1962	0.1689
1,4-Methylethylbenzene	A9	0.0720	0.0651	0.0560
1,3,5-Trimethylbenzene	A9	0.1717	0.1552	0.1345
2,3-Dimethyloctane	I10	0.0666	0.0713	0.0723
5-Methylnonane	I10	0.2369	0.2557	0.2616
1,2-Methylethylbenzene	A9	0.3965	0.3584	0.3069
2-Methylnonane	I10	0.0250	0.0268	0.0277
3-Ethyloctane	I10	0.0679	0.0727	0.0737
3-Methylnonane	I10	0.2523	0.2700	0.2759
t-Butylbenzene	A10	0.6218	0.6277	0.5434
i-Butylcyclohexane	N10	0.1413	0.1491	0.1377
UnknownC9s	U9	0.7156	0.6903	0.7208
n-Decane	P10	4.2523	4.5506	4.6720
1,2,3-Trimethylbenzene	A9	0.1360	0.1247	0.1046
1,3-Methyl-i-propylbenzene	A10	0.0797	0.0721	0.0617
1,4-Methyl-i-propylbenzene	A10	0.0613	0.0554	0.0474
Sec-Butylcyclohexane	N10	0.2419	0.2552	0.2354
1,2-Methyl-i-propylbenzene	A10	0.1582	0.1597	0.1366
3-Ethylnonane	I10	0.0358	0.0383	0.0395

1,3-Diethylbenzene	A10	0.0832	0.0840	0.0729
1,3-Methyl-n-propylbenzene	A10	0.1006	0.1016	0.0885
1,4-Diethylbenzene	A10	0.1011	0.1021	0.0888
1,4-Methyl-n-propylbenzene	A10	0.0225	0.0227	0.0198
n-Butylbenzene	A10	0.0590	0.0596	0.0519
1,3-Dimethyl-5-ethylbenzene	A10	0.0540	0.0545	0.0473
1,2-Diethylbenzene	A10	0.0494	0.0499	0.0426
1,2-Methyl-n-propylbenzene	A10	0.1022	0.1032	0.0886
1,4-Dimethyl-2-ethylbenzene	A10	0.1264	0.1276	0.1091
1,2-Dimethyl-4-ethylbenzene	A10	0.2159	0.2180	0.1870
1,3-Dimethyl-2-ethylbenzene	A10	0.1377	0.1390	0.1171
1t,2c,4-Trimethylcyclopentane	A10	0.0979	0.0826	0.0828
1,2-Dimethyl-3-ethylbenzene	A10	0.0780	0.0787	0.0662
1,4-Methyl-t-butylbenzene	A11	0.1706	0.1722	0.1473
UnknownC10s	U10	0.7310	0.7823	0.8032
n-Undecane	P11	4.4162	5.1920	5.2566
1,4-Ethyl-i-propylbenzene	A11	0.3209	0.3240	0.2772
1,2,4,5-Tetramethylbenzene	A11	0.1122	0.1133	0.0959
1,2-Methyl-n-butylbenzene	A11	0.0462	0.0466	0.0399
1,2,3,5-Tetramethylbenzene	A11	0.0714	0.0721	0.0607
1,2-Methyl-t-butylbenzene	A11	0.0298	0.0301	0.0258
5-Methylindan	A11	0.0724	0.0928	0.0929
4-Methylindan	A11	0.1031	0.1321	0.1323
1,2-Ethyl-n-propylbenzene	A11	0.0697	0.0704	0.0602
2-Methylindan	A11	0.0539	0.0691	0.0692
1,3-Methyl-n-butylbenzene	A11	0.0479	0.0484	0.0414
1,3-Di-i-propylbenzene	A11	0.0568	0.0573	0.0490
sec-Pentylbenzene	A11	0.1289	0.1301	0.1113
n-Pentylbenzene	A11	0.0597	0.0666	0.0582
1t-M-2-(4MP)cyclopentane	P12	0.0268	0.0343	0.0343
1,2-Di-n-propylbenzene	A11	0.1131	0.1142	0.0977
1,4-Di-i-propylbenzene	A11	0.2449	0.2472	0.2115
Tetrahydronaphthalene	A10	0.0699	0.0706	0.0604
t-Decahydronaphthalene	A10	0.0478	0.0483	0.0413
Naphthalene	A10	0.1307	0.1260	0.1076
1-t-Butyl-3,5-dimethylbenzene	A12	0.0455	0.0459	0.0393
1,4-Ethyl-t-butylbenzene	A11	0.0415	0.0419	0.0358
UnknownC11s	U11	0.8907	1.0472	1.0602
n-Dodecane	P12	4.9719	6.3699	6.3783
1,3-Di-n-propylbenzene	A12	0.0669	0.0675	0.0576
1,2,4-Triethylbenzene	A12	0.3394	0.3068	0.2626
1,4-Methyl-n-pentylbenzene	A12	0.1038	0.1048	0.0897
n-Hexylbenzene	A12	0.1977	0.2413	0.2110
1,2,3,4,5-Pentamethylbenzene	A13	0.1609	0.1624	0.1389
2-Methylnaphthalene	A11	0.2674	0.2860	0.2447
1-Methylnaphthalene	A11	0.1608	0.1718	0.1263
UnknownC12s	U12	0.3963	0.5077	0.5084
n-Tridecane	P13	3.7540	5.2054	5.1507
UnknownC13s	U13	1.7361	2.4073	2.3820
n-Tetradecane	P14	2.4414	3.6430	3.5974
UnknownC14s	U14	2.6751	3.9917	3.9417
n-Pentadecane	P15	1.2584	2.0105	1.9825
UnknownC15s	U15	2.0127	3.2157	3.1389
n-Hexadecane	P16	0.6725	1.1454	1.1108
UnknownC16s	U16	1.1377	1.9377	1.8792
n-Heptadecane	P17	0.4517	0.8170	0.7899
UnknownC17s	U17	0.4221	0.7634	0.7381
n-Octadecane	P18	0.4653	0.8907	0.8586
UnknownC18s	U18	0.4834	0.9253	0.8920
n-Nonadecane	P19	0.3408	0.6883	0.6593
UnknownC19s	U19	0.4537	0.9163	0.8777
n-Eicosane	P20	0.1433	0.3045	0.2901
UnknownC20s	U20	0.1593	0.3385	0.3225
n-Heneicosane	P21	0.0655	0.1461	0.1385
UnknownC21s	U21	0.1246	0.2779	0.2634
n-Docosane	P22	0.0357	0.0834	0.0788
UnknownC22s	U22	0.0506	0.1182	0.1116

n-Tricosane	P23	0.0184	0.0449	0.0423
UnknownC23s	U23	0.0071	0.0173	0.0163
n-Tetracosane	P24	0.0174	0.0443	0.0416
n-Pentacosane	P25	0.0060	0.0159	0.0149
n-Hexacosane	P26	0.0063	0.0174	0.0162
TOTAL		100.0000	100.0000	100.0000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201112170	ANALYSIS NO. :	03
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 20, 2011
PRODUCER :		CYLINDER NO. :	55
LEASE NO. :		SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	16-26-36 BTR @ 9:00 A.M. BTR FIELD; VAPOR GAS		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SAMPLE FROM TEST 1 OF 2 EMISSION		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
ALCOHOLS	0.0026	0.0035		
OXYGEN/ARGON	1.30	0.76	—	—
NITROGEN	6.85	3.51	—	—
CARBON DIOXIDE	0.28	0.23	—	—
METHANE	19.26210	5.65680	—	—
ETHANE	8.0933	4.4557	2.1825	2.1944
PROPANE	8.6576	6.9898	2.4049	2.4180
I-BUTANE	2.6565	2.8270	0.8764	0.8812
N-BUTANE	8.2924	8.8246	2.6384	2.6508
I-PENTANE	7.0110	9.2358	2.5383	2.5522
N-PENTANE	11.3210	14.9550	4.1376	4.1602
HEXANES PLUS	26.2735	42.5518	10.8747	10.7323
TOTALS	100.00000	100.00000	25.4508	25.5891

BTEX COMPONENTS	MOLE%	WT%
BENZENE	1.6404	2.3461
TOLUENE	0.3471	0.5856
ETHYLBENZENE	0.0045	0.0088
XYLENES	0.0330	0.0842
TOTAL BTEX	2.0250	3.0047

	BTU @	14.650	14.730
LOW	NET DRY REAL :	2715.3 /scf	2730.1 /scf
	NET WET REAL :	2667.6 /scf	2682.6 /scf
HIGH	GROSS DRY REAL :	2938.3 /scf	2954.3 /scf
	GROSS WET REAL :	2886.9 /scf	2902.9 /scf
	NET DRY REAL :	18893.8 /lb	18996.9 /lb
	GROSS DRY REAL :	20447.4 /lb	20559.1 /lb
	RELATIVE DENSITY (AIR=1):		1.8847
	COMPRESSIBILITY FACTOR :		0.98613

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

"(DETAILED HYDROCARBON ANALYSIS/NJ 1993) : ASTM D6730

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201112170	ANALYSIS NO. :	03
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 20, 2011
PRODUCER :		CYLINDER NO. :	55
LEASE NO. :		SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	16-26-36 BTR @ 9:00 A.M. BTR FIELD; VAPOR GAS		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SAMPLE FROM TEST 1 OF 2 EMISSION		

Componet	Mole %	Wt %
Carbon Dioxide	0.28	0.23
Nitrogen	6.85	3.51
Methane	19.26210	5.65680
Ethane	8.0933	4.4557
Propane	8.6576	6.9898
Isobutane	2.6565	2.8270
n-Butane	8.2924	8.8246
Isopentane	6.3149	8.3419
n-Pentane	11.3210	14.9550
Cyclopentane	0.6961	0.8939
n-Hexane	8.6660	13.6733
Cyclohexane	1.6466	2.5373
Other Hexanes	8.8571	13.9159
Heptanes	3.8617	7.0657
Methycyclohexane	0.7490	1.3465
2,2,4 Trimethylpentane	0.0012	0.0025
Benzene	1.6404	2.3461
Toluene	0.3471	0.5856
Ethylbenzene	0.0045	0.0088
Xylenes	0.0330	0.0642
C8+ Heavies	0.4669	1.0059
Subtotal	98.69740	99.23850
Oxygen/Argon	1.30	0.76
Alcohols	0.0026	0.0035
Total	100.00000	100.00000

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201112170	ANALYSIS NO. :	03
COMPANY NAME :	BILL BARRETT CORP	ANALYSIS DATE:	JANUARY 2, 2012
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 20, 2011
PRODUCER :		CYLINDER NO. :	55
LEASE NO. :		SAMPLED BY :	GALE MCENDREE - EMPACT
NAME/DESCRIP :	16-26-36 BTR @ 9:00 A.M. BTR FIELD; VAPOR GAS		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SAMPLE FROM TEST 1 OF 2 EMISSION		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Oxygen/Argon	—	1.30	0.76	—	—
Nitrogen	—	6.85	3.51	—	—
Carbon Dioxide	—	0.28	0.23	—	—
Methane	P1	19.26210	5.65680	—	—
Ethane	P2	8.0933	4.4557	2.183	2.194
Propane	P3	8.6576	6.9898	2.405	2.418
i-Butane	I4	2.6565	2.8270	0.876	0.881
n-Butane	P4	8.2924	8.8246	2.636	2.651
2,2-Dimethylpropane	I5	0.0458	0.0605	0.018	0.018
i-Pentane	I5	6.2691	8.2814	2.312	2.325
n-Pentane	P5	11.3207	14.9546	4.138	4.160
t-Butanol	X4	0.0015	0.0020	0.001	0.001
2,2-Dimethylbutane	I6	0.2807	0.4429	0.118	0.119
Cyclopentane	N5	0.6961	0.8939	0.208	0.209
2,3-Dimethylbutane	I6	0.6468	1.0205	0.267	0.268
2-Methylpentane	I6	4.0687	6.4198	1.702	1.712
i-Butanol	X4	0.0011	0.0015	0.000	0.000
3-Methylpentane	I6	2.2576	3.5621	0.929	0.934
UnknownC5s	U5	0.0003	0.0004	0.000	0.000
n-Hexane	P6	8.6660	13.6733	3.594	3.613
2,2-Dimethylpentane	I7	0.1256	0.2304	0.060	0.060
Methylcyclopentane	N6	1.6033	2.4706	0.572	0.575
2,4-Dimethylpentane	I7	0.1725	0.3165	0.082	0.082
2,2,3-Trimethylbutane	I7	0.0256	0.0470	0.012	0.012
Benzene	A6	1.6404	2.3461	0.463	0.466
3,3-Dimethylpentane	I7	0.0467	0.0857	0.021	0.021
Cyclohexane	N6	1.6466	2.5373	0.565	0.568
2-Methylhexane	I7	0.6528	1.1977	0.306	0.308
2,3-Dimethylpentane	I7	0.1649	0.3025	0.076	0.076
1,1-Dimethylcyclopentane	N7	0.1197	0.2152	0.050	0.050
3-Methylhexane	I7	0.5814	1.0667	0.269	0.270
1c,3-Dimethylcyclopentane	N7	0.1140	0.2050	0.053	0.053
1t,3-Dimethylcyclopentane	N7	0.1005	0.1807	0.047	0.047
3-Ethylpentane	I7	0.0332	0.0609	0.015	0.015
1t,2-Dimethylcyclopentane	N7	0.1605	0.2885	0.075	0.075
2,2,4-Trimethylpentane	I8	0.0012	0.0025	0.001	0.001
n-Heptane	P7	1.5365	2.8189	0.715	0.719

EMPACT Analytical Systems, Inc 385 S. Main Street, Brighton, CO 80601 303-637-0150

1c,2-Dimethylcyclopentane	N7	0.0094	0.0169	0.004	0.004
Methylcyclohexane	N7	0.7490	1.3465	0.303	0.305
2,2-Dimethylhexane	I8	0.0318	0.0665	0.015	0.015
Ethylcyclopentane	N7	0.0180	0.0324	0.007	0.007
2,5-Dimethylhexane	I8	0.0158	0.0331	0.008	0.008
2,2,3-Trimethylpentane	I8	0.0006	0.0013	0.000	0.000
2,4-Dimethylhexane	I8	0.0187	0.0391	0.010	0.010
1c,2t,4-Trimethylcyclopentane	N8	0.0137	0.0281	0.006	0.006
3,3-Dimethylhexane	I8	0.0062	0.0130	0.003	0.003
1t,2c,4-Trimethylcyclopentane	N8	0.0100	0.0205	0.005	0.005
2,3,4-Trimethylpentane	I8	0.0010	0.0021	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0008	0.0017	0.000	0.000
Toluene	A7	0.3471	0.5856	0.117	0.118
2,3-Dimethylhexane	I8	0.0087	0.0182	0.004	0.004
2-Methyl-3-ethylpentane	I8	0.0030	0.0063	0.001	0.001
2-Methylheptane	I8	0.0563	0.1178	0.029	0.030
4-Methylheptane	I8	0.0150	0.0314	0.008	0.008
3-Methyl-3-ethylpentane	I8	0.0012	0.0025	0.001	0.001
3,4-Dimethylhexane	I8	0.0015	0.0031	0.001	0.001
1c,2c,4-Trimethylcyclopentane	N8	0.0005	0.0010	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0004	0.0008	0.000	0.000
3-Methylheptane	I8	0.0321	0.0671	0.016	0.016
1c,2t,3-Trimethylcyclopentane	N8	0.0341	0.0701	0.017	0.017
3-Ethylhexane	I8	0.0008	0.0017	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0131	0.0269	0.007	0.007
1,1-Dimethylcyclohexane	N8	0.0069	0.0142	0.003	0.003
3c-Ethylmethylcyclopentane	N8	0.0005	0.0010	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0010	0.0021	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0010	0.0021	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0016	0.0033	0.001	0.001
2,2,4-Trimethylhexane	I9	0.0007	0.0017	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0099	0.0203	0.005	0.005
1t,3-Dimethylcyclohexane	N8	0.0001	0.0002	0.000	0.000
UnknownC7s	U7	0.0004	0.0007	0.000	0.000
n-Octane	P8	0.0813	0.1700	0.043	0.043
1c,4-Dimethylcyclohexane	N8	0.0051	0.0105	0.003	0.003
i-Propylcyclopentane	I8	0.0008	0.0017	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0003	0.0007	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0004	0.0009	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0011	0.0026	0.001	0.001
1c,2-Dimethylcyclohexane	N8	0.0027	0.0056	0.001	0.001
1,1,4-Trimethylcyclohexane	N9	0.0106	0.0245	0.005	0.005
2,2,3-Trimethylhexane	I9	0.0041	0.0096	0.002	0.002
2,4-Dimethylheptane	I9	0.0018	0.0042	0.001	0.001
Ethylcyclohexane	N8	0.0049	0.0101	0.002	0.002
n-Propylcyclopentane	N8	0.0022	0.0045	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0005	0.0012	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0009	0.0021	0.000	0.000
Ethylbenzene	I8	0.0045	0.0088	0.002	0.002
1c,2t,4t-Trimethylcyclohexane	N9	0.0009	0.0021	0.001	0.001
2,3-Dimethylheptane	I9	0.0002	0.0005	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0202	0.0393	0.008	0.008
1,4-Dimethylbenzene (p-Xylene)	A8	0.0070	0.0136	0.003	0.003
3,4-Dimethylheptane	I9	0.0002	0.0005	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0004	0.0009	0.000	0.000
4-Methyloctane	I9	0.0024	0.0056	0.001	0.001
2-Methyloctane	I9	0.0023	0.0054	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0003	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0007	0.0017	0.000	0.000

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

3-Methyloctane	I9	0.0027	0.0063	0.002	0.002
3,3-Diethylpentane	I9	0.0002	0.0005	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0058	0.0113	0.002	0.002
i-Butylcyclopentane	N9	0.0019	0.0044	0.001	0.001
UnknownC8s	U8	0.0008	0.0017	0.000	0.000
n-Nonane	P9	0.0083	0.0195	0.005	0.005
1,1-Methylethylcyclohexane	N9	0.0012	0.0028	0.001	0.001
i-Propylbenzene	A9	0.0007	0.0015	0.000	0.000
i-Propylcyclohexane	N9	0.0005	0.0012	0.000	0.000
2,4-Dimethyloctane	I10	0.0004	0.0010	0.000	0.000
n-Butylcyclopentane	N9	0.0010	0.0023	0.001	0.001
3,3-Dimethyloctane	I10	0.0002	0.0005	0.000	0.000
n-Propylbenzene	A9	0.0008	0.0018	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0008	0.0021	0.000	0.000
1,3-Methylethylbenzene	A9	0.0013	0.0029	0.001	0.001
1,4-Methylethylbenzene	A9	0.0003	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0014	0.0031	0.001	0.001
5-Methylnonane	I10	0.0005	0.0013	0.000	0.000
1,2-Methylethylbenzene	A9	0.0009	0.0020	0.001	0.001
2-Methylnonane	I10	0.0002	0.0005	0.000	0.000
3-Ethyloctane	I10	0.0003	0.0008	0.000	0.000
3-Methylnonane	I10	0.0007	0.0018	0.000	0.000
t-Butylbenzene	A10	0.0022	0.0054	0.001	0.001
i-Butylcyclohexane	N10	0.0003	0.0008	0.000	0.000
UnknownC9s	U9	0.0036	0.0085	0.002	0.002
n-Decane	P10	0.0033	0.0086	0.002	0.002
1,2,3-Trimethylbenzene	A9	0.0017	0.0037	0.001	0.001
1,3-Methyl-i-propylbenzene	A10	0.0009	0.0022	0.001	0.001
1,4-Methyl-i-propylbenzene	A10	0.0004	0.0010	0.000	0.000
Sec-Butylcyclohexane	A10	0.0010	0.0026	0.001	0.001
1,2-Methyl-i-propylbenzene	A10	0.0004	0.0010	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0003	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0003	0.0007	0.000	0.000
1,4-Dimethyl-2-ethylbenzene	A10	0.0006	0.0015	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0005	0.0012	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0006	0.0015	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0003	0.0008	0.000	0.000
UnknownC10s	U10	0.0018	0.0047	0.001	0.001
n-Undecane	P11	0.0032	0.0092	0.002	0.002
5-Methylindan	A11	0.0004	0.0010	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0004	0.0012	0.000	0.000
n-Dodecane	P12	0.0035	0.0109	0.003	0.003
1,2,4-Triethylbenzene	A12	0.0009	0.0027	0.001	0.001
n-Tridecane	P13	0.0023	0.0078	0.002	0.002
n-Tetradecane	P14	0.0012	0.0044	0.001	0.001
n-Pentadecane	P15	0.0006	0.0023	0.001	0.001
TOTAL		100.00000	100.00000	25.4518	25.5901

BTEX COMPONENTS	MOLE%	WT%
BENZENE	1.6404	2.3461
TOLUENE	0.3471	0.5856
ETHYLBENZENE	0.0045	0.0088
XYLENES	0.0330	0.0642
TOTAL BTEX	2.0250	3.0047

	BTU @	14.650	14.730
LOW	NET DRY REAL :	2715.3 /scf	2730.1 /scf
	NET WET REAL :	2667.8 /scf	2682.6 /scf
HIGH	GROSS DRY REAL :	2938.3 /scf	2954.3 /scf
	GROSS WET REAL :	2886.9 /scf	2902.9 /scf
	NET DRY REAL :	18893.8 /lb	18996.9 /lb
	GROSS DRY REAL :	20447.4 /lb	20559.1 /lb

RELATIVE DENSITY (AIR=1): 1.6847
COMPRESSIBILITY FACTOR : 0.98613

(CALC: GPA STD 2145 & TP-17 @14.696 & 60 F)
(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES
THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601
303-637-0150

January 5, 2012

Bill Barrett Corp
1099 18th Street, Ste 2300
Denver, CO 80202

Attn: Peg Young

RE: Request for Resample
EMPACT Project # 201112170-04

Lease Name / Description: BTR 16-26-36; VAPOR GAS
Lease #:
Cylinder #: 0940
Sample By: GALE MCENDREE
Sample Date: DECEMBER 21, 2011 – DECEMBER 22, 2011

☒ Cylinder did not contain enough sample to analyze.

☐ Cylinder Leaking.

☐ Cylinder contained two phase samples.

☐ Cylinder contained water.

☐ Sample shows more than 0.1% Oxygen / Argon

Comments: SAMPLE FOR EMISSIONS TEST 2 OF 2

If you have any questions, please contact 303-637-0150 or burl.mcendree@empactanalytical.com

Sincerely,
Burl McEndree

Attachment B

Volume Report

Meter -26-36 BTR 13-26-36 BTR
12/13/2011 09:00:00 To 12/17/2011 09:00:00
Last Data Available

Formation					
Location					
OP Center Code		Contract Hour	9		
Meter #	-26-36 BTR	Manufacturer	CFX	Serial Num	
Meas. Op		Lease Op		Transporter	
Pumper ID		Meas Tech ID		Foreman ID	
Log. Int. (Mins)		Site Lat. (Deg)		Elev. (Ft. ASL)	
Temp. Base (Deg F)	60.0	Press.Base (PSI)	14.7300	Atm Press.(PSI)	12.3000
MeterTube ID(in)	2.0670	Orifice Dia. (in)	1.8459	Measurement Basis	27A0
DP F. Scale (in. H2O)	30	SP F. Scale (PSIA)	100	Mat.- Type - Loc	SSU
DCF	1.000000				
Spec. Gravity	1.091200	CO2 (Mol %)	0.65000	N2 (Mol %)	18.77000
Dry BTU/CF	1434.90	Sat BTU/CF	1409.90	Lbs H2O/MMCF	0.00

Day Beginning	DP H20	SP PSIA	Temp F	Flow Time (hrs)	Volume MCF/INT	MMBTU /INT
12/14/2011	0.0	12.3	30.1	2.49	0.112	0.16058
12/15/2011	0.0	12.3	25.2	4.15	1.173	1.68295

Volume Report

Meter -26-36 BTR 16-26-36 BTR
12/18/2011 10:00:00 To 12/23/2011 10:00:00
Last Data Available

Formation					
Location					
OP Center Code		Contract Hour	10		
Meter #	-26-36 BTR	Manufacturer	CFX	Serial Num	
Meas. Op		Lease Op		Transporter	
Pumper ID		Meas Tech ID		Foreman ID	
Log. Int. (Mins)		Site Lat. (Deg)		Elev. (Ft. ASL)	
Temp. Base (Deg F)	60.0	Press.Base (PSI)	14.7300	Atm Press.(PSI)	12.3000
MeterTube ID(in)	2.0670	Orifice Dia. (in)	1.8459	Measurement Basis	27A0
DP F. Scale (in. H2O)	30	SP F. Scale (PSIA)	100	Mat.- Type - Loc	SSU
DCF	1.000000				
Spec. Gravity	1.884700	CO2 (Mol %)	0.28000	N2 (Mol %)	6.85000
Dry BTU/CF	2954.30	Sat BTU/CF	2902.90	Lbs H2O/MMCF	0.00

Day Beginning	DP H20	SP PSIA	Temp F	Flow Time (hrs)	Volume MCF/INT	MMBTU /INT
12/20/2011	0.2	12.3	35.2	2.18	2.197	6.49193
12/21/2011	0.1	12.3	30.6	3.96	2.353	6.95305

13-26-36 BTR - Vapor Analysis - Run1
Sample Date: 12/15/2011 @ 9:00am

Component	Mole %	Mole Frac.	Lb/Lb-mol	MW	VOC
Helium	0.0000	0	4.00	0.00	
Oxygen	4.9600	0.0496	32.00	1.59	
CO2	0.6500	0.0065	44.01	0.29	
N2	18.7700	0.1877	28.02	5.26	
Methane	37.5799	0.375799	16.04	6.03	
Ethane	12.5343	0.125343	30.07	3.77	
Propane	10.5843	0.105843	44.09	4.67	4.67
Isobutane	2.3801	0.023801	58.12	1.38	1.38
n-Butane	5.5044	0.055044	58.12	3.20	3.20
Isopentane	2.1098	0.021098	72.15	1.52	1.52
n-Pentane	2.4331	0.024331	72.15	1.76	1.76
Cyclopentane	0.1095	0.001095	70.13	0.08	0.08
n-Hexane	0.7430	0.00743	86.18	0.64	0.64
Cyclohexane	0.1331	0.00133	84.16	0.11	0.11
Other Hexanes	1.0133	0.01013	85.00	0.86	0.86
Heptanes	0.2623	0.002623	100.20	0.26	0.26
Methycyclohexane	0.0516	0.00052	98.18	0.05	0.05
2,2,4 Trimethylpentane	0.0001	0.00000	114.22	0.00	0.00
Benzene	0.1255	0.00126	78.11	0.10	0.10
Toluene	0.0235	0.000235	92.14	0.02	0.02
Ethylbenzene	0.0003	0.000003	106.17	0.00	0.00
Xylenes	0.0023	0.000023	106.17	0.00	0.00
C8+ Heavies	0.0288	0.000288	120.00	0.03	0.03
Alcohols	0.0008	0.000008	58.80	0.00	0.00
	100.0000	1.000		31.62	14.69

Percentage of Vapors that are VOC 46.46%
Percentage of VOCs that are HAP 5.19%

Volume of vapor (mcf)	0.112	Btu/scf	1307.1
Corrected volume (mcf)	0.085	Annual savings ($)	$181.68
Vapor temp (F)	30.1		
Vapor pressure (psi)	12.3		
Volume of vapor (mscf)	0.08		
VOC (lb/hr)	0.133		
HAPs (lb/hr)	0.007		

13-26-36 BTR - Vapor Analysis - Run2
Sample Date: 12/16/2011 @ 9:00am

Component	Mole %	Mole Frac.	Lb/Lb-mol	MW	VOC
Helium	0.0000	0	4.00	0.00	
Oxygen	5.1500	0.0515	32.00	1.65	
CO2	0.4800	0.0048	44.01	0.21	
N2	19.1500	0.1915	28.02	5.37	
Methane	29.2934	0.292934	16.04	4.70	
Ethane	10.1402	0.101402	30.07	3.05	
Propane	10.0428	0.100428	44.09	4.43	4.43
Isobutane	2.7382	0.027382	58.12	1.59	1.59
n-Butane	7.0522	0.070522	58.12	4.10	4.10
Isopentane	3.4579	0.034579	72.15	2.49	2.49
n-Pentane	4.5892	0.045892	72.15	3.31	3.31
Cyclopentane	0.2646	0.002646	70.13	0.19	0.19
n-Hexane	2.2971	0.022971	86.18	1.98	1.98
Cyclohexane	0.4763	0.00476	84.16	0.40	0.40
Other Hexanes	2.7943	0.02794	85.00	2.38	2.38
Heptanes	1.1720	0.01172	100.20	1.17	1.17
Methycyclohexane	0.2483	0.00248	98.18	0.24	0.24
2,2,4 Trimethylpentane	0.0005	0.00001	114.22	0.00	0.00
Benzene	0.3826	0.00383	78.11	0.30	0.30
Toluene	0.1068	0.001068	92.14	0.10	0.10
Ethylbenzene	0.0011	0.000011	106.17	0.00	0.00
Xylenes	0.0092	0.000092	106.17	0.01	0.01
C8+ Heavies	0.1519	0.001519	120.00	0.18	0.18
Alcohols	0.0014	0.000014	58.80	0.00	0.00
	100.0000	1.000		37.85	22.88

Percentage of Vapors that are VOC	60.44%
Percentage of VOCs that are HAP	10.44%

Volume of vapor (mcf)	1.173	Btu/scf	1613.1
Corrected volume (mcf)	0.885	Annual savings ($)	$2,348.18
Vapor temp (F)	63.2		
Vapor pressure (psi)	12.3		
Volume of vapor (mscf)	0.73		
VOC (lb/hr)	1.849		
HAPs (lb/hr)	0.193		

16-26-36 BTR - Vapor Analysis - Run1
Sample Date: 12/20/2011 @ 9:00 am

Component	Mole %	Mole Frac.	Lb/Lb-mol	MW	VOC
Helium	0.0000	0	4.00	0.00	
Oxygen	1.3000	0.013	32.00	0.42	
CO2	0.2800	0.0028	44.01	0.12	
N2	6.8500	0.0685	28.02	1.92	
Methane	19.2621	0.192621	16.04	3.09	
Ethane	8.0933	0.080933	30.07	2.43	
Propane	8.6576	0.086576	44.09	3.82	3.82
Isobutane	2.6565	0.026565	58.12	1.54	1.54
n-Butane	8.2924	0.082924	58.12	4.82	4.82
Isopentane	6.3149	0.063149	72.15	4.56	4.56
n-Pentane	11.3210	0.11321	72.15	8.17	8.17
Cyclopentane	0.6961	0.006961	70.13	0.49	0.49
n-Hexane	8.6660	0.08666	86.18	7.47	7.47
Cyclohexane	1.6466	0.01647	84.16	1.39	1.39
Other Hexanes	8.8571	0.08857	85.00	7.53	7.53
Heptanes	3.8617	0.038617	100.20	3.87	3.87
Methycyclohexane	0.7490	0.00749	98.18	0.74	0.74
2,2,4 Trimethylpentane	0.0012	0.00001	114.22	0.00	0.00
Benzene	1.6404	0.01640	78.11	1.28	1.28
Toluene	0.3471	0.003471	92.14	0.32	0.32
Ethylbenzene	0.0045	0.000045	106.17	0.00	0.00
Xylenes	0.0330	0.00033	106.17	0.04	0.04
C8+ Heavies	0.4669	0.004669	120.00	0.56	0.56
Alcohols	0.0026	0.000026	58.80	0.00	0.00
	100.0000	1.000		54.57	46.58

Percentage of Vapors that are VOC	85.37%
Percentage of VOCs that are HAP	19.56%

Volume of vapor (mcf)	2.197	Btu/scf	2715.3
Corrected volume (mcf)	2.004	Annual savings ($)	$7,403.20
Vapor temp (F)	35.2		
Vapor pressure (psi)	12.3		
Volume of vapor (mscf)	1.76		
VOC (lb/hr)	9.002		
HAPs (lb/hr)	1.761		

16-26-36 BTR - Vapor Analysis - Run2 (analysis from Run1 was used)
Sample Date: 12/20/2011 @ 9:00 am

Component	Mole %	Mole Frac.	Lb/Lb-mol	MW	VOC
Helium	0.0000	0	4.00	0.00	
Oxygen	1.3000	0.013	32.00	0.42	
CO2	0.2800	0.0028	44.01	0.12	
N2	6.8500	0.0685	28.02	1.92	
Methane	19.2621	0.192621	16.04	3.09	
Ethane	8.0933	0.080933	30.07	2.43	
Propane	8.8576	0.088576	44.09	3.82	3.82
Isobutane	2.6565	0.026565	58.12	1.54	1.54
n-Butane	8.2924	0.082924	58.12	4.82	4.82
Isopentane	6.3149	0.063149	72.15	4.56	4.56
n-Pentane	11.3210	0.11321	72.15	8.17	8.17
Cyclopentane	0.6961	0.006961	70.13	0.49	0.49
n-Hexane	8.6660	0.08666	86.18	7.47	7.47
Cyclohexane	1.6466	0.01647	84.16	1.39	1.39
Other Hexanes	8.8571	0.08857	85.00	7.53	7.53
Heptanes	3.8617	0.038617	100.20	3.87	3.87
Methycyclohexane	0.7490	0.00749	98.18	0.74	0.74
2,2,4 Trimethylpentane	0.0012	0.00001	114.22	0.00	0.00
Benzene	1.6404	0.01640	78.11	1.28	1.28
Toluene	0.3471	0.003471	92.14	0.32	0.32
Ethylbenzene	0.0045	0.000045	106.17	0.00	0.00
Xylenes	0.0330	0.00033	106.17	0.04	0.04
C8+ Heavies	0.4669	0.004669	120.00	0.56	0.56
Alcohols	0.0026	0.000026	58.80	0.00	0.00
	100.0000	1.000		54.57	46.58

Percentage of Vapors that are VOC	85.37%
Percentage of VOCs that are HAP	19.56%

Volume of vapor (mcf)	2.353	Btu/scf	2715.3
Corrected volume (mcf)	2.146	Annual savings ($)	$7,928.87
Vapor temp (F)	30.6		
Vapor pressure (psi)	12.3		
Volume of vapor (mscf)	1.90		
VOC (lb/hr)	9.730		
HAPs (lb/hr)	1.903		

Attachment C

```
*****************************************************************************
*     Project Setup Information                                             *
*****************************************************************************
Project File              : Z:\359601_Bill_Barrett_Corp\Utah Tanks\Consent Decree\Emission Quantification Projec
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : Utah
Well Name                 : 14X-22-46 DLB
Well ID                   : 41.6 BPD
Permit Number             : Emission Evaluation Run 1
Date                      : 2011.07.13


*****************************************************************************
*     Data Input                                                            *
*****************************************************************************

Separator Pressure        : 54.00[psig]
Separator Temperature     : 180.00[F]
Ambient Pressure          : 11.70[psia]
Ambient Temperature       : 160.00[F]
C10+ SG                   : 0.7660
C10+ MW                   : 168.76

-- Low Pressure Oil ----------------------------------------------------------
   No.    Component            mol %
   1      H2S                  0.0000
   2      O2                   0.0000
   3      CO2                  0.0000
   4      N2                   0.0314
   5      C1                   0.1516
   6      C2                   0.1458
   7      C3                   0.1890
   8      i-C4                 0.0711
   9      n-C4                 0.2006
   10     i-C5                 0.1268
   11     n-C5                 0.5494
   12     C6                  10.5394
   13     C7                  17.9211
   14     C8                  12.9938
   15     C9                  10.5553
   16     C10+                32.0221
   17     Benzene              1.7973
   18     Toluene              1.9124
   19     E-Benzene            0.3854
   20     Xylenes              1.5340
   21     n-C6                 0.5074
   22     224Trimethylp        0.2861

-- Sales Oil -----------------------------------------------------------------
Production Rate           : 41.6[bbl/day]
Days of Annual Operation  : 365 [days/year]
API Gravity               : 40.4
Reid Vapor Pressure       : 5.53[psia]


*****************************************************************************
*     Calculation Results                                                   *
*****************************************************************************

-- Emission Summary ----------------------------------------------------------
Item                 Uncontrolled   Uncontrolled
```

	[ton/yr]	[lb/hr]
Total HAPs	0.610	0.139
Total HC	2.729	0.623
VOCs, C2+	2.544	0.581
VOCs, C3+	2.413	0.551

Uncontrolled Recovery Info.

Vapor	99.3100 x1E-3	[MSCFD]
HC Vapor	91.8600 x1E-3	[MSCFD]
GOR	2.39	[SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.000	0.000
4	N2	0.101	0.023
5	C1	0.185	0.042
6	C2	0.131	0.030
7	C3	0.105	0.024
8	i-C4	0.026	0.006
9	n-C4	0.056	0.013
10	i-C5	0.021	0.005
11	n-C5	0.072	0.016
12	C6	0.665	0.152
13	C7	0.559	0.128
14	C8	0.190	0.043
15	C9	0.076	0.017
16	C10+	0.033	0.008
17	Benzene	0.080	0.018
18	Toluene	0.037	0.008
19	E-Benzene	0.004	0.001
20	Xylenes	0.013	0.003
21	n-C6	0.467	0.107
22	224Trimethylp	0.008	0.002
	Total	2.829	0.646

-- Stream Data ----------

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	N2	28.01	0.0314	0.0098	0.0098	7.5095	0.0000	7.5095
5	C1	16.04	0.1516	0.0827	0.0827	24.0510	0.0000	24.0510
6	C2	30.07	0.1458	0.1200	0.1200	9.1130	0.0000	9.1130
7	C3	44.10	0.1890	0.1752	0.1752	4.9839	0.0000	4.9839
8	i-C4	58.12	0.0711	0.0686	0.0686	0.9251	0.0000	0.9251
9	n-C4	58.12	0.2006	0.1954	0.1954	2.0058	0.0000	2.0058
10	i-C5	72.15	0.1268	0.1254	0.1254	0.5975	0.0000	0.5975
11	n-C5	72.15	0.5494	0.5450	0.5450	2.0921	0.0000	2.0921
12	C6	86.16	10.5394	10.5220	10.5220	16.5618	0.0000	16.5618
13	C7	100.20	17.9211	17.9380	17.9380	12.0522	0.0000	12.0522
14	C8	114.23	12.9938	13.0209	13.0209	3.5861	0.0000	3.5861
15	C9	128.28	10.5553	10.5820	10.5820	1.2913	0.0000	1.2913
16	C10+	168.76	32.0221	32.1132	32.1132	0.4102	0.0000	0.4102
17	Benzene	78.11	1.7973	1.7963	1.7963	2.1482	0.0000	2.1482
18	Toluene	92.13	1.9124	1.9155	1.9155	0.8501	0.0000	0.8501
19	E-Benzene	106.17	0.3854	0.3863	0.3863	0.0718	0.0000	0.0718
20	Xylenes	106.17	1.5340	1.5377	1.5377	0.2591	0.0000	0.2591
21	n-C6	86.18	8.5874	8.5795	8.5795	11.3365	0.0000	11.3365
22	224Trimethylp	114.24	0.2861	0.2865	0.2865	0.1548	0.0000	0.1548
	MW		121.50	121.68	121.68	59.17	0.00	59.17
	Stream Mole Ratio		1.0000	0.9971	0.9971	0.0029	0.0000	0.0029
	Heating Value	[BTU/SCF]				3153.18	0.00	3153.18
	Gas Gravity	[Gas/Air]				2.04	0.00	2.04

Bubble Pt. @ 100F	[psia]	10.68	6.44	6.44
RVP @ 100F	[psia]	3.76	3.24	3.24
Spec. Gravity @ 100F		0.694	0.694	0.694

Attachment C


```
*****************************************************************************
*     Project Setup Information                                             *
*****************************************************************************
Project File              : E:\359601_Bill_Barrett_Corp\Utah Tanks\Consent Decree\Emission Quantification Projec
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : Utah
Well Name                 : 14X-22-46 DLB
Well ID                   : 59.7 BFD
Permit Number             : Emission Evaluation Run 2
Date                      : 2011.07.13


*****************************************************************************
*     Data Input                                                            *
*****************************************************************************

Separator Pressure        : 54.00[psig]
Separator Temperature     : 180.00[F]
Ambient Pressure          : 11.70[psia]
Ambient Temperature       : 160.00[F]
C10+ SG                   : 0.7660
C10+ MW                   : 168.76

-- Low Pressure Oil ----------------------------------------------------------
   No.    Component          mol %
   1      H2S                0.0000
   2      O2                 0.0000
   3      CO2                0.0000
   4      N2                 0.0314
   5      C1                 0.1516
   6      C2                 0.1458
   7      C3                 0.1890
   8      i-C4               0.0711
   9      n-C4               0.2006
   10     i-C5               0.1268
   11     n-C5               0.5494
   12     C6                10.5394
   13     C7                17.9211
   14     C8                12.9938
   15     C9                10.5553
   16     C10+              32.0221
   17     Benzene            1.7973
   18     Toluene            1.9124
   19     E-Benzene          0.3854
   20     Xylenes            1.5340
   21     n-C6               8.5874
   22     224Trimethylp      0.2861

-- Sales Oil -----------------------------------------------------------------
Production Rate           : 59.7[bbl/day]
Days of Annual Operation  : 365 [days/year]
API Gravity               : 40.4
Reid Vapor Pressure       : 5.53[psia]


*****************************************************************************
*     Calculation Results                                                   *
*****************************************************************************

-- Emission Summary ----------------------------------------------------------
Item                Uncontrolled   Uncontrolled
```

	[ton/yr]	[lb/hr]
Total HAPs	0.080	0.201
Total HC	3.916	0.894
VOCs, C2+	3.651	0.834
VOCs, C3+	3.463	0.791

Uncontrolled Recovery Info.

Vapor	142.5200 x1E-3	[MSCFD]
HC Vapor	131.8200 x1E-3	[MSCFD]
GOR	2.39	[SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.000	0.000
4	N2	0.144	0.033
5	C1	0.265	0.061
6	C2	0.188	0.043
7	C3	0.151	0.034
8	i-C4	0.037	0.008
9	n-C4	0.080	0.018
10	i-C5	0.030	0.007
11	n-C5	0.104	0.024
12	C6	0.955	0.218
13	C7	0.802	0.183
14	C8	0.273	0.062
15	C9	0.109	0.025
16	C10+	0.048	0.011
17	Benzene	0.115	0.026
18	Toluene	0.054	0.012
19	E-Benzene	0.005	0.001
20	Xylenes	0.019	0.004
21	n-C6	0.670	0.153
22	224Trimethylp	0.012	0.003
	Total	4.061	0.927

-- Stream Data ----------

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	N2	28.01	0.0314	0.0098	0.0098	7.5095	0.0000	7.5095
5	C1	16.04	0.1516	0.0827	0.0827	24.0510	0.0000	24.0510
6	C2	30.07	0.1458	0.1200	0.1200	9.1130	0.0000	9.1130
7	C3	44.10	0.1890	0.1752	0.1752	4.9839	0.0000	4.9839
8	i-C4	58.12	0.0711	0.0686	0.0686	0.9251	0.0000	0.9251
9	n-C4	58.12	0.2006	0.1954	0.1954	2.0058	0.0000	2.0058
10	i-C5	72.15	0.1268	0.1254	0.1254	0.5975	0.0000	0.5975
11	n-C5	72.15	0.5494	0.5450	0.5450	2.0921	0.0000	2.0921
12	C6	86.16	10.5394	10.5220	10.5220	16.5618	0.0000	16.5618
13	C7	100.20	17.9211	17.9380	17.9380	12.0522	0.0000	12.0522
14	C8	114.23	12.9938	13.0209	13.0209	3.5861	0.0000	3.5861
15	C9	128.28	10.5553	10.5820	10.5820	1.2913	0.0000	1.2913
16	C10+	168.76	32.0221	32.1132	32.1132	0.4102	0.0000	0.4102
17	Benzene	78.11	1.7973	1.7963	1.7963	2.1482	0.0000	2.1482
18	Toluene	92.13	1.9124	1.9155	1.9155	0.8501	0.0000	0.8501
19	E-Benzene	106.17	0.3854	0.3863	0.3863	0.0718	0.0000	0.0718
20	Xylenes	106.17	1.5340	1.5377	1.5377	0.2591	0.0000	0.2591
21	n-C6	86.18	8.5874	8.5795	8.5795	11.3365	0.0000	11.3365
22	224Trimethylp	114.24	0.2861	0.2865	0.2865	0.1548	0.0000	0.1548
	MW		121.50	121.68	121.68	59.17	0.00	59.17
	Stream Mole Ratio		1.0000	0.9971	0.9971	0.0029	0.0000	0.0029
	Heating Value	[BTU/SCF]				3153.18	0.00	3153.18
	Gas Gravity	[Gas/Air]				2.04	0.00	2.04

Bubble Pt. @ 100F	[psia]	10.68	6.44	6.44
RVP @ 100F	[psia]	3.76	3.24	3.24
Spec. Gravity @ 100F		0.694	0.694	0.694

Attachment C


```
*****************************************************************************************
*     Project Setup Information                                                         *
*****************************************************************************************
Project File              : Z:\359601_Bill_Barrett_Corp\Utah Tanks\Consent Decree\Emission Quantification Projec
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : Utah
Well Name                 : 13-26-36 BTR
Well ID                   : 71.8 BPD
Permit Number             : Emission Evaluation Run 1
Date                      : 2012.01.11


*****************************************************************************************
*     Data Input                                                                        *
*****************************************************************************************

Separator Pressure        : 75.00[psig]
Separator Temperature     : 160.00[F]
Ambient Pressure          : 12.30[psia]
Ambient Temperature       : 160.00[F]
C10+ SG                   : 0.7690
C10+ MW                   : 184.42

-- Low Pressure Oil ------------------------------------------------------------------
   No.    Component              mol %
   1      H2S                    0.0000
   2      O2                     0.0000
   3      CO2                    0.0028
   4      N2                     0.0099
   5      C1                     0.2565
   6      C2                     0.1312
   7      C3                     0.1905
   8      i-C4                   0.0876
   9      n-C4                   0.3004
   10     i-C5                   0.2331
   11     n-C5                   0.6800
   12     C6                     8.8884
   13     C7                    14.2472
   14     C8                    12.2752
   15     C9                    10.6080
   16     C10+                  37.3223
   17     Benzene                1.4009
   18     Toluene                3.6792
   19     E-Benzene              0.4116
   20     Xylenes                2.9418
   21     n-C6                   6.0435
   22     224Trimethylp          0.2899

-- Sales Oil -------------------------------------------------------------------------
Production Rate           : 71.8[bbl/day]
Days of Annual Operation  : 365 [days/year]
API Gravity               : 42.1
Reid Vapor Pressure       : 5.84[psia]


*****************************************************************************************
*     Calculation Results                                                               *
*****************************************************************************************

-- Emission Summary ------------------------------------------------------------------
Item                 Uncontrolled   Uncontrolled
```

	[ton/yr]	[lb/hr]
Total HAPs	0.830	0.189
Total HC	4.256	0.972
VOCs, C2+	3.743	0.855
VOCs, C3+	3.546	0.810

Uncontrolled Recovery Info.

Vapor	172.6400 x1E-3	[MSCFD]
HC Vapor	168.3700 x1E-3	[MSCFD]
GOR	2.40	[SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.010	0.002
4	N2	0.052	0.012
5	C1	0.513	0.117
6	C2	0.197	0.045
7	C3	0.180	0.041
8	i-C4	0.054	0.012
9	n-C4	0.142	0.032
10	i-C5	0.064	0.015
11	n-C5	0.152	0.035
12	C6	0.930	0.212
13	C7	0.737	0.168
14	C8	0.298	0.068
15	C9	0.126	0.029
16	C10+	0.030	0.007
17	Benzene	0.105	0.024
18	Toluene	0.121	0.028
19	E-Benzene	0.007	0.002
20	Xylenes	0.042	0.010
21	n-C6	0.545	0.124
22	224Trimethylp	0.014	0.003
	Total	4.319	0.986

-- Stream Data ----------

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0028	0.0020	0.0020	0.2598	0.0000	0.2598
4	N2	28.01	0.0099	0.0031	0.0031	2.2115	0.0000	2.2115
5	C1	16.04	0.2565	0.1377	0.1377	38.4637	0.0000	38.4637
6	C2	30.07	0.1312	0.1070	0.1070	7.8984	0.0000	7.8984
7	C3	44.10	0.1905	0.1759	0.1759	4.9002	0.0000	4.9002
8	i-C4	58.12	0.0876	0.0844	0.0844	1.1107	0.0000	1.1107
9	n-C4	58.12	0.3004	0.2922	0.2922	2.9348	0.0000	2.9348
10	i-C5	72.15	0.2331	0.2305	0.2305	1.0705	0.0000	1.0705
11	n-C5	72.15	0.6800	0.6743	0.6743	2.5277	0.0000	2.5277
12	C6	86.16	8.8884	8.8746	8.8746	13.3239	0.0000	13.3239
13	C7	100.20	14.2472	14.2631	14.2631	9.1378	0.0000	9.1378
14	C8	114.23	12.2752	12.3033	12.3033	3.2294	0.0000	3.2294
15	C9	128.28	10.6080	10.6371	10.6371	1.2366	0.0000	1.2366
16	C10+	184.42	37.3223	37.4378	37.4378	0.1953	0.0000	0.1953
17	Benzene	78.11	1.4009	1.4002	1.4002	1.6115	0.0000	1.6115
18	Toluene	92.13	3.6792	3.6857	3.6857	1.5743	0.0000	1.5743
19	E-Benzene	106.17	0.4116	0.4127	0.4127	0.0739	0.0000	0.0739
20	Xylenes	106.17	2.9418	2.9495	2.9495	0.4781	0.0000	0.4781
21	n-C6	86.18	6.0435	6.0386	6.0386	7.6126	0.0000	7.6126
22	224Trimethylp	114.24	0.2899	0.2903	0.2903	0.1493	0.0000	0.1493
	MW		131.27	131.52	131.52	51.93	0.00	51.93
	Stream Mole Ratio		1.0000	0.9969	0.9969	0.0031	0.0000	0.0031
	Heating Value	[BTU/SCF]				2848.85	0.00	2848.85
	Gas Gravity	[Gas/Air]				1.79	0.00	1.79

Bubble Pt. @ 100F	[psia]	11.68	7.28	7.28
RVP @ 100F	[psia]	3.59	2.97	2.97
Spec. Gravity @ 100F		0.694	0.694	0.694

```
*****************************************************************************
*     Project Setup Information                                             *
*****************************************************************************
Project File              : Z:\359601_Bill_Barrett_Corp\Utah Tanks\Consent Decree\Emission Quantification Projec
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : Utah
Well Name                 : 13-26-36 BTR
Well ID                   : 59.2 BPD
Permit Number             : Emission Evaluation Run 2
Date                      : 2012.01.11


*****************************************************************************
*     Data Input                                                            *
*****************************************************************************

Separator Pressure        : 72.00[psig]
Separator Temperature     : 161.00[F]
Ambient Pressure          : 12.30[psia]
Ambient Temperature       : 160.00[F]
C10+ SG                   : 0.7690
C10+ MW                   : 184.42

-- Low Pressure Oil ---------------------------------------------------------
   No.    Component            mol %
   1      H2S                  0.0000
   2      O2                   0.0000
   3      CO2                  0.0028
   4      N2                   0.0099
   5      C1                   0.2565
   6      C2                   0.1312
   7      C3                   0.1905
   8      i-C4                 0.0876
   9      n-C4                 0.3004
   10     i-C5                 0.2331
   11     n-C5                 0.6800
   12     C6                   8.8884
   13     C7                  14.2472
   14     C8                  12.2752
   15     C9                  10.6080
   16     C10+                37.3223
   17     Benzene              1.4009
   18     Toluene              3.6792
   19     E-Benzene            0.4116
   20     Xylenes              2.9418
   21     n-C6                 6.0435
   22     224Trimethylp        0.2899

-- Sales Oil ----------------------------------------------------------------
Production Rate           : 59.2[bbl/day]
Days of Annual Operation  : 365 [days/year]
API Gravity               : 42.1
Reid Vapor Pressure       : 5.84[psia]


*****************************************************************************
*     Calculation Results                                                   *
*****************************************************************************

-- Emission Summary ---------------------------------------------------------
Item                Uncontrolled   Uncontrolled
```

	[ton/yr]	[lb/hr]
Total HAPs	0.690	0.158
Total HC	3.504	0.800
VOCs, C2+	3.082	0.704
VOCs, C3+	2.919	0.666

Uncontrolled Recovery Info.

Vapor	142.1500 x1E-3	[MSCFD]
HC Vapor	138.6400 x1E-3	[MSCFD]
GOR	2.40	[SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.008	0.002
4	N2	0.042	0.010
5	C1	0.423	0.097
6	C2	0.163	0.037
7	C3	0.148	0.034
8	i-C4	0.044	0.010
9	n-C4	0.117	0.027
10	i-C5	0.053	0.012
11	n-C5	0.125	0.029
12	C6	0.766	0.175
13	C7	0.607	0.139
14	C8	0.245	0.056
15	C9	0.104	0.024
16	C10+	0.025	0.006
17	Benzene	0.086	0.020
18	Toluene	0.099	0.023
19	E-Benzene	0.005	0.001
20	Xylenes	0.035	0.008
21	n-C6	0.449	0.103
22	224Trimethylp	0.012	0.003
	Total	3.556	0.812

-- Stream Data ----------

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0020	0.0020	0.0020	0.2598	0.0000	0.2598
4	N2	28.01	0.0099	0.0031	0.0031	2.2125	0.0000	2.2125
5	C1	16.04	0.2565	0.1377	0.1377	38.4749	0.0000	38.4749
6	C2	30.07	0.1312	0.1071	0.1071	7.8988	0.0000	7.8988
7	C3	44.10	0.1905	0.1759	0.1759	4.8999	0.0000	4.8999
8	i-C4	58.12	0.0876	0.0844	0.0844	1.1106	0.0000	1.1106
9	n-C4	58.12	0.3004	0.2922	0.2922	2.9343	0.0000	2.9343
10	i-C5	72.15	0.2331	0.2305	0.2305	1.0703	0.0000	1.0703
11	n-C5	72.15	0.6800	0.6743	0.6743	2.5271	0.0000	2.5271
12	C6	86.16	8.8884	8.8746	8.8746	13.3205	0.0000	13.3205
13	C7	100.20	14.2472	14.2631	14.2631	9.1351	0.0000	9.1351
14	C8	114.23	12.2752	12.3033	12.3033	3.2283	0.0000	3.2283
15	C9	128.28	10.6080	10.6371	10.6371	1.2361	0.0000	1.2361
16	C10+	184.42	37.3223	37.4377	37.4377	0.1952	0.0000	0.1952
17	Benzene	78.11	1.4009	1.4002	1.4002	1.6111	0.0000	1.6111
18	Toluene	92.13	3.6792	3.6857	3.6857	1.5738	0.0000	1.5738
19	E-Benzene	106.17	0.4116	0.4126	0.4126	0.0738	0.0000	0.0738
20	Xylenes	106.17	2.9418	2.9495	2.9495	0.4780	0.0000	0.4780
21	n-C6	86.18	6.0435	6.0386	6.0386	7.6105	0.0000	7.6105
22	224Trimethylp	114.24	0.2899	0.2903	0.2903	0.1492	0.0000	0.1492
	MW		131.27	131.52	131.52	51.93	0.00	51.93
	Stream Mole Ratio		1.0000	0.9969	0.9969	0.0031	0.0000	0.0031
	Heating Value	[BTU/SCF]				2848.36	0.00	2848.36
	Gas Gravity	[Gas/Air]				1.79	0.00	1.79

Bubble Pt. @ 100F	[psia]	11.68	7.28	7.28
RVP @ 100F	[psia]	3.59	2.98	2.98
Spec. Gravity @ 100F		0.694	0.694	0.694

```
*****************************************************************************
*     Project Setup Information                                             *
*****************************************************************************
Project File              : Z:\359601_Bill_Barrett_Corp\Utah Tanks\Consent Decree\Emission Quantification Projec
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : Utah
Well Name                 : 16-26-36 BTR
Well ID                   : 98.4 BPD
Permit Number             : Emission Evaluation Run 1
Date                      : 2012.01.11

*****************************************************************************
*     Data Input                                                            *
*****************************************************************************

Separator Pressure        : 54.00[psig]
Separator Temperature     : 175.00[F]
Ambient Pressure          : 12.30[psia]
Ambient Temperature       : 160.00[F]
C10+ SG                   : 0.7710
C10+ MW                   : 177.78

-- Low Pressure Oil ---------------------------------------------------------
   No.    Component          mol %
   1      H2S                0.0000
   2      O2                 0.0000
   3      CO2                0.0098
   4      N2                 0.0000
   5      C1                 0.2166
   6      C2                 0.1074
   7      C3                 0.1562
   8      i-C4               0.0707
   9      n-C4               0.2527
   10     i-C5               0.1393
   11     n-C5               0.6573
   12     C6                 8.5778
   13     C7                14.0859
   14     C8                 9.9867
   15     C9                 9.1413
   16     C10+              41.6196
   17     Benzene            2.0277
   18     Toluene            3.5495
   19     E-Benzene          0.3121
   20     Xylenes            3.2596
   21     n-C6               5.5826
   22     224Trimethylp      0.2472

-- Sales Oil ----------------------------------------------------------------
Production Rate           : 98.4[bbl/day]
Days of Annual Operation  : 365 [days/year]
API Gravity               : 42.1
Reid Vapor Pressure       : 5.84[psia]

*****************************************************************************
*     Calculation Results                                                   *
*****************************************************************************

-- Emission Summary ---------------------------------------------------------
Item                Uncontrolled   Uncontrolled
```

	[ton/yr]	[lb/hr]
Total HAPs	0.540	0.123
Total HC	2.697	0.616
VOCs, C2+	2.320	0.530
VOCs, C3+	2.201	0.503

Uncontrolled Recovery Info.

Vapor	112.7800 x1E-3	[MSCFD]
HC Vapor	111.5700 x1E-3	[MSCFD]
GOR	1.15	[SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.026	0.006
4	N2	0.000	0.000
5	C1	0.377	0.086
6	C2	0.119	0.027
7	C3	0.102	0.023
8	i-C4	0.029	0.007
9	n-C4	0.080	0.018
10	i-C5	0.026	0.006
11	n-C5	0.098	0.022
12	C6	0.588	0.134
13	C7	0.476	0.109
14	C8	0.158	0.036
15	C9	0.071	0.016
16	C10+	0.029	0.007
17	Benzene	0.098	0.022
18	Toluene	0.075	0.017
19	E-Benzene	0.003	0.001
20	Xylenes	0.030	0.007
21	n-C6	0.330	0.075
22	224Trimethylp	0.008	0.002
	Total	2.723	0.622

-- Stream Data ----------

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0098	0.0082	0.0082	1.0733	0.0000	1.0733
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	0.2166	0.1519	0.1519	43.3028	0.0000	43.3028
6	C2	30.07	0.1074	0.0966	0.0966	7.2646	0.0000	7.2646
7	C3	44.10	0.1562	0.1500	0.1500	4.2643	0.0000	4.2643
8	i-C4	58.12	0.0707	0.0694	0.0694	0.9305	0.0000	0.9305
9	n-C4	58.12	0.2527	0.2493	0.2493	2.5466	0.0000	2.5466
10	i-C5	72.15	0.1393	0.1385	0.1385	0.6535	0.0000	0.6535
11	n-C5	72.15	0.6573	0.6545	0.6545	2.4896	0.0000	2.4896
12	C6	86.16	8.5778	8.5713	8.5713	12.8904	0.0000	12.8904
13	C7	100.20	14.0859	14.0935	14.0935	9.0410	0.0000	9.0410
14	C8	114.23	9.9867	9.9978	9.9978	2.6273	0.0000	2.6273
15	C9	128.28	9.1413	9.1534	9.1534	1.0651	0.0000	1.0651
16	C10+	177.78	41.6196	41.6817	41.6817	0.2978	0.0000	0.2978
17	Benzene	78.11	2.0277	2.0273	2.0273	2.3066	0.0000	2.3066
18	Toluene	92.13	3.5495	3.5526	3.5526	1.4984	0.0000	1.4984
19	E-Benzene	106.17	0.3121	0.3125	0.3125	0.0552	0.0000	0.0552
20	Xylenes	106.17	3.2596	3.2637	3.2637	0.5222	0.0000	0.5222
21	n-C6	86.18	5.5826	5.5804	5.5804	7.0432	0.0000	7.0432
22	224Trimethylp	114.24	0.2472	0.2474	0.2474	0.1277	0.0000	0.1277
	MW		131.92	132.05	132.05	50.14	0.00	50.14
	Stream Mole Ratio		1.0000	0.9985	0.9985	0.0015	0.0000	0.0015
	Heating Value	[BTU/SCF]				2765.39	0.00	2765.39
	Gas Gravity	[Gas/Air]				1.73	0.00	1.73

Attachment C

****
* Project Setup Information *
****

Project File	: Z:\359601_Bill_Barrett_Corp\Utah Tanks\Consent Decree\Emission Quantification Projec
Flowsheet Selection	: Oil Tank with Separator
Calculation Method	: RVP Distillation
Control Efficiency	: 100.0%
Known Separator Stream	: Low Pressure Oil
Entering Air Composition	: No
Filed Name	: Utah
Well Name	: 16-26-36 BTR
Well ID	: 110.4 BPD
Permit Number	: Emission Evaluation Run 2
Date	: 2012.01.11

****
* Data Input *
****

Separator Pressure	: 54.00[psig]
Separator Temperature	: 176.00[F]
Ambient Pressure	: 12.30[psia]
Ambient Temperature	: 160.00[F]
C10+ SG	: 0.7710
C10+ MW	: 177.78

-- Low Pressure Oil ----------

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0098
4	N2	0.0000
5	C1	0.2166
6	C2	0.1074
7	C3	0.1562
8	i-C4	0.0707
9	n-C4	0.2527
10	i-C5	0.1393
11	n-C5	0.6573
12	C6	8.5778
13	C7	14.0859
14	C8	9.9867
15	C9	9.1413
16	C10+	41.6196
17	Benzene	2.0277
18	Toluene	3.5495
19	E-Benzene	0.3121
20	Xylenes	3.2596
21	n-C6	5.5826
22	224Trimethylp	0.2472

-- Sales Oil ----------

Production Rate	: 110.4[bbl/day]
Days of Annual Operation	: 365 [days/year]
API Gravity	: 42.1
Reid Vapor Pressure	: 5.84[psia]

****
* Calculation Results *
****

-- Emission Summary ----------

Item	Uncontrolled	Uncontrolled

Bubble Pt. @ 100F	[psia]	9.49	7.40	7.40
RVP @ 100F	[psia]	3.31	3.00	3.00
Spec. Gravity @ 100F		0.703	0.703	0.703

	[ton/yr]	[lb/hr]
Total HAPs	0.610	0.139
Total HC	3.024	0.690
VOCs, C2+	2.601	0.594
VOCs, C3+	2.468	0.563

Uncontrolled Recovery Info.

Vapor	126.4500 x1E-3	[MSCFD]
HC Vapor	125.0900 x1E-3	[MSCFD]
GOR	1.15	[SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.029	0.007
4	N2	0.000	0.000
5	C1	0.423	0.097
6	C2	0.133	0.030
7	C3	0.114	0.026
8	i-C4	0.033	0.008
9	n-C4	0.090	0.021
10	i-C5	0.029	0.007
11	n-C5	0.109	0.025
12	C6	0.659	0.150
13	C7	0.534	0.122
14	C8	0.178	0.041
15	C9	0.080	0.018
16	C10+	0.032	0.007
17	Benzene	0.110	0.025
18	Toluene	0.084	0.019
19	E-Benzene	0.004	0.001
20	Xylenes	0.034	0.008
21	n-C6	0.370	0.084
22	224Trimethylp	0.009	0.002
	Total	3.054	0.697

-- Stream Data ----------

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0098	0.0082	0.0082	1.0733	0.0000	1.0733
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	0.2166	0.1519	0.1519	43.3028	0.0000	43.3028
6	C2	30.07	0.1074	0.0966	0.0966	7.2646	0.0000	7.2646
7	C3	44.10	0.1562	0.1500	0.1500	4.2643	0.0000	4.2643
8	i-C4	58.12	0.0707	0.0694	0.0694	0.9305	0.0000	0.9305
9	n-C4	58.12	0.2527	0.2493	0.2493	2.5466	0.0000	2.5466
10	i-C5	72.15	0.1393	0.1385	0.1385	0.6535	0.0000	0.6535
11	n-C5	72.15	0.6573	0.6545	0.6545	2.4896	0.0000	2.4896
12	C6	86.16	8.5778	8.5713	8.5713	12.8904	0.0000	12.8904
13	C7	100.20	14.0859	14.0935	14.0935	9.0410	0.0000	9.0410
14	C8	114.23	9.9867	9.9978	9.9978	2.6273	0.0000	2.6273
15	C9	128.28	9.1413	9.1534	9.1534	1.0651	0.0000	1.0651
16	C10+	177.78	41.6196	41.6817	41.6817	0.2978	0.0000	0.2978
17	Benzene	78.11	2.0277	2.0273	2.0273	2.3066	0.0000	2.3066
18	Toluene	92.13	3.5495	3.5526	3.5526	1.4984	0.0000	1.4984
19	E-Benzene	106.17	0.3121	0.3125	0.3125	0.0552	0.0000	0.0552
20	Xylenes	106.17	3.2596	3.2637	3.2637	0.5222	0.0000	0.5222
21	n-C6	86.18	5.5826	5.5804	5.5804	7.0432	0.0000	7.0432
22	224Trimethylp	114.24	0.2472	0.2474	0.2474	0.1277	0.0000	0.1277
	MW		131.92	132.05	132.05	50.14	0.00	50.14
	Stream Mole Ratio		1.0000	0.9985	0.9985	0.0015	0.0000	0.0015
	Heating Value	[BTU/SCF]				2765.39	0.00	2765.39
	Gas Gravity	[Gas/Air]				1.73	0.00	1.73

Bubble Pt. @ 100F	[psia]	9.49	7.40	7.40
RVP @ 100F	[psia]	3.31	3.00	3.00
Spec. Gravity @ 100F		0.703	0.703	0.703

Attachment D

Attachment D
Bill Barrett Corporation
VRU Systems
16-26-36 BTR Run 2

Capital Cost Factors

			VRU	EVRU	Reference
DIRECT COSTS					
Cost of one VRU System		=	$ 198,000	$ 80,000	Vendor Quotes, VRU monthly lease times 10 year control life
TOTAL DIRECT COSTS (TDC)		=	$ 198,000	$ 80,000	Calculated Total
INDIRECT COSTS					
General facilities, engineering, construction fees		=	$ 49,500	$ 20,000	Assumed 25% of TDC
TOTAL INDIRECT COSTS (TIC)		=	$ 49,500	$ 20,000	Calculated Total
TOTAL DIRECT AND INDIRECT COSTS (TDIC)	(TDC) + (TIC)	=	$ 247,500	$ 100,000	Calculated Total
Contingency	0.10 * (TDIC)	=	$ 24,750	$ 10,000	Assumed 10% of TDIC
TOTAL INSTALLED CAPITAL COSTS (TICC)		=	$ 272,250	$ 110,000	Calculated Total
ANNUAL FIXED O&M COSTS					
Operating Labor	10% of FTE * $20/hr	=	$ 4,160	$ 4,160	Assumed
Administrative and Support Labor		=	$ -	$ -	
Maintenance Labor and Materials	25% of FTE * $20/hr	=	$ 5,200	$ 10,400	Maintenance labor included in lease rate for VRU, assumed for EVRU
Parts and Materials (included in maintenance labor and materials cost)		=	$ -	$ -	
TOTAL FIXED O&M COSTS (FOM)		=	$ 9,360	$ 14,560	Calculated Total
ANNUAL VARIABLE O&M COSTS					
Fuel Cost:			$ 7,192	$	Based on 5 mscfd and $3.40/MMbtu
Vapor Savings:			$ (7,929)	$ (7,929)	See Attachment B
TOTAL VARIABLE O&M COSTS (VOM)		=	$ (737)	$ (7,929)	Calculated Total
TOTAL DIRECT COSTS (TDAC) = FOM + VOM		=	$ 8,623	$ 6,631	Calculated Total
INDIRECT COSTS					
Overhead	Included in Fixed O&M Costs	=			
Property Tax	1% of (TICC)	=	$ 1,980	$ 1,100	OAQPS Control Cost Manual
Insurance	1% of (TICC)	=	$ 1,980	$ 1,100	OAQPS Control Cost Manual
G&A Charges	2% of (TICC)	=	$ 5,960	$ 1,600	OAQPS Control Cost Manual
Capital Recovery	0.117 * (TICC)	=	$ 23,257	$ 12,921	Based on 10% interest rate
TOTAL INDIRECT COSTS (TIAC)		=	$ 31,177	$ 16,721	Calculated Total
TOTAL ANNUALIZED COSTS	TDAC + TIAC	=	$ 39,800	$ 23,352	Calculated
TOTAL VOC REMOVED PER YEAR (VOC)		=	[illegible]	1.70	Based on 98% operation of VRU and 95% control by flare during VRU downtime
COST EFFECTIVENESS ($ per ton of pollutant removed)		=	$ 23,347	$ 13,698	Calculated

Attachment D
Bill Barrett Corporation
VRU Systems
16-26-36 BTR Run 2

Capital Cost Factors

			VRU	EVRU	Reference
DIRECT COSTS					
Cost of one VRU System		=	$ 198,000	$ 80,000	Vendor Quotes, VRU monthly lease times 10 year control life
TOTAL DIRECT COSTS (TDC)		=	$ 198,000	$ 80,000	Calculated Total
INDIRECT COSTS					
General facilities, engineering, construction fees		=	$ 49,500	$ 20,000	Assumed 25% of TDC
TOTAL INDIRECT COSTS (TIC)		=	$ 49,500	$ 20,000	Calculated Total
TOTAL DIRECT AND INDIRECT COSTS (TDIC)	(TDC) + (TIC)	=	$ 247,500	$ 100,000	Calculated Total
Contingency	0.10 * (TDIC)	=	$ 24,750	$ 10,000	Assumed 10% of TDIC
TOTAL INSTALLED CAPITAL COSTS (TICC)		=	$ 272,250	$ 110,000	Calculated Total
ANNUAL FIXED O&M COSTS					
Operating Labor	10% of FTE * $20/hr	=	$ 4,160	$ 4,160	Assumed
Administrative and Support Labor		=	$ -	$ -	
Maintenance Labor and Materials	25% of FTE * $20/hr	=	$ 5,200	$ 10,400	Maintenance labor included in lease rate for
Parts and Materials (included in maintenance labor and materials cost)		=	$ -	$ -	VRU, assumed for EVRU
TOTAL FIXED O&M COSTS (FOM)		=	$ 9,360	$ 14,560	Calculated Total
ANNUAL VARIABLE O&M COSTS					
Fuel Cost:		=	$ 7,192	$ -	Based on 5 mscfd and $3.40/MMbtu
Vapor Savings:			$ (7,929)	$ (7,929)	See Attachment B
TOTAL VARIABLE O&M COSTS (VOM)		=	$ (737)	$ (7,929)	Calculated Total
TOTAL DIRECT COSTS (TDAC) = FOM + VOM		=	$ 8,623	$ 6,631	Calculated Total
INDIRECT COSTS					
Overhead	Included in Fixed O&M Costs	=			
Property Tax	1% of (TICC)	=	$ 1,980	$ 1,100	OAQPS Control Cost Manual
Insurance	1% of (TICC)	=	$ 1,980	$ 1,100	OAQPS Control Cost Manual
G&A Charges	2% of (TICC)	=	$ 5,960	$ 1,600	OAQPS Control Cost Manual
Capital Recovery	0.117 * (TICC)	=	$ 23,257	$ 12,921	Based on 10% interest rate
TOTAL INDIRECT COSTS (TIAC)		=	$ 31,177	$ 16,721	Calculated Total
TOTAL ANNUALIZED COSTS	TDAC + TIAC	=	$ 39,800	$ 23,352	Calculated
TOTAL VOC REMOVED PER YEAR (VOC)		=	[illegible]	1.70	Based on 98% operation of VRU and 95% control by flare during VRU downtime
COST EFFECTIVENESS ($ per ton of pollutant removed)		=	$ 23,347	$ 13,698	Calculated