

Industrial Commission of North Dakota  
Oil and Gas Division  
Spill / Incident Report

Date/Time Reported : Aug 22 2014 / 08:48

State Agency person :

Responsible Party : Oasis Petroleum

Well Operator : OASIS PETROLEUM NORTH AMERICA LLC

Date/Time of Incident : 8/21/2014 12:00:00 AM

NDIC File Number : 20864

Facility Number :

Well or Facility Name : BRAY 5301 43-12H

Type of Incident : Stuffing Box Leak

Field Name : BAKER

County : MCKENZIE

Section : 12

Township : 153

Range : 101

Quarter-Quarter : SW

Quarter : SE

Distance to nearest residence : 1 Mile

Distance to nearest water well : 1 Mile

Release Oil : 4 Barrels

Release Brine : 1 Barrels

Release Other :

Recovered Oil : 4 Barrels

Recovered Brine : 1 Barrels

Recovered Other :

Has/Will the incident be reported to the NRC? : Unknown

Was release contained : Yes - on Facility Site

Description of other released substance :

Immediate risk evaluation : none, spill has been cleaned up

Followup Report Requested Y/N : Y



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.  
**222100-01**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>October 1, 2013</b>
<input type="checkbox"/> Report of Work Done	Date Work Completed
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date

<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
<input checked="" type="checkbox"/> Other	<b>Central production facility-commingle prod</b>

**Well Name and Number  
(see details)**

Footages	F	L	F	L	Qtr-Qtr	Section	Township	Range
						<b>12</b>	<b>153 N</b>	<b>101 W</b>
Field	Pool <b>Bakken</b>					County	<b>McKenzie</b>	
<b>Baker</b>								

**24-HOUR PRODUCTION RATE**

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)

Address	City	State	Zip Code
---------	------	-------	----------

**DETAILS OF WORK**

Oasis Petroleum North America LLC requests permission to add the following wells to CTB # 222100-01.

Well File #22740 Larry 5301 44-12B SESE 12-153-101 API 33-053-04981

Well File #22099 Yukon 5301 41-12T SWSW 12-153-101 API 33-053-03911

Well File #25571 Colville 5301 44-12T SESE 12-153-101 API 33-053-04981

Well File #22221 Innoko 5301 43-12T SWSE 12-153-101 API 33-053-03937

The following wells are currently being commingled in the subject CTB:

Well File #22100 Achilles 5301 41-12B SWSW 12-153-101 API 33-053-03912

Well File #22220 Jefferies 5301 43-12B SWSE 12-153-101 API 33-053-03936

Well File #20864 Bray 5301 43-12H SWSE 12-153-101 API 33-053-03609

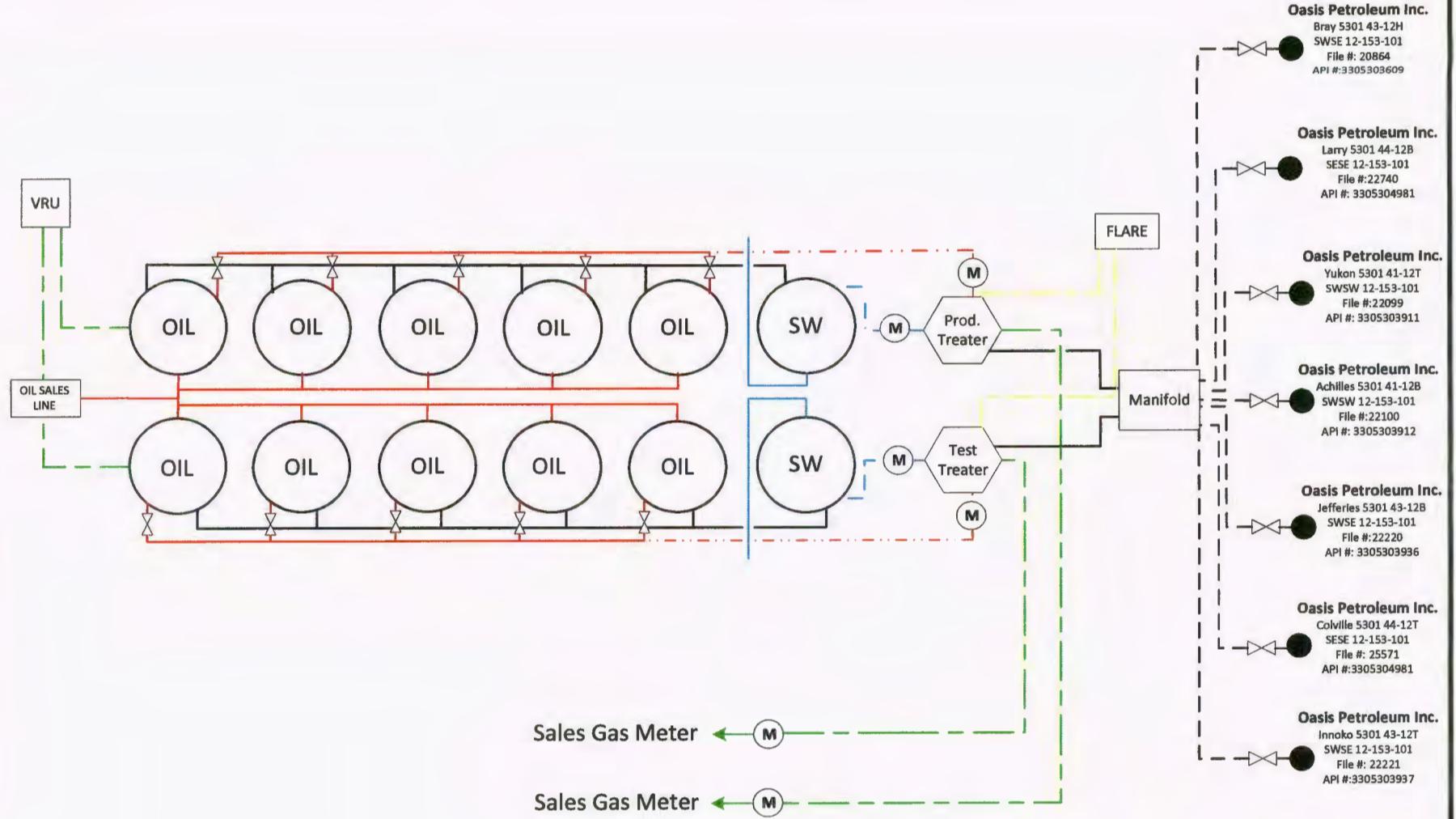
Well File #22740 Larry 5301 44-12B SESE 12-153-101 API 33-053-04071

Please find the following attachments: 1. A schematic drawing of the facility which diagrams the testing, treating, routing, and transferring of production. 2. A plat showing the location of the central facility 3. Affidavit of title indicating common ownership.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature <i>Brandi Terry</i>	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>July 24, 2013</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

**FOR STATE USE ONLY**

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>7-30-13</b>	
By <b>ORIGINAL SIGNED BY DARYL GRONFUR METER SPECIALIST</b>	
Title	



<b>OASIS</b> PETROLEUM					
5301 13-24 ACHILLES CENTRAL TANK BATTERY					
DATE	REV.	BY	APPR.	SCALE	
JULY 23, 2013	0	LEE		NA	
LOCATION	FIELD				
NORTH DAKOTA	BAKER				

# COMMINGLING AFFIDAVIT

STATE OF NORTH DAKOTA      )  
                                )  
                                ) ss.  
COUNTY OF MCKENZIE        )

Tom F. Hawkins, being duly sworn, states as follows:

1. I am the Vice President - Land and Contracts employed by Oasis Petroleum North America LLC with responsibilities in the State of North Dakota and I have personal knowledge of the matters set forth in this affidavit.

2. Sections 13 and 24, Township 153 North, Range 101 West, 5<sup>th</sup> P.M., McKenzie County, North Dakota constitute a spacing unit in accordance with the applicable orders of the North Dakota Industrial Commission for the Bakken pool.

3. Four wells have been drilled in the spacing unit, which are the Bray 5301 43-12H, Achilles 5301 41-12B, Jefferies 5301 43-12B, Larry 5301 44-12B; and three wells have been permitted in the spacing unit, which are the Colville 5301 44-12T, Innoko 5301 43-12T and Yukon 5301 41-12T.

4. By Declaration of Pooled Unit dated August 26, 2011, filed in McKenzie County, North Dakota, document number 422312, all oil and gas interests within the aforementioned spacing unit were pooled.

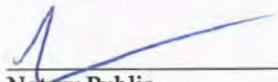
5. All Working Interests, Royalty Interests and Overriding Royalty Interests in the Bray 5301 43-12H, Achilles 5301 41-12B, Jefferies 5301 43-12B, Colville 5301 44-12T, Innoko 5301 43-12T and Yukon 5301 41-12 wells are common.

Dated this 9<sup>th</sup> day of July, 2013.

  
Tom F. Hawkins  
Vice President-Land and Contracts

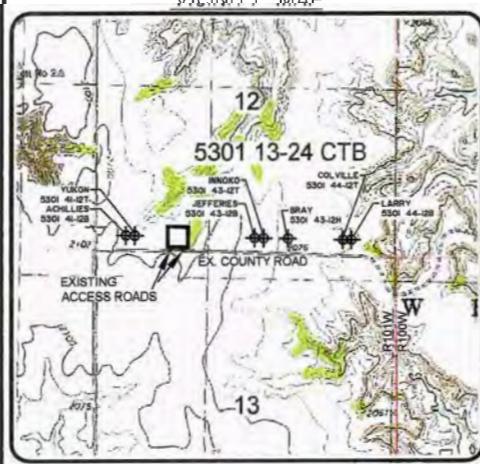
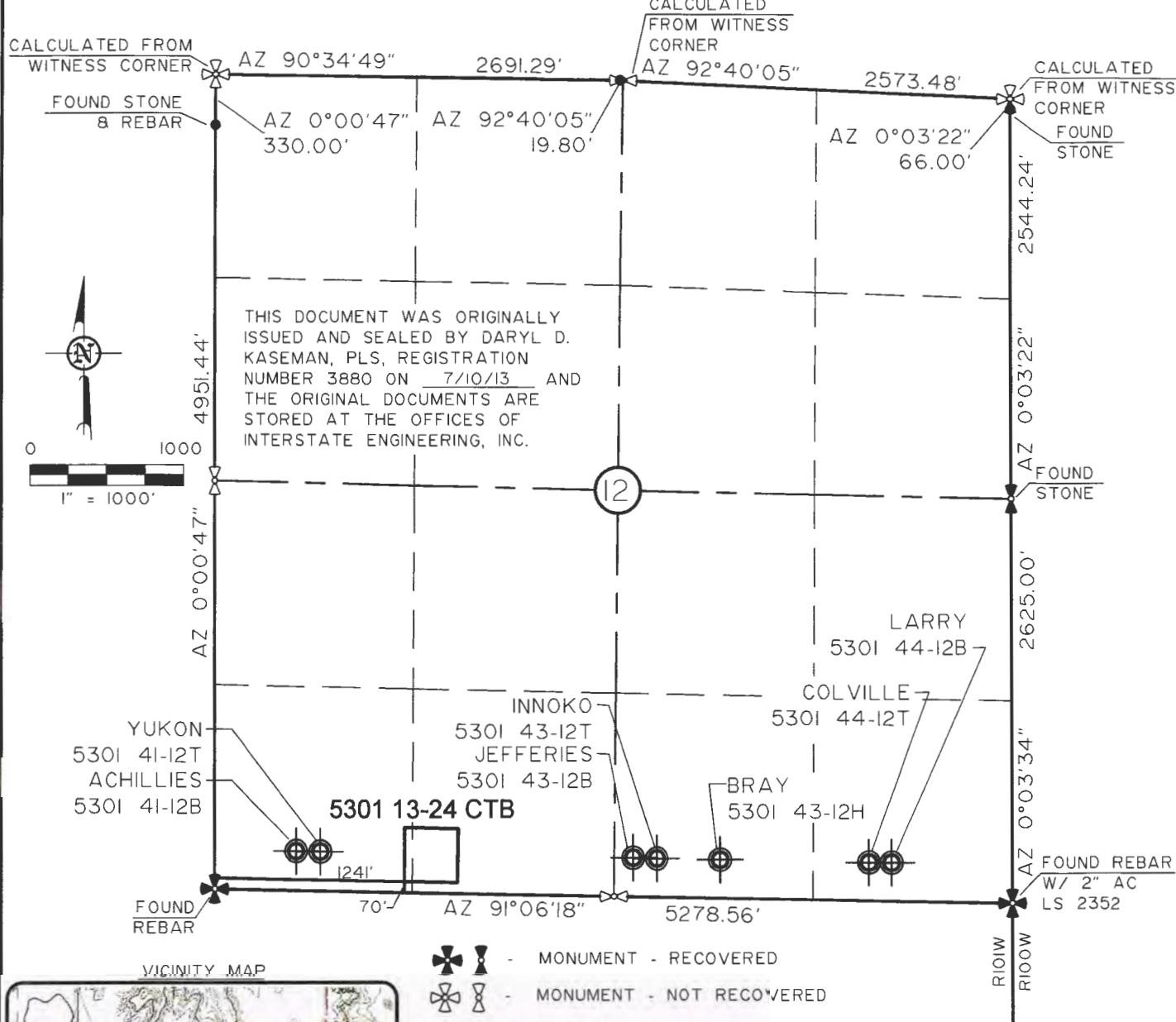
STATE OF TEXAS      )  
                                )  
                                ) ss.  
COUNTY OF HARRIS     )

Subscribed to and sworn before me this 9<sup>th</sup> day of July, 2013.

  
Notary Public  
State of Texas  
My Commission Expires: August 14, 2017

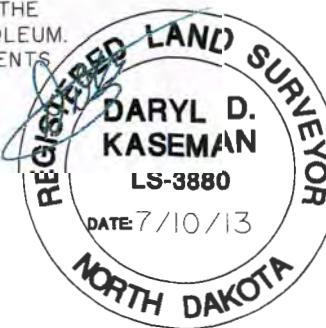


**BATTERY LOCATION PLAT**  
 OASIS PETROLEUM NORTH AMERICA, LLC  
 1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
 "5301 13-24 CTB"  
 SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



STAKED ON 3/08/12  
 VERTICAL CONTROL DATUM WAS BASED UPON  
 CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF FABIAN KJORSTAD OF OASIS PETROLEUM. I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS WORK PERFORMED BY ME OR UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



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DARYL D. KASEMAN LS-3880

1/5

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ENGINEERING  
Professionals you need, people you trust!

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Interstate Engineering, Inc.  
 P.O. Box 648  
 425 East Main Street  
 Sidney, Montana 59270  
 Ph (406) 433-5617  
 Fax (406) 433-5618  
[www.iengi.com](http://www.iengi.com)

Other offices in Minnesota, North Dakota and South Dakota

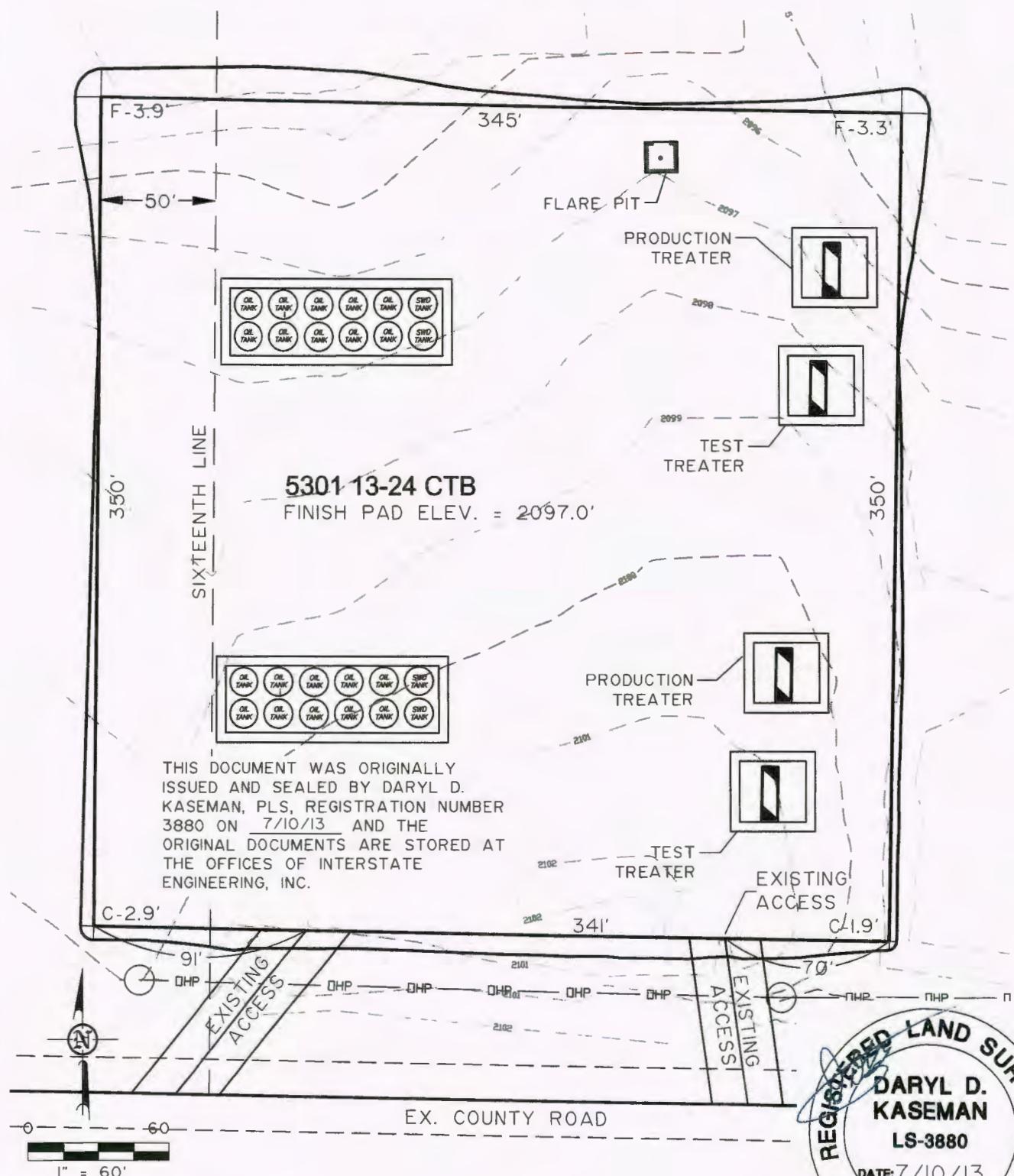
OASIS PETROLEUM NORTH AMERICA, LLC  
 WELL LOCATION PLAT  
 SECTION 12, T153N, R101W

MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M Project No.: S12-09-249  
 Checked By: D.D.K Date: SEPT. 2012

Revision No.	Date	By	Description
REV 1	7/10/13	J.D.M	ADDED WELLS

**PAD LAYOUT**  
 OASIS PETROLEUM NORTH AMERICA, LLC  
 1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
 "5301 13-24 CTB"  
 SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

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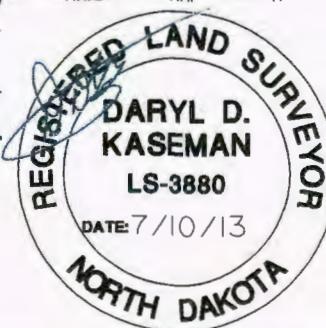
SHEET NO.

Interstate Engineering, Inc.  
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425 East Main Street  
Sidney, Montana 59270  
Ph (406) 433-5617  
Fax (406) 433-5618  
[www.iengi.com](http://www.iengi.com)  
Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
PAD LAYOUT  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. Project No.: 512-9-249  
Checked By: D.D.K. Date: SEPT. 2012

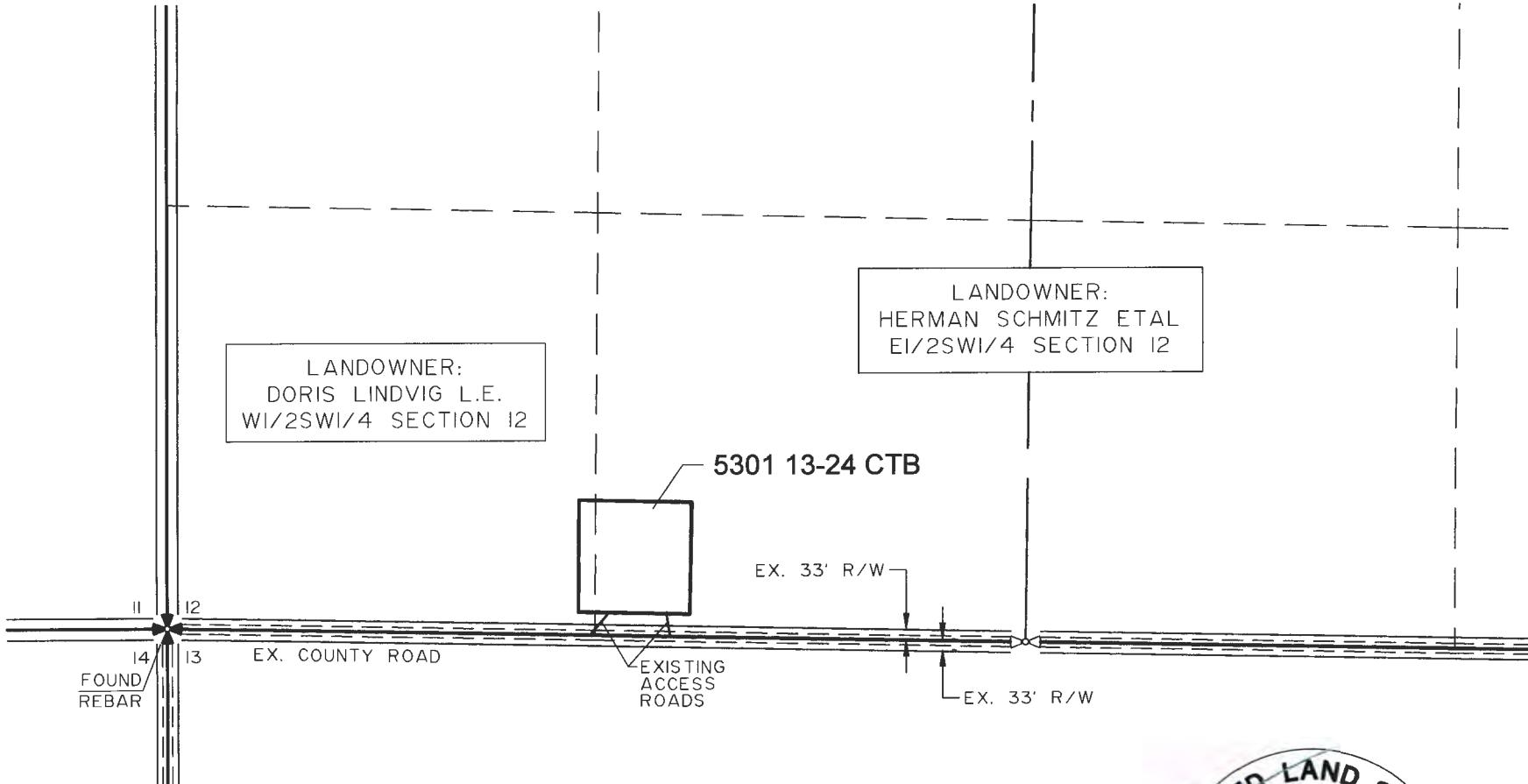
Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS



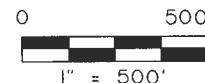
# ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"5301 13-24 CTB"

SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



THIS DOCUMENT WAS ORIGINALLY  
ISSUED AND SEALED BY DARYL D.  
KASEMAN, PLS, REGISTRATION NUMBER  
3880 ON 7/10/13 AND THE  
ORIGINAL DOCUMENTS ARE STORED AT  
THE OFFICES OF INTERSTATE  
ENGINEERING, INC.



NOTE: All utilities shown are preliminary only, a complete  
utilities location is recommended before construction.

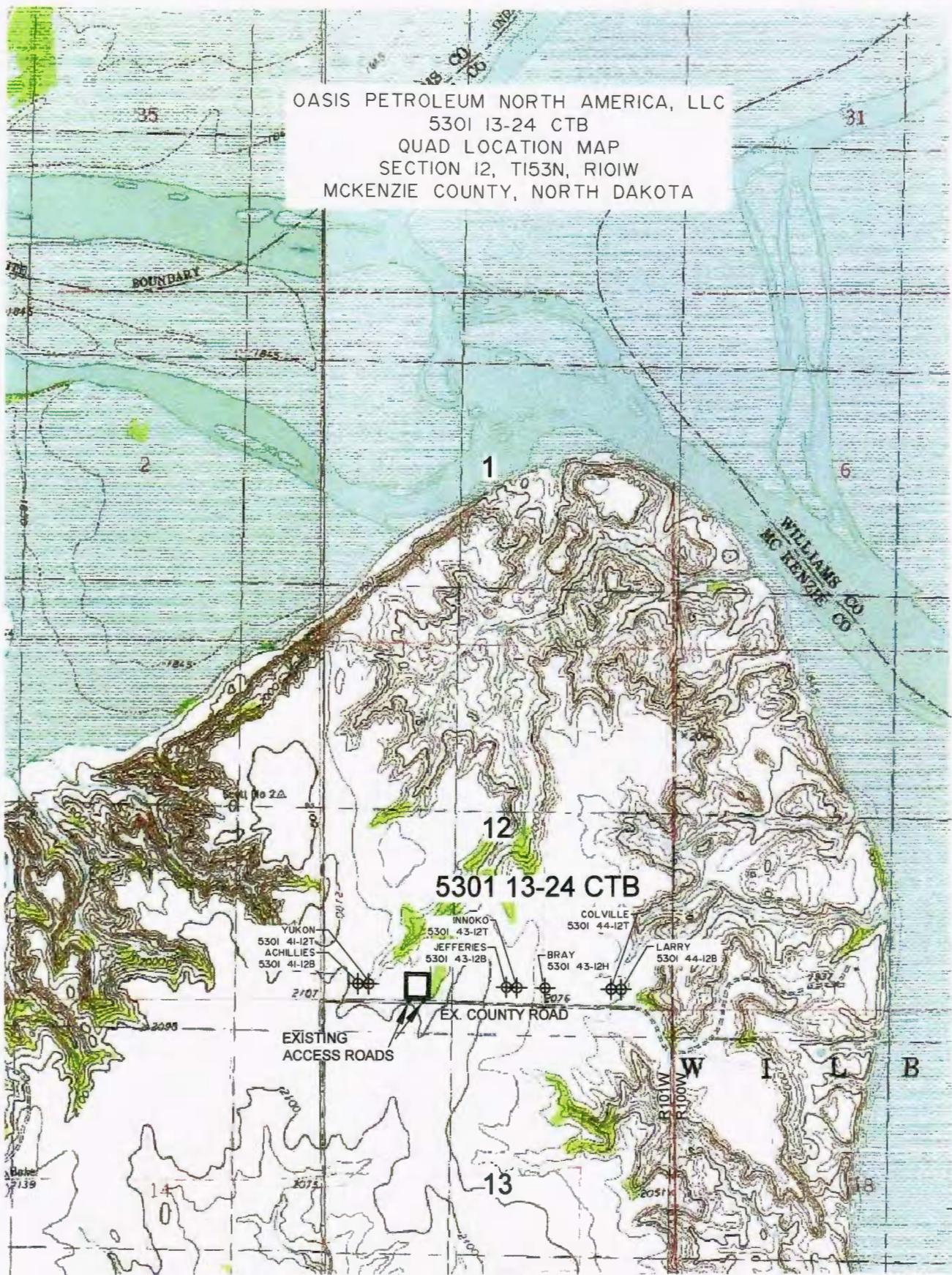


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Sidney, Montana 59270  
Ph: (406) 433-5617  
Fax: (406) 433-5618  
www.leng.com  
Other offices in Montana, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
ACCESS APPROACH  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA  
Drawn By: J.D.M.  
Checked By: D.D.K.  
Project No.: ST2309-249  
Date: SEPT. 2012



4/5

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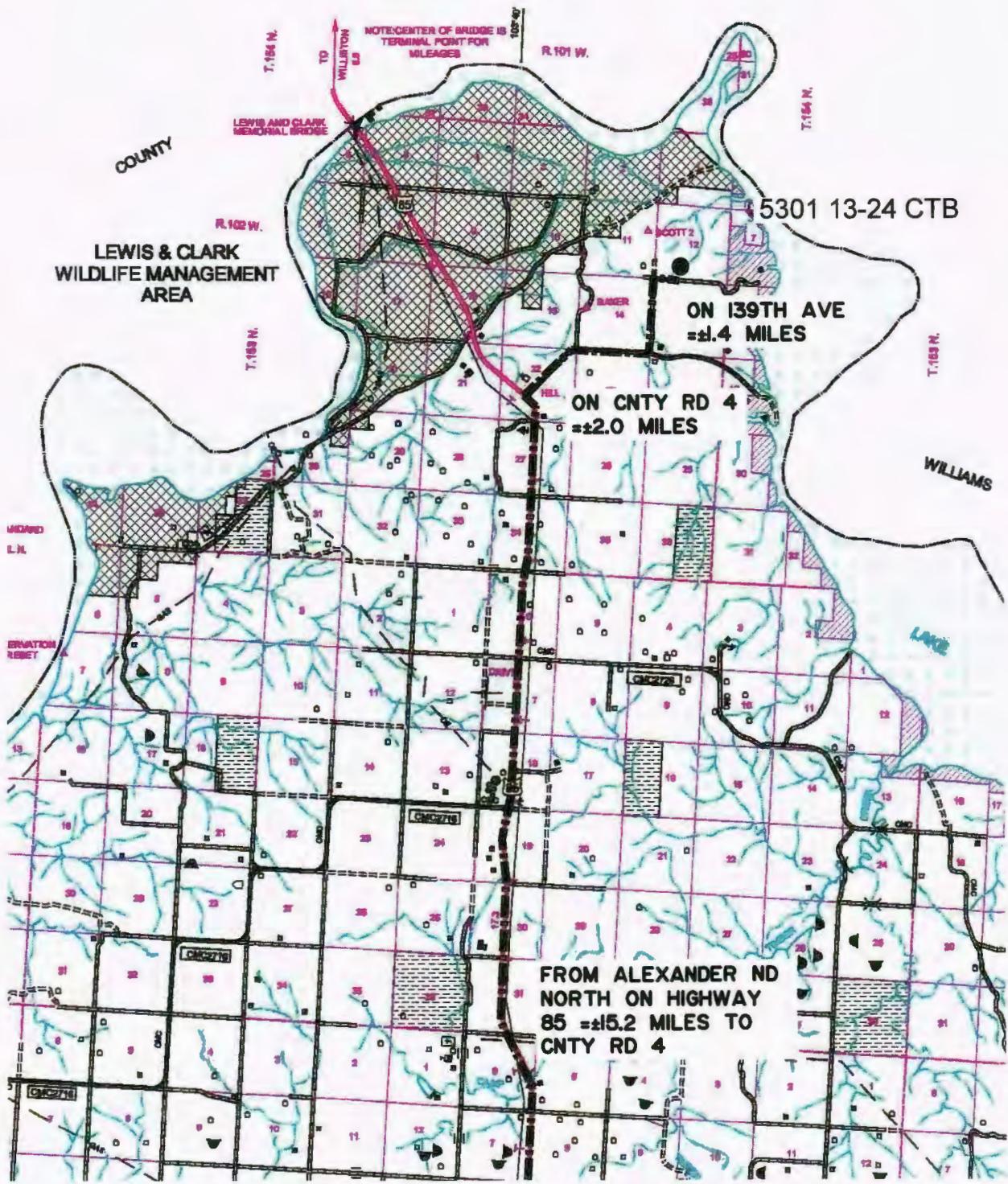
Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
QUAD LOCATION MAP  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. Project No.: S12-09-249  
Checked By: DDK Date: SEPT 2012

Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS

**COUNTY ROAD MAP**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"5301 13-24 CTB"  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

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Sidney, Montana 59270  
Ph (406) 433-5617  
Fax (406) 433-5618  
[www.iengi.com](http://www.iengi.com)

**INTERSTATE ENGINEERING, INC.**  
P.O. Box 648  
425 East Main Street  
**OASIS PETROLEUM NORTH AMERICA, LLC**  
**COUNTY ROAD MAP**  
SECTION 12, T45R21M, R42W1M

421 East Main Street  
Sidney, Montana 59270  
Ph (406) 433-5617

SECTION 12, T15N, R10W  
MCKENZIE COUNTY, NORTH DAKOTA

Fax (406) 433-5618  
www.ingeni.com  
Other offices in Minnesota, North Dakota and South Dakota

Drawn By:	J.D.M.	Project No.:	S12-09-248
Checked By:	D.D.K.	Date:	SEPT. 2012

Revision No.	Date	By	Description
REV I	7/10/13	JDM	ADDED WELLS

LAT/LONG PAD CORNERS

345'

48°05'00.01"N  
103°37'13.86"W

48°04'59.95"N  
103°37'08.78"W

5301 13-24 CTB

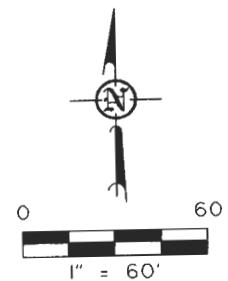
350'

350'

48°04'56.56"N  
103°37'13.89"W

48°04'56.50"N  
103°37'08.87"W

341'



Industrial Commission of North Dakota  
Oil and Gas Division  
Spill / Incident Report

Date/Time Reported : Feb 22 2012 / 0800

State Agency person :

Responsible Party : GRIZZLY MOUNTAIN TRUCKING LLC

Well Operator : OASIS PETROLEUM NORTH AMERICA LLC

Date/Time of Incident : 2/21/2012 12:00:00 AM

NDIC File Number : 20864

Facility Number :

Well or Facility Name : BRAY 5301 43-12H

Field Name : BAKER

County : MCKENZIE

Section : 12

Township : 153

Range : 101

Quarter-Quarter : SW

Quarter : SE

Distance to nearest residence : 2 Miles

Distance to nearest water well : 2 Miles

Release Oil : 2 barrels

Release Brine : 0 barrels

Release Other : 0 barrels

Recovered Oil : 2 barrels

Recovered Brine : 0 barrels

Recovered Other : 0 barrels

Has/Will the incident be reported to the NRC? : No

Was release contained : Yes - Within Dike

Description of other released substance :

Immediate risk evaluation : None.

Followup Report Requested Y/N : N



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 2012

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)



Well File No.  
**20864**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input type="checkbox"/> Notice of Intent	Approximate Start Date
<input checked="" type="checkbox"/> Report of Work Done	Date Work Completed <b>August 15, 2012</b>
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	
Approximate Start Date	

<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
<input type="checkbox"/> Temporarily Abandon	<input checked="" type="checkbox"/> Reclamation
<input type="checkbox"/> Other	<u>Reserve pit reclamation</u>

Well Name and Number  
**Bray 5301 43-12H**

Footages	Qtr-Qtr	Section	Township	Range
250 F S L	1927 F E L	SWSE	12	153 N 101 W
Field <b>Baker</b>	Pool <b>Bakken</b>		County <b>McKenzie</b>	

## 24-HOUR PRODUCTION RATE

Before	After
Oil	Bbls
Water	Bbls
Gas	MCF

Name of Contractor(s)  
**Excel Industries, Inc**

Address <b>P.O. Box 159</b>	City <b>Miles City</b>	State <b>MT</b>	Zip Code <b>59301</b>
--------------------------------	---------------------------	--------------------	--------------------------

## DETAILS OF WORK

Oasis Petroleum North America LLC has completed the reclamation of the reserve pit for the above referenced well.

The NDIC field inspector, Mark Binns (NDIC) and the surface owners were notified.

Surface owners: Larry P Heen, 14033 45th St NW, Williston, ND 58801

Procedure followed as proposed.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>August 17, 2012</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

## FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date <b>8-27-13</b>	
By 	
Title <b>Rep. [Signature]</b>	



# SUNDRY NOTICE AND REPORTS ON WELLS - FORM

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.  
**20864**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input type="checkbox"/> Notice of Intent	Approximate Start Date
<input checked="" type="checkbox"/> Report of Work Done	Date Work Completed <b>April 30, 2012</b>
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date

- |   |   |
|---|---|
| <input type="checkbox"/> Drilling Prognosis   | <input type="checkbox"/> Spill Report                 |
| <input type="checkbox"/> Redrilling or Repair | <input type="checkbox"/> Shooting                     |
| <input type="checkbox"/> Casing or Liner      | <input type="checkbox"/> Acidizing                    |
| <input type="checkbox"/> Plug Well            | <input type="checkbox"/> Fracture Treatment           |
| <input type="checkbox"/> Supplemental History | <input type="checkbox"/> Change Production Method     |
| <input type="checkbox"/> Temporarily Abandon  | <input type="checkbox"/> Reclamation                  |
| <input type="checkbox"/> Other                | <b>Change of status - well now on artificial lift</b> |

Well Name and Number <b>Bray 5301 43-12H</b>				
Footages <b>250 F S L</b>	Qtr-Qtr <b>1927 F E L</b>	Section <b>SWSE</b>	Township <b>12</b>	Range <b>153 N 101 W</b>
Field <b>Baker</b>	Pool <b>Bakken</b>	County <b>McKenzie</b>		

24-HOUR PRODUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

## DETAILS OF WORK

Effective 04-30-2012, the above referenced well is on pump:

Tubing: 2-7/8" L-80 tubing assembly @ 10,048'

Pump: 2-1/2" x 2" x 24' pump @ 10,016'

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281 404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>May 3, 2012</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date <b>May 15, 2012</b>	
By 	
Title <b>PETROLEUM ENGINEER</b>	



WELL COMPLETION OR RECOMPLETION REPORT - FORM

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SBN 2468 (04-2010)

**Well File No.**

**PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.**

APR 2012

RECEIVED  
NO OIL & GAS  
DIVISION

**Designate Type of Completion**

- Oil Well       EOR Well       Recompletion       Deepened Well       Added Horizontal Leg       Extended Horizontal Leg  
 Gas Well       SWD Well       Water Supply Well       Other:

Well Name and Number <b>Bray 5301 43-12H</b>			Spacing Unit Description <b>Sec. 13 &amp; 24 T153N R101W</b>
Operator <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	Field <b>Baker</b>	
Address <b>1001 Fannin, Suite 1500</b>		Pool <b>Bakken</b>	
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>	Permit Type <input type="checkbox"/> Wildcat <input checked="" type="checkbox"/> Development <input type="checkbox"/> Extension

**LOCATION OF WELL**

## **CASING & TUBULARS RECORD (Report all strings set in well)**

## **PERFORATION & OPEN HOLE INTERVALS**

## **PRODUCTION**

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) <b>Lateral 1 - 11,071'-20,978'</b>								Name of Zone (If Different from Pool Name)	
Date Well Completed (SEE INSTRUCTIONS) 1/13/2012			Producing Method <b>Flowing</b>	Pumping-Size & Type of Pump				Well Status (Producing or Shut-In) <b>Producing</b>	
Date of Test <b>1/29/2012</b>	Hours Tested <b>24</b>	Choke Size <b>64 /64</b>	Production for Test	Oil (Bbls) <b>2521</b>	Gas (MCF) <b>2555</b>	Water (Bbls) <b>2098</b>	Oil Gravity-API (Corr.) °	Disposition of Gas <b>Sold</b>	
Flowing Tubing Pressure (PSI) <b>650</b>		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls) <b>2521</b>	Gas (MCF) <b>2555</b>	Water (Bbls) <b>2098</b>	Gas-Oil Ratio <b>1013</b>	

## **GEOLOGICAL MARKERS**

## **PLUG BACK INFORMATION**

CORES CUT

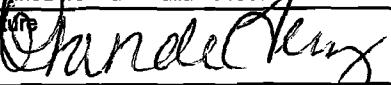
Top (Ft)	Bottom (Ft)	Formation	Top (Ft)	Bottom (Ft)	Formation

## Drill Stem Test

### Well Specific Stimulation

Date Stimulated 1/3/2012	Stimulated Formation Bakken		Top (Ft) 11071	Bottom (Ft) 20978	Stimulation Stages 36	Volume 86805	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 4377826	Maximum Treatment Pressure (PSI) 8762		Maximum Treatment Rate (BBLS/Min) 37.7		
Details 40/70 Sand- 1,824,600 20/40 Ceramic-2,553,226							
Date Stimulated	Stimulated Formation		Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)		
Details							
Date Stimulated	Stimulated Formation		Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)		
Details							
Date Stimulated	Stimulated Formation		Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)		
Details							
Date Stimulated	Stimulated Formation		Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)		
Details							

### ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address bterry@oasispetroleum.com	Date 3/23/2012
Signature 	Printed Name Brandi Terry	Title Regulatory Specialist



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2008)

20864

Well File No.

CTB # 222100-01



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>March 19, 2012</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	<b>Central production facility-commingle prod</b>

Well Name and Number  
**(see details)**

Footages	F	L	F	L	Qtr-Qtr	Section	Township	Range
						<b>12</b>	<b>153 N</b>	<b>101 W</b>
Field <b>Baker</b>	Pool <b>Bakken</b>				County <b>McKenzie</b>			

## 24-HOUR PRODUCTION RATE

	Before		After
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)

Address	City	State	Zip Code

## DETAILS OF WORK

Oasis Petroleum North America LLC requests approval to commingle oil and gas in a central production facility known as: Oasis 5301 13-24CTB with common ownership for the following wells:

Well File #22100 Achilles 5301 41-12B SW SW 12-153-101 API 33-053-03912

Well File #22220 Jefferies 5301 43-12B SW SE 12-153-101 API 33-053-03936

Well File #20864 Bray 5301 43-12H SW SE 12-153-101 API 33-053-03609

Please find the following attachments:

1. A schematic drawing of the facility which diagrams the testing, treating, routing, and transferring of production.
2. A plat showing the location of the central facility
3. Affidavit of title indicating common ownership

Oasis will allocate production measured at the central production facility to the various wells on the basis of isolated production tests utilizing oil, gas and water meters on a test separator at the central production facility. Oasis will measure the production from each well separately each month for a minimum of three days. Oasis believes that such allocation will result in an accurate determination of production from each well. Tank vapor gas is being recovered and burned by a 98% DRE enclosed combuster.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>March 19, 2012</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

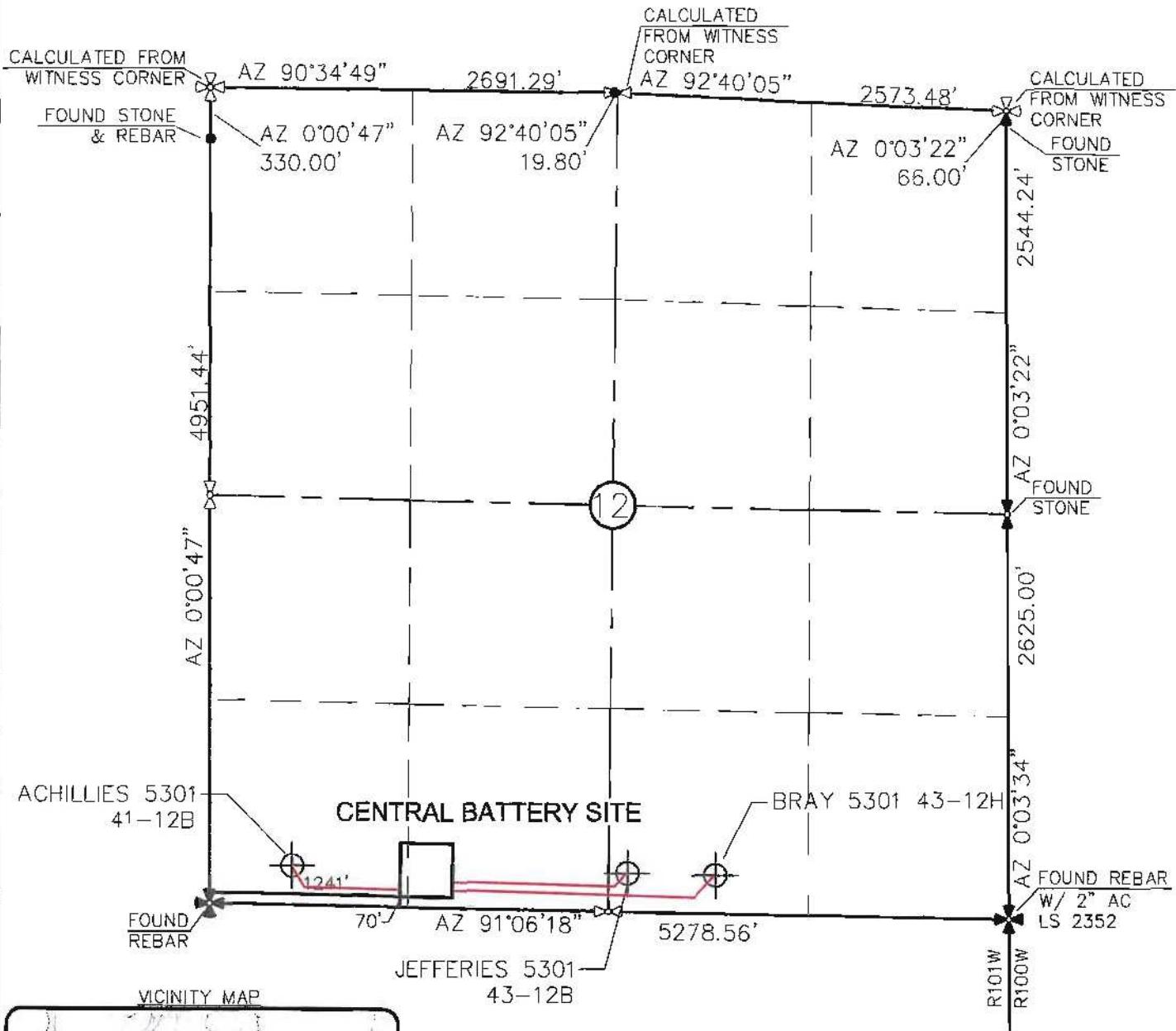
## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>3-23-12</b>	
By <b>DARYL GRONFUR</b>	ORIGINAL SIGNED BY <b>METER SPECIALIST</b>
Title	

# ADJACENT WELL LOCATIONS PLAT

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
CENTRAL BATTERY SITE<sup>®</sup>

SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



1/1  
SHEET NO.



INTERSTATE  
ENGINEERING  
Professionals you need, people you trust

Interstate Engineering, Inc.  
P.O. Box 646  
425 East Main Street  
Sidney, Montana 59270  
Ph. (406) 433-5617  
Fax (406) 433-5619  
[www.ienji.com](http://www.ienji.com)  
Other offices in Alberta, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
ADJACENT WELLS PLAT  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA  
Drawn By: J.J.B. Project No.: S11-09-137  
Checked By: D.D.K. Date: MARCH 2012

Revision No.	Date	By	Description

Oasis Petroleum Inc.

Brays 5301 43-12H  
SWSE 12-153-101  
File #: 20864  
API #: 3305303609



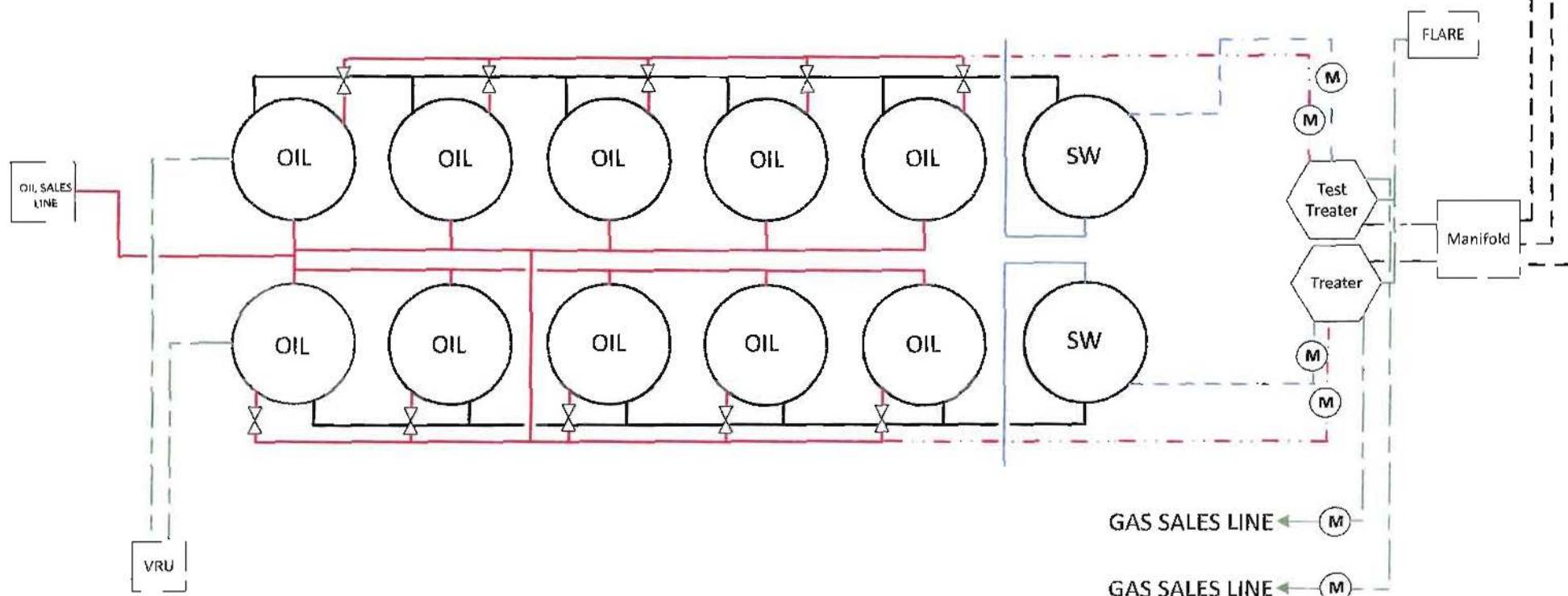
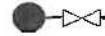
Oasis Petroleum Inc.

Jeffries 5301 43-12B  
SWSW 12-153-101  
File #: 22220  
API #: 3305303936



Oasis Petroleum Inc.

Achilles 5301 41-12B  
SWSW 12-153-101  
File #: 22100  
API #: 3305303912



**OASIS**  
PETROLEUM

PRODUCTION COMMINGLING DIAGRAM - BRAY 5301 43-12H  
JEFFRIES 5301 43-12B & ACHILLES 5301 41-12B

DATE	REV.	BY	APPR.	SCALE
March 14, 2012	0	LTZ		NA
LOCATION	FIELD			
NORTH DAKOTA	INDIAN HILLS - SOUTH			

STATE OF NORTH DAKOTA      )  
                                    )  
COUNTY OF MCKENZIE      )

Tom F. Hawkins, being duly sworn, states as follows:

1. I am the Vice President - Land and Contracts employed by Oasis Petroleum North America LLC with responsibilities in the State of North Dakota and I have personal knowledge of the matters set forth in this affidavit.

2. Sections 13 and 24, Township 153 North, Range 101 West, McKenzie County, North Dakota constitute a spacing unit in accordance with the applicable orders for the Bakken pool.

3. Three wells have been drilled in the spacing unit, which are the Bray 5301 43-12H, the Achilles 5301 41-12B and the Jefferies 5301 43-12B .

4. By Declaration of Pooled Unit dated August 26, 2011, filed in McKenzie County, North Dakota, document number 422312, all oil and gas interests within the aforementioned spacing unit were pooled.

5. All Working Interests, Royalty Interests and Overriding Royalty Interests in the Bray 5301 43-12H, the Achilles 5301 41-12B and the Jefferies 5301 43-12B wells are common.

Dated this 14<sup>th</sup> day of March, 2012

Tom F. Hawkins

STATE OF TEXAS      )  
                            )  
COUNTY OF HARRIS      )

Subscribed to and sworn before me this 14<sup>th</sup> day of March, 2012

Lauren Shields



Notary Public  
State of Texas  
My Commission Expires: 10-17-2012



# AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5698 (03-2000)



Well File No.
20864
NDIC CTB No. 120864

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number <b>BRAY 5301 43-12H</b>	Qtr-Qtr <b>SWSE</b>	Section <b>12</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>MCKENZIE</b>
Operator <b>OASIS PETROLEUM NORTH AMERICA LLC</b>	Telephone Number <b>(281) 404-9435</b>		Field <b>WILDCAT</b>		
Address <b>1001 FANNIN, STE 1500</b>	City <b>HOUSTON</b>		State <b>TX</b>	Zip Code <b>77002</b>	

Name of First Purchaser <b>OASIS PETROLEUM MARKETING LLC</b>	Telephone Number <b>(281) 404-9435</b>	% Purchased <b>100</b>	Date Effective <b>January 1, 2012</b>
Principal Place of Business <b>3773 CHERRY CREEK NORTH, STE 1000</b>	City <b>DENVER</b>	State <b>CO</b>	Zip Code <b>80209</b>
Field Address	City	State	Zip Code
Name of Transporter <b>GRIZZLY MOUNTAIN TRUCKING</b>	Telephone Number <b>(406) 377-6831</b>	% Transported <b>75</b>	Date Effective <b>January 1, 2012</b>
Address <b>54 HWY 16</b>	City <b>GLENDIVE</b>	State <b>MT</b>	Zip Code <b>59330</b>
The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.			

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease <b>COCORD ENERGY TRANSPORT</b>	% Transported <b>25</b>	Date Effective <b>January 1, 2012</b>
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments <b>REVISED TO CHANGE 1ST PURCHASER EFFECTIVE 1/1/2012</b>		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date <b>December 21, 2011</b>
Signature 	Printed Name <b>DINA BARRON</b>	Title <b>MKTG CONTRACTS ADMINISTRATOR</b>

Above Signature Witnessed By		
Witness Signature 	Witness Printed Name <b>GARY BURLESON</b>	Witness Title <b>MARKETING DIRECTOR</b>

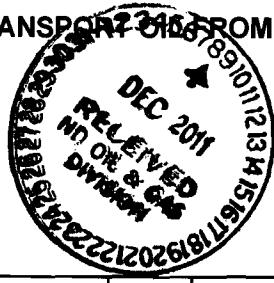
## FOR STATE USE ONLY

Date Approved <b>JAN 18 2012</b>
By 
Title <b>Eric Peterson</b>
Oil & Gas Production Analyst



# AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5698 (03-2000)



Well File No.	20864
NDIC CTB No.	120864

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number <b>BRAY 5301 43-12H</b>	Qtr-Qtr <b>SWSE</b>	Section <b>12</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>MCKENZIE</b>
Operator <b>OASIS PETROLEUM NORTH AMERICA LLC</b>	Telephone Number <b>(281) 404-9435</b>		Field <b>WILDCAT</b>		
Address <b>1001 FANNIN, STE 1500</b>	City <b>HOUSTON</b>		State <b>TX</b>	Zip Code <b>77002</b>	

Name of First Purchaser <b>High Sierra Crude Oil &amp; Marketing, LLC</b>	Telephone Number <b>(303) 319-3259</b>	% Purchased <b>75</b>	Date Effective <b>December 1, 2011</b>
Principal Place of Business <b>3773 CHERRY CREEK NORTH, STE 1000</b>	City <b>DENVER</b>	State <b>CO</b>	Zip Code <b>80209</b>
Field Address	City	State	Zip Code
Name of Transporter <b>GRIZZLY MOUNTAIN TRUCKING</b>	Telephone Number <b>(406) 377-6831</b>	% Transported <b>75</b>	Date Effective <b>December 1, 2011</b>
Address <b>54 HWY 16</b>	City <b>GLENDALE</b>	State <b>MT</b>	Zip Code <b>59330</b>
The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.			

Other First Purchasers Purchasing From This Lease <b>COCONORD ENERGY</b>	% Purchased <b>25</b>	Date Effective <b>December 1, 2011</b>
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease <b>COCORD ENERGY TRANSPORT</b>	% Transported <b>25</b>	Date Effective <b>December 1, 2011</b>
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Date <b>December 1, 2011</b>	
Signature 	Printed Name <b>DINA BARRON</b>	Title <b>MKTG CONTRACTS ADMINISTRATOR</b>

Above Signature Witnessed By	Witness Signature 	Witness Printed Name <b>GARY BURLESON</b>	Witness Title <b>MARKETING DIRECTOR</b>
------------------------------	-----------------------	--	--

FOR STATE USE ONLY

Date Approved <b>JAN 18 2012</b>
By 
Title <b>Oil &amp; Gas Production Analyst</b>



**ORIGINAL**

Industrial Commission of North Dakota  
Oil and Gas Division

Well or Facility No

**20864**

Verbal Approval To Purchase and Transport Oil      Tight Hole      Yes

**OPERATOR**

Operator <b>OASIS PETROLEUM NORTH AMERICA LL</b>	Representative <b>Todd Hanson</b>	Rep Phone <b>(701) 577-1632</b>
---	--------------------------------------	------------------------------------

**WELL INFORMATION**

Well Name <b>BRAY 5301 43-12H</b>	Inspector <b>Marc Binns</b>	
Well Location SWSE      QQ      Sec      Twp      Rng 12      153    N      101    W	County <b>MCKENZIE</b>	
Footages 250      Feet From the S Line	Field <b>WILDCAT</b>	
1927      Feet From the E Line	Pool	
Date of First Production Through Permanent Wellhead	<b>1/12/2012</b>	<b>This Is Not The First Sales</b>

**PURCHASER / TRANSPORTER**

Purchaser <b>OASIS PETROLEUM MARKETING LLC</b>	Transporter <b>CONCORD ENERGY TRANSPORT</b>
---	--

**TANK BATTERY**

Single Well Tank Battery Number :
-----------------------------------

**SALES INFORMATION**    **This Is Not The First Sales**

ESTIMATED BARRELS TO BE SOLD	ACTUAL BARRELS SOLD	DATE
5000	BBLS	
	BBLS	

**DETAILS**

--

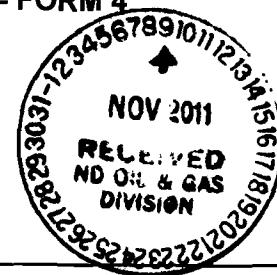
Start Date      **1/13/2012**  
Date Approved      **1/13/2012**  
Approved By



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.  
**20864**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>November 8, 2011</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	<b>Change well status to CONFIDENTIAL</b>

Well Name and Number  
**Bray 5301 43-12H**

Footages	Qtr-Qtr	Section	Township	Range
250 F S L	1927 F E L	SWSE	12	153 N 101 W
Field <b>Wildcat</b>	Pool <b>Bakken</b>		County <b>McKenzie</b>	

## 24-HOUR PRODUCTION RATE

Before	After
Oil	Bbls
Water	Bbls
Gas	MCF

Name of Contractor(s)

Address	City	State	Zip Code

## DETAILS OF WORK

Effective immediately, we request CONFIDENTIAL STATUS for the above referenced well.

Ends 05-14-2012

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>November 8, 2011</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>11-14-2011</b>	
By <b>David Tabor</b>	
Title <b>Engineering Technician</b>	



**SUNDY NOTICES AND REPORTS ON WELLS - FORM 4**

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

**PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.**

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>November 8, 2011</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input type="checkbox"/> Other	<b>Waiver from tubing/packer requirement</b>

**Well Name and Number**

**Bray 5301 43-12H**

## **Footages**

250

Name of Contractor(s)

**Address**

#### **24-HOUR PRODUCTION RATE**

THERMOTRENT REDUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

### **DETAILS OF WORK**

**Oasis Petroleum North America LLC requests a waiver from the tubing/pkr requirement included in NDAC 43-02-03-21: Casing, tubing, and cementing requirements during the completion period immediately following the upcoming fracture stimulation.**

**The following assurances apply:**

1. The well is equipped with new 29# & 32# casing at surface with an API burst rating of 11,220 psi
  2. The frac design will use a safety factor of 0.85 API burst rating to determine the maximum pressure.
  3. Damage to the casing during the frac would be detected immediately by monitoring equipment.
  4. The casing is exposed to significantly lower rates and pressures during flow back than during the frac job.
  5. The frac fluid and formation fluids have very low corrosion and erosion rates.
  6. Production equipment will be installed as soon as possible after the well ceases flowing.
  7. A 300# gauge will be installed on the surface casing during the flowback period.

Company <b>Oasis Petroleum North America LLC</b>		Telephone Number <b>281-404-9491</b>
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>		State <b>TX</b>
Zip Code <b>77002</b>		
Signature 		Printed Name <b>Brandi Terry</b>
Title <b>Regulatory Specialist</b>		Date <b>November 8, 2011</b>
Email Address <b>bterry@oasispetroleum.com</b>		

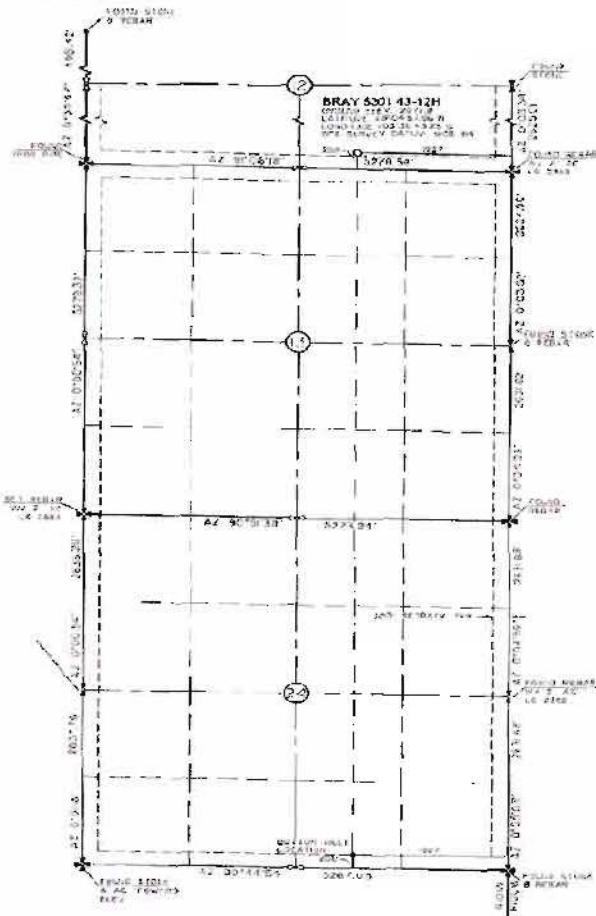
<b>FOR STATE USE ONLY</b>	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date	<u>November 9, 2011</u>
By	<u>Don J. M. Culver</u>
Title	PETROLEUM ENGINEER

20864

**Oasis Petroleum**  
**Bray 5301 43-12H**  
**250' FSL & 1,927' FEL**  
**SW SE Section 12, T153N, R101W**  
**Wildcat / Bakken**  
**McKenzie County, North Dakota**



WELL LOCATION PLAT  
 OASIS PETROLEUM NORTH AMERICA, LLC  
 1001 FANNIN, SUITE 1500  
 HOUSTON, TX 77002  
 300 FEET FROM SOUTHLINE AND 1337 FEET FROM EASTLINE  
 SW SE SECTION 12, T153N, R101W, MCKENZIE COUNTY, NORTH DAKOTA



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**BOTTOM HOLE LOCATION:**

10,478.70' South & 2.05' East of surface location or approx.  
 308.07' FSL & 1924.95' FEL, SW SE Section 24, T153N, R101W

**Prepared for:**

John Gillespie, Andy Nelson  
 Oasis Petroleum North America, LLC  
 1001 Fannin, Suite 1500  
 Houston, TX 77002

**Prepared by:**

Nathan Gabelman, Kyle Kavalec, Scott Smith  
 P.O. Box 51297  
 Billings, Montana 59105  
 (406) 259-4124  
 geology@sunburstconsulting.com  
 www.sunburstconsulting.com

**Oasis Petroleum North America, LLC**  
**Bray 5301 43-12H**

**WELL EVALUATION**



Xtreme Coil Rig 17 drilling for Oasis Petroleum North America in North Dakota during 2011.  
(Nathan Gabelman, well site geologist for Sunburst Consulting)

## INTRODUCTION

The **Oasis Petroleum North America, LLC Bray 5301 43-12H** [SW SE Section 12 T153N R101W] is located approximately 4 miles south of Williston in McKenzie County, North Dakota. The well is part of Oasis Petroleum's Williston Basin drilling program, targeting the Middle Bakken with two section laterals and utilizing the latest technology in fracture stimulation completions. The well was permitted for a 10,086' lateral drilling south 1,927' from the east line of sections 12, 13 and 24. Directional tools will kick-off from the vertical hole in the Lodepole Formation, build a curve and land in the Middle Bakken target zone. The proposed lateral would be geo-steered within the ideal target rock, focusing on a higher porosity zone approximately 8 feet from the bottom of the Upper Bakken Shale. The lateral will be directed along an azimuth of 180° to a TD approximately 200' from the south line in the SW ¼ of SE ¼ Section 24.

## OFFSET INFORMATION

Three previously completed wells were used as the main offsets to assist in landing the curve build section of the Bray 5301 43-12H. The *Lindvig 1-11H*, initially completed as a vertical well, was drilled on December 12, 1981 and was then re-entered on February 17, 2008 and completed as a horizontal well, located approximately 0.80 miles west of Bray 5301 43-12H in [Sec. 11, T153N, R101W]. The *Lindvig 1-11HR* was initially drilled to produce both the Red River Formation (dry to date) and the Madison Group (producing 201,159 Bbls of oil to date). *Lindvig 1-11HR* was then re-entered and completed as a single section lateral, to focus production in the Mississippian Nesson interval (approximately -7,321' subsea). The initial completion of the lateral showed an increase in production from approximately 200 Bbls of oil a month to 1,600 Bbls of oil a month, which has since tapered off to 400 Bbls of oil a month as of August, 2011. The *SM Energy Company Rosebud 22-11* [Sec. 11, T153N, R101W] is a vertical well targeting the Red River Formation (199,061 Bbls of oil). This well was drilled on September 21, 1985 and is located 1.45 miles northwest of Bray 5301 43-12H. The third offset well is the *Earthstone Energy Edwin M. Dahl 23-1*, which is a vertical well targeting the Red River Formation (producing 26,011 Bbls of oil to date) and the Madison Group (producing 113,393 Bbls of oil to date). *Edwin M. Dahl 23-1* was drilled on June 29, 1980 and is located 2.50 miles southwest of Bray 5301 43-12H in Section 23. The gamma ray signatures through the lower Lodgepole and Bakken observed in the *SM Energy Company Lindvig 1-11HR* provided the best correlation with the MWD gamma ray observed during operations, and provided formation thicknesses consistent with what was observed on Bray 5301 43-12H. Complete tops data are included as an appendix to this report.

## ENGINEERING

Professional Directional LTD, provided equipment and personnel for measurement-while-drilling (MWD) and directional drilling services. Sunburst Consulting geologists worked closely throughout the project with Professional Directional personnel to make steering decisions to maximize the amount of borehole in the pay zone

### Spud

The *Bray 5301 43-12H* was initially spud on July 24, 2011, with a Reed 13 ½" tri-cone surface bit (bit #1). Bit #1 was used to drill the surface hole with fresh water and drilled 2,040' in 49 hours, reaching the initial surface casing depth on July 25, 2011. The hole was then sealed to be re-entered on August 27, 2011.

### Re-Entry: Vertical

*Bray 5301 43-12H* was then re-entered on August 27, 2011 with a Security 8 ¾" PDC bit (bit #2). Bit #2 was used to drill out of surface casing with a 1.50° Hunting LS fixed motor in invert drilling fluid with a weight between 9.5-9.7 pound per gallon (ppg), with 5" drill pipe. This assembly drilled 8,080' in 79.5 hours to kick-off point (KOP) at 10,220' MD, and then was tripped out on September 02, 2011 to be replaced with the curve assembly.

### Curve

Curve building started September 03, 2011 at 10,220' MD (KOP). Diesel invert drilling fluid fluctuated in density between 10.48 and 10.6 ppg. The curve bottom hole assembly (BHA) consisted of a Security 8 ¾" bit (bit #3) and a 2.5° Professional Direction LS fixed mud motor. The BHA also included a Professional Directional MWD tool that recorded survey and gamma ray data. This assembly drilled the entire curve of 862' in 13 hours, achieving exceptional build rates and landing the curve 12 feet into the Middle Bakken Member, reaching the curve TD of 11,082' MD (10,734' TVD). The drill string and BHA were tripped out of the hole while laying down the 5" drill pipe using a lay-down crew. Casing operations were performed by Wyoming Casing Services Inc. The 7" intermediate casing consisted of 182 joints of 29# HCP-110 and 64 joints of 32# HCP-110 set to 11,071' MD. Cementing operations were then performed by Schlumberger.

### Lateral

After intermediate casing procedures were completed, 4" drill pipe was picked up, diesel invert drilling fluid was replaced with salt water drilling fluid which fluctuated in density from 10.2-10.6 ppg throughout the lateral. The first lateral BHA consisted of a 6" Smith PDC bit (bit #4), with a Hunting LS 1.5 degree bend motor and a gamma tool 37' from the bit. This assembly drilled to 15,562' MD in 55 hours before a trip was required to replace the motor. The next assembly consisted of a 6" Smith PDC bit (bit #4); with a Hunting LS 1.5 degree bend motor and a gamma tool 37' from the bit. This final BHA reached TD at 20,978' taking 76 hours. The wellbore reached a planned total depth (TD) on October 22, 2011 at 1230 CDT, with a bottom hole location at 10,478.70' south & 2.05' east of surface location or approximately 308.07' FSL & 1,924.95' FEL, SW SE Section 24, T153N, R101W.

## GEOLOGIC EVALUATION

### Methods

Two well-site geologists contracted by Sunburst Consulting Inc. conducted the geologic analysis for *Bray 5301 43-12H*. Sunburst installed and monitored a digital gas detector and chromatograph interfaced with a Pason Electronic Data Recording System (EDR). The EDR provided depth, drilling rate and pump stroke data to the M-Controller gas-monitoring software which returned gas data in the form of total gas units and hydrocarbon constituent (methane, ethane, propane, butane) concentrations expressed in parts-per-million. Gas samples were pulled through ¼" poly-flow tubing after agitation in Sunburst's gas trap installed in the possum belly. Rig crews caught lagged samples under the supervision of well-site geologists in 30' intervals from 8,240' to 10,880'; 10' intervals from 10,880' to 11,090'; 30' intervals from 11,090' to 20,960'. Wet and dry cuttings were examined under a binocular microscope, complete lithologic descriptions are provided in this evaluation. Cuttings were also evaluated for hydrocarbon "cut" by immersion in Entron and inspected under a UV fluoroscope until samples became contaminated with lateral lubricant at approximately 15,300' MD. One set of dry cuttings were collected and sent to the North Dakota Geological Survey Core Library.

## Lithology and Hydrocarbon Shows

Geologic evaluation began at 8,240' in orange to orange brown siltstone with trace amount of white to off white sandstone in the Kibbey Formation. The Kibbey "Lime" was drilled at 8,355' (-6,261'), coming in 3' low to *Lindvig I-11HR* and was determined based off a decrease in rate of penetration (ROP), due to a 16' layer of anhydrite. Samples from this interval are mostly light gray to brown lime mudstone with a crystalline texture. Below the Kibbey "Lime" marker samples consist of orange brown to brown calcareous siltstone. No significant shows were observed in the Kibbey.



*Figure 1: Photograph of limestone from Kibbey Formation.*

The First Charles Salt was penetrated at 8,494' (-6,400') and came in even to *Lindvig I-11HR*, based off ROP breaks. The Base of the Last Charles Salt was drilled at 9,198' (-7,104'), 1' high to *Lindvig I-11HR*. Samples from this interval were primarily salt which was translucent to a milky white color and typically consisting of firm to hard subhedral crystals, inter-bedded with argillaceous limestone and anhydrite. The lime mudstone was firm to friable, crystalline and primarily light to medium gray to gray-brown in color. The anhydrite was white, soft, and amorphous in texture.



*Figure 2: Photograph of limestone, salt, anhydrite, and dolomite in Charles Formation.*

The Ratcliffe Interval was penetrated at 9,230' (-7,136'), 1' high to *Lindvig 1-11HR*. This formation consists of dolomitic mudstone, anhydrite, and limestone that were argillaceous in sections. The observed tan, light to medium gray brown dolomite was microcrystalline, firm, and contained a chalky to earthy texture. The anhydrite was a white to off white color, with a microcrystalline texture, and was soft and amorphous. The tan, light to medium gray brown argillaceous lime mudstone-wackestone described was microcrystalline, firm, with an earthy textured and exhibited no visible porosity. This section can contain a significant amount of oil and gas, and was particularly productive in the offset well *Lindvig 1-11HR*. The cuttings and mud gas analysis by a total gas chromatograph, however, did not log productive shows suspected over this interval. These shows, however, were present within the lower unit of the Mississippian Madison Group, the Mission Canyon Formation.

The Mission Canyon Formation [Mississippian Madison Group] was penetrated at 9,416' (-7,322'), 5' high to *Lindvig 1-11HR*. This formation consists predominately of limestone with poor intercrystalline porosity and an earthy texture. The lime mudstone was typically medium to dark gray, microcrystalline, firm and contained sections that were partially argillaceous. Traces of anhydrite were also observed, that were white to off white, soft and amorphous. There was *trace spotty dark brown oil staining observed in cuttings*, which was highlighted by a *gas show of 107 units*, present in the limestone unit.



*Figure 3: Photograph of anhydrite and limestone from the Mission Canyon Formation*

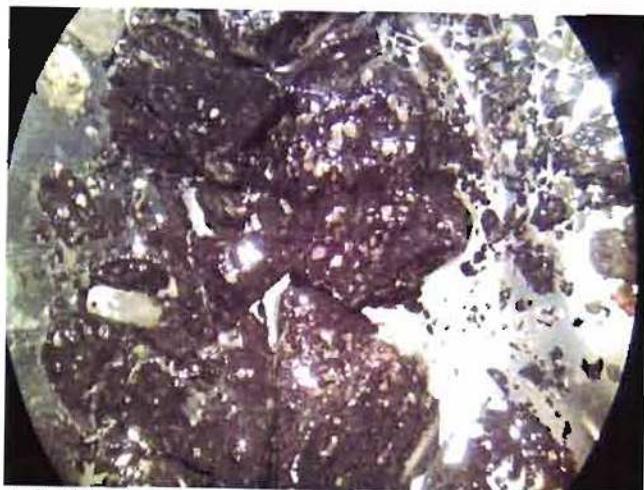
The Lodgepole Formation [Mississippian Madison Group] was drilled at 9,978' (-7,884'), 3' high to *Lindvig 1-11HR*. The Lodgepole contains some limestone near the top of the formation, but was dominated primarily by an argillaceous lime mudstone with common traces of pyrite. The limestone samples are tan, light gray to cream, microcrystalline, earthy texture, and friable to firm with no visible porosity or oil show.



*Figure 4: Photograph of limestone from the Lodgepole Formation.*

The “False Bakken” was penetrated at 10,692' TVD (-8,598'), 3' low to *Lindvig 1-IIHR*. The False Bakken in this area is particularly thin, and was not observed in the cuttings. The False Bakken consists of very dark gray carbonaceous shale. *Fracture porosity was observed though, present in a gas spike of up to 4000 units*, which is typical of the False Bakken.

The Upper Bakken Shale was drilled at 10,703' TVD (-8,609'), 6' low to *Lindvig 1-IIHR*. Sample returns were black, carbonaceous and petroliferous shale with common disseminated pyrite and characterized by gamma ray values in excess of 300 API counts.



*Figure 5: Photograph of black carbonaceous Upper Bakken Shale, displaying disseminated pyrite.*

The Bakken Middle Member was penetrated at 10,719' TVD (-8,625'), 4' low to *Lindvig 1-IIHR*. The middle member is topped by dense, dark gray siltstone with poor intergranular porosity. The bit was landed at 10,732' TVD, near the center of the target interval.



Figure 6: Photograph of sample from the target zone of the Middle Bakken.

The **target zone** within the Middle Bakken was determined during a casing point meeting prior to horizontal drilling operations. The desired target zone was primarily chosen off of data provided by the *Lindvig 1-11HR* offset log. The 12' interval shaded in red and yellow in Figure 7; set 8' below the base of the Upper Bakken Shale and the base set at ~14' above the top of the Lower Bakken Shale, was defined as the primary target interval. Within the 12' target zone, drilling was focused on the two high gamma spike (112-120 API) right at the top of target, for geo-steering purposes, and this gamma marked an eight foot high porosity zone at the top of target labeled and shaded in yellow in Figure 7. The eight foot zone was distinguishable in cuttings as silty sandstone, having moderate calcite cement, abundant in light to medium brown color, *spotty to even brown oil staining* and occasional light to medium gray color. Directly below this zone was well cemented light gray to medium gray silty sandstone, which showed occasional *spotty brown oil staining*. Above the eight foot high porosity zone consisted of moderately cemented medium to light gray silty sandstone occasional medium to light brown and common dark gray in color, with *occasional spotty brown oil staining*.

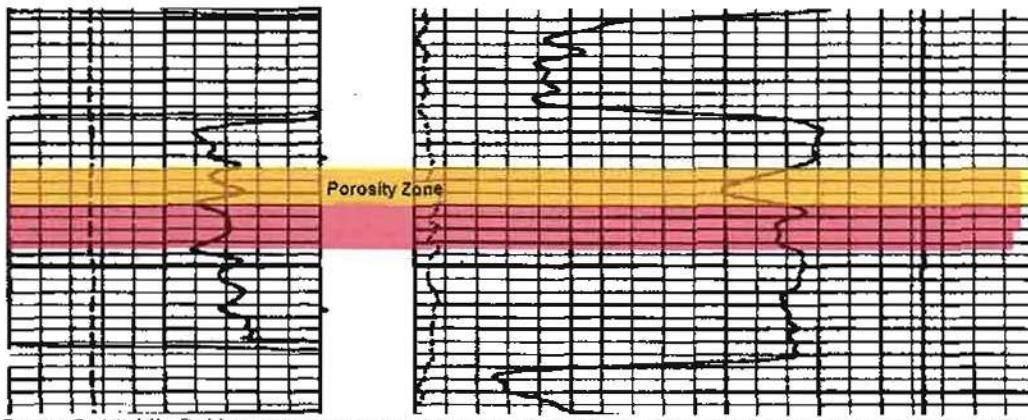
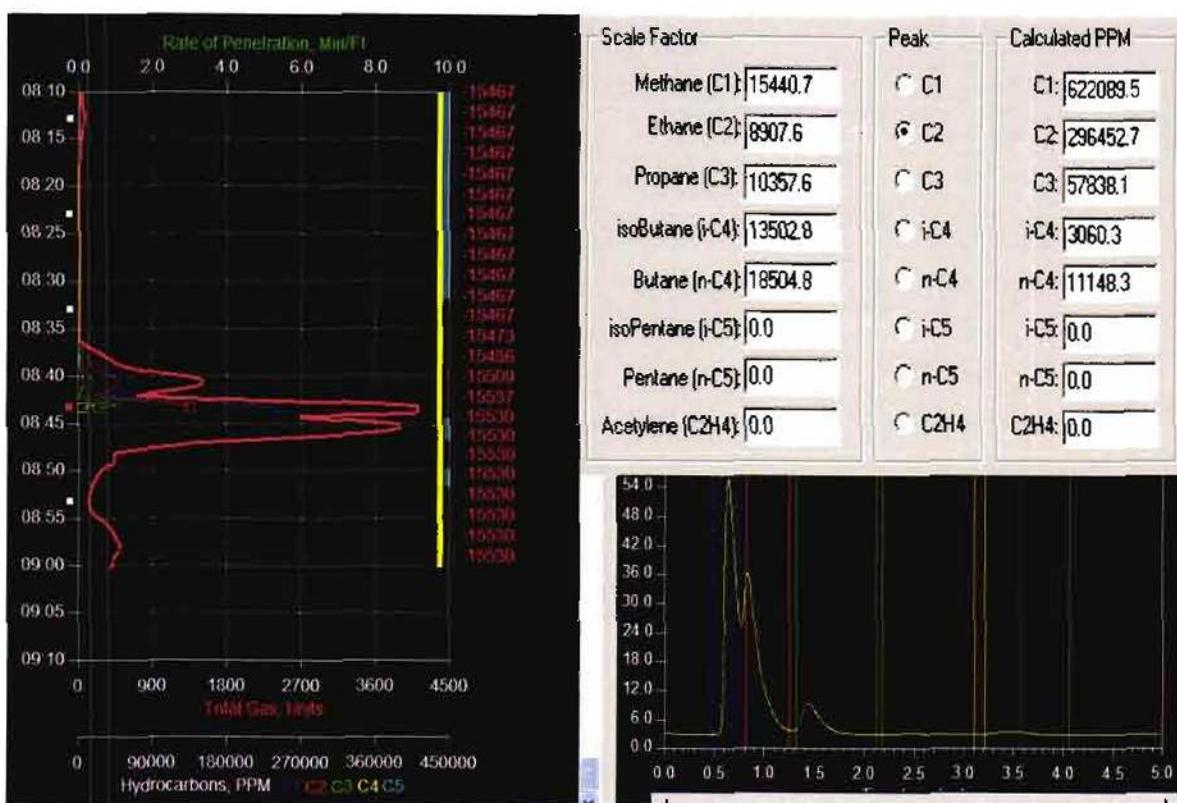


Figure 7: Middle Bakken target zone gamma ray and porosity profile detailed in the *Lindvig 1-11HR* log.

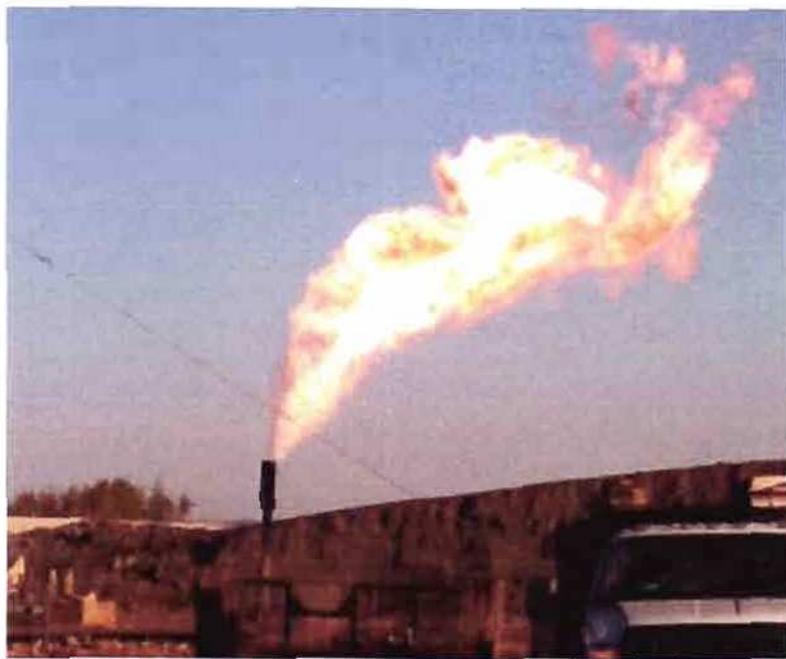
Rate of penetration in the targeted Middle Bakken averaged 100-150 ft/hr while drilling early in the lateral. For the latter half of the lateral, rates dropped to 80-100 ft/hr due to motor and bit wear. In the later half, however, an increase in rate of penetration was witnessed at 19,400'

measured depth, due to the entrance into the porosity zone marked by the high gamma counts of 120 API.



*Figure 8: Chromatography of Bray 5301 43-12H gas show at 15,561' MD during tripping operations.*

A chromatograph separated the total gas into prospective components, as displayed in *Figure 8*, showing a larger concentration of normal butane relative to iso-butane, which is typical for Bakken crude associated gas. Background gas concentrations observed in the Middle Bakken lateral ranged from approximately 600 units during the curve and at the beginning of lateral with a 10.0 ppg mud weight with shows in the mid 2,500 units. Towards the end of the lateral background gas increased to an excess of 3,000 units with shows in excess of 5,000 units with a 10.8 ppg mud weight. Increased background gas concentrations were witnessed during intervals of high apparent formation dips. These intervals of high dips were between 13,950' MD and 14,350' MD where the dip averaged 0.8 degrees down and then again between 15,750' MD and 20,975' MD where the dip averaged 1.0 degrees up. This increase in gas is likely due to increased fracture porosity, caused by fracturing within the rock from the strain caused by these deformations or a local structural trap. The highest peak value observed was nearly 7,144 units at 20,673' MD with a mud weight of 10.5 ppg. Connection gases within the target zone averaged ~1,500-2,000 units in the beginning of the lateral to ~4,000-6,000 units towards the end. *Greenish brown oil* was observed coming over the shakers and within the sample cuttings throughout the entire lateral. When sample cuttings were submerged in Entron, they emitted a slow to very slow diffuse green fluorescence. Entron submersion was then halted once samples became contaminated with lube. Throughout the lateral a 1-8' intermittent flare was observed, and at points could reach up to 25', as portrayed in *Figure 9*.



*Figure 9: 25' trip flare observed during tripping operations.*

### Geo-steering

The target zone within the Bakken Middle Member was established using the density porosity logs from the aforementioned offset wells. A 12' zone in the *Lindvig I-11HR* offset well set the basis for the choice of target interval in the *Bray 5301 43-12H* project (Figure 7). This 12' section was 8' below the base of the Upper Bakken Shale and 16' above the Lower Bakken Shale. The target displayed two peaks of high gamma (112-120 API), one at the center of target, the other at the top of target. Low gamma points that established points just below the center of target and bottom of the target zone. Within the 12' zone, particular efforts were made to stay in the top eight feet of the target zone which correlated to the high porosity displayed in the *Lindvig I-11HR* electric logs. The well plan was to land in the center of the Middle Bakken target interval to allow maximum exposure to the target porosity. To accommodate the planned liner run, severe doglegs were to be avoided to obtain the desired vertical section.

Kick off point for the curve was changed to 10,220' based off the observed thickness to target from the Base Last Salt marker. The represented targets are below in Table 1. At this point the Base Last Salt was the most consistent marker throughout the offset wells, allowing for a raise of the target depth approximately 8 feet. This changed the proposed target landing to 10,724' TVD, which remained consistent throughout the vertical hole. Throughout the curve the target approximation remained overly consistent, but began to drop as lower Lodgepole markers were logged. As the lower Lodgepole markers were observed the target landing was moved to 10,730' TVD to account for this thickening to target. Once the Upper Bakken Shale top was reached, the landing point was one foot lower to the initial prognosis. The target landing point was then change back to its initial prognosis of 10,732' TVD, allowing for the curve build to safely land the borehole into the Middle Bakken Member, at approximately 90 degrees to begin the lateral.

## TARGET PROXIMATION

**Formation/ Zone:** **Proposed Top of Target From:**

	Lindvig 1-11HR	RoseBud 22-11	Edwin M. Dahl 23-1	Average of Offset Wells
Kibbey "Lime"	10,730'	10,716'	10,726'	10,724'
First Charles Salt	10,727'	10,709'	10,723'	10,720'
UB	10,724'	10,715'	10,728'	10,722'
Base Last Salt	10,726'	10,719'	10,727'	10,724'
Ratcliffe	10,726'	10,719'	10,726'	10,724'
Mission Canyon	10,722'	10,706'	10,725'	10,718'
Lodgepole	10,724'	10,721'	10,724'	10,723'
Lodgepole A	10,724'	10,718'	10,726'	10,723'
Lodgepole B	10,724'	10,700'	10,727'	10,717'
Lodgepole C	10,732'	10,715'	10,727'	10,725'
Lodgepole D	10,724'	10,716'	10,726'	10,722'
Lodgepole E	10,726'	10,721'	10,720'	10,722'
Lodgepole F	10,727'	10,724'	10,731'	10,727'
False Bakken	10,730'	10,731'	10,730'	10,730'
<b>Upper Bakken Shale</b>	10,733'	10,730'	10,732'	10,732'
Middle Bakken	10,731'	10,730'	10,731'	10,731'
Middle Bakken (Target)	10,732'	10,732'	10,732'	10,732'

*Table 1. Chart used to determine landing target based on formation thicknesses in the offset wells.*

The wellbore landed at a casing point of 11,082' MD (10,733' TVD); approximately 14' TVD into the Middle Bakken Member and 6' into the target zone. Upon drilling out of casing, build tendencies were observed, in that the well bore would build up in rotation, approximately one degree per a hundred feet. Slides were implemented to account for this continuous rotational building. Once out of the casing an inclination of 87.7 was accurately determined by the MWD tool to replace the initial projected inclination of 90 degrees. The lateral assembly was then leveled out to slowly drop in target to obtain the full gamma signature of the targeted zone. By using the cool gamma and hot gamma near the center of target the dip was able to be calculated, and was found to be an overall down dip of approximately 0.5 degrees. By steering the well bore up and down through this sequence of hot and cold gamma signatures multiple times, reliable dip calculations were established until 14,250' MD. After 14,250' MD the dip of formation turned up placing the wellbore near the base of target. In this stratigraphic section there is a low gamma marker at the base of target followed by ratty high gamma above and below the low gamma marker. Using this sequence of gamma markers the well bore was steered within target to 19,477' MD, which showed an overall dip of formation of over 1.0 degrees up. At this point the wellbore ascended back up to the center of target where it was steered, using the hot gamma marker at the center of target, to a total depth of 20,978'. Over the entire vertical section of 10,479' the overall dip of formation was calculate to be 0.39 degrees up, with the well bore over 90 percent within the target interval, and 50 percent of the time the well bore was steered within the ideal porosity zone.

## SUMMARY

- 1) The Oasis Petroleum North America, LLC Bray 5301 43-12H was drilled to further develop the Middle Bakken in the northern McKenzie County portion of the Williston Basin.
- 2) The well was re-entered on August 27, 2011 and the vertical hole was drilled to a kick-off point of 10,220'. The well path landed below the Middle Bakken porosity zone at 10,733' TVD. Intermediate casing was set at 11,082' MD in preparation for lateral operations. Lateral operations progressed within the Middle Bakken, with very good hydrocarbon shows to the final bottom hole location when drilling was completed on October 22, 2011.
- 3) The mud program consisted of diesel invert (9.6 – 9.8 ppg) from surface casing and through the curve build, which was successful in maintaining stable hole conditions and minimizing washout through the salt intervals. After landing the curve the diesel invert mud was replaced with salt brine (10.2 - 10.6 ppg) and was successful in preventing loss of pore pressure throughout the lateral.
- 4) The lithology of the Middle Bakken target zone is off white to light brown and gray, very fine grained sandstone and siltstone with poor to fair intergranular porosity and common to occasional spotty to even brown oil stain. Gas was burned as a 1-8' intermittent flare while circulating higher show areas of the formation.
- 5) The Oasis Petroleum North America, LLC Bray 5301 43-12H reached 20,978' TD on October 22, 2011, reaching the proposed TD. The well currently awaits completion as successful Middle Bakken horizontal oil well.

Respectfully Submitted,  
*Nathan Gabelman*  
C/o Sunburst Consulting, Inc.  
October 25, 2011,

## WELL DATA SUMMARY

OPERATOR: Oasis Petroleum North America, LLC

ADDRESS: 1001 Fannin, Suite 1500  
Houston, TX 77002

WELL NAME: Bray 5301 43-12H

API #: 33-053-03609

WELL FILE #: 20864

SURFACE LOCATION: 250' FSL & 1,927' FEL  
SW SE Section 12, T153N, R101W

FIELD/ PROSPECT: Wildcat / Bakken

COUNTY, STATE McKenzie County, North Dakota

BASIN: Williston

WELL TYPE: Middle Bakken Horizontal

ELEVATION: GL: 2,078'  
KB: 2,094'

SPUD/ RE-ENTRY DATE: Spud: 7/23/2011

BOTTOM HOLE LOCATION: 10,478.70' South & 2.05' East of surface location or approx.  
308.07' FSL & 1924.95' FEL, SW SE Section 24, T153N, R101W

CLOSURE COORDINATES: Closure Direction Azimuth: 179.99°  
Closure Distance: 10,478.71'

TOTAL DEPTH / DATE: 20,978' at 1230 Hrs CDT on 22 October 2011  
90% within target interval

TOTAL DRILLING DAYS: 32 days

STATUS OF WELL: Open-hole completion/ preparing to open-hole frac

CONTRACTOR: Xtreme #17

PUMPS: #1 & #2 - Gardner-Denver-PZ-11 (stroke length - 11")

TOOLPUSHERS: Brandon Clampitt, David Bowlby

FIELD SUPERVISORS: Wade Larmer, Bruce Jorgenson

CHEMICAL COMPANY: National Oilwell Varco  
Prairie Petro-Chem of America

MUD ENGINEER: Nate Joseph

MUD TYPE: Oil based mud; salt water

MUD LOSSES: Invert Mud: 389 bbls, Salt Water: 0 bbls

PROSPECT GEOLOGIST: John Gillespie, Andy Nelson

WELLSITE GEOLOGISTS: Nathan Gabelman, Kyle Kavalec, Scott Smith

GEOSTEERING SYSTEM: Sunburst Digital Wellsite Geological System

ROCK SAMPLING: 30' from 8,240' - 10,880', 11,070'-20,960'  
10' from 10,880'-11,070'

SAMPLE EXAMINATION: Binocular microscope & fluoroscope

SAMPLE CUTS: Entron

GAS DETECTION: Mudlogging Systems Model TGC, Serial #: ML-169

DIRECTIONAL DRILLERS: Professional Directional  
Mike Dibble, Nate Linde

MWD: Professional Directional  
John Capra, Tim Pile

CASING: Surface: 9 5/8" 52 JTS 36# J-55 set to 2,100'  
Intermediate: 7" 182 JTS 29# HCP-110, 64 JTS 32# HCP-110  
set to 11,071'

**KEY OFFSET WELLS:**

**SM Energy Company**  
**Lindvig 1-11HR**  
SE SE Sec. 11, T153N, R101W  
McKenzie County, ND

**SM Energy Company**  
**RoseBud 22-11**  
SE NW Sec. 11, T153N, R101W  
McKenzie County, ND

**Earthstone Energy**  
**Dahl No. 23-1**  
SW SE Sec. 23, T153N, R101W  
McKenzie County, ND

**DISTRIBUTION:**

**Oasis Petroleum**  
1001 Fannin St. #1500  
Houston, Texas 77002

**North Dakota Industrial Commission**  
Oil and Gas Division  
600 East Boulevard Ave, Dept. 405  
Bismarck, ND 58505-0840

**Hunt Oil and Gas**  
1900 N. Akard St.  
Dallas, TX 75201

**Golden Eye Resources, LLC**  
5460 South Quebec Street, Suite 335  
Greenwood Village, CO 80111

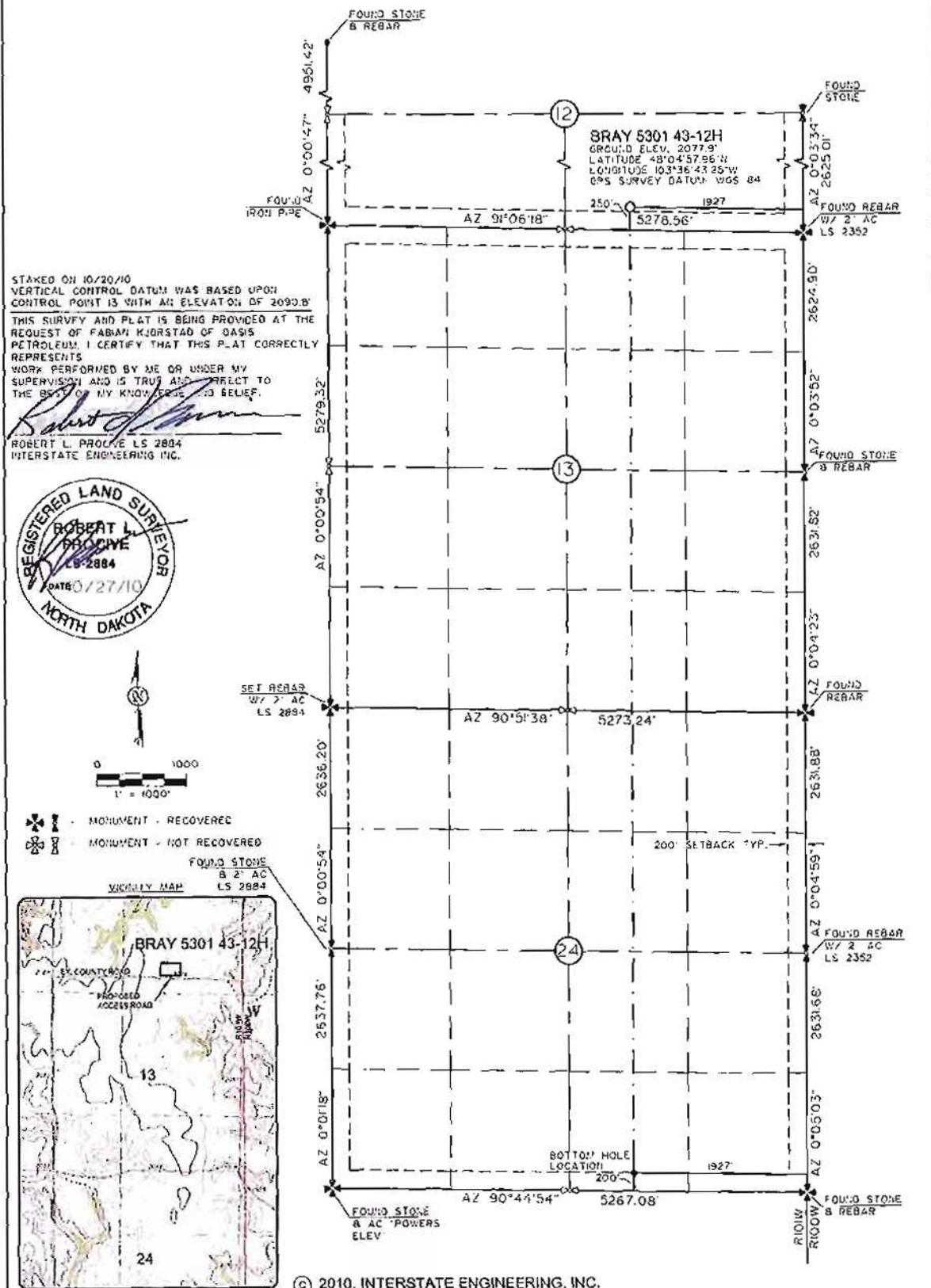
**WELL LOCATION PLAT**

**WELL LOCATION CAT**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

'8RAY 530143-12H

844-531-4111  
TOLL-FREE 1-800-531-4111

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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**Montana Engineering Inc.**  
P.O. Box 810  
425 East Main Street  
Livingston, Montana 59047  
Ph: (406) 223-5817  
Fax: (406) 223-5813  
www.menginc.com

DASIO PETROLEUM NORTH AMERICA, LLC  
WELL LOCATION PLAT  
SECTION 12 Twp 8 R10W

McKENZIE COUNTY, NORTH DAKOTA

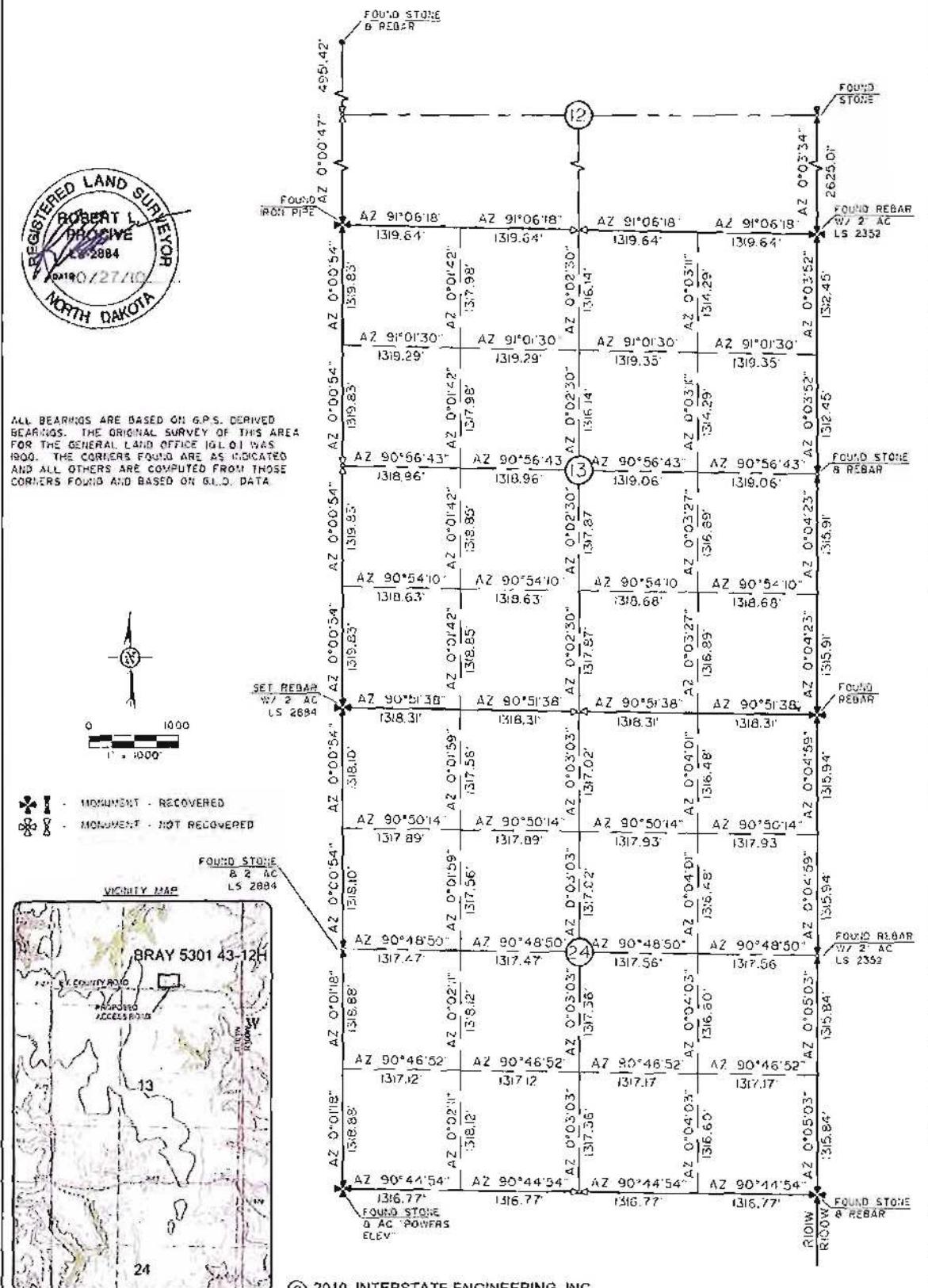
2-Br-4-(10<sup>10</sup>)

SEARCHED AM 514 DATE 10/2/95

**SECTION BREAKDOWN**  
ASIS PETROLEUM NORTH AMERICA, LLC  
FANNIN, SUITE 202 HOUSTON, TX 77002

"BRAY 530 43-12"

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



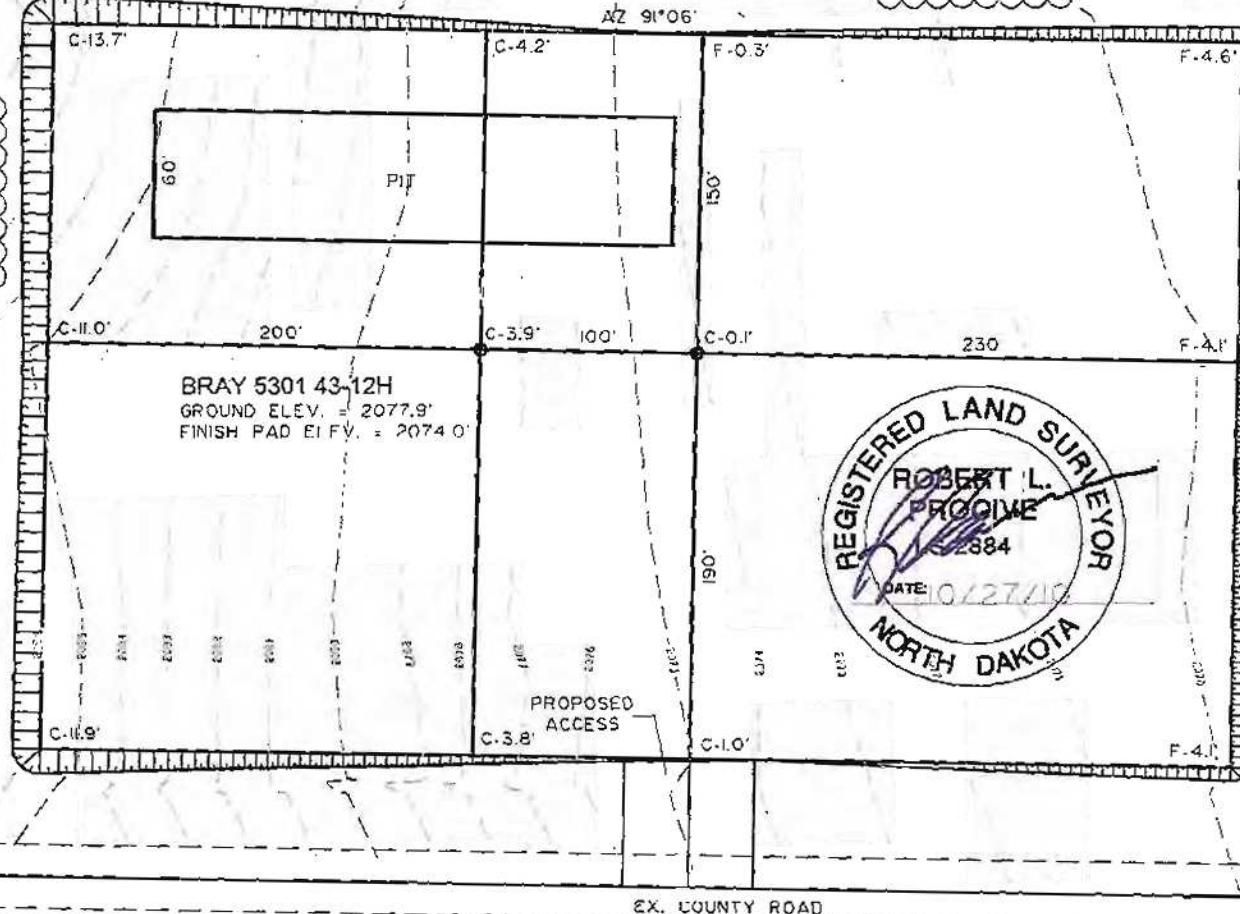
- 2 -

# PAD LAYOUT

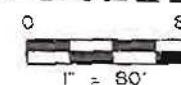
CASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

"BRAY 5301 43-12H"

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



NOTE: All utilities shown are preliminary only. A complete utilities location is recommended before construction.



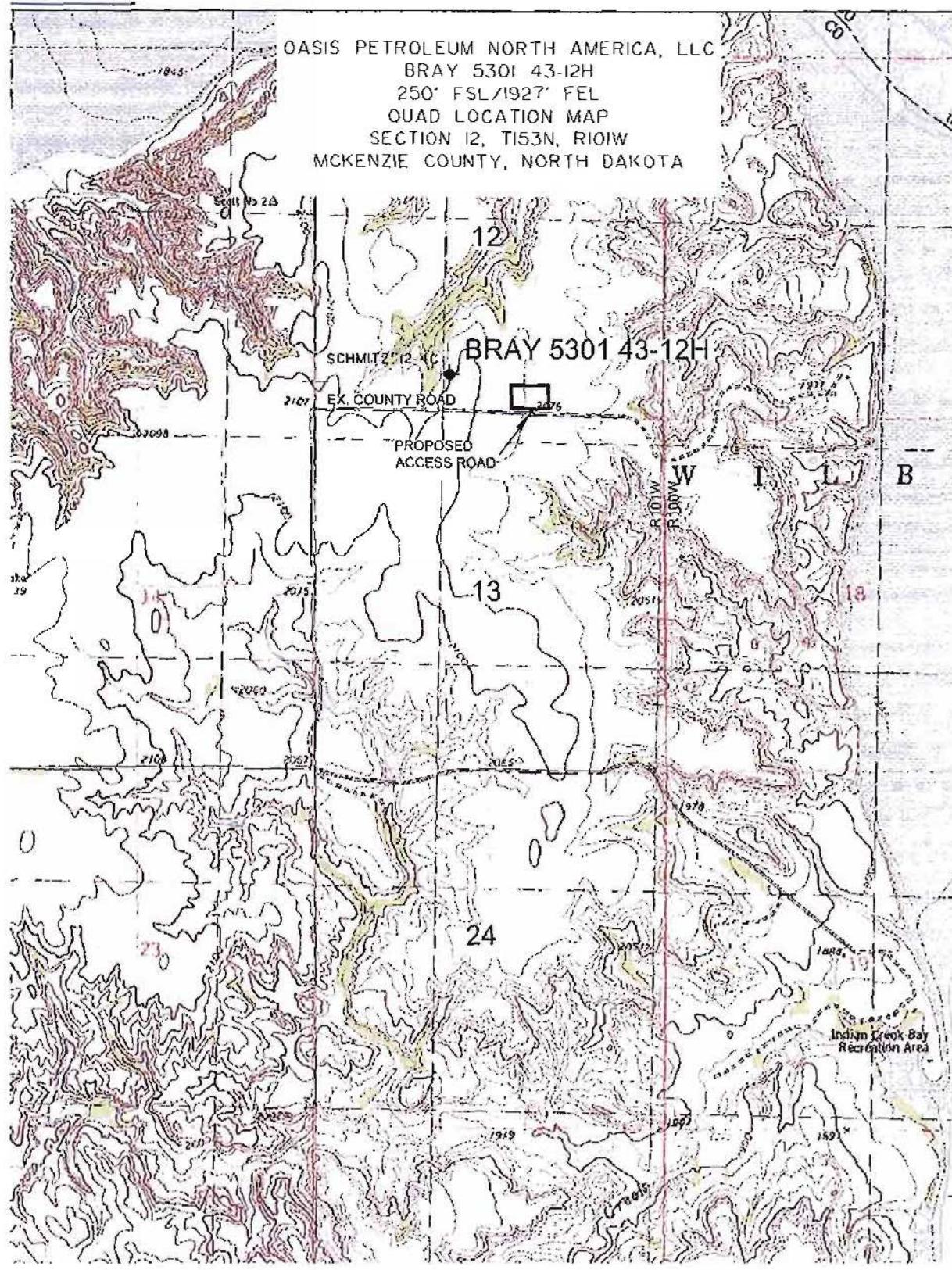
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Casis Petroleum North America, LLC	
Pad Layout	
Section 12, T153N, R101W	
McKenzie County, North Dakota	
Date: 10/27/10	Project No.: 5301-12
Drawn by: H.J.O.	Checked by: A.H.B.L.
Supervised by: C.R.S.	Approved by: C.R.S.
Printed on 100% Recycled Paper	



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Sheet 1 of 3



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SHEET 1/1

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Engineering In Montana, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
 QUAD LOCATION MAP  
 SECTION 12, T153N, R10W  
 MCKENZIE COUNTY, NORTH DAKOTA

Revision	Date	Ex.	Discard

Drawn By: HJD Printed By: S4009-15r  
 Created By: A.I.I./G.L.P. Date: OCT 2010

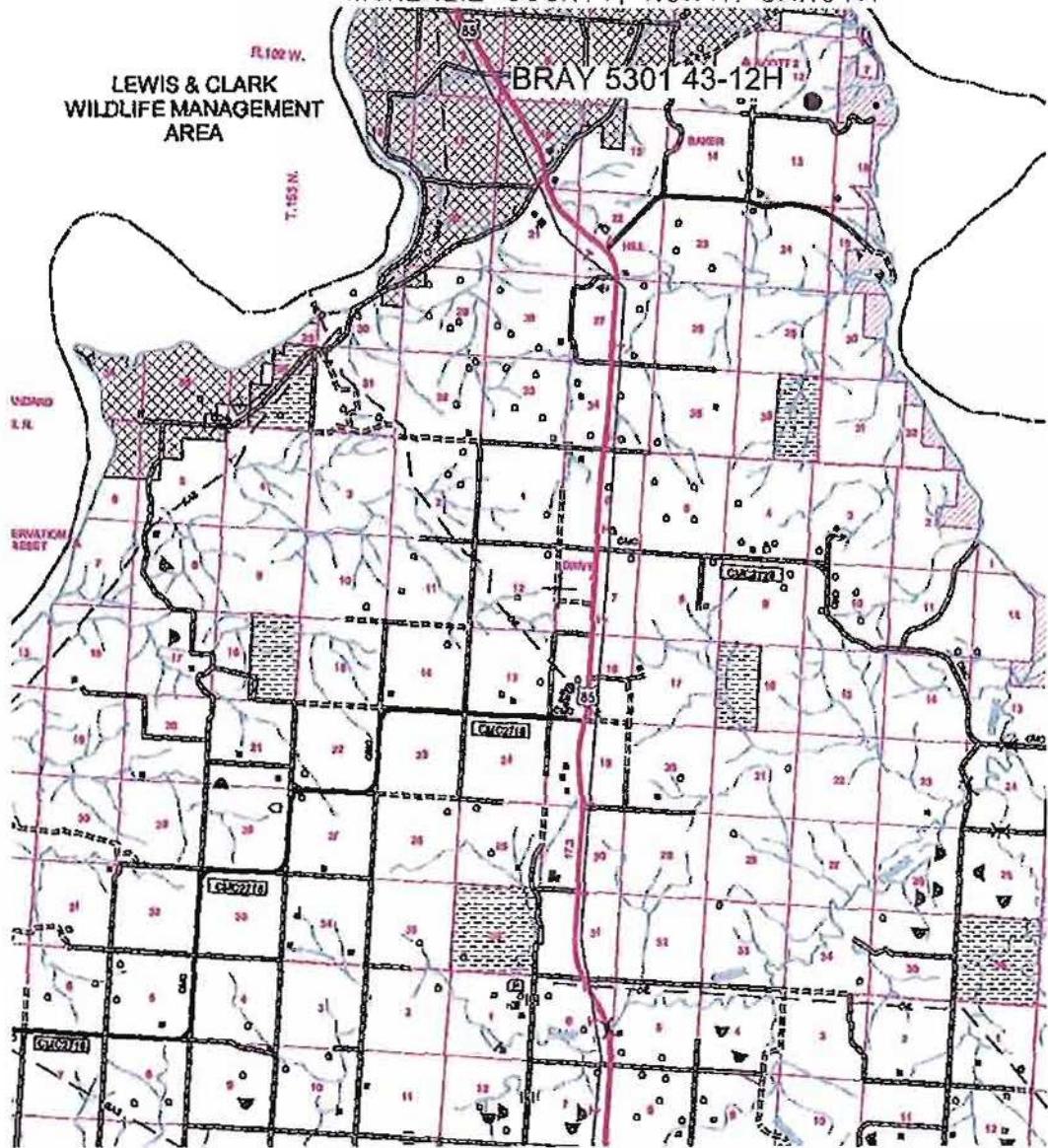
**COUNTY ROAD MAP**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"BRAY 5301 43-12H"  
250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

OASIS PETROLEUM NORTH AMERICA, LLC  
BRAY 5301 43-I2H  
250' FSL/I927' FEL  
QUAD LOCATION MAP  
SECTION I2, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

LEWIS & CLARK  
WILDLIFE MANAGEMENT  
AREA

MCKENZIE COUNTY, NORTH DAKOTA

BRAY 5301 43-12H



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SCALE: 1" = 2 MILE

6



Professionals you need, people you trust.

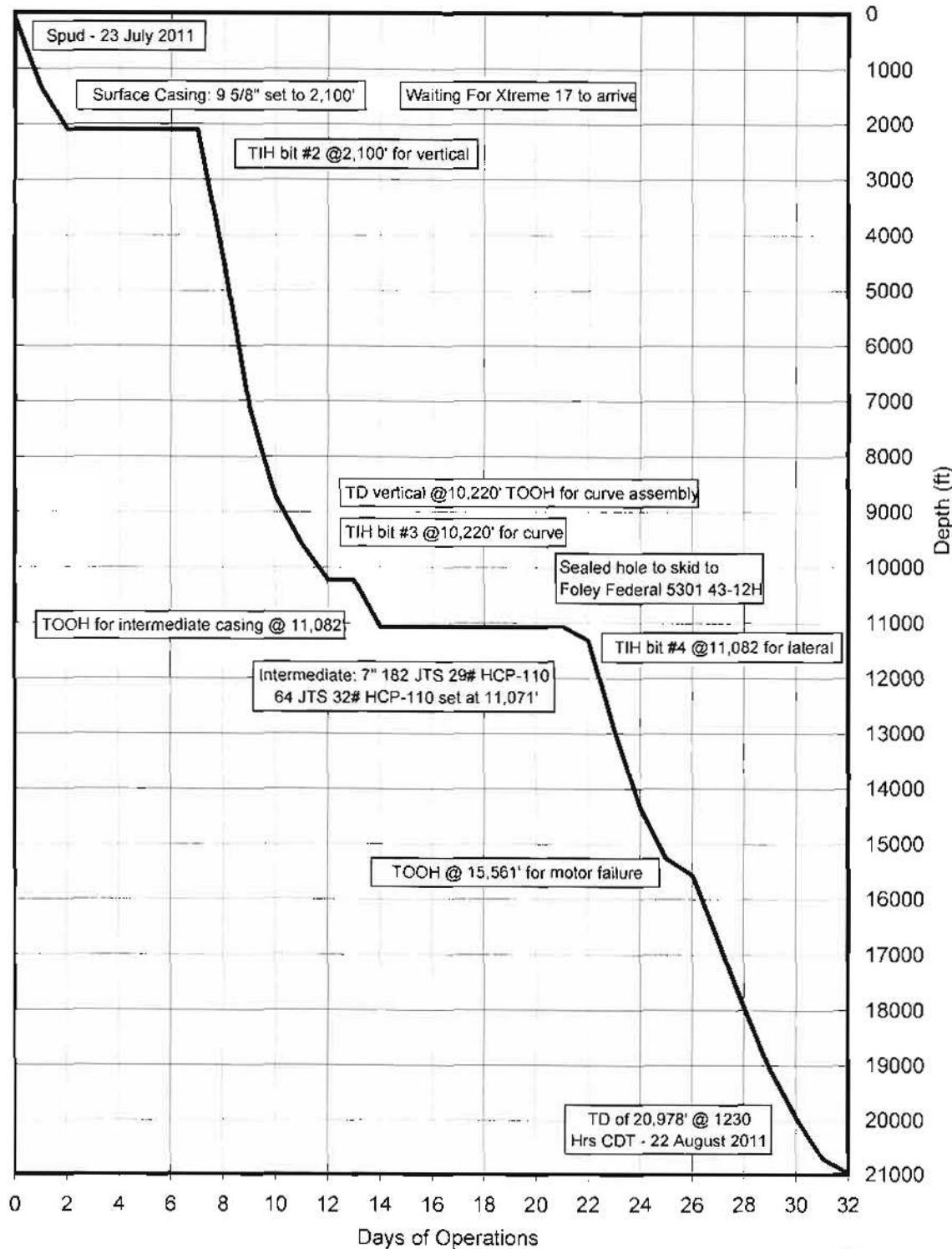
Interstate Engineering, Inc.  
P.O. Box 418  
425 East Main Street  
Sidney, Montana 59270  
Ph (406) 433-5517  
Fax (406) 433-5518  
[www.ileg.com](http://www.ileg.com)  
A registered engineering firm in Montana

OASIS PETROLEUM NORTH AMERICA, LLC  
COUNTY ROAD MAP  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

# TIME VS DEPTH

Oasis Petroleum North America, LLC

Bray 5301 43-12H



## DAILY DRILLING SUMMARY

Day	Date 2011	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	WOB (Klbs) MM	RPM (RT)	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity				Formation
0	7/23	120'	-	1	-	-	100	-	-	-	-	-	Work on pumps, spud-drill 60-120				Surface
1	7/24	1,320'	1200	1	-	-	100	-	-	-	-	-	Circulate, drill, run surveys, circulate hole to thin mud				Surface
2	7/25	2,100'	780	1	30	-	100	-	-	-	-	-	Drill, survey, condition hole, wiper trip				Pierre
3	7/26	2,100'	0	1	-	-	-	-	-	-	-	-	Wiper trip, TOOH, run casing, rig up cementers				Pierre
4	7/27	2,100'	0	1	-	-	-	-	-	-	-	-	Rig down cementers, seal hole to be re-entered by Xtreme 17 drilling rig				Pierre
5	7/28	2,100'	0	-	-	-	-	-	-	-	-	-	-				Pierre
6	8/27	2,100'	0	1	-	-	-	-	-	-	-	-	Rig up, nipple up BOP, rig accepted				Pierre
7	8/28	2,100'	0	1	-	-	-	-	-	-	-	-	Finish testing BOP, make vertical BHA				Pierre
8	8/29	4,398'	2298	2	25	-	45	128	-	-	-	-	Service rig, drill float and shoe, drill vertical				Greenhorn
9	8/30	7,128'	2730	2	12	-	50	-	3100	125	-	483	Drill vertical				Spearfish
10	8/31	8,730'	1602	2	12	-	50	-	3100	125	-	483	Drill actual F/7,128-7,411; Lubricate Rig; Drill Actual F/7,411-8,635'; Lubriacte Rig; Drill Actual 8,635'				Charles Sall
11	9/1	9,575'	845	2	25	-	50	-	3150	125	-	483	Drill actual F/8,729-9,012'; Lubricate Rig; Drill Actual F/9,012-9,160'; Lubriacte Rig; Drill Actual 9,160'				Mission Canyon
12	9/2	10,220'	645	2	25	-	50	-	3150	125	-	483	Drill Vertical				Lodgepole
13	9/3	10,228'	8	3	-	16	-	-	3300	125	-	483	TOOH, TIH, Log BLS and Lodgepole Tops, Slide and Drill				Lodgepole
14	9/4	11,082'	854	3	20	40	20	266	3150	125	-	483	Drill Actual 10,236-10,519'; Install Rot. Rubber; Lubricate Rig; Drill Actual 10,519-11,084'; Condition and Circulate				Middle Bakken
15	9/5	11,082'	0	3	-	-	-	-	-	-	-	-	Condition Mud and Circulate; Trips; Reaming; Trips; Condition mud and Circulate; Repair mud pumps; Condition and Circulate; TOOH; Casing Operations				Middle Bakken
16	9/6	11,082'	0	3	-	-	-	-	-	-	-	-	Pull wear brushing; Change power tongs; Wait on float collar; Run intermediate casing, casing stuck work tight casing				Middle Bakken
17	9/7	11,082'	0	3	-	-	-	-	-	-	-	-	Wait on wire line truck; Wireline logs; Condition and circulate mud; cement; wait on cement, set casing slips and cap well head				Middle Bakken
18	10/9	11,082'	0	-	-	-	-	-	-	-	-	-	Meeting with cased hole solutions, bleed off 1500 PSI, nipple down night cap, skid rig back to Bray				Middle Bakken
19	10/10	11,082'	0	-	-	-	-	-	-	-	-	-	Rig up, test BOP, manual choke failed, rig service, test choke				Middle Bakken
20	10/11	11,082'	0	-	-	-	-	-	-	-	-	-	Pull test plug, rig service top drive, pick up baker tools, TIH fill pipe, displace 35 Bbls Bakken oil, displace mud, circulate, TOOH				Middle Bakken
21	10/12	11,082'	0	3	6	18	50	135	-	-	79	303	TOOH, pick up lateral BHA, TIH, drill lateral and slide as needed				Middle Bakken

## DAILY DRILLING SUMMARY

Day	Date 2011	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	WOB (Klbs) MM	RPM (RT)	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity		
22	10/13	11,315'	233	3	6	18	50	135	-	-	79	303	TOOH, pick up lateral BHA, TIH, drill lateral and slide as needed		Middle Bakken
23	10/14	12,940'	1625	3	6	18	50	160	2245	-	79	303	Drill lateral		Middle Bakken
24	10/15	14,350'	1385	3	13	31	54	139	2990	-	79	303	Drill lateral		Middle Bakken
25	10/16	15,250'	900	4	14	36	52	138	3050	-	78	299	Drill F/14,283-14,823', service rig, repair mud pumps, dril F/14,823-14,837' repair mud pumps, drill F/14,837-15,177', service rig, drill F/15,177-15,190'		Middle Bakken
26	10/17	15,561'	311	4	14	29	50	138	3280	-	78	299	Drill F/15,190-15,276', service rig, drill F/15276-15561', Circulate & condition mud while building dry pill, TOOH, change out BHA, TIH.		Middle Bakken
27	10/18	16,730'	1169	4	12	36	50	136	3760	-	77	296	TIH, service rig, repair mud pumps, circulate out trip gas, drill F/15,561- 16,696', service rig, drill F/16,696-		Middle Bakken
28	10/19	17,950'	1220	5	13	39	50	136	3790	-	77	296	Drill F/16,730-17,325', service rig, drill F/17,325-17,841', service rig, drill F/17,841-		Middle Bakken
29	10/20	19,075'	1125	5	14	57	50	136	3640	-	77	296	Drill F/17,950-18,506', service rig, drill F/18,506-19,034'		Middle Bakken
30	10/21	19,950'	875	5	14	59	50	136	3680	-	77	296	Drill F/19,034-19,296', service rig, drill F/19,296-19,819, circulate & condition mud, drill F/19,819-19,838'		Middle Bakken
31	10/22	20,700'	1625	5	14	61	50	136	3540	-	77	296	Drill F/19,838-19,970', service rig, drill F/19,970-20,409', lay down washed out drill pipe, change out saver sub & grabber box dies, service rig, repair grabber box suspension do to broken pin, drill F/20,409-20,582'		Middle Bakken
32	10/23	20,978'	1028	5	14	-	50	136	3720	-	77	296	Drill F/20,582-20,978' (TD), Service rig, circulate & condition mud, pump dry pill, TOOH to KOP, TOOH to 10,427', condition mud & circulate, build slug to 12.6 ppg, cut off drilling line, TOOH		Middle Bakken

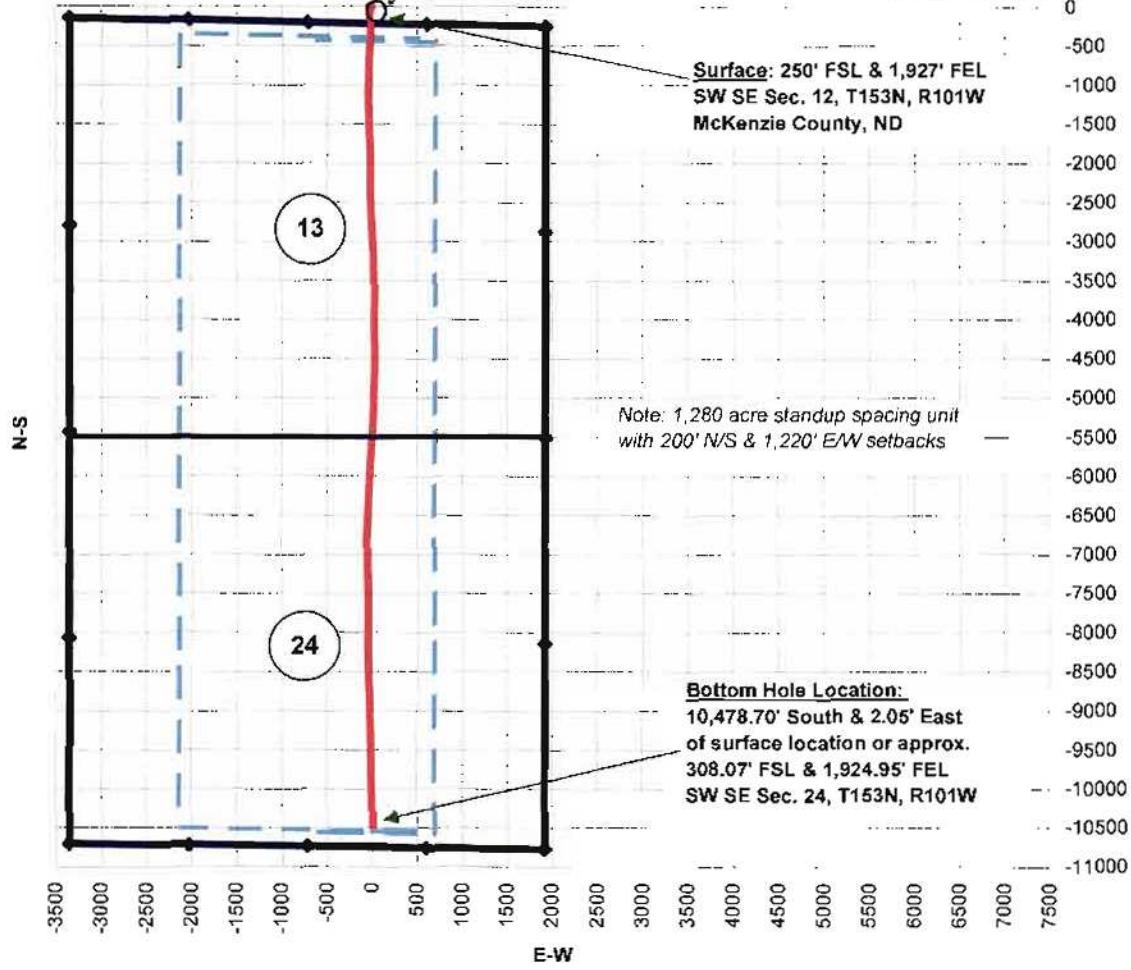
## DAILY MUD SUMMARY

## BIT RECORD

Bit #	Size	Type	Make	Model	Serial #	Jets	Depth In	Depth Out	Footage	Hours	Accum. Hours	Vert. Dev.
1	13 1/2	Tri-cone	Reed	RR		16x18	60'	2,140'	2,080'	33	33.00	Surface
2	8 3/4	PDC	Security	FX65D	11825613	6x14	2,140'	10,220'	8,080'	79.5	112.50	Vertical
3	8 3/4	PDC	Security	FX55D	11762270	5x18	10,220'	11,082'	862'	13	125.50	Curve
4	6	PDC	Smith	MDi613	JE8240	16x22	11,082'	15,561'	4,479'	55	180.50	Lateral
5	6	PDC	Smith	MDi613	JE7181	16x22	15,561'	20,978'	5,417'	76	256.50	Lateral

## PLAN VIEW

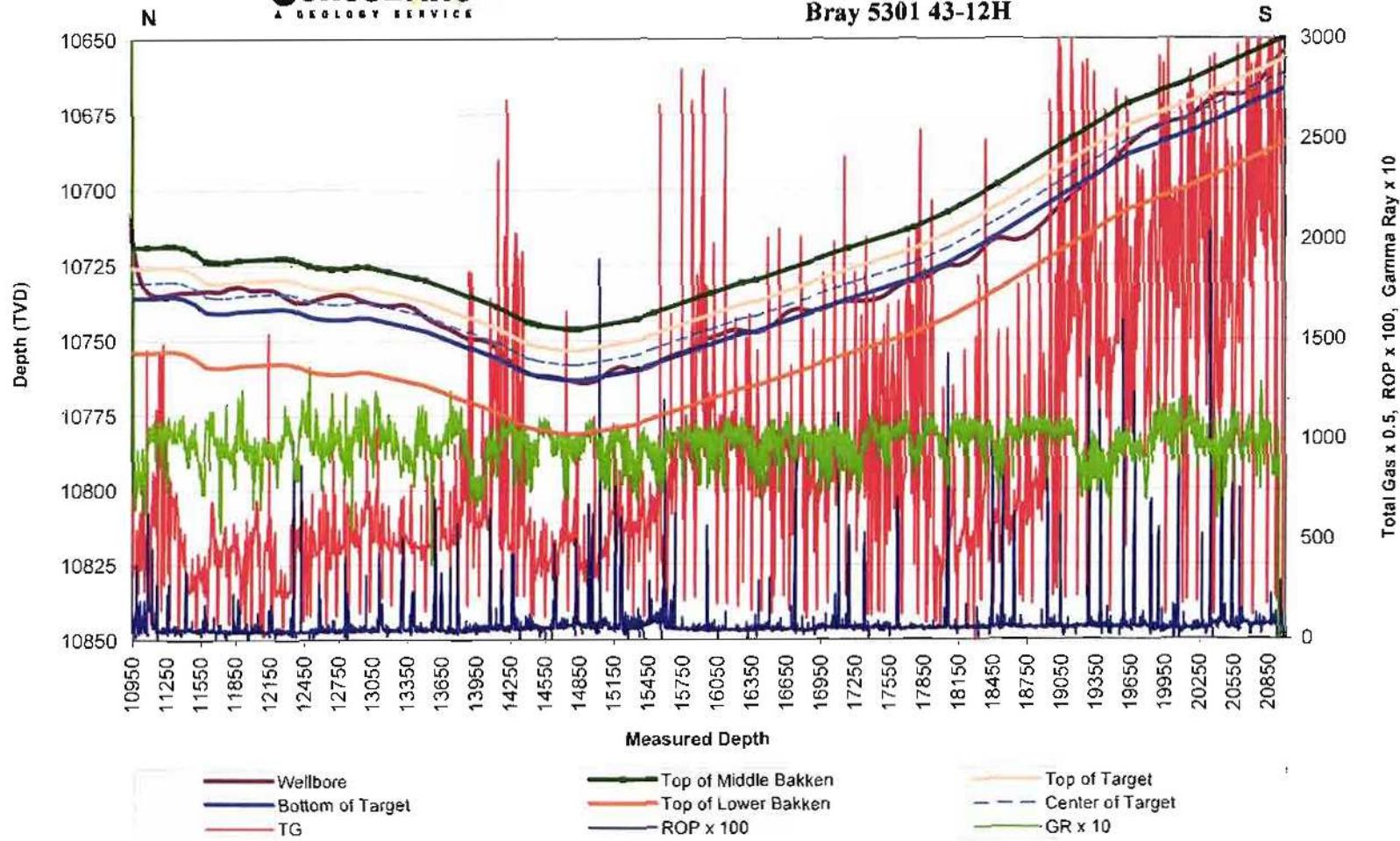
Oasis Petroleum North America, LLC  
Bray 5301 43-12H





## PROFILE

Oasis Petroleum North America, LLC  
Bray 5301 43-12H



## FORMATION MARKERS & DIP ESTIMATES

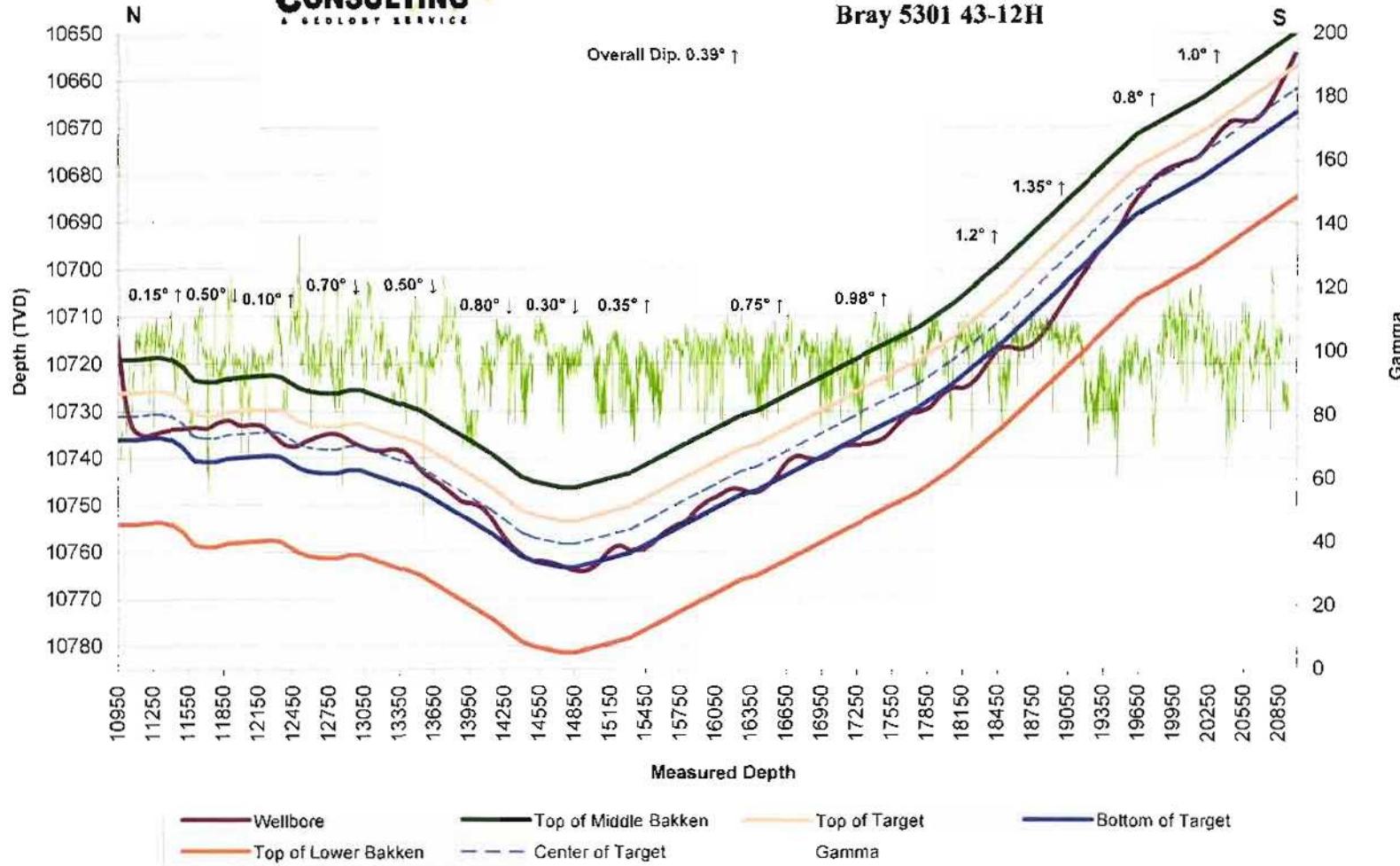
*Oasis Petroleum North America, LLC - Bray 5301 43-12H*

Dip Change Points	MD	TVD	TVD diff.	MD diff.	Dip	Dipping up/down	Type of Marker
<b>Marker</b>							
Middle Hot Gamma	11,650'	10,735.75					Gamma
	12,288'	10,734.43	-1.32	638.00	<b>0.12</b>	Up	Gamma
	12,500'	10,737.02	2.59	212.00	<b>-0.70</b>	Down	Gamma
	13,434'	10,741.05	4.03	934.00	<b>-0.25</b>	Down	Gamma
	13,831'	10,747.53	6.48	397.00	<b>-0.93</b>	Down	Gamma
Upper Hot Gamma	11,668'	10,733.46					
	11,774'	10,734.00	0.54	106.00	<b>-0.29</b>	Down	Gamma
	11,906'	10,733.40	-0.60	132.00	<b>0.26</b>	Up	Gamma
Middle Cool Gamma	11,059'	10,732.00					
	11,582'	10,734.00	2.00	523.00	<b>-0.22</b>	Down	Gamma
	12,402'	10,737.00	3.00	820.00	<b>-0.21</b>	Down	Gamma
	13,054'	10,738.00	1.00	652.00	<b>-0.09</b>	Down	Gamma
	13,568'	10,744.00	6.00	514.00	<b>-0.67</b>	Down	Gamma
	13,965'	10,747.00	3.00	397.00	<b>-0.43</b>	Down	Gamma
Lower Cool Gamma	11,258'	10,735.50					
	14,450'	10,761.40	25.90	3192.00	<b>-0.46</b>	Down	Gamma
	14,745'	10,763.25	1.85	295.00	<b>-0.36</b>	Down	Gamma
	15,355'	10,759.86	-3.39	610.00	<b>0.32</b>	Up	Gamma
	17,770'	10,729.48	-30.38	2415.00	<b>0.72</b>	Up	Gamma
	18,065'	10,724.44	-5.05	295.00	<b>0.98</b>	Up	Gamma
	18,500'	10,715.33	-9.11	435.00	<b>1.20</b>	Up	Gamma
	19,233'	10,698.06	-17.27	733.00	<b>1.35</b>	Up	Gamma
<b>Gross Dip</b>							
Initial Target Contact	10,950'	10,719.00					
Final Target Contact	20,978'	10,649.98	-69.02	10028.00	<b>0.39</b>	Up	



## DIP PROFILE

**Oasis Petroleum North America, LLC**  
**Bray 5301 43-12H**



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## SUNBURST CONSULTING, INC.

&gt;

Operator:	Oasis Petroleum North America, LLC		
Well :	Bray 5301 43-12H		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
Township:	153	N/S:	N
Range:	101	E/W:	W
Footages:	250	FN/SL:	S
	1927	FE/WL:	E

Kick-off: 9/3/2011  
 Finish: 10/22/2011  
 Directional Supervision:  
 Professional Directional

Date: 10/27/2011  
 Time: 15:07  
**F9 to re-calculate**

Proposed dir: 180

Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE			N-S	E-W	SECT	DLS/ 100
			AZM	TVD					
Tie	2106.00	0.00	0.00	2106.00					
1	2187.00	0.60	187.70	2187.00	-0.42	-0.06	0.42	0.74	
2	2281.00	0.80	201.60	2280.99	-1.52	-0.36	1.52	0.28	
3	2375.00	1.30	199.10	2374.98	-3.14	-0.95	3.14	0.53	
4	2469.00	1.70	196.40	2468.94	-5.48	-1.70	5.48	0.43	
5	2563.00	1.90	191.40	2562.90	-8.35	-2.40	8.35	0.27	
6	2657.00	1.90	203.90	2656.85	-11.30	-3.34	11.30	0.44	
7	2751.00	2.10	214.60	2750.79	-14.14	-4.95	14.14	0.45	
8	2846.00	1.90	221.60	2845.73	-16.75	-6.98	16.75	0.33	
9	2940.00	2.20	219.30	2939.67	-19.31	-9.16	19.31	0.33	
10	3034.00	2.20	219.30	3033.60	-22.11	-11.44	22.11	0.00	
11	3128.00	1.00	223.60	3127.56	-24.10	-13.15	24.10	1.28	
12	3222.00	1.00	228.30	3221.55	-25.24	-14.33	25.24	0.09	
13	3316.00	0.10	268.70	3315.54	-25.78	-15.03	25.78	0.99	
14	3410.00	0.20	18.30	3409.54	-25.63	-15.06	25.63	0.27	
15	3504.00	0.00	127.00	3503.54	-25.47	-15.00	25.47	0.21	
16	3598.00	0.20	230.90	3597.54	-25.58	-15.13	25.58	0.21	
17	3693.00	0.40	274.10	3692.54	-25.66	-15.59	25.66	0.30	
18	3787.00	0.30	255.50	3786.54	-25.70	-16.16	25.70	0.16	
19	3881.00	0.20	288.50	3880.54	-25.70	-16.55	25.70	0.18	
20	3975.00	0.30	296.10	3974.54	-25.54	-16.93	25.54	0.11	
21	4069.00	0.20	299.40	4068.54	-25.36	-17.29	25.36	0.11	
22	4163.00	0.30	284.20	4162.54	-25.21	-17.67	25.21	0.13	
23	4257.00	0.40	281.30	4256.53	-25.09	-18.23	25.09	0.11	
24	4352.00	0.30	309.00	4351.53	-24.87	-18.75	24.87	0.20	
25	4445.00	0.50	302.90	4444.53	-24.50	-19.28	24.50	0.22	
26	4540.00	0.40	327.60	4539.53	-23.99	-19.81	23.99	0.23	
27	4634.00	0.60	331.70	4633.52	-23.28	-20.22	23.28	0.22	
28	4728.00	0.60	319.80	4727.52	-22.47	-20.77	22.47	0.13	
29	4822.00	0.70	332.00	4821.51	-21.59	-21.35	21.59	0.18	
30	4916.00	0.90	339.40	4915.50	-20.39	-21.88	20.39	0.24	
31	5010.00	1.00	329.20	5009.49	-18.99	-22.56	18.99	0.21	
32	5104.00	1.00	317.70	5103.48	-17.68	-23.54	17.68	0.21	
33	5198.00	0.80	290.60	5197.47	-16.84	-24.70	16.84	0.49	
34	5292.00	0.70	327.40	5291.46	-16.13	-25.63	16.13	0.51	
35	5387.00	0.90	48.10	5386.45	-15.14	-25.38	15.14	1.10	
36	5481.00	0.70	46.80	5480.44	-14.26	-24.41	14.26	0.21	
37	5575.00	0.30	8.30	5574.44	-13.62	-23.96	13.62	0.53	
38	5669.00	0.10	331.00	5668.44	-13.31	-23.97	13.31	0.24	
39	5763.00	0.80	51.20	5762.43	-12.82	-23.49	12.82	0.84	

**SUNBURST CONSULTING, INC.**

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Operator:	Oasis Petroleum North America, LLC		
Well :	Bray 5301 43-12H		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
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[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE			N-S	E-W	SECT	DLS/ 100
			AZM	TVD					
40	5857.00	1.20	83.30	5856.42	-12.30	-22.00	12.30	0.72	
41	5951.00	1.30	69.10	5950.40	-11.80	-20.03	11.80	0.35	
42	6045.00	1.00	26.80	6044.38	-10.69	-18.66	10.69	0.93	
43	6139.00	0.90	343.30	6138.37	-9.25	-18.51	9.25	0.76	
44	6233.00	0.90	323.40	6232.36	-7.95	-19.16	7.95	0.33	
45	6327.00	0.80	325.50	6326.35	-6.82	-19.97	6.82	0.11	
46	6421.00	2.50	319.00	6420.31	-4.73	-21.69	4.73	1.82	
47	6515.00	3.00	311.20	6514.20	-1.56	-24.88	1.56	0.66	
48	6609.00	2.40	304.90	6608.09	1.19	-28.35	-1.19	0.71	
49	6703.00	1.80	289.20	6702.03	2.80	-31.36	-2.80	0.88	
50	6796.00	0.60	249.30	6795.01	3.11	-33.19	-3.11	1.50	
51	6891.00	0.30	314.20	6890.01	3.10	-33.84	-3.10	0.57	
52	6985.00	0.60	316.70	6984.00	3.63	-34.35	-3.63	0.32	
53	7079.00	0.70	296.30	7078.00	4.25	-35.20	-4.25	0.27	
54	7173.00	0.40	114.30	7172.00	4.37	-35.42	-4.37	1.17	
55	7267.00	1.00	138.80	7265.99	3.61	-34.58	-3.61	0.70	
56	7362.00	1.20	135.70	7360.97	2.28	-33.34	-2.28	0.22	
57	7456.00	1.10	134.90	7454.95	0.94	-32.01	-0.94	0.11	
58	7550.00	1.10	128.50	7548.93	-0.26	-30.67	0.26	0.13	
59	7644.00	1.00	119.40	7642.92	-1.23	-29.25	1.23	0.21	
60	7738.00	0.80	129.60	7736.91	-2.05	-28.02	2.05	0.27	
61	7832.00	0.70	104.80	7830.90	-2.61	-26.96	2.61	0.36	
62	7926.00	0.60	91.80	7924.89	-2.77	-25.92	2.77	0.19	
63	8021.00	0.50	84.10	8019.89	-2.75	-25.01	2.75	0.13	
64	8115.00	0.40	82.80	8113.89	-2.66	-24.27	2.66	0.11	
65	8209.00	0.30	52.40	8207.88	-2.47	-23.75	2.47	0.22	
66	8303.00	0.50	72.20	8301.88	-2.20	-23.17	2.20	0.26	
67	8397.00	0.50	51.00	8395.88	-1.81	-22.46	1.81	0.20	
68	8491.00	0.30	30.90	8489.88	-1.35	-22.01	1.35	0.26	
69	8585.00	0.50	55.20	8583.87	-0.90	-21.55	0.90	0.27	
70	8680.00	0.60	55.00	8678.87	-0.38	-20.80	0.38	0.11	
71	8774.00	0.80	66.60	8772.86	0.16	-19.80	-0.16	0.26	
72	8868.00	1.00	69.10	8866.85	0.72	-18.43	-0.72	0.22	
73	8963.00	1.00	75.10	8961.84	1.23	-16.85	-1.23	0.11	
74	9057.00	1.00	70.10	9055.82	1.72	-15.29	-1.72	0.09	
75	9151.00	1.00	66.10	9149.81	2.33	-13.77	-2.33	0.07	
76	9245.00	0.70	70.60	9243.80	2.85	-12.48	-2.85	0.33	
77	9339.00	0.50	71.10	9337.79	3.18	-11.55	-3.18	0.21	
78	9434.00	0.40	64.20	9432.79	3.45	-10.86	-3.45	0.12	
79	9527.00	0.50	39.90	9525.79	3.91	-10.30	-3.91	0.23	

**SUNBURST CONSULTING, INC.**

Operator:	Oasis Petroleum North America, LLC		
Well :	Bray 5301 43-12H		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
Township:	153	N/S:	N
Range:	101	E/W:	W
Footages:	250	FN/SL:	S
	1927	FE/WL:	E

Kick-off:	9/3/2011
Finish:	10/22/2011
Directional Supervision:	Professional Directional

Date: 10/27/2011  
 Time: 15:07  
**F9 to re-calculate**

Proposed dir: 180

Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE			N-S	E-W	SECT	DLS/ 100
			AZM	TVD					
80	9622.00	0.40	29.50	9620.78		4.51	-9.87	-4.51	0.14
81	9716.00	0.50	23.10	9714.78		5.18	-9.55	-5.18	0.12
82	9810.00	0.50	35.20	9808.78		5.89	-9.15	-5.89	0.11
83	9904.00	0.10	84.20	9902.78		6.23	-8.84	-6.23	0.47
84	9999.00	0.20	317.50	9997.78		6.36	-8.87	-6.36	0.29
85	10093.00	0.20	29.00	10091.78		6.63	-8.90	-6.63	0.25
86	10171.00	0.30	329.90	10169.77		6.92	-8.93	-6.92	0.34
87	10187.00	0.30	310.10	10185.77		6.99	-8.99	-6.99	0.64
88	10218.00	0.70	187.40	10216.77		6.85	-9.07	-6.85	2.90
89	10250.00	5.40	193.80	10248.72		5.19	-9.46	-5.19	14.70
90	10281.00	9.50	199.20	10279.45		1.36	-10.65	-1.36	13.40
91	10313.00	15.70	191.90	10310.67		-5.38	-12.41	5.38	19.97
92	10344.00	22.00	189.30	10339.99		-15.22	-14.22	15.22	20.50
93	10376.00	26.50	186.90	10369.16		-28.23	-16.04	28.23	14.39
94	10407.00	27.60	186.20	10396.77		-42.24	-17.65	42.24	3.69
95	10439.00	29.60	186.20	10424.86		-57.47	-19.30	57.47	6.25
96	10470.00	31.80	184.90	10451.52		-73.22	-20.83	73.22	7.41
97	10501.00	33.90	183.30	10477.56		-89.99	-22.02	89.99	7.33
98	10533.00	37.40	180.10	10503.56		-108.62	-22.55	108.62	12.39
99	10564.00	41.40	178.50	10527.51		-128.29	-22.30	128.29	13.31
100	10596.00	45.60	178.60	10550.72		-150.31	-21.75	150.31	13.13
101	10627.00	49.60	179.20	10571.62		-173.19	-21.31	173.19	12.98
102	10658.00	52.90	180.40	10591.02		-197.36	-21.23	197.36	11.06
103	10690.00	55.70	181.60	10609.69		-223.34	-21.69	223.34	9.26
104	10721.00	58.40	181.30	10626.55		-249.34	-22.35	249.34	8.75
105	10752.00	60.00	181.10	10642.42		-275.97	-22.90	275.97	5.19
106	10784.00	61.50	180.80	10658.06		-303.88	-23.37	303.88	4.76
107	10815.00	62.60	181.80	10672.59		-331.26	-23.99	331.26	4.55
108	10846.00	67.20	182.70	10685.73		-359.30	-25.10	359.30	15.07
109	10878.00	71.60	182.70	10696.99		-389.21	-26.51	389.21	13.75
110	10909.00	74.90	182.30	10705.92		-418.87	-27.80	418.87	10.72
111	10941.00	77.30	182.80	10713.61		-449.90	-29.18	449.90	7.65
112	10972.00	78.40	183.30	10720.13		-480.16	-30.80	480.16	3.88
113	11003.00	80.70	182.70	10725.76		-510.60	-32.39	510.60	7.66
114	11033.00	83.80	181.90	10729.80		-540.30	-33.58	540.30	10.67
115	11085.00	87.70	181.80	10733.65		-592.12	-35.26	592.12	7.50
116	11179.00	90.60	182.20	10735.05		-686.04	-38.54	686.04	3.11
117	11273.00	90.00	181.10	10734.56		-780.00	-41.24	780.00	1.33
118	11367.00	90.70	181.20	10733.98		-873.98	-43.13	873.98	0.75
119	11430.00	89.50	181.10	10733.87		-936.96	-44.39	936.96	1.91

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## SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC		
Well :	Bray 5301 43-12H		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
Township:	153	N/S:	N
Range:	101	E/W:	W
Footages:	250	FN/SL:	S
	1927	FE/WL:	E

Kick-off:	9/3/2011
Finish:	10/22/2011
Directional Supervision:	
	Professional Directional
Date:	10/27/2011
Time:	15:07
F9 to re-calculate	

Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE			E-W	SECT	DLS/ 100
			AZM	TVD	N-S			
120	11524.00	90.70	181.20	10733.71	-1030.94	-46.28	1030.94	1.28
121	11619.00	89.60	179.50	10733.46	-1125.93	-46.86	1125.93	2.13
122	11714.00	90.20	178.90	10733.63	-1220.92	-45.53	1220.92	0.89
123	11809.00	91.30	178.90	10732.38	-1315.90	-43.71	1315.90	1.16
124	11904.00	89.20	178.10	10731.97	-1410.86	-41.22	1410.86	2.37
125	11999.00	89.50	177.60	10733.05	-1505.78	-37.66	1505.78	0.61
126	12094.00	90.70	177.10	10732.88	-1600.68	-33.27	1600.68	1.37
127	12189.00	89.00	177.60	10733.13	-1695.57	-28.88	1695.57	1.87
128	12284.00	88.60	176.70	10735.12	-1790.43	-24.15	1790.43	1.04
129	12379.00	89.10	179.70	10737.03	-1885.36	-21.17	1885.36	3.20
130	12474.00	90.40	180.00	10737.44	-1980.35	-20.92	1980.35	1.40
131	12569.00	91.10	179.30	10736.20	-2075.34	-20.34	2075.34	1.04
132	12664.00	90.00	180.40	10735.28	-2170.34	-20.09	2170.34	1.64
133	12759.00	90.70	179.70	10734.70	-2265.33	-20.18	2265.33	1.04
134	12854.00	88.90	179.80	10735.04	-2360.33	-19.76	2360.33	1.90
135	12949.00	89.40	178.90	10736.44	-2455.31	-18.68	2455.31	1.08
136	13044.00	89.30	176.60	10737.52	-2550.22	-14.95	2550.22	2.42
137	13139.00	89.80	178.10	10738.27	-2645.12	-10.56	2645.12	1.66
138	13234.00	90.30	177.00	10738.19	-2740.03	-6.50	2740.03	1.27
139	13329.00	90.00	176.70	10737.94	-2834.88	-1.28	2834.88	0.45
140	13424.00	88.30	177.50	10739.35	-2929.75	3.52	2929.75	1.98
141	13519.00	88.40	177.40	10742.08	-3024.61	7.75	3024.61	0.15
142	13613.00	89.10	176.80	10744.13	-3118.47	12.50	3118.47	0.98
143	13708.00	89.10	178.10	10745.62	-3213.36	16.73	3213.36	1.37
144	13803.00	88.60	179.50	10747.53	-3308.32	18.72	3308.32	1.56
145	13898.00	89.30	179.80	10749.27	-3403.30	19.30	3403.30	0.80
146	13993.00	90.10	179.40	10749.77	-3498.30	19.96	3498.30	0.94
147	14088.00	88.30	178.80	10751.10	-3593.27	21.45	3593.27	2.00
148	14183.00	87.60	180.20	10754.49	-3688.20	22.28	3688.20	1.65
149	14278.00	88.50	181.50	10757.73	-3783.14	20.87	3783.14	1.66
150	14373.00	88.70	181.40	10760.05	-3878.08	18.47	3878.08	0.24
151	14468.00	89.40	180.40	10761.62	-3973.05	16.98	3973.05	1.28
152	14563.00	90.40	178.90	10761.79	-4068.04	17.56	4068.04	1.90
153	14658.00	89.10	179.50	10762.20	-4163.03	18.89	4163.03	1.51
154	14753.00	89.80	178.60	10763.12	-4258.01	20.46	4258.01	1.20
155	14847.00	89.30	178.80	10763.85	-4351.98	22.59	4351.98	0.57
156	14943.00	90.60	179.10	10763.94	-4447.97	24.35	4447.97	1.39
157	15038.00	91.10	180.40	10762.53	-4542.95	24.77	4542.95	1.47
158	15132.00	92.20	180.50	10759.82	-4636.91	24.03	4636.91	1.18
159	15228.00	89.40	182.40	10758.48	-4732.86	21.60	4732.86	3.52

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## SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC		
Well :	Bray 5301 43-12H		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
Township:	153	N/S:	N
Range:	101	E/W:	W
Footages:	250	FN/SL:	S
	1927	FE/WL:	E

Kick-off:	9/3/2011
Finish:	10/22/2011
Directional Supervision:	Professional Directional
Date:	10/27/2011
Time:	15:07
F9 to re-calculate	

Minimum Curvature Method (SPE-3362)

Proposed dir:

180

[North and East are positive and South and West are negative, relative to surface location]

TRUE

No.	MD	INC	AZM	TVD	N-S	E-W	SECT	DLS/ 100
160	15323.00	89.40	182.20	10759.48	-4827.77	17.79	4827.77	0.21
161	15418.00	90.50	181.10	10759.56	-4922.73	15.05	4922.73	1.64
162	15513.00	91.20	180.10	10758.15	-5017.71	14.06	5017.71	1.28
163	15608.00	91.40	180.00	10755.99	-5112.69	13.98	5112.69	0.24
164	15703.00	90.40	182.20	10754.50	-5207.65	12.15	5207.65	2.54
165	15797.00	90.90	182.40	10753.44	-5301.57	8.38	5301.57	0.57
166	15892.00	91.80	182.60	10751.20	-5396.45	4.24	5396.45	0.97
167	15987.00	90.60	183.30	10749.21	-5491.30	-0.65	5491.30	1.46
168	16082.00	90.80	183.80	10748.05	-5586.11	-6.53	5586.11	0.57
169	16177.00	90.90	183.80	10746.64	-5680.90	-12.83	5680.90	0.11
170	16272.00	89.10	182.10	10746.64	-5775.76	-17.72	5775.76	2.61
171	16367.00	90.00	182.00	10747.38	-5870.70	-21.12	5870.70	0.95
172	16462.00	90.90	181.90	10746.64	-5965.64	-24.35	5965.64	0.95
173	16557.00	91.80	182.50	10744.40	-6060.54	-27.99	6060.54	1.14
174	16652.00	92.20	182.20	10741.08	-6155.40	-31.89	6155.40	0.53
175	16748.00	89.70	182.20	10739.49	-6251.31	-35.57	6251.31	2.60
176	16843.00	89.70	181.90	10739.99	-6346.25	-38.97	6346.25	0.32
177	16938.00	90.10	182.60	10740.16	-6441.17	-42.70	6441.17	0.85
178	17033.00	91.30	182.30	10739.00	-6536.08	-46.76	6536.08	1.30
179	17128.00	90.50	182.90	10737.50	-6630.97	-51.07	6630.97	1.05
180	17223.00	89.90	181.40	10737.17	-6725.90	-54.63	6725.90	1.70
181	17317.00	90.10	181.10	10737.17	-6819.87	-56.68	6819.87	0.38
182	17412.00	90.40	179.30	10736.76	-6914.87	-57.01	6914.87	1.92
183	17507.00	91.10	179.60	10735.51	-7009.86	-56.10	7009.86	0.80
184	17602.00	92.00	179.90	10732.94	-7104.82	-55.69	7104.82	1.00
185	17697.00	90.50	179.30	10730.87	-7199.79	-55.02	7199.79	1.70
186	17792.00	90.30	178.70	10730.21	-7294.77	-53.37	7294.77	0.67
187	17887.00	91.10	178.90	10729.05	-7389.75	-51.38	7389.75	0.87
188	17982.00	91.90	178.80	10726.56	-7484.69	-49.47	7484.69	0.85
189	18077.00	89.80	179.30	10725.15	-7579.66	-47.90	7579.66	2.27
190	18172.00	90.30	179.60	10725.07	-7674.66	-46.99	7674.66	0.61
191	18267.00	91.70	180.30	10723.41	-7769.64	-46.90	7769.64	1.65
192	18362.00	92.20	180.10	10720.18	-7864.59	-47.23	7864.59	0.57
193	18457.00	91.60	180.40	10717.03	-7959.53	-47.65	7959.53	0.71
194	18551.00	89.20	180.80	10716.37	-8053.52	-48.63	8053.52	2.59
195	18647.00	90.20	179.00	10716.88	-8149.51	-48.46	8149.51	2.14
196	18742.00	90.90	178.90	10715.96	-8244.49	-46.72	8244.49	0.74
197	18837.00	92.00	179.80	10713.56	-8339.45	-45.65	8339.45	1.50
198	18932.00	92.20	178.90	10710.08	-8434.38	-44.57	8434.38	0.97
199	19027.00	92.30	178.00	10706.35	-8529.27	-42.00	8529.27	0.95

**SUNBURST CONSULTING, INC.**

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Operator:	Oasis Petroleum North America, LLC		
Well :	Bray 5301 43-12H		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
Township:	153	N/S:	N
Range:	101	E/W:	W
Footages:	250	FN/SL:	S
	1927	FE/WL:	E

Kick-off:	9/3/2011
Finish:	10/22/2011
Directional Supervision:	
Professional Directional	

Date:	10/27/2011
Time:	15:07
F9 to re-calculate	

Proposed dir:	180
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Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE			N-S	E-W	SECT	DLS/ 100
			AZM	TVD					
200	19122.00	91.70	177.30	10703.03	-8624.13	-38.11	8624.13	0.97	
201	19217.00	92.20	177.20	10699.80	-8718.97	-33.55	8718.97	0.54	
202	19312.00	91.70	177.40	10696.57	-8813.81	-29.08	8813.81	0.57	
203	19406.00	91.30	179.20	10694.11	-8907.73	-26.29	8907.73	1.96	
204	19501.00	92.40	179.50	10691.04	-9002.67	-25.22	9002.67	1.20	
205	19596.00	92.70	179.00	10686.81	-9097.57	-23.97	9097.57	0.61	
206	19690.00	91.20	178.10	10683.61	-9191.48	-21.60	9191.48	1.86	
207	19785.00	92.00	178.60	10680.96	-9286.40	-18.86	9286.40	0.99	
208	19881.00	90.20	178.90	10679.12	-9382.36	-16.77	9382.36	1.90	
209	19976.00	91.10	179.10	10678.04	-9477.34	-15.11	9477.34	0.97	
210	20071.00	89.90	178.80	10677.21	-9572.32	-13.37	9572.32	1.30	
211	20165.00	91.40	180.00	10676.15	-9666.30	-12.39	9666.30	2.04	
212	20261.00	91.80	179.20	10673.47	-9762.26	-11.72	9762.26	0.93	
213	20356.00	91.80	178.80	10670.48	-9857.20	-10.06	9857.20	0.42	
214	20450.00	90.50	178.20	10668.60	-9951.14	-7.60	9951.14	1.52	
215	20545.00	89.50	177.90	10668.60	-10046.09	-4.37	10046.09	1.10	
216	20640.00	90.80	178.80	10668.35	-10141.05	-1.63	10141.05	1.66	
217	20735.00	92.00	179.40	10666.03	-10236.00	-0.14	10236.00	1.41	
218	20829.00	92.80	179.30	10662.09	-10329.91	0.93	10329.91	0.86	
219	20929.00	93.10	179.70	10656.94	-10429.78	1.80	10429.78	0.50	
220	20978.00	93.10	179.70	10654.29	-10478.70	2.05	10478.70	0.00	

## FORMATION TOPS & STRUCTURAL RELATIONSHIPS

Operator: Well Name: Location: Elevation:	Subject Well:								Offset Wells:		
	Oasis Petroleum North America, LLC Bray 5301 43-12H 250' FSL & 1,927' FEL SW SE Section 12, T153N, R101W										
Formation/ Zone	Prog. Top	Prog. Datum (MSL)	Est. Top (ROP)	MWD GR Top	Datum (MSL)	Interval Thickness	Thickness to Target	Dip To Prognosis	Dip To Lindvig 1-11HR	Dip To RoseBud 22-11	Dip To Dahl No. 23-1
Kibbey "Lime"	8,353'	-6,259'	8,355'		-6,261'	139'	2,379'	-2'	-3'	-39'	-34'
First Charles Salt	8,499'	-6,405'	8,494'		-6,400'	626'	2,240'	5'	0'	-32'	-31'
UB	9,123'	-7,029'	9,120'		-7,026'	78'	1,614'	3'	3'	-38'	-36'
Base Last Salt	9,199'	-7,105'	9,198'		-7,104'	32'	1,536'	1'	1'	-42'	-35'
Ratcliffe	9,247'	-7,153'	9,230'		-7,136'	186'	1,504'	17'	1'	-42'	-34'
Mission Canyon	9,423'	-7,329'	9,416'		-7,322'	562'	1,318'	7'	5'	-29'	-33'
Lodgepole	9,998'	-7,904'	9,978'		-7,884'	128'	756'	20'	3'	-44'	-32'
Lodgepole A			10,106'	10,106'	-8,012'	56'	628'		3'	-41'	-34'
Lodgepole B			10,162'	10,162'	-8,068'	54'	572'		3'	-23'	-35'
Lodgepole C			10,216'	10,216'	-8,122'	179'	518'	-5'	-5'	-38'	-35'
Lodgepole D			10,395'	10,395'	-8,301'	139'	339'		3'	-39'	-34'
Lodgepole E			10,534'	10,534'	-8,440'	113'	200'	1'	1'	-44'	-28'
Lodgepole F			10,647'	10,647'	-8,553'	45'	87'		0'	-47'	-39'
False Bakken	10,703'	-8,609'	10,693'	10,692'	-8,598'	11'	42'		-3'	-54'	-38'
Upper Bakken Shale	10,713'	-8,619'	10,703'	10,703'	-8,609'	16'	31'	10'	-6'	-53'	-40'
Middle Bakken	10,727'	-8,633'	10,719'	10,719'	-8,625'	12'	15'	8'	-4'	-53'	-39'
Middle Bakken (Target)	10,734'	-8,640'	10,731'	10,731'	-8,637'	24'		3'	-4'	-54'	-39'
Lower Bakken Shale	10,763'	-8,669'									

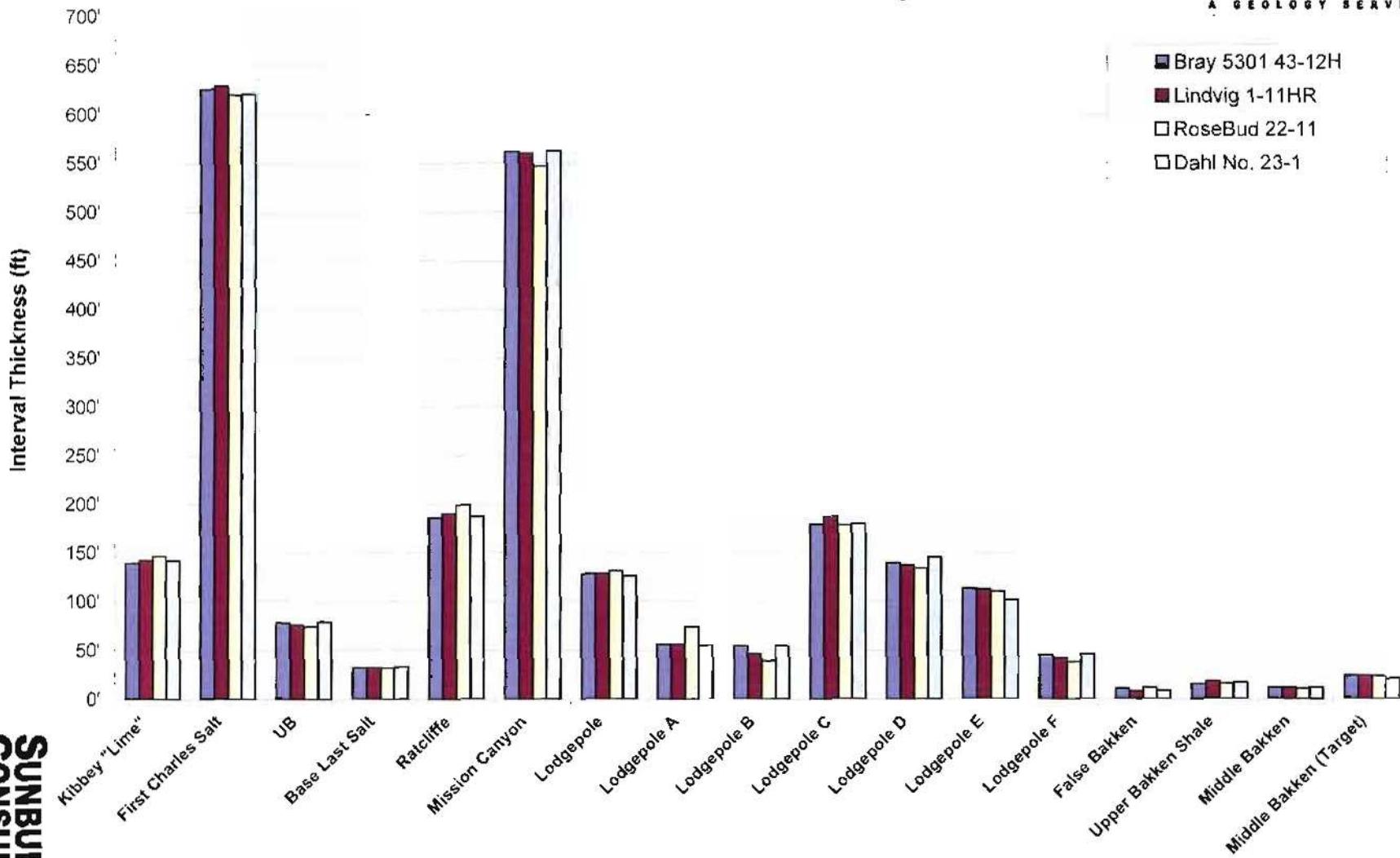
## CONTROL DATA

Operator:	SM Energy Company Lindvig 1-11HR				SM Energy Company RoseBud 22-11				Earthstone Energy Dahl No. 23-1			
Well Name:	SE SE Sec. 11, T153N, R101W McKenzie County, ND 0.80 mi. W of Bray 5301 43-12H				SE NW Sec. 11, T153N, R101W McKenzie County, ND 1.45 mi. NW of Bray 5301 43-12H				SW SE Sec. 23, T153N, R101W Mckenzie County, ND 2.50 mi. SW of Bray 5301 43-12H			
Elevation:	KB: 2,105'				KB: 1,872'				KB: 2,035'			
Formation/ Zone	E-Log Top	Datum KB:	Interval	Thickness to Target	E-Log Top	Datum (MSL)	Interval	Thickness to Target	E-Log Top	Datum (MSL)	Interval	Thickness to Target
Kibbey "Lime"	8,363'	-6,258'	142'	2,375'	8,094'	-6,222'	146'	2,361'	8,262'	-6,227'	142'	2,371'
First Charles Salt	8,505'	-6,400'	629'	2,233'	8,240'	-6,368'	620'	2,215'	8,404'	-6,369'	621'	2,229'
UB	9,134'	-7,029'	76'	1,504'	8,860'	-6,988'	74'	1,595'	9,025'	-6,990'	79'	1,608'
Base Last Salt	9,210'	-7,105'	32'	1,528'	8,934'	-7,062'	32'	1,521'	9,104'	-7,069'	33'	1,529'
Ratcliffe	9,242'	-7,137'	190'	1,496'	8,966'	-7,094'	199'	1,489'	9,137'	-7,102'	187'	1,496'
Mission Canyon	9,432'	-7,327'	560'	1,306'	9,165'	-7,293'	547'	1,290'	9,324'	-7,289'	563'	1,309'
Lodgepole	9,992'	-7,887'	128'	746'	9,712'	-7,840'	131'	743'	9,887'	-7,852'	126'	746'
Lodgepole A	10,120'	-8,015'	56'	618'	9,843'	-7,971'	74'	612'	10,013'	-7,978'	55'	620'
Lodgepole B	10,176'	-8,071'	46'	562'	9,917'	-8,045'	39'	538'	10,068'	-8,033'	54'	565'
Lodgepole C	10,222'	-8,117'	187'	516'	9,956'	-8,084'	178'	499'	10,122'	-8,087'	180'	511'
Lodgepole D	10,409'	-8,304'	137'	329'	10,134'	-8,262'	134'	321'	10,302'	-8,267'	145'	331'
Lodgepole E	10,546'	-8,441'	112'	192'	10,268'	-8,396'	110'	187'	10,447'	-8,412'	102'	186'
Lodgepole F	10,658'	-8,553'	42'	80'	10,378'	-8,506'	38'	77'	10,549'	-8,514'	46'	84'
False Bakken	10,700'	-8,595'	8'	38'	10,416'	-8,544'	12'	39'	10,595'	-8,560'	9'	38'
Upper Bakken Shale	10,708'	-8,603'	18'	30'	10,428'	-8,556'	16'	27'	10,604'	-8,569'	17'	29'
Middle Bakken	10,726'	-8,621'	12'	12'	10,444'	-8,572'	11'	11'	10,621'	-8,586'	12'	12'
Middle Bakken (Target)	10,738'	-8,633'	24'	0'	10,455'	-8,583'	24'	0'	10,633'	-8,598'	21'	0'
Lower Bakken Shale	10,762'	-8,657'			10,479'	-8,607'		-24'	10,654'	-8,619'		-21'



## INTERVAL THICKNESS

Oasis Petroleum North America, LLC. - Bray 5301 43-12H

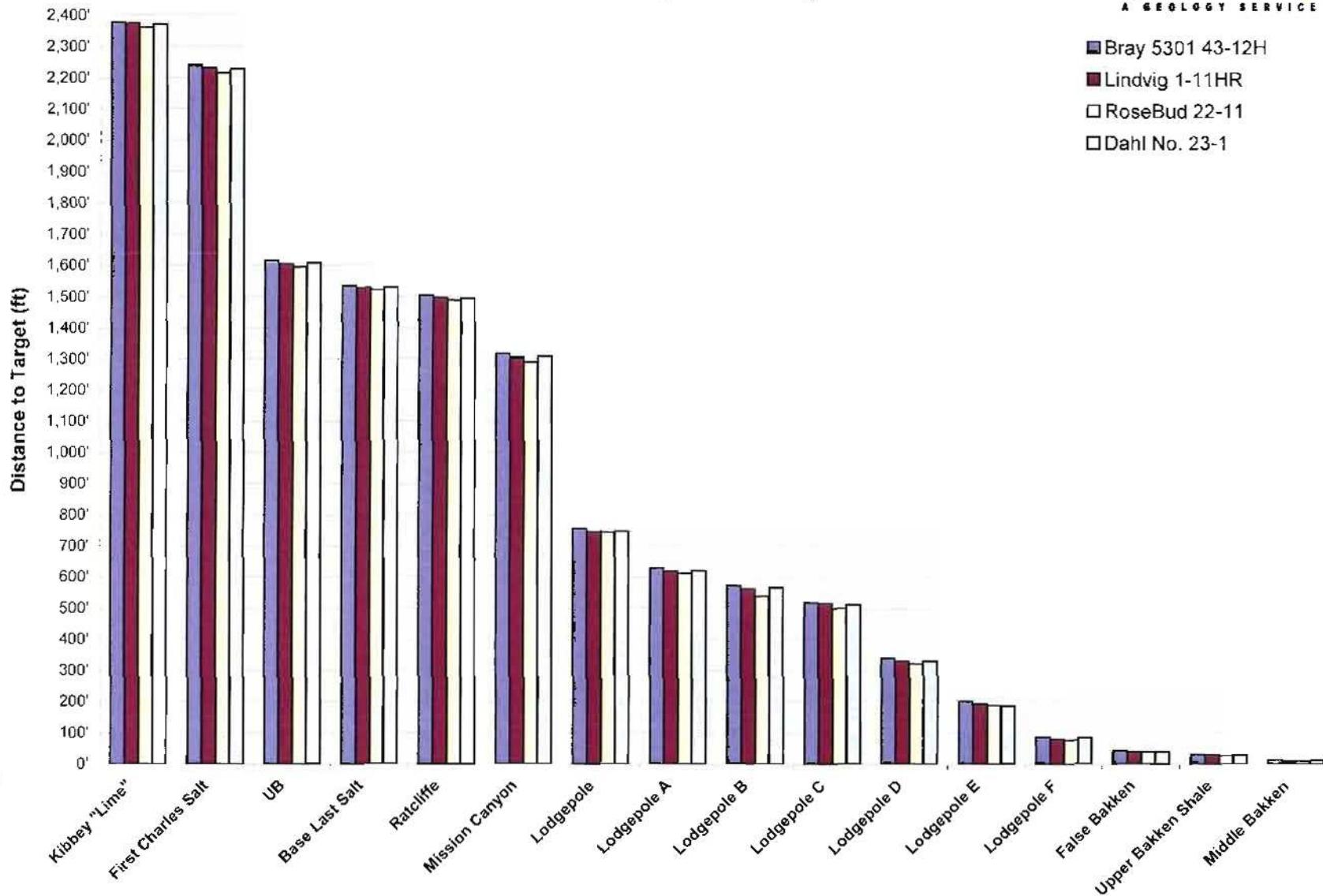


## TARGET PROXIMATION

Formation/ Zone:	Proposed Top of Target From:			
	Lindvig 1-11HR	RoseBud 22-11	Dahl No. 23-1	Average of Offset Wells
Kibbey "Lime"	10,730'	10,716'	10,726'	10,724'
First Charles Salt	10,727'	10,709'	10,723'	10,720'
UB	10,724'	10,715'	10,728'	10,722'
Base Last Salt	10,726'	10,719'	10,727'	10,724'
Ratcliffe	10,726'	10,719'	10,726'	10,724'
Mission Canyon	10,722'	10,706'	10,725'	10,718'
Lodgepole	10,724'	10,721'	10,724'	10,723'
Lodgepole A	10,724'	10,718'	10,726'	10,723'
Lodgepole B	10,724'	10,700'	10,727'	10,717'
Lodgepole C	10,732'	10,715'	10,727'	10,725'
Lodgepole D	10,724'	10,716'	10,726'	10,722'
Lodgepole E	10,726'	10,721'	10,720'	10,722'
Lodgepole F	10,727'	10,724'	10,731'	10,727'
False Bakken	10,731'	10,732'	10,731'	10,731'
Upper Bakken Shale	10,733'	10,730'	10,732'	10,732'
Middle Bakken	10,731'	10,730'	10,731'	10,731'
Middle Bakken (Target)	10,731'	10,731'	10,731'	10,731'

# ISOPACH TO TARGET

Oasis Petroleum North America, LLC. - Bray 5301 43-12H



# Vertical Hole Lithology Descriptions

## Oasis Bray 5301 43-12H

Rig crew caught samples in 30' intervals. Formation tops and markers are based off rate of penetration and offset interval thickness projections. No MWD gamma or open-hole logs used while in the vertical.

### Drilling vertical hole in Mississippian Kibbey Formation (Big Snowy Group)

8240-8270 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted no visible porosity

8270-8300 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted no visible porosity

8300-8330 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted, no visible porosity; SILTY SANDSTONE: off white to gray, soft to friable, sub blocky, calcareous cement, moderately cemented

### Kibbey "Lime" Marker

8,355' TVD (6,261' MSL)

8330-8360 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

8360-8390 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

8390-8420 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted, no visible porosity; LIMESTONE: mudstone, light to medium gray, microcrystalline, firm, laminated, earthy, no visible porosity; rare ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

8420-8450 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted, no visible porosity; rare ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

8450-8480 SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted no visible porosity

### First Charles Salt

8,494' TVD (-6,400' MSL)

8480-8510 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture; trace SILTSTONE: orange to orange brown, soft, blocky to sub platy, calcareous cement, partially cemented, well sorted, no visible porosity

8510-8540 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture; trace ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous; occasional LIMESTONE: mudstone, light to medium gray, firm, earthy texture

8540-8570 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8570-8600 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8600-8630 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8630-8660 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8660-8690 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8690-8720 SALT; clear to milky, crystalline, hard, euhedral, crystalline texture, occasional ARGILLACEOUS LIMESTONE: gray, grained to brown, microcrystalline, hard, crystalline, dense, no visible porosity

8720-8750 ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous, occasional SALT; clear to milky, crystalline, hard, euhedral, crystalline texture; occasional ARGILLACEOUS LIMESTONE: gray, grained to brown, microcrystalline, hard, crystalline, dense, no visible porosity

8750-8780: SALT; clear to milky, crystalline, hard, euhedral, crystalline texture; occasional ARGILLACEOUS LIMESTONE: gray, grained to brown, microcrystalline, hard, crystalline, dense, no visible porosity

8780-8810: ARGILLACEOUS LIMESTONE: mudstone gray, grained to brown, microcrystalline, hard, crystalline, dense, no visible porosity; common ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous; trace SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8810-8840: SALT; clear to milky, crystalline, hard, euhedral, crystalline texture; occasional ARGILLACEOUS LIMESTONE: mudstone gray, grained to brown, microcrystalline, hard, crystalline, dense, no visible porosity; trace ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

8840-8870: SALT; clear to milky, crystalline, hard, euhedral, crystalline texture

8870-8900 LIMESTONE: wackestone gray, grained brown, microcrystalline, hard, dense, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, amorphous

8900-8930 DOLOMitic LIMESTONE: wackestone light gray, tan to cream, microcrystalline, hard, dense, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, amorphous; trace SALT: clear to milky, crystalline, hard, euhedral, crystalline texture

8930-8960 SALT: clear to milky, crystalline, hard, euhedral, crystalline texture; occasional ANHYDRITE: white to off white, microcrystalline, soft, amorphous; occasional ARGILLACEOUS LIMESTONE: mudstone gray to gray brown, microcrystalline, hard

8960-8990 ARGILLACEOUS LIMESTONE: mudstone, gray, gray brown, microcrystalline, hard, crystalline, dense, no visible porosity; common ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous; occasional SALT: clear to milky, crystalline, hard, euhedral, crystalline texture

8990-9020 ARGILLACEOUS LIMESTONE: mudstone, gray, gray brown, microcrystalline, hard, crystalline, dense, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

9020-9050 ARGILLACEOUS LIMESTONE: mudstone, gray, gray brown, microcrystalline, hard, crystalline, dense, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

9050-9080 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray, gray brown, microcrystalline, hard, crystalline, dense, no visible porosity

9080-9110 ARGILLACEOUS LIMESTONE: mudstone, gray, gray brown, microcrystalline, hard, crystalline, dense, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, massive, amorphous

Upper Berenton

9,120' TVD (-7,026' MSL)

9110-9140 ARGILLACEOUS LIMESTONE: mudstone, gray, gray brown, microcrystalline, hard, crystalline, dense, no visible porosity

9140-9170 SALT: clear to milky, crystalline, hard, euhedral, crystalline texture; trace ARGILLACEOUS LIMESTONE: mudstone gray to gray brown, microcrystalline, hard; trace ANHYDRITE: white to off white, microcrystalline, soft, amorphous

**Base Last Salt**

**9,198' TVD (-7,104' MSL)**

9170-9200 DOLOMITE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity; rare ANHYDRITE: white to off white, microcrystalline, soft, amorphous

**Ratcliffe**

**9,230' TVD (-7,136' MSL)**

9200-9230 DOLOMITE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity; LIMESTONE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, amorphous

9230-9260 LIMESTONE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity, trace spotty oil stain; occasional DOLOMITE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity

9260-9290 LIMESTONE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity, trace spotty oil stain; occasional ANHYDRITE: white to off white, microcrystalline, soft, amorphous

9290-9320 LIMESTONE: mudstone, light gray to light tan, microcrystalline, hard to firm, chalky texture, no visible porosity; occasional ANHYDRITE: white to off white, microcrystalline, soft, amorphous

9320-9350 ARGILLACEOUS LIMESTONE: mudstone, light to dark gray, microcrystalline, firm, dense, earthy texture, trace spotty brown oil stain; rare ANHYDRITE: white to off white, microcrystalline, soft, amorphous

9350-9380 ARGILLACEOUS LIMESTONE: mudstone, light to dark gray, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity; rare ANHYDRITE: white to off white, microcrystalline, soft, amorphous

9380-9410 ARGILLACEOUS LIMESTONE: mudstone, light to dark gray, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

**Mission Canyon**

**9,416' TVD (-7,322' MSL)**

9410-9440 LIMESTONE: mudstone, light gray to light tan, trace white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity

9440-9470 LIMESTONE: mudstone, light gray to light tan, trace white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity

9470-9500 ARGILLACEOUS LIMESTONE: mudstone, light gray to light tan, trace white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity, trace spotty oil stain

9500-9530 LIMESTONE: mudstone, light gray to light tan, trace white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity, occasional spotty to even oil stain

9530-9560 ARGILLACEOUS LIMESTONE: mudstone, light gray to light tan, trace white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity, occasional spotty brown oil stain

9560-9590 ARGILLACEOUS LIMESTONE: mudstone, light gray to light tan, trace white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity, rare spotty oil stain

9590-9620 ARGILLACEOUS LIMESTONE: mudstone, light gray to light tan, trace white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity, rare spotty oil stain

9620-9650 ARGILLACEOUS LIMESTONE: mudstone, light gray, light to medium brown, trace white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, argillaceous in part, no visible porosity, trace spotty oil stain

9650-9680 ARGILLACEOUS LIMESTONE: mudstone, light gray to light tan, trace white, occasional dark gray, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, rare spotty oil stain

9680-9710 LIMESTONE: mudstone, light gray to light tan, common white, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, trace spotty oil stain

9710-9740 LIMESTONE: mudstone, light gray to light tan, common white, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, trace spotty oil stain

9740-9770 LIMESTONE: mudstone, light gray to light tan, common white, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, rare spotty brown oil stain

9770-9800 LIMESTONE: mudstone, light gray to light tan, common white, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, rare spotty to even brown oil stain

9800-9830 LIMESTONE: mudstone, light gray to light tan, occasional white, rare dark gray, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, common spotty to even brown oil stain

9830-9860 LIMESTONE: mudstone, light gray to light tan, occasional white, occasional dark gray, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, common spotty to even brown oil stain

9860-9890 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, trace white, abundant dark gray, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, common spotty to even brown oil stain

9890-9920 LIMESTONE: mudstone, light gray to light tan, common white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, trace spotty brown oil stain

9920-9950 LIMESTONE: mudstone, light to medium gray, light tan, occasional white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite, argillaceous in part, no visible porosity, trace spotty brown oil stain

Lodgepole

9,978' TVD (-7,884' MSL)

9950-9980 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, occasional white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite, argillaceous in part, no visible porosity, trace spotty brown oil stain

9980-10010 LIMESTONE: mudstone, dark gray, light to medium brown to brown gray, trace white, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite, argillaceous in part, no visible porosity, trace spotty brown oil stain

10010-10040 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, occasional white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite, no visible porosity

10040-10070 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, occasional white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite, no visible porosity

10070-10100 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, occasional white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite, no visible porosity

10100-10130 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, occasional white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite, no visible porosity

10130-10160 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, common dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10160-10190 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, common dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10190-10220 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, light tan, common dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

**Begin Curve and Lateral Sample Descriptions**

Rig crew caught samples in 30' intervals from 10,220'-10,880' and 11,090'-TD  
10' Samples from 10,880'-11,090'

*Note: Formation tops and markers are based off MWD gamma*

10220-10250 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10250-10280 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10280-10310 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10310-10340 ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10340-10370 ARGILLACEOUS LIMESTONE: mudstone, medium gray, trace dark gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite

10370-10400 ARGILLACEOUS LIMESTONE: mudstone, medium gray, trace dark gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, rare disseminated pyrite

10400-10430 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace dark gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10430-10460 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace dark gray, trace white to off white, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10460-10490 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10490-10520 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace white to off white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite

10520-10550 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace white to off white, common dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite

10550-10580 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, rare white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, occasional disseminated pyrite

10580-10610 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, rare white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10610-10640 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, occasional white to off white, rare dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10640-10670 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, rare white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10670-10700 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, rare white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10700-10730 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, rare white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10730-10760 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10760-10790 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, trace white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10790-10820 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, rare white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

10820-10850 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, occasional white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

**False Bakken** **10,859' MD 10,692' TVD (-8,598')**

10850-10880 ARGILLACEOUS LIMESTONE: mudstone, medium to light gray, occasional white to off white, trace dark gray, microcrystalline, friable to firm, dense, earthy texture, trace disseminated pyrite

**Upper Bakken Shale** **10,888' MD 10,703' TVD (-8,609')**

10880-10910 SHALE: black, blocky, friable to firm, earthy texture, carbonaceous, petroliferous, common disseminated pyrite, even black oil stain

10910-10920 SHALE: black, blocky, friable to firm, earthy texture, carbonaceous, petroliferous, common disseminated pyrite, even black oil stain

10920-10930 SHALE: black, blocky, friable to firm, earthy texture, carbonaceous, petroliferous, common disseminated pyrite, even black oil stain

10930-10940 SHALE: black, blocky, friable to firm, earthy texture, carbonaceous, petroliferous, common disseminated pyrite, even black oil stain

10940-10950 SHALE: black, blocky, friable to firm, earthy texture, carbonaceous, petroliferous, common disseminated pyrite, even black oil stain

10950-10960 SHALE: black, blocky, friable to firm, earthy texture, carbonaceous, petroliferous, common disseminated pyrite, even black oil stain

**Middle Bakken**

**10,965' MD 10,719' TVD (-8,625')**

10960-10970 SILTSTONE: dark gray, occasional medium gray, firm, blocky, well to moderately calcareous cement, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain; trace SHALE: as above

10970-10980 SILTSTONE: medium gray to tan, trace dark gray, firm, blocky, well to moderately calcareous cemented, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

10980-10990 SILTSTONE: medium gray to tan, trace dark gray, firm, blocky, well to moderately calcareous cemented, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

10990-11000 SILTSTONE: medium gray to tan, trace dark gray, firm, blocky, well to moderately calcareous cemented, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11000-11010 SILTSTONE: medium gray to tan, trace dark gray, firm, blocky, well to moderately calcareous cemented, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11010-11020 SILTSTONE: medium gray to tan, trace dark gray, firm, blocky, well to moderately calcareous cemented, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11020-11030 SILTSTONE: medium gray to tan, trace dark gray, firm, blocky, well to moderately calcareous cemented, occasional disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11030-11040 SILTY SANDSTONE: medium brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty to even oil stain; rare SILTSTONE: as above

11040-11050 SILTY SANDSTONE: medium brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty to even oil stain; rare SILTSTONE: as above

11050-11060 SILTY SANDSTONE: medium brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty to even oil stain; trace SILTSTONE: as above

11060-11070 SILTY SANDSTONE: medium brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty to even oil stain; trace SILTSTONE: as above

11070-11080 SILTY SANDSTONE: medium brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty to even oil stain

11080-11090 SILTY SANDSTONE: medium brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty to even oil stain

11090-11120 SILTY SANDSTONE: light gray to light gray brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty oil stain, sample contaminated with cement

11120-11150 SILTY SANDSTONE: light gray to light gray brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty oil stain, sample contaminated with cement

11150-11180 SILTY SANDSTONE: light gray to light gray brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty oil stain

11180-11210 SILTY SANDSTONE: light gray to light gray brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace nodular and disseminated pyrite; trace intergranular porosity, trace brown spotty oil stain

11210-11240 SILTY SANDSTONE: light gray to light gray brown, fine grained, friable to firm, sub rounded, vitreous, moderately calcareous cemented, trace disseminated pyrite; trace intergranular porosity, trace brown spotty oil stain

11240-11270 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11270-11300 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11300-11330 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11330-11360 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11360-11390 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11390-11420 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11420-11450 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

11450-11480 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11480-11510 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11510-11540 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

11540-11570 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11570-11600 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11600-11630 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, very slow green diffuse cut fluorescence

11630-11660 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11660-11690 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11690-11720 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

11720-11750 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11750-11780 SILTY SANDSTONE: light gray, very common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11780-11810 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

11810-11840 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11840-11870 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11870-11900 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

11900-11930 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11930-11960 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

11960-11990 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

11990-12020 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12020-12050 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

#### 12050-12080 No Sample

12080-12110 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12110-12140 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12140-12170 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12170-12200 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12200-12230 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12230-12260 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12260-12290 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic

cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12290-12320 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12320-12350 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12350-12380 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12380-12410 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12410-12440 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12440-12470 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12470-12500 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12500-12530 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12530-12560 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12560-12590 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12590-12620 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12620-12650 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub rounded to rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12650-12680 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub rounded to rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12680-12710 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub rounded to rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12710-12740 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub rounded to rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, contaminated cut

12740-12770 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12770-12800 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12800-12830 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12830-12860 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12860-12890 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12890-12920 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

12920-12950 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

12950-12980 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, contaminated with lube

12980-13010 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, slow green diffuse cut fluorescence

13010-13040 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

13040-13070 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

13070-13100 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, common dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

13100-13130 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, common dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, very slow green diffuse cut fluorescence

13130-13160 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

13160-13190 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample

13190-13220 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, occasional oil in sample, very slow green diffuse cut fluorescence

13220-13250 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13250-13280 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13280-13310 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13310-13340 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13340-13370 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13370-13400 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13400-13430 SILTY SANDSTONE: light gray, occasional medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13430-13460 SILTY SANDSTONE: light gray, occasional medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13460-13490 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13490-13520 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13520-13550 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13550-13580 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13580-13610 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13610-13640 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13640-13670 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13670-13700 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13700-13730 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13730-13760 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13760-13790 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13790-13820 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13820-13850 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13850-13880 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13880-13910 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13910-13940 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

13940-13970 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

13970-14000 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14000-14030 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

14030-14060 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14060-14090 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14090-14120 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

14120-14150 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14150-14180 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14180-14210 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14210-14240 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14240-14270 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14270-14300 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, trace off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14300-14330 SILTY SANDSTONE: light gray, common medium gray to brown, common dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

14330-14360 SILTY SANDSTONE: light gray, common medium gray to brown, common dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14360-14390 SILTY SANDSTONE: light gray, common medium gray to brown, common dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14390-14420 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14420-14450 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14450-14480 SILTY SANDSTONE: light gray, common medium gray to brown, common dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

14480-14510 SILTY SANDSTONE: light gray, common medium gray to brown, common dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14510-14540 SILTY SANDSTONE: light gray, common medium gray to brown, common dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14540-14570 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14570-14600 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14600-14630 SILTY SANDSTONE: light gray, common medium gray to brown, rare dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic

cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample, slow green diffuse cut fluorescence

14630-14660 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14660-14690 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, common oil in sample

14690-14720 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

14720-14750 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, samples moderately contaminated with lube

14750-14780 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, samples moderately contaminated with lube

14780-14810 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, samples moderately contaminated with lube

14810-14840 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, slow green diffuse cut fluorescence

14840-14870 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

14870-14900 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

14900-14930 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, slow green diffuse cut fluorescence

14930-14960 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

14960-14990 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

14990-15020 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain, slow green diffuse cut fluorescence

15020-15050 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

15050-15080 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, rare light brown spotty to even oil stain

15080-15110 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

15110-15140 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15140-15170 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15170-15200 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, rare dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15200-15230 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15230-15260 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15260-15290 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15290-15320 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15320-15350 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15350-15380 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic

cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15380-15410 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15410-15440 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15440-15470 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15470-15500 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15500-15530 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15530-15560 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15560-15590 SILTY SANDSTONE: light gray, occasional medium gray to brown, common off white, common dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15590-15620 SILTY SANDSTONE: light gray, occasional medium gray to brown, common off white, common dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15620-15650 SILTY SANDSTONE: light gray, occasional medium gray to brown, common off white, common dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15650-15680 SILTY SANDSTONE: light gray, occasional medium gray to brown, common off white, common dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15680-15710 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15710-15740 SILTY SANDSTONE: light gray, common medium gray to brown, common off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic

cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, heavily contaminated with lube

15740-15770 SILTY SANDSTONE: light gray, occasional medium gray to brown, rare off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

15770-15800 SILTY SANDSTONE: light gray, occasional medium gray to brown, rare off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15800-15830 SILTY SANDSTONE: light gray, occasional medium gray to brown, rare off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15830-15860 SILTY SANDSTONE: light gray, occasional medium gray to brown, rare off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

15860-15890 SILTY SANDSTONE: light gray, occasional medium gray to brown, rare off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15890-15920 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15920-15950 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

15950-15980 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

15980-16010 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16010-16040 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16040-16070 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16070-16100 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16100-16130 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16130-16160 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16160-16190 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16190-16220 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16220-16250 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16250-16280 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16280-16310 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16310-16340 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16340-16370 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, rare off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16370-16400 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, rare off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16400-16430 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, rare off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16430-16460 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, rare off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16460-16490 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, rare off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16490-16520 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, rare off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16520-16550 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16550-16580 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, slow green diffuse cut fluorescence

16580-16610 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16610-16640 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16640-16670 SILTY SANDSTONE: light gray, occasional medium gray to brown, occasional dark gray, occasional off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16670-16700 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16700-16730 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16730-16760 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16760-16790 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16790-16820 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16820-16850 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16850-16880 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

16880-16910 SILTY SANDSTONE: light gray, common medium gray to brown, occasional dark gray, common off white, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain





17750-17780 SILTY SANDSTONE: light gray, occasional off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17780-17810 SILTY SANDSTONE: light gray, occasional off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17810-17840 SILTY SANDSTONE: light gray, common off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17840-17870 SILTY SANDSTONE: light gray, occasional off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17870-17900 SILTY SANDSTONE: light gray, occasional off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17900-17930 SILTY SANDSTONE: light gray, occasional off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17930-17960 SILTY SANDSTONE: light gray, occasional off white, trace medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain

17960-17990 SILTY SANDSTONE: light gray, occasional off white, occasional medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, moderately contaminated with lube

17990-18020 SILTY SANDSTONE: light gray, occasional off white, occasional medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, moderately contaminated with lube

18020-18050 SILTY SANDSTONE: light gray, occasional off white, occasional medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, moderately contaminated with lube

18050-18080 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, moderately contaminated with lube

18080-18110 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, moderately contaminated with lube

18110-18140 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic



18530-18560 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18560-18590 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18590-18620 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18620-18650 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

18650-18680 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18680-18710 SILTY SANDSTONE: light gray, occasional off white, common medium gray to brown, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18710-18740 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18740-18770 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample heavily contaminated with lube

18770-18800 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample heavily contaminated with lube

18800-18830 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

18830-18860 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18860-18890 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18890-18920 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18920-18950 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18950-18980 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, common oil in sample

18980-19010 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample heavily contaminated with lube

19010-19040 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19040-19070 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19070-19100 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19100-19130 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19130-19160 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19160-19190 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19190-19220 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19220-19250 SILTY SANDSTONE: light gray, common medium gray to brown, occasional off white, occasional dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19250-19280 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement,

trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19280-19310 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19310-19340 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19340-19370 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19370-19400 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19400-19430 SILTY SANDSTONE: light gray, common medium gray to brown, rare off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19430-19460 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19460-19490 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19490-19520 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19520-19550 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19550-19580 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19580-19610 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement,

trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19610-19640 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19640-19670 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19670-19700 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19700-19730 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19730-19760 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19760-19790 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19790-19820 SILTY SANDSTONE: light gray, common medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19820-19850 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19850-19880 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, sample contaminated with lube

19880-19910 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

19910-19940 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement,

trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

19940-19970 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

19970-20000 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20000-20030 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20030-20060 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20060-20090 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20090-20120 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20120-20150 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20150-20180 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20180-20210 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20210-20240 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20240-20270 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement,

trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20270-20300 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20300-20330 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20330-20360 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20360-20390 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20390-20420 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20420-20450 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20450-20480 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20480-20510 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20510-20540 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20540-20570 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20570-20600 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement,

trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20600-20630 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20630-20660 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20660-20690 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20690-20720 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20720-20750 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20750-20780 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20780-20810 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20810-20840 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20840-20870 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20870-20900 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20900-20930 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement,

trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube

20930-20960 SILTY SANDSTONE: light gray, abundant medium gray to brown, trace off white, trace dark gray, friable to firm, very fine grained to fine grained, sub angular to sub rounded, moderately sorted, dolomitic cement, trace disseminated and nodular pyrite, occasional light brown spotty to even oil stain, trace oil in sample, sample contaminated with lube



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.

20864



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>November 7, 2011</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input type="checkbox"/> Other	<b>Reserve pit reclamation</b>

Well Name and Number  
**Bray 5301 43-12H**

Footages <b>250 F S L</b>	Qtr-Qtr <b>1927 F E L</b>	Section <b>SWSE 12</b>	Township <b>153 N</b>	Range <b>101 W</b>
Field <b>Wildcat</b>	Pool <b>Bakken</b>	County <b>McKenzie</b>		

## 24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)  
**Excel Industries, Inc.**

Address <b>P.Box 159</b>	City <b>Miles City</b>	State <b>MT</b>	Zip Code <b>59301</b>
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## DETAILS OF WORK

Oasis Petroleum North America LLC plans to reclaim the reserve pit for the above referenced well as follows:

NDIC field inspector, Mark Binns and the landowner were notified on 11/1/2011

Landowner: Larry P Heen, 14033 45th Street NW, Williston, ND 58801

Fluids will be hauled to the Oasis Petroleum, Belle SWD 5503 43-1 (NDIC 90147)

Cuttings will be mixed with clay to solidify. Slope and contour wellsite to ensure proper drainage.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>November 1, 2011</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>11-2-11</b>	
By 	
Title <b>Regulatory Specialist</b>	



5125 Carroll Court, Suite 200  
Evansville, WY 82636  
307-233-8550

## Survey Certification Sheet

Date Submitted:	October 24, 2011
Operator Name:	Oasis Petroleum North America LLC
Well Name:	Bray 5301 43-12H
NDIC File No.	20864
Location:	Section 12-T153N-R101W
County/State:	McKenzie County, ND
Surveyed From a Depth of:	2,187' MD to 20,929' MD
Type of Survey:	Magnetic MWD
Name(s) of MWD Supervisor(s):	Brandon Ramirez / Brent Peterson
	Mark Hamrick / John Capra /Lukman Ajijoayla

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Professional Directional Ltd. This report represents a true and correct Directional Survey of this well based on the original data obtained at the well site. The survey was calculated using the minimum curvature method.

Robert D. Hays / Well Planner

# Oasis Petroleum North America LLC



**Project: McKenzie County, ND**  
**Site: Sec 12-T153N-R101W**  
**Well: Bray 5301 43-12H**  
**Wellbore: Original Hole**  
**Final Surveys**  
**Rig: Xtreme XCT-17**



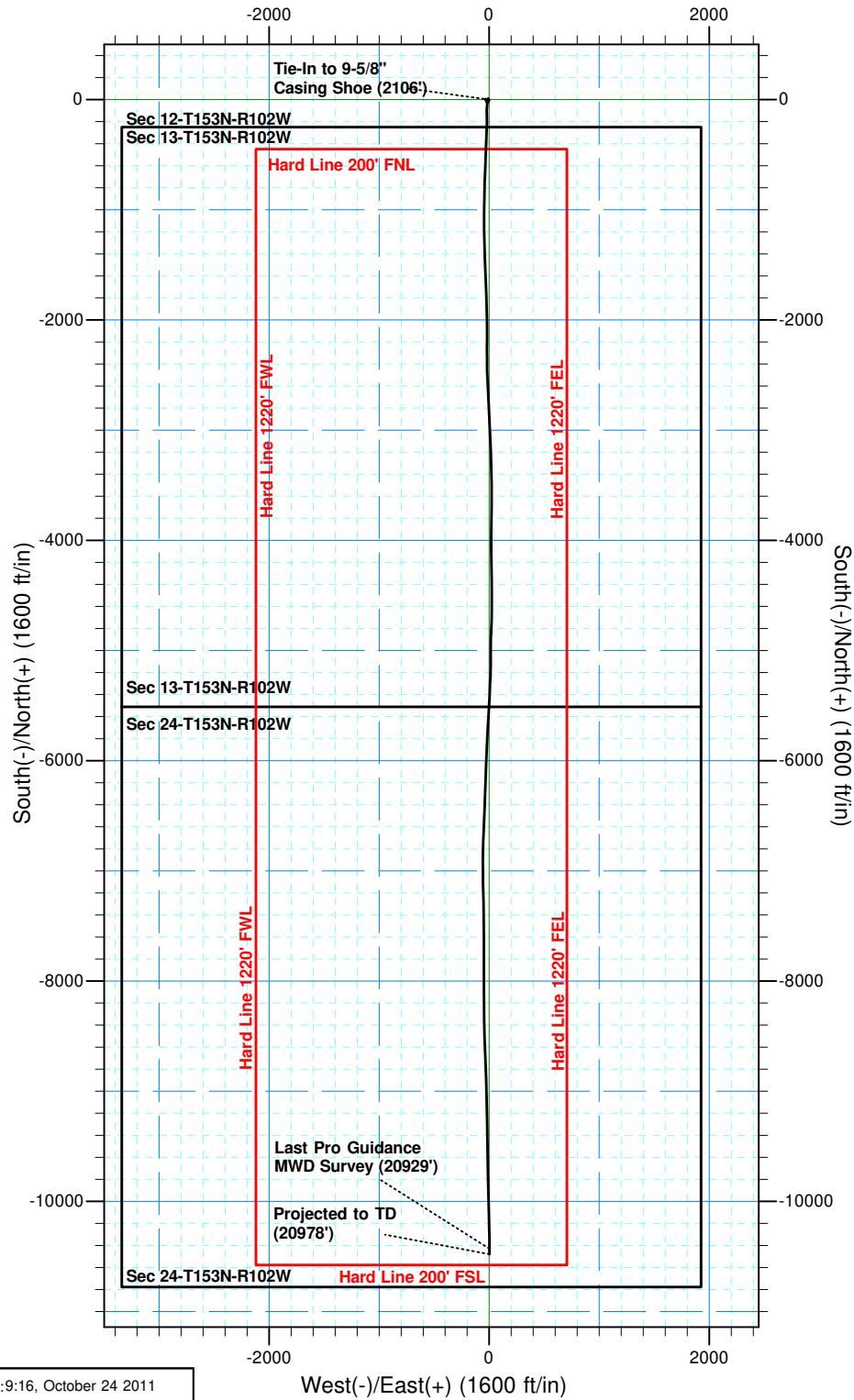
**Surface Location:**  
**SHL 250' FSL & 1927' FEL Sec 12-T153N-R101W**

US State Plane 1983  
 North Dakota Northern Zone  
**Elevation: 2074GL + 16.5' KB @ 2090.50ft (Xtreme XCT-17)**  
 Northing 410326.97      Easting 1208053.03      Latitude 48° 4' 57.960 N      Longitude 103° 36' 43.250 W

To convert a Magnetic Direction to a True Direction, Add 8.61° East

Magnetic Model: IGRF200510      Date: 22-Aug-11

Azimuths & Coordinates to True North



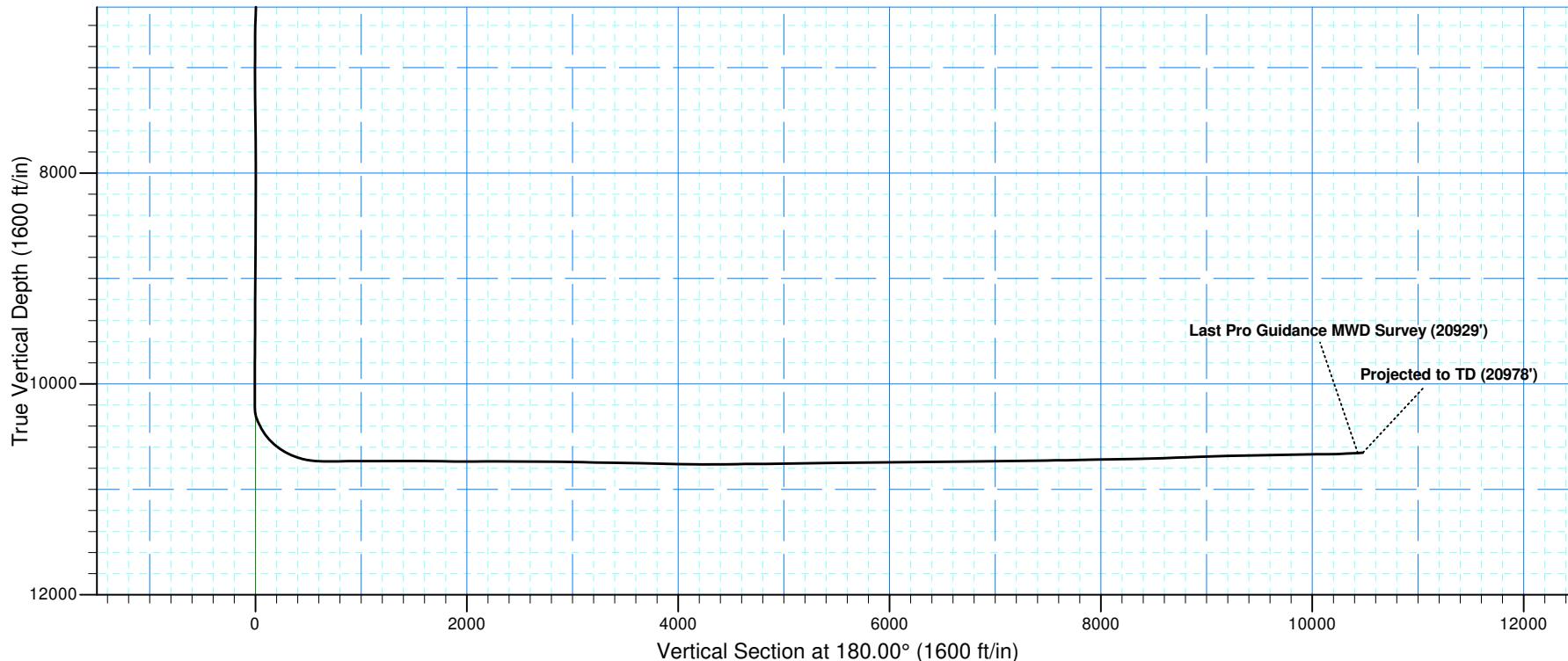
# Oasis Petroleum North America LLC



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**LLC**

**M**

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**B**

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<b>C</b>	McK	<b>L</b>	7 GL+6.0 K @ 9 f(X) M
McK		<b>TV</b>	XCT
		<b>M</b>	7 GL+6.0 K @ 9 f(X) M
<b>W</b>		<b>N</b>	XCT
<b>W</b>		<b>C</b>	T
McK	F	<b>M h</b>	M
		EDM	

<b>j</b>	McK		
<b>M</b>	U	m m	M
<b>G</b>	A c n D 98		
<b>M</b>	D k Z		

		<b>c T</b>			
			<b>N</b>	6.97 f	L
			E	, 8, f	L
			f	, f	G

<b>W</b>					
<b>W</b>	+N/-	f	<b>N</b>	6.97 f	L
	+E/-W	f	E	, 8, f	L
		f	W	f	G

<b>W</b>					
<b>M</b>	<b>M</b>	m			
			(°)	A (°)	h (°)
	IG	8/	8.6	7	6,7 6

	<b>F</b>		
<b>A</b>			
<b>V</b>	□	h	ACTUAL
<b>V</b>	h m (TV)	+N/-	T
	(f	(f	

m		□/□/□
m	T	
(f	(f	(W)
6.00	9.00 G d n c M D (g n) M	T
978.00	978.00 j c d TD (g n) M	

M	V	V	B	T
h	h	h	h	h
(f	(f	(f	(f	(f
0.00	0.00	0.00	0.00	0.00
6.00	6.00	6.00	6.00	6.00
<b>T</b>				
87.00	87.00	87.00	87.00	87.00
88.00	88.00	88.00	88.00	88.00
87.00	99.00	79.98	9.00	66
69.00	96.00	68.90	8.00	87
60.00	90.00	60.90	8.00	80



<b>C</b>	McK	A LLC	<b>L</b>			
W			<b>TV</b>			
W			<b>M</b>			
W	F		<b>N</b>	C M h		
				EDM		

M	V		V		B		T	
	h	I	h	I	+N/-	+E/-W	(%)	(%)
(f)	(°)	(f)	(°)	(f)	(f)	(f)	(%)	(%)
6.7.00	90	9.00	6.80	6.00	0.00	0.00	0.00	0.00
7.00.00	00	6.00	7.79	00	0.90	0.00	0.00	0.00
8.6.00	90	6.00	8.70	6.70	6.98	6.70	0.00	7.
9.00.00	00	9.00	9.67	9.00	9.6	9.00	0.00	0.00
9.00.00	00	9.00	9.60	00	0.00	0.00	0.00	0.00
9.8.00	00	6.00	7.6	00	0.00	0.00	0.8	0.7
9.00.00	00	8.00	8.00	00	0.00	0.00	0.00	0.00
9.6.00	00	68.70	8.00.00	00	0.78	00	0.99	0.98
9.00.00	00	8.00	9.00	00	0.6	0.00	0.00	0.6.00
9.00.00	00	7.00	9.00.00	00	0.7	0.00	0.00	0.00
98.00	00	9.00	97.00	00	0.8	0.00	0.00	0.00
69.00	00	7.00	69.00	00	0.66	0.00	0.00	0.00
787.00	00	00.00	786.00	00	0.70	0.00	0.00	0.9.79
88.00	00	88.00	88.00	00	0.70	0.00	0.00	0.00
97.00	00	96.00	97.00	00	0.90	0.00	0.00	8.
69.00	00	99.00	68.00	00	0.6	0.00	0.00	0.00
6.00.00	00	8.00	6.00	00	0.00	0.00	0.00	0.6.07
0.00.00	00	8.00	6.00	00	0.9	0.00	0.00	0.00
9.00.00	00	9.00	9.00.00	00	0.87	0.00	0.00	0.9.06
9.00.00	00	9.00	9.00.00	00	0.8	0.00	0.00	16.06
9.00.00	00	7.60	9.00	00	0.99	0.00	0.00	0.6.00
6.00.00	00	6.00	7.00	00	0.8	0.00	0.00	0.00
7.8.00	00	9.80	7.00.00	00	0.7	0.00	0.00	0.00
8.00.00	00	7.00	8.00.00	00	0.87	0.00	0.00	0.9.06
9.00.00	00	9.00	9.00.00	00	0.8	0.00	0.00	0.6.00
7.8.00	00	9.80	7.00.00	00	0.77	0.00	0.00	0.00
8.00.00	00	7.00	8.00.00	00	0.9	0.00	0.00	0.9.08
9.6.00	00	9.00	9.00.00	00	0.9	0.00	0.00	7.87
9.00.00	00	9.00	9.00.00	00	0.899	0.00	0.00	0.00
7.00.00	00	7.70	8.00.00	00	0.768	0.00	0.00	0.00
98.00	00	8.00	9.60	00	0.97.07	0.00	0.00	0.8.80
9.00.00	00	7.00	9.00.00	00	0.90.6	0.00	0.00	0.00
87.00	00	8.00	86.00	00	0.8	0.00	0.00	8
8.00.00	00	6.80	8.00.00	00	0.6	0.00	0.00	0.00
7.00.00	00	8.	7.00.00	00	0.6	0.00	0.00	0.00
669.00	00	00.00	668.00	00	0.97	0.00	0.00	0.9.68
76.00	00	8.00	76.00	00	0.80	0.00	0.00	0.70
8.7.00	00	8	8.6.00	00	0.00	0.00	0.00	0.00
9.00.00	00	69.	9.00.00	00	0.8	0.00	0.00	0.00
6,	00	6.80	6,	00	0.69	0.00	0.00	0.00
6,	00	90	6,	00	0.90	0.00	0.00	0.00
6,	00	0.00	6,	00	0.790	0.00	0.00	0.00
6,	00	0.00	6,	00	0.68	0.00	0.00	0.00
6,	00	0.00	6,	00	0.69	0.00	0.00	0.00
6,	00	0.00	6,	00	0.88	0.00	0.00	0.00



<b>C</b>	McK	<b>L</b>	7 GL+6.0 K @ 9.0 f(X)
W	c T	<b>M</b>	7 GL+6.0 K @ 9.0 f(X)
<b>W</b>	g n	<b>N</b>	XCT
W	F		T
			M
			EDM

M	h (f)	I (°)	Az (°)	V		+N/- (f)	+E/-W (f)	V (f)	H	B (°)	T (°)
				h (f)	V (f)						
6,6	0.00	0.00	9.00	6,6	0.9	8.00	0.9	0.70	0.60	6.70	
6,7	0.80	0.80	89.00	6,7	0.80	0.6	0.80	0.88	0.60	6.70	
6,796.	0.60	0.60	9.00	6,79	0.00	0.9	0.00	0.00	0.9	0.90	
6,89	0.00	0.00	0.00	6,89	0.00	0.80	0.00	0.07	0.00	68.	
6,98	0.60	0.60	6.70	6,98	0.60	0.00	0.60	0.00	0.00	0.66	
7,	0.70	0.96.00	7,	0.00	0.00	0.00	0.00	0.07	0.00	0.70	
7,	0.00	0.00	0.00	7,	0.07	0.00	0.07	0.07	0.00	0.89.06	
7,	0.00	0.00	8.80	7,	0.60	0.08	0.60	0.70	0.60	0.6.6	
7,	0.00	0.00	0.70	7,	0.08	0.00	0.08	0.00	0.00	0.06	
7,	0.00	0.00	0.90	7,	0.90	0.00	0.90	0.00	0.00	0.80	
7,	0.00	0.00	0.800	7,	0.06	0.67	0.06	0.00	0.00	0.6.80	
7,6	0.00	0.00	0.9.00	7,6	0.00	0.9.00	0.00	0.00	0.00	0.9.68	
7,7	0.80	0.00	0.9.60	7,7	0.00	0.8.00	0.00	0.07	0.00	0.80	
7,8	0.70	0.00	0.8.00	7,8	0.60	0.6.96	0.60	0.06	0.00	0.6.80	
7,9	0.60	9	7,9	0.77	0.00	0.90	0.77	0.09	0.00	0.00.80	
8,	0.00	8	8,	0.170	0.00	0.70	0.00	0.00	0.00	0.8.00	
8,	0.00	0.00	8	0.00	0.00	0.07	0.00	0.00	0.00	0.00.80	
8,	0.00	0.00	7	8,	0.00	0.00	0.07	0.00	0.00	0.00.6	
8,	0.00	0.00	0.00	8,	0.00	0.00	0.06	0.00	0.00	0.00.00	
8,	0.00	0.00	0.90	8,	0.00	0.00	0.00	0.06	0.00	0.00.80	
8,	0.00	0.00	0.00	8,	0.00	0.00	0.00	0.00	0.00	0.00.80	
8,	0.00	0.00	0.00	8,	0.00	0.00	0.00	0.07	0.00	0.00.80	
8,68	0.60	0.00	0.00	8,678.87	0.00	0.08	0.00	0.08	0.00	0.00.00	
8,77	0.80	0.00	66.6	8,77	0.06	0.9.80	0.06	0.06	0.00	0.00.00	
8,868.	0.00	0.00	69.	8,866.8	0.70	0.00	0.00	0.00	0.00	0.00.66	
8,96	0.00	0.00	7	8,96	0.00	0.00	0.00	0.00	0.00	0.00.6	
9,	0.00	0.00	7	9,	0.00	0.00	0.00	0.00	0.00	0.00.00	
9,	0.00	0.00	66.	9,	0.00	0.00	0.00	0.00	0.00	0.00.6	
9,	0.70	0.00	7	9,	0.00	0.00	0.00	0.00	0.00	0.00.79	
9,	0.00	0.00	7	9,	0.00	0.00	0.00	0.00	0.00	0.00.00	
9,	0.00	0.00	6	9,	0.00	0.00	0.00	0.00	0.00	0.00.7.6	
9,	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00.6.00	
9,6	0.00	0.00	0.00	9.6	0.00	0.00	0.00	0.00	0.00	0.00.90	
9,7	0.00	0.00	0.00	9.7	0.00	0.00	0.00	0.00	0.00	0.00.6.80	
9,8	0.00	0.00	0.00	9.8	0.00	0.00	0.00	0.00	0.00	0.00.87	
9,9	0.00	0.00	8	9,9	0.00	0.00	0.00	0.00	0.00	0.00.00	
9,999.	0.00	0.00	0.00	9.997.78	0.00	0.00	0.00	0.00	0.00	0.00.07	
00,090.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00.76	
00,070.00	0.00	0.00	0.00	9.90	0.00	0.00	0.00	0.00	0.00	0.00.77	
00,087.00	0.00	0.00	0.00	8.77	0.00	0.00	0.00	0.00	0.00	0.00.70	
00,088.00	0.00	0.00	0.00	87.00	0.00	0.00	0.00	0.00	0.00	0.00.80	
00,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00.00	



<b>C</b>	□ □□□□□□□□□□□□□□□ A □□c□LLC	<b>L</b>	□ □□□□□□□□□□□□□□□
□□j□□□	McK	<b>T</b>	□□7□GL+□6.□□K□@□□□9□□f□(X□□□□
□□□□□	□□c□□T□□□□□□□□	<b>M</b>	XCT
<b>W</b>	□□□□□□□□□□□□□□□	<b>N</b>	□□7□GL+□6.□□K□@□□□9□□f□(X□□□□
<b>W</b>	□□g□n□□□□□	□□□□□□C□□□□□□□□M□h□□□	XCT
□□□□□□	F	□□□□□□□□□□	T
			M
			EDM

M	V						V			B	T
	□□□h	I	Az	□□□h	+N/-	+E/-W	□□□□□	□□□	(°)		
(f	(°)	(°)	(f	(f	(f	(f	(f	(f	(°)	(f	(°)
□□,8□□	9.	□□,99.□□	□□,79.□□	□□,6	□□,6□	□□,6	□□,□□□	□□,□□	□□,□□	□□,□□	□□,7.□□
□□,□□□.□□	□□,7□	□□,9□9□	□□,□□□.67	□□,8	□□,□□	□□,8	□□,□□□	□□,□□	□□,□□	□□,□□	□□,9.8□
□□,□□□.□□	□□,□□	□□,89.□□	□□,□□□.99	□□,□□	□□,□□	□□,□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,8.□□
□□,76.□□	□□,6□□	□□,86.9□	□□,□□□.6	□□,8.□□	□□,6.□□	□□,8.□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,7.□□
□□,□□7.□□	□□,7.6□	□□,86.□□	□□,□□□.96.77	□□,□□	□□,7.6□	□□,□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.6
□□,□□9.□□	□□,9.6□	□□,86.□□	□□,□□□.86	□□,7.7	□□,9.□□	□□,7.□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□
□□,□□7.□□	□□,8□	□□,8□9□	□□,□□□.□□	□□,7.□□	□□,8□	□□,7	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.9
□□,□□□.□□	□□,9□	□□,8□□□	□□,□□□.77.6	□□,89.99	□□,□□	□□,89.99	□□,□□□	□□,□□	□□,□□	□□,□□	□□,6.77
□□,□□□.□□	□□,7□	□□,8□□□	□□,□□□.6	□□,8.6□	□□,□□	□□,8.6□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□□
□□,6□□	□□,1□	□□,78.□□	□□,□□□.7.□□	□□,8.□□	□□,8.□□	□□,8.□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.6
□□,96.□□	□□,6□	□□,78.6□	□□,□□□.7	□□,□□	□□,7□	□□,□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□
□□,6□7.□□	□□,9.6□	□□,79.□□	□□,□□□.6.□□	□□,7.□□	□□,□□	□□,7.□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.9
□□,6□8.□□	□□,9□	□□,8□□□	□□,□□□.9	□□,97.16	□□,□□	□□,97.6	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.87
□□,69.□□	□□,7□	□□,8□6□	□□,□□□.6.9.69	□□,□□□	□□,69	□□,□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.7□
□□,7□□.□□	□□,8□□	□□,8□□□	□□,□□□.6.6.□□	□□,9.□□	□□,□□	□□,9.□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.97
□□,7□□.□□	6	□□,8□□□	□□,6□□□.□□	□□,7.97	□□,9□	□□,7.97	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.6□
□□,78.□□	6	□□,8□8□	□□,6□8.6	□□,88	□□,□□	□□,88	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.9□
□□,8□□.□□	6	□□,8□8□	□□,67□.9	□□,□□□.6	□□,99	□□,□□□.6	□□,□□	□□,□□	□□,□□	□□,□□	□□,□□
□□,8□6.□□	67.	□□,8□7□	□□,68□.7□	□□,9.□□	□□,□□	□□,9.□□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.9□
□□,878.□□	7	□□,8□7□	□□,696.99	□□,89.□□	□□,6.□□	□□,89.□□	□□,7□	□□,7□	□□,7□	□□,7□	□□,□□
□□,9□9.□□	7	□□,8□□□	□□,7□□.9□	□□,8.87	□□,7.8□	□□,8.87	□□,7□	□□,7□	□□,6□	□□,6□	□□,□□.9
□□,9□□.□□	77.	□□,8□.8□	□□,7□□.6□	□□,9.9□	□□,9.□□	□□,9.9□	□□,7.6	□□,7.6	7.	7.	□□,□□.6
□□,97□.□□	78.	□□,8□.□□	□□,7□□.□□	□□,8.□□	□□,8.□□	□□,8.□□	□□,8.6	□□,8.6	□□,□□	□□,□□	□□,□□.6□
□□,□□□.□□	8	□□,8□7□	□□,7□□.76	□□,□□□.6□	□□,□□	□□,□□□.6□	□□,7.66	□□,7.66	7.	7.	□□,□□.9□
□□,□□□.□□	8	□□,8□9□	□□,7□□.9.8□	□□,□□□.□□	□□,□□	□□,□□□.8□	□□,□□□	□□,□□	□□,□□	□□,□□	□□,□□.67
□□,8□□.□□	87.7	□□,8□8□	□□,7□□.66	□□,9□□□	□□,□□	□□,□□□.6	□□,9□□□	□□,□□	7.	7.	□□,□□.9
□□,79.□□	9	□□,8□□□	□□,7□□.□□	686.□□	□□,8□	686.	□□,□□	□□,□□	□□,□□	□□,□□	□□,□□.9□
□□,7□□.□□	9	□□,8□□□	□□,7□□.6	78□□	□□,□□	78	□□,□□	□□,□□	□□,6□	□□,6□	□□,□□.7
□□,67.□□	9	□□,8□□□	□□,7□□.98	87.98	□□,□□	87	□□,□□	□□,□□	□□,□□	□□,□□	□□,□□
□□,□□□.□□	89.	□□,8□□□	□□,7□□.87	9.6.96	□□,□□	9.□□	9	□□,□□	□□,□□	□□,□□	□□,□□.6
□□,□□□.□□	9	□□,8□□□	□□,7□□.7	□□,□□□.9□	□□,□□	□□,□□□.8	□□,□□□.9□	□□,□□	□□,□□	□□,□□	□□,□□
□□,6□9.□□	89.6	□□,79.□□	□□,7□□.6	□□,□□□.9□	□□,□□	□□,□□□.86	□□,□□□.9□	□□,□□	□□,□□	□□,□□	□□,□□.79
□□,7□□.□□	9	□□,78.9□	□□,7□□.6	□□,□□□.9□	□□,□□	□□,□□□.9□	□□,□□□.9□	□□,□□	□□,□□	□□,□□	□□,□□.6
□□,8□9.□□	9	□□,78.9□	□□,7□□.8	□□,□□□.9□	□□,□□	□□,□□□.7□	□□,□□□.9□	□□,□□	□□,□□	□□,□□	□□,□□
□□,9□□.□□	89.	□□,78.□□	□□,7□□.97	□□,□□□.86	□□,□□	□□,□□□.86	□□,□□□.86	□□,□□	□□,□□	□□,□□	□□,□□.8
□□,999.□□	89.	□□,77.6□	□□,7□□.□□	□□,□□□.78	□□,□□	□□,□□□.76	□□,□□□.78	□□,□□	□□,□□	□□,□□	□□,□□
□□,9□□.□□	9	□□,77.□□	□□,7□□.88	□□,6□□.68	□□,□□	□□,□□□.7	□□,□□□.68	□□,□□	□□,□□	□□,□□	□□,□□
□□,89.□□	89.	□□,77.6□	□□,7□□.□□	□□,69□.□7	□□,□□	□□,□□□.88	□□,□□□.87	□□,□□	□□,□□	□□,□□	□□,□□
□□,8□□.□□	88.6	□□,76.7□	□□,7□□.□□	□□,79.□□	□□,□□	□□,□□□.79	□□,□□□.79	□□,□□	□□,□□	□□,□□	□□,□□.9□
□□,79.□□	89.	□□,79.7□	□□,7□□.□□	□□,88.□□	□□,□□	□□,□□□.7	□□,□□□.6	□□,□□	□□,□□	□□,□□	□□,□□.6
□□,7□□.□□	9	□□,8□□□	□□,7□□.7□	□□,98.□□	□□,□□	□□,□□□.9	□□,□□□.98	□□,□□	□□,□□	□□,□□	□□,□□
□□,69.□□	9	□□,79.□□	□□,7□□.6□	□□,7□□.□□	□□,□□	□□,□□□.7	□□,□□□.7	□□,□□	□□,□□	□□,□□	□□,□□



<b>C</b>	McK	<b>L</b>	7 GL+6. K @ 9 f(X)
W	c T	M	7 GL+6. K @ 9 f(X)
W	g n	N	XCT
F			T
			M
			EDM

M	h (f)	I (°)	Az (°)	V		+E/-W (f)	V (f)	B (°)	T (°)
				h (f)	+N/- (f)				
66.00	9	8.00	7.08	7.00	7.00	9	7.00	6.0	6.0
79.00	9	79.70	7.07	6.00	6.00	8	6.00	7.0	7.0
8.00	88.9	79.80	7.00	6.00	6.00	9.76	6.00	9.0	89.
9.00	89.	78.90	7.6.00	9.00	9.00	8.68	9.00	8.0	9.0
9.00	89.	76.60	7.7.00	9.00	9.00	9.00	9.00	9.00	9.00
9.00	89.8	78.00	7.8.7	6.00	6.00	9.00	6.00	6.66	8.0
9.00	9	77.00	7.8.9	7.00	7.00	6.00	7.00	7.0	6.0
09.00	9	76.70	7.9.00	8.00	8.88	8.00	8.00	8.00	8.00
09.00	88.	77.00	7.9.00	9.9.70	9.9.70	0.00	9.9.70	98	79
09.00	88.	77.00	7.0.8	0.00	6.0	7.7	0.00	0.00	0.00
6.00	89.	76.80	7.00	0.00	8.07	0.00	0.00	98	70
7.00	89.	78.00	7.0.6	0.00	0.00	6.70	0.00	0.07	0.07
8.00	88.6	79.00	7.7.00	0.00	8.00	8.70	0.00	0.06	0.07
898.00	89.	79.80	7.9.07	0.00	0.00	9.00	0.00	0.08	0.00
99.00	9	79.00	7.9.77	98.00	98.00	9.96	98.00	9.0	8.0
88.00	88.	78.80	7.00	0.00	0.00	0.00	0.00	0.09	0.06
8.00	87.6	8.00	7.0.9	688.00	688.00	0.00	688.00	0.06	0.07
78.00	88.	8.00	7.7.00	78.00	78.00	0.00	78.00	0.06	0.07
7.00	88.7	8.00	76.00	878.08	878.08	0.00	878.08	0.00	0.00
68.00	89.	8.00	76.60	97.00	97.00	6.98	97.00	0.08	0.07
6.00	9	78.90	76.79	68.00	68.00	7.06	68.00	0.09	0.08
6.8.00	89.	79.00	76.00	0.00	0.00	8.89	0.00	0.07	0.06
7.00	89.8	78.60	76.00	0.00	0.00	0.00	0.00	0.07	0.09
8.7.00	89.	78.80	76.80	0.00	0.00	0.00	0.00	0.07	0.00
9.00	9	79.00	76.90	0.00	0.00	0.00	0.00	0.09	0.00
8.00	9	8.00	76.00	0.00	0.00	0.00	0.00	0.07	0.07
9.00	9	8.00	7.9.80	0.00	0.00	0.00	0.00	0.08	0.07
08.00	89.	8.00	7.8.8	7.00	8.86	0.00	7.00	0.00	0.09
09.00	89.	8.00	7.9.8	8.77	8.77	7.79	8.77	0.00	0.00
08.00	9	8.00	7.9.6	9.00	7.0	0.00	9.00	0.00	0.06
09.00	9	8.00	7.8.0	0.00	0.00	0.00	0.00	0.08	0.07
6.8.00	9	8.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00	9	8.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00
797.00	9	8.00	7.00	0.00	0.00	0.00	0.00	0.07	0.00
89.00	9	8.60	7.00	0.00	0.00	0.00	0.00	0.97	0.90
987.00	9	8.00	7.9.00	0.00	0.00	0.00	0.00	0.06	0.06
6.8.00	9	8.00	7.8.00	0.00	0.00	0.00	0.00	0.07	0.00
6.77.00	9	8.00	7.6.60	0.00	0.00	0.00	0.00	0.00	0.00
6.7.00	89.	8.00	7.6.60	0.00	0.00	0.00	0.00	0.00	0.00
6.67.00	9	8.00	7.7.8	0.00	0.00	0.00	0.00	0.00	0.00
6.6.00	9	8.00	7.6.60	0.00	0.00	0.00	0.00	0.00	0.00
6.07.00	9	8.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00



M	V						V						B		T	
	□□□h	I	Az	□□□h	+N/-	+E/-W	□□□□□	(f)	(°)	(f)	(°)	(f)	(°)	(f)	(°)	(f)
6,6□□.□□	9	□8.□□	□□,7□□.□8	6,□□□.□□	□□.89	6,	□.□□							□.□□	□.□□	
6,7□8.□□	89.7	□8.□□	□□,7□□.□9	6,□□□.□□	□□.7	6,	□6□							□.6□	□.□□	
6,8□□.□□	89.7	□8.□9	□□,7□□.99	6,□□6.□□	□8.97	6,	□□□							□.□□	□.□□	
6,9□8.□□	9	□8.6□	□□,7□□.□6	6,□□□.□7	□□.7□	6,	□8□							□.□□	□.7□	
7,□□□.□□	9	□8.□□	□□,7□□.□□	6,□□6.□8	□6.76	6,	□□□							□.6	□.□□	
7,□□8.□□	9	□8.9□	□□,7□□.□□	6,6□□.97	□□.7	6,6	□.□□							□.8□	□.6□	
7,□□□.□□	89.9	□8.□□	□□,7□□.□7	6,7□□.9□	□□.6□	6,7	□7□							□.6□	□.8	
7,□□7.□□	9	□8.□□	□□,7□□.□7	6,8□□.88	□6.68	6,8	□.□8							□.□□	□.□□	
7,□□□.□□	9	□79.□□	□□,7□□.676	6,9□□.87	□7.□□	6,9	□9□							□.□□	□.89	
7,□□7.□□	9	□79.6□	□□,7□□.□□	7,□□9.86	□6.□□	7,	□8□							□.7□	□.□□	
7,6□□.□□	9	□79.9□	□□,7□□.9□	7,□□□.8□	□□.69	7,	□.□□							□.9□	□.□□	
7,697.□□	9	□79.□□	□□,7□□.87	7,□□9.79	□□.□□	7,	□7□							□.6□	□.□□	
7,79□.□□	9	□78.7□	□□,7□□.□□	7,□□9.77	□□.7	7,	□67							□.6□		
7,887.□□	9	□78.9□	□□,7□□.□□	7,□□9.7□	□□.8	7,	□87							□.8□	□.□□	
7,98□.□□	9	□78.8□	□□,7□□.66	7,□□8.69	□9.□7	7,	□8□							□.8□	□.□□	
8,□77.□□	89.8	□79.□□	□□,7□□.□□	7,□□9.66	□□.9□	7,	□□7							□.□□	□.□□	
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8,□□□.□□	89.	□8.8□	□□,7□□.67	8,□□□.□□	□8.6□	8,	□.□9							□.□□	□.□□	
8,6□7.□□	9	□79.□□	□□,7□□.88	8,□□9.□□	□8.□6	8,	□□□							□.□□	□.88	
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8,9□□.□□	9	□78.9□	□□,7□□.8	8,□□□.□8	□□.7	8,	□97							□.9□		
9,□□7.□□	9	□78.□□	□□,7□□.□□	8,□□9.□7	□□.□□	8,	□9□							□.□□	□.9□	
9,□□□.□□	9	□77.□□	□□,7□□.□□	8,6□□.□□	□8.□□	8,6	□97							□.6□	□.7□	
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9,□□□.□□	9	□79.□□	□□,69□.□□	9,□□□.67	□□.□□	9,	□□□							□.6	□.□□	
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9,□69.□□	9	□78.□□	□□,68□.6□	9,□□9.□8	□□.6□	9,	□86							□.6□	□.96	
9,□78.□□	9	□78.6□	□□,68□.96	9,□□6.□□	□8.86	9,	□99							□.8□	□.□□	
9,□88.□□	9	□78.9□	□□,679.□□	9,□□8.□6	□6.77	9,	□9□							□.88	□.□□	
9,976.□□	9	□79.□□	□□,678.□□	9,□□7.□□	□□.□□	9,	□97							□.9□	□.□□	
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□□,6□□.□□	9	□8.□□	□□,676.□□	9,666.□□	□□.9	9,666.	□□□							□.6□	□.8	
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□□,6□□.□□	9	□78.8□	□□,67□.8	9,8□□.7□	□□.6	9,8	□□□							□.□□	□.□□	
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□□,□□□.□□	89.	□77.9□	□□,668.6□	9,□□6.□9	□□.7	□□,6.□9	□□□							□.□□	□.□□	



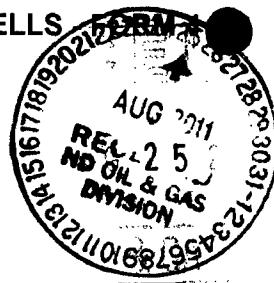
<b>C</b>	□□□□□□□□□□□□□□□□A□□c□LLC	<b>L</b>	□□□□□□□□□□□□□□□□
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# SUNDRY NOTICES AND REPORTS ON WELLS

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)



Well File No.  
**20864**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>August 24, 2011</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	<b>Waiver to rule Rule 43-02-03-31</b>

Well Name and Number <b>Bray 5301 43-12H</b>				
Footages <b>250 F S L</b>	Qtr-Qtr <b>1927 F E L</b>	Section <b>SWSE 12</b>	Township <b>153 N</b>	Range <b>101 W</b>
Field <b>Wildcat</b>	Pool <b>Bakken</b>	County <b>McKenzie</b>		

24-HOUR PRODUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

## DETAILS OF WORK

Oasis Petroleum respectfully requests a waiver to Rule 43-02-03-31 in regards to running open hole logs for the above referenced well. Justification for this request is as follows:

The Oasis Petroleum/Lewis Federal 5300-31-31H (NDIC 20314) located within a half mile of the subject well  
*Kline Federal 5300 11-18H (NDIC# 20275)*

If this exception is approved, Oasis Petroleum will run a CBL on the intermediate string, and we will also run GR to surface. Oasis Petroleum will also submit two digital copies of each cased hole log and a copy of the mud log containing MWD gamma ray.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>	
Title <b>Regulatory Specialist</b>	Date <b>August 24, 2011</b>	
Email Address <b>bterry@oasispetroleum.com</b>		

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>9-1-2011</b>	
By 	
Title <b>Richard A. Suggs Geologist</b>	

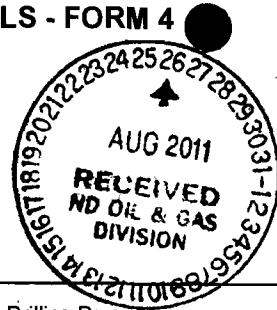


# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA

OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.  
**20864**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Notice of Intent

Approximate Start Date  
**August 27, 2011**

Report of Work Done

Date Work Completed

Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.

Approximate Start Date

Drilling Prognosis

Spill Report

Redrilling or Repair

Shooting

Casing or Liner

Acidizing

Plug Well

Fracture Treatment

Supplemental History

Change Production Method

Temporarily Abandon

Reclamation

Other      **suspend drilling operations**

Well Name and Number  
**Bray 5301 43-12H**

Footages

**250**

F

S

L

**1927**

F

E

L

**SWSE**

Qtr-Qtr

Section

**12**

Township

**153 N**

Range

**101 W**

Field

**Wildcat**

Pool

**Bakken**

County

**McKenzie**

## 24-HOUR PRODUCTION RATE

Before	After
Oil	Bbls
Water	Bbls
Gas	MCF

Name of Contractor(s)

Address

City

State

Zip Code

## DETAILS OF WORK

We respectfully request permission to suspend drilling operations for the subject well. Oasis intends to have XTC-17 drill the 8-3/4" hole and run and cement 7" casing. While waiting on cement, we will skid the rig 100' to the east onto the Foley Federal 5301 43-12H with 5" drill pipe in the derrick to begin drilling operations in the 8-3/4" hole for this well. Once we run and cement the 7" casing, we will continue with operations and drill our 6" lateral to TD. We will run our liner and packers and finish operations on the Foley Federal 5301 43-12H before skidding back to the Bray 5301 43-12H to do the same. This method of drilling will save Oasis several days of rig time which results in cost savings for our operations.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9491</b>
---	---

Address

**1001 Fannin, Suite 1500**

City

**Houston**

State

**TX**

Zip Code

**77002**

Signature

Printed Name

**Brandi Terry**

Title

**Regulatory Specialist**

Date

**August 25, 2011**

Email Address

**bterry@oasispetroleum.com**

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>8-30-2011</b>	
By <b>David Tabor</b>	
Title <b>Engineering Technician</b>	



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.  
**20864**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>August 27, 2011</b>
<input type="checkbox"/> Report of Work Done	Date Work Completed
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	
Approximate Start Date	

<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
<input checked="" type="checkbox"/> Other	<u>suspend drilling operations</u>

Well Name and Number <b>Bray 5301 43-12H</b>					
Footages <b>250 F S L</b>	Qtr-Qtr <b>1927 F E L</b>	SWSE	Section <b>12</b>	Township <b>153 N</b>	Range <b>101 W</b>
Field <b>Wildcat</b>	Pool <b>Bakken</b>	County <b>McKenzie</b>			

24-HOUR PRODUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address		City	State
			Zip Code

## DETAILS OF WORK

We respectfully request permission to suspend drilling operations for the subject well. Oasis intends to have XTC-17 drill the 8-3/4" hole and run and cement 7" casing. While waiting on cement, we will skid the rig 100' to the east onto the Foley Federal 5301 43-12H with 5" drill pipe in the derrick to begin drilling operations in the 8-3/4" hole for this well. Once we run and cement the 7" casing, we will continue with operations and drill our 6" lateral to TD. We will run our liner and packers and finish operations on the Foley Federal 5301 43-12H before skidding back to the Bray 5301 43-12H to do the same. This method of drilling will save Oasis several days of rig time which results in cost savings for our operations.

Company <b>Oasis Petroleum North America LLC</b>		Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin, Suite 1500</b>			
City <b>Houston</b>		State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Brandi Terry</b>		
Title <b>Regulatory Specialist</b>	Date <b>August 25, 2011</b>		
Email Address <b>bterry@oasispetroleum.com</b>			

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>8-30-2011</b>	
By 	
Title <b>Engineering Technician</b>	



SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2008)

**PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY**

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>June 30, 2011</b>
<input type="checkbox"/> Report of Work Done	Date Work Completed
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date



Well File No. 20864

- |   |   |
|---|---|
| <input type="checkbox"/> Drilling Prognosis   | <input type="checkbox"/> Spill Report             |
| <input type="checkbox"/> Redrilling or Repair | <input type="checkbox"/> Shooting                 |
| <input type="checkbox"/> Casing or Liner      | <input type="checkbox"/> Acidizing                |
| <input type="checkbox"/> Plug Well            | <input type="checkbox"/> Fracture Treatment       |
| <input type="checkbox"/> Supplemental History | <input type="checkbox"/> Change Production Method |
| <input type="checkbox"/> Temporarily Abandon  | <input type="checkbox"/> Reclamation              |
| <input checked="" type="checkbox"/> Other     | <b>Offsite Battery</b>                            |

Well Name and Number <b>Bray 5301 43-12H</b>											
Footages				Qtr-Qtr	Section	Township	Range				
250	F	S	L	1927	F	E	L	SWSE	12	153 N	101 W
Field <b>Wildcat</b>				Pool <b>Bakken</b>				County <b>McKenzie</b>			

24-HOUR PRODUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)

Address	City	State	Zip Code
---------	------	-------	----------

## **DETAILS OF WORK**

Oasis Petroleum respectfully request to build an offsite tank battery in the SESW of Section 12 T153N R101W (plat attached). This tank battery will be used for the Kline 5300 11-18H (NDIC 20275), Bray 5301 43-12H (NDIC 20864)/Foley Federal 5301 43-12H (NDIC 20863). The production will not be commingled, the facilities will just be in one central location.

Company <b>Oasis Petroleum North America LLC</b>		Telephone Number <b>281-404-9491</b>
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>		State <b>TX</b>
Signature 		Zip Code <b>77002</b>
Signature 		Printed Name <b>Brandi Terry</b>
Title <b>Regulatory Specialist</b>		Date <b>June 30, 2011</b>
Email Address <b>bterry@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date	7-19-2011
By	<i>Glenn L. Wollan</i>
Title	GLENN L. WOLLAN Field Supervisor

# PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE

"BRAY 5301 43-12H"  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



NOTE: All utilities shown are preliminary only. A complete utilities location is recommended before construction.

3



Professionals you need, people you trust

SHEET NO.

Interstate Engineering, Inc.  
P.O. Box 648  
425 East Main Street  
Sidney, Montana 59270  
Ph (406) 433-5617  
Fax (406) 433-5618  
[www.ieng.com](http://www.ieng.com)  
Our offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
PAD LAYOUT  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	H.J.G.	Project No.:	S109-107
Checked By:	A.J.H.R.L.P.	Date:	OCT 2010

Revision No.	Date	By	Description

**BATTERY LOCATION PLAT**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"KLINE/BRAY/FOLEY BATTERY SITE"  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

CALCULATED FROM WITNESS CORNER

AZ 90°34'49"

2691.29'

FRCM WITNESS CORNER

AZ 92°40'05"

2573.48'

CALCULATED FROM WITNESS CORNER

FOUND STONE & REBAR

AZ 0°00'47"

330.00'

AZ 92°40'05"

19.80'

AZ 0°03'22"

66.00'

AZ 0°00'47"

495.44'

AZ 0°03'34"

1000'

AZ 91°06'8"

5278.56'

AZ 0°03'22"

2625.00'

1360'

70'

KLINE/BRAY/FOLEY BATTERY SITE

FCUND STCNE

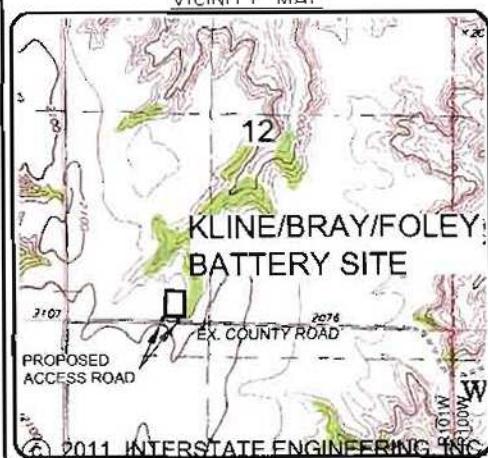
FOUND REBAR W/ 2" AC LS 2352

R100W

VICINITY MAP

MONUMENT RECOVERED

MONUMENT - NOT RECOVERED



STAKED ON 6/01/II  
VERTICAL CONTROL DATUM WAS BASED UPCM  
CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF FABIAN KJØRSTAD OF OASIS PETROLEUM. I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS WORK PERFORMED BY ME OR UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

CARL S. VENDER LS. #222  
INTERSTATE ENGINEERING INC.

A circular stamp with "NORTH DAKOTA" at the top and "LAND SURVEYOR" at the bottom. The center contains "CALIFORNIA", "S.", "VENDER", "1222", "6/06/11", and "REGISTERED".

117



 INTERSTATE  
ENGINEERING

SHEET NO.

Interstate Engineering, Inc.  
P.O. Box 643  
425 East Main Street  
Sidney, Montana 59270  
Ph (406) 433-5617  
Fax (406) 433-5618  
[www.leng.com](http://www.leng.com)  
Other offices in Minnesota, North Dakota and South Dakota

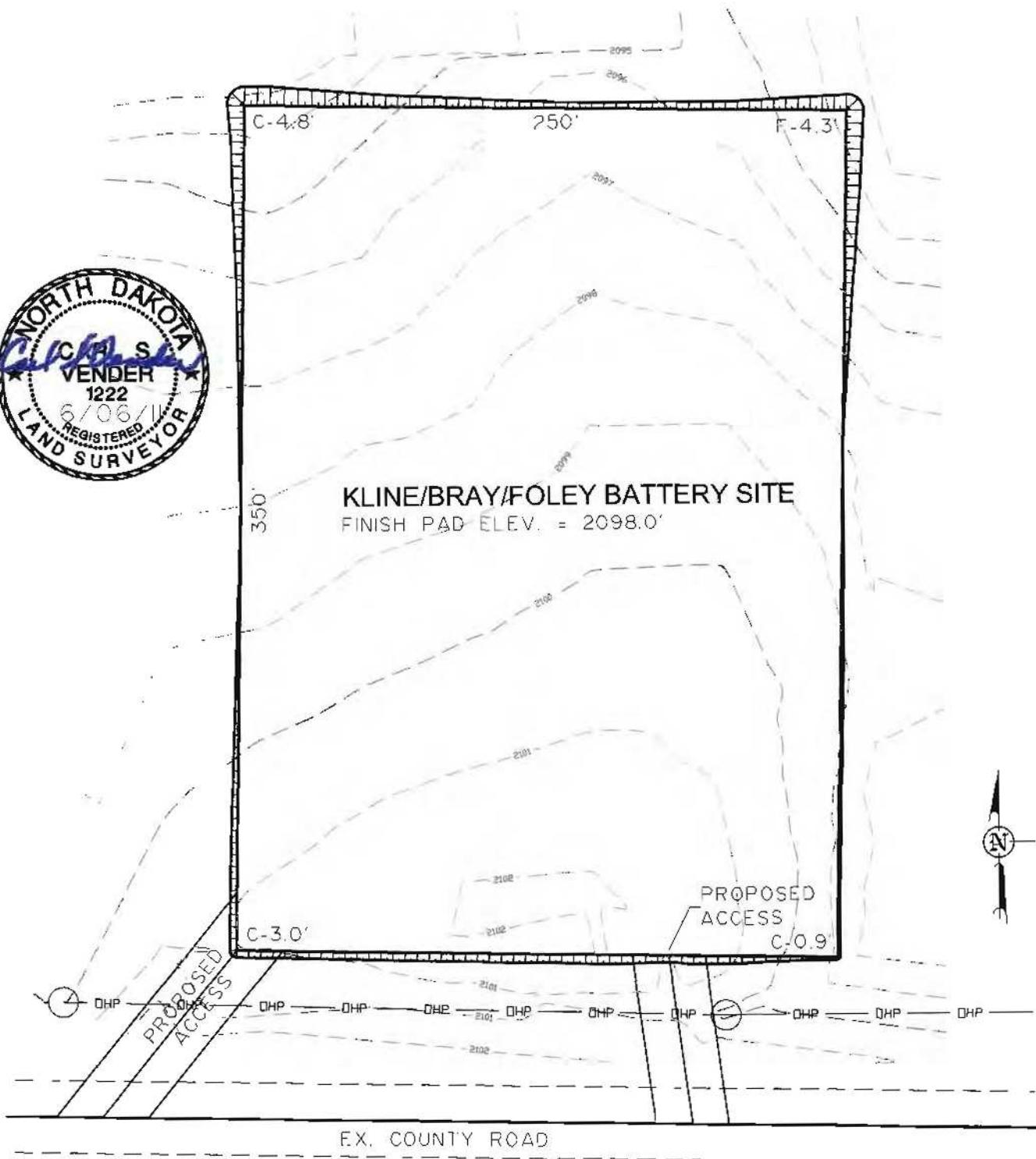
OASIS PETROLEUM NORTH AMERICA, LLC  
WELL LOCATION PLAT  
SECTION 12, T153N, R101W

Revision No.	Date	By	Description
REV 1	6/06/11	HJD	BATTERY NAME CHANGE

## PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"KLINE/BRAY/FOLEY BATTERY SITE"

**REINE/BRATT CLEY BATTERY ONE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA**



NOTE: All utilities shown are preliminary only, a complete utility location is recommended before construction.

0                    80  
  
1" = 80'

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SHEET NO.

**Interstate Engineering, Inc.**  
P.O. Box 648  
425 East Main Street  
Sidney, Montana 59270  
Ph (406) 433-5617  
Fax (406) 433-5818  
[www.lengi.com](http://www.lengi.com)

OASIS PETROLEUM NORTH AMERICA, LLC  
PAD LAYOUT  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

Project No.: S11-9-137  
Date: JUNE 2011

Description	Date	By	Revision No.
BATTERY NAME CHANGE	6/06/01	HJC	REV 1



COUNTY ROAD MAP  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"KLINE/BRAY/FOLEY BATTERY SITE"  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

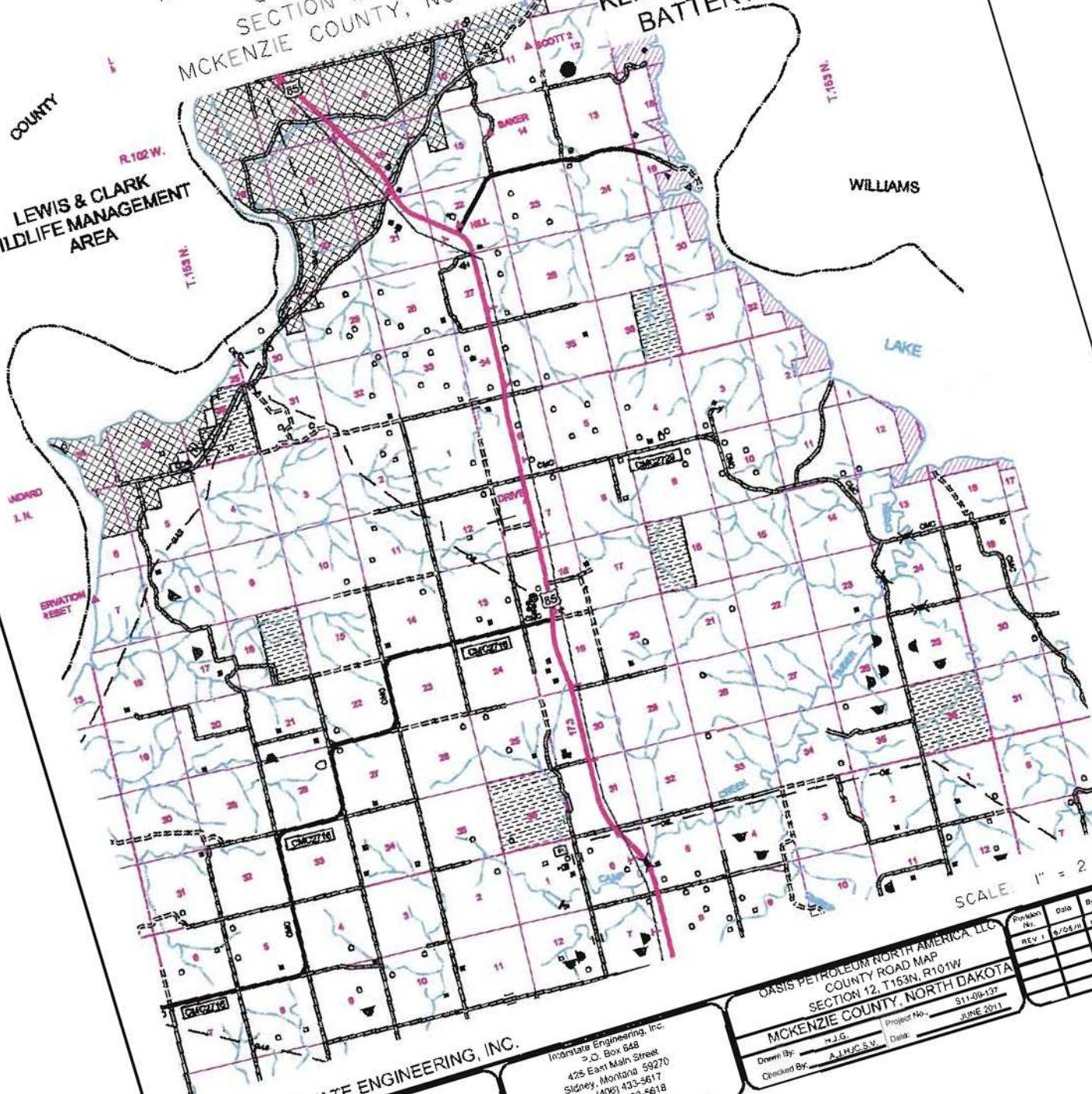
OASIS PETROLEUM NORTH AMERICA, LLC  
KLINE/BRAY/FOLEY BATTERY SITE  
QUAD LOCATION MAP  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

KLINE/BRAY/FOLEY  
BATTERY SITE

COUNTY  
R.102W.  
LEWIS & CLARK  
WILDLIFE MANAGEMENT  
AREA

WILLIAMS

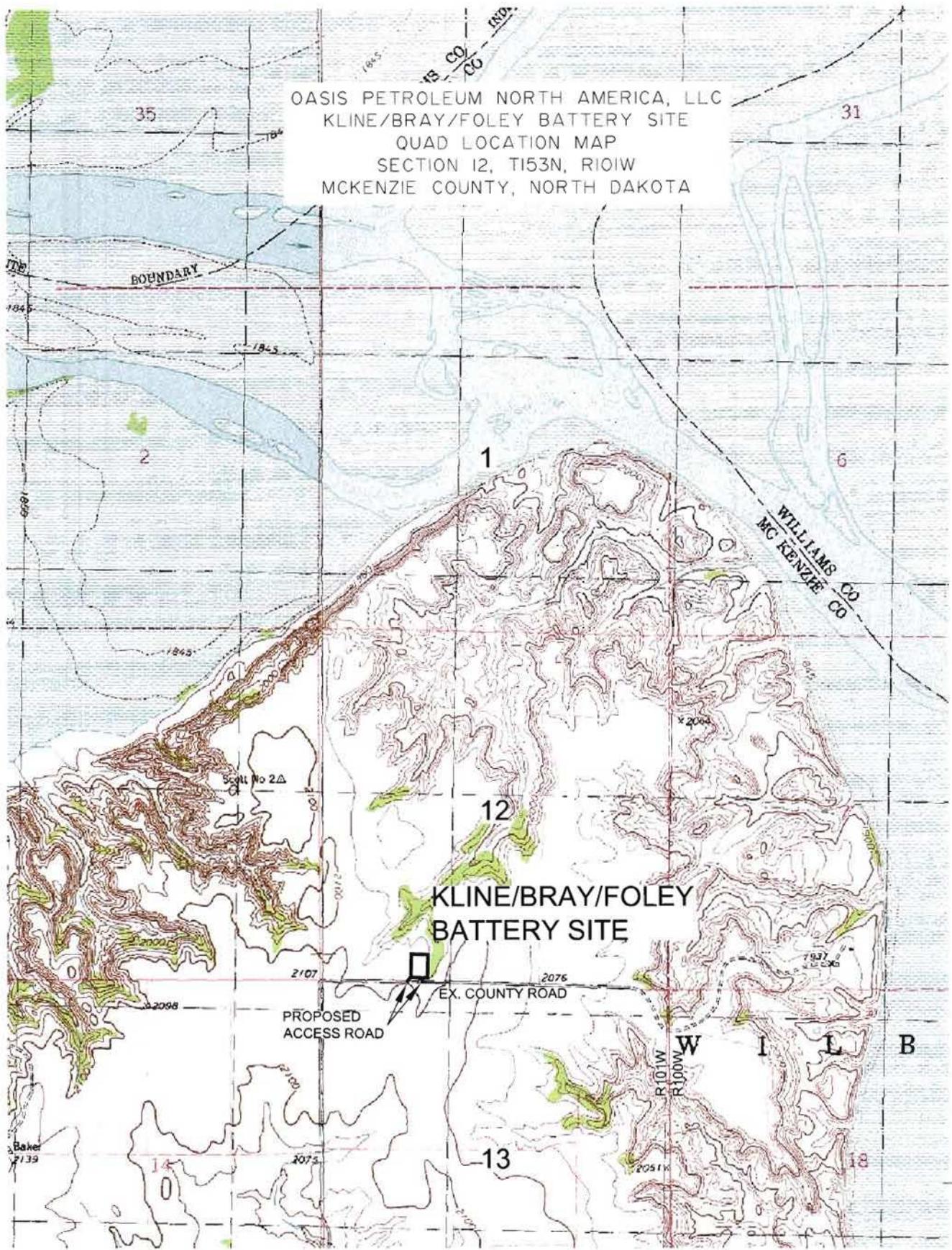
SCALE, 1" = 2 MILE



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Other offices in Missoula, Helena, Billings and Great Falls

OASIS PETROLEUM NORTH AMERICA, LLC  
COUNTY ROAD MAP  
SECTION 12, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA  
Drawn By: H.J.G.  
Checked By: A.J.H./C.S.V.  
Project No.: S11-09-137  
Rev. 1  
Date: JUNE 2011



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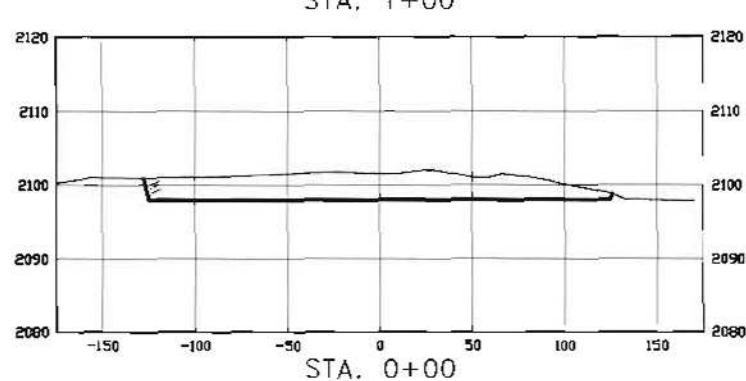
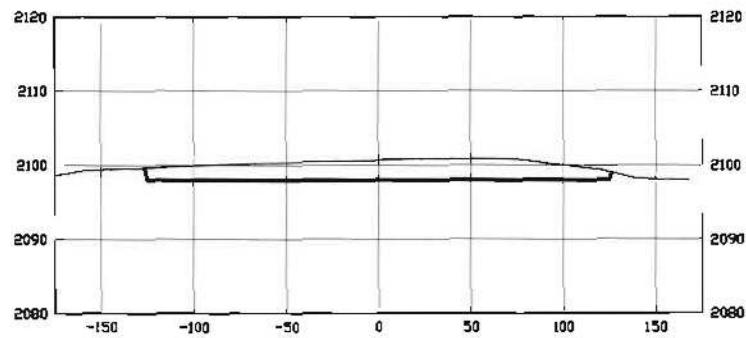
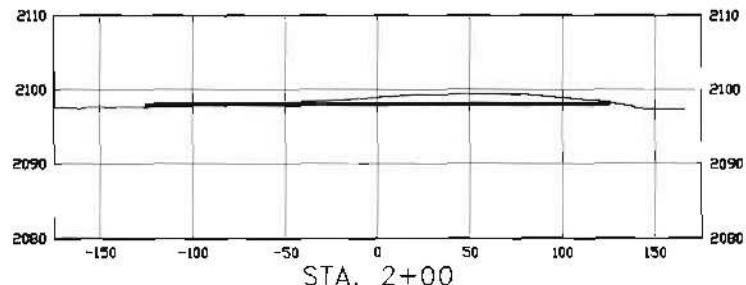
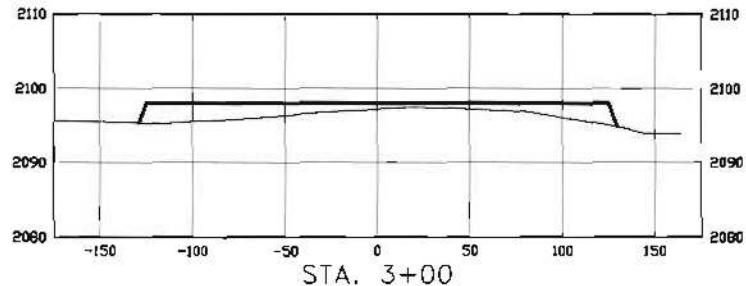
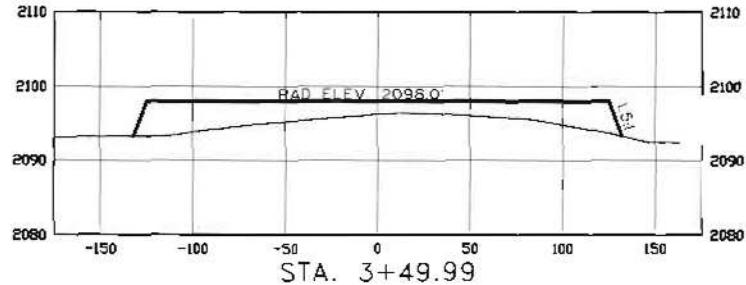
SHEET NO.

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Fax (406) 433-5618  
[www.engl.com](http://www.engl.com)

**OASIS PETROLEUM NORTH AMERICA, LLC**  
**QUAD LOCATION MAP**  
**SECTION 12, T153N, R101W**  
**MCKENZIE COUNTY, NORTH DAKOTA**

Revision No.	Date	By	Description
REV 1	6/06/01	HJC	BATTERY NAME CHANGE

## CROSS SECTIONS



SCALE  
HORIZ 1' = 100'  
VERT 1' = 25'

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OASIS PETROLEUM NORTH AMERICA, LLC  
PAD CROSS SECTIONS  
SECTION 12, T15N, R101W

**MCKENZIE COUNTY, NORTH DAKOTA**

rown By: H.J.G. Project No.: S11-9-137

Marked By: A.J.H/C.S.V. Date: JUNE 2011

Ref.-No.	Date	By	Description
REV 1	6/06/01	HJD	BATTERY NAME CHANGE

**WELL LOCATION SITE QUANTITIES**  
 OASIS PETROLEUM NORTH AMERICA, LLC  
 1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
 "KLINE/BRAY/FOLEY BATTERY SITE"  
 SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

PAD ELEVATION

2098.0

EXCAVATION	4,494
EMBANKMENT	1,672
PLUS SHRINKAGE (30%)	$\begin{array}{r} 501 \\ \hline 2,174 \end{array}$
STOCKPILE TOP SOIL (6")	1,683
STOCKPILE FROM PAD	637
DISTURBED AREA FROM PAD	2.09 ACRES

NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS NOTED)

CUT END SLOPES AT 1:1

FILL END SLOPES AT 1.5:1

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Other offices in Livingston, Helena, Great Falls and Missoula

OASIS PETROLEUM, LLC

QUANTITIES

SECTION 12, T153N, R101W

MCKENZIE COUNTY, ND

Drawn By:	H.J.G.	Project No.:	511-09-137
Checked By:	A.J.H./C.S.V.	Date:	JUNE 2011

Revision No.	Date	By	Description
REV. 1	6/09/11	H.J.G.	BATTERY NAME CHANGE



# SUNDY NOTICES AND REPORTS ON WELLS - FORM 43-02-03-21

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)



Well File No.  
**20864**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>June, 2011</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	<b>Suspension of Drilling</b>

Well Name and Number  
**Bray 5301 43-12H**

Footages <b>250 F S L</b>	Qtr-Qtr <b>1927 F E L</b>	Section <b>SWSE 12</b>	Township <b>153 N</b>	Range <b>101 W</b>
Field <b>Wildcat</b>	Pool <b>Dakota</b>		County <b>McKenzie</b>	

## 24-HOUR PRODUCTION RATE

Before	After
Oil	Bbls
Water	Bbls
Gas	MCF

Name of Contractor(s)

Address

City

State

Zip Code

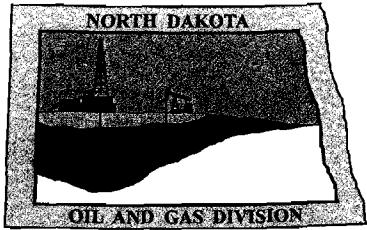
## DETAILS OF WORK

Oasis requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis intends to drill the surface hole with freshwater based drilling mud and set surface casing with a small drilling rig and move off within 3 to 5 days. The casing will be set at a depth pre-approved by the NDIC per the Application for Permit to Drill NDAC 43-02-03-21. No saltwater will be used in the drilling and cementing operations of the surface casing. Once the surface casing is cemented, a plug or mechanical seal will be placed at the top of the casing to prevent any foreign matter from getting into the well. A rig capable of drilling to TD will move onto the location within the 90 days previously outlined to complete the drilling and casing plan as per the APD. The undersigned states that this request for suspension of drilling operations in accordance with the Subsection 4 of Section 43-02-03-55 of the NDAC, is being requested to take advantage of the cost savings and time savings of using an initial rig that is smaller than the rig necessary to drill a well to total depth but is not intended to alter or extend the terms and conditions of, or suspend any obligation under, any oil and gas lease with acreage in or under the spacing or drilling unit for the above-referenced well. Oasis understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The lined reserve pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis will plug and abandon the well and reclaim the well site if the well is not drilled by the larger rotary rig within 90 days after spudding the well with the smaller drilling rig.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281.404.9488</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Laura Strong</b>	
Title <b>Drilling Engineer</b>	Date <b>May 11, 2011</b>	
Email Address <b>Lstrong@oasispetroleum.com</b>		

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>5/27/11</b>	
By 	
Title <b>Jim L. H. H.</b>	



# Oil and Gas Division

Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

20864  
S

ROBIN E. HESKETH  
OASIS PETROLEUM NORTH AMERICA LLC  
1001 FANNIN, SUITE 1500  
HOUSTON, TX 77002 USA

Date: 5/16/2011

**RE: CORES AND SAMPLES**

Well Name: **BRAY 5301 43-12H** Well File No.: **20864**  
Location: **SWSE 12-153-101** County: **MCKENZIE**  
Permit Type: **Wildcat - HORIZONTAL**  
Field: **WILDCAT** Target Horizon: **BAKKEN**

Dear ROBIN E. HESKETH:

North Dakota Century Code (NDCC) Section 38-08-04 provides for the preservation of cores and samples and their shipment to the State Geologist when requested. The following is required on the above referenced well:

- 1) All cores, core chips and samples must be submitted to the State Geologist as provided for the NDCC Section 38-08-04 and North Dakota Administrative Code 43-02-03-38.1.
- 2) Samples shall include all cuttings from:

**Base of the Last Charles Salt**

Samples of cuttings shall be taken at 30' maximum intervals through all vertical, build and horizontal sections. Samples must be washed, dried, packed in sample envelopes in correct order with labels showing operator, well name, location and depth, and forwarded in standard boxes to the State Geologist within 30 days of the completion of drilling operations.

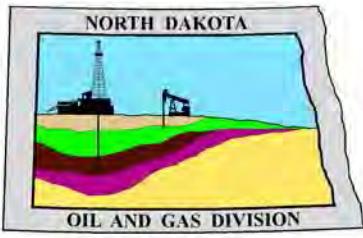
- 3) Cores: ALL CORES cut shall be preserved in correct order, properly boxed, and forwarded to the State Geologist within 90 days of completion of drilling operations. Any extension of time must have written approval from the State Geologist.
- 4) All cores, core chips, and samples must be shipped, prepaid, to the State Geologist at the following address:

**ND Geological Survey Core Library  
Campus Road and Cornell  
Grand Forks, ND 58202**

- 5) NDCC Section 38-08-16 allows for a civil penalty for any violation of Chapter 38 08 not to exceed \$12,500 for each offense, and each day's violation is a separate offense.

Sincerely

**Richard A. Suggs**  
Geologist



# Oil and Gas Division

Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director

## Department of Mineral Resources

Lynn D. Helms - Director

## North Dakota Industrial Commission

[www.oilgas.nd.gov](http://www.oilgas.nd.gov)

May 11, 2011

Brandi Terry  
Engineering Tech  
OASIS PETROLEUM NORTH AMERICA LLC  
1001 Fannin Suite 202  
Houston, TX 77002

**RE: HORIZONTAL WELL  
BRAY 5301 43-12H  
SWSE Section 12-153N-101W  
McKenzieCounty  
Well File # 20864**

Dear Brandi :

Pursuant to Commission Order No. 14007, approval to drill the above captioned well is hereby given. The approval is granted on the condition that all portions of the well bore not isolated by cement, be no closer than the **200' setback** (per ICO 14498) from the north & south boundaries and **1220' setback** (per Commission policy) from the east & west boundaries within the 1280 acre drilling unit consisting of Section 13 & 24 T153N R101W.

**PERMIT STIPULATIONS:** A Closed Mud System is required on multi-well pads, although the disposal of drill cuttings is contingent upon site specific conditions to be determined by an NDIC Field Inspector. In cases where a spacing unit is accessed from an off-site drill pad, an affidavit must be provided affirming that the surface owner of the multi-well pad agrees to accept burial on their property of the cuttings generated from drilling the well(s) into an offsite spacing/drilling unit. OASIS PETRO NO AMER must contact NDIC Field Inspector Kevin Connors at 701-220-5989 prior to location construction. OASIS PETROLEUM NORTH AMERICA LLC must ensure the pit is not constructed in fill dirt.

### Location Construction Commencement (Three Day Waiting Period)

Operators shall not commence operations on a drill site until the 3rd business day following publication of the approved drilling permit on the NDIC - OGD Daily Activity Report. If circumstances require operations to commence before the 3rd business day following publication on the Daily Activity Report, the waiting period may be waived by the Director. Application for a waiver must be by sworn affidavit providing the information necessary to evaluate the extenuating circumstances, the factors of NDAC 43-02-03-16.2 (1), (a)-(f), and any other information that would allow the Director to conclude that in the event another owner seeks revocation of the drilling permit, the applicant should retain the permit.

### Permit Fee & Notification

Payment was received in the amount of \$100 via credit card .The permit fee has been received. It is requested that notification be given immediately upon the spudding of the well. This information should be relayed to the Oil & Gas Division, Bismarck, via telephone. The following information must be included: Well name, legal location, permit number, drilling contractor, company representative, date and time of spudding. Office hours are 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m. Central Time. Our telephone number is (701) 328-8020, leave a message if after hours or on the weekend.

Brandi Terry  
May 11, 2011  
Page 2

### **Survey Requirements for Horizontal, Horizontal Re-entry, and Directional Wells**

NDAC Section 43-02-03-25 (Deviation Tests and Directional Surveys) states in part (that) the survey contractor shall file a certified copy of all surveys with the director free of charge within thirty days of completion. Surveys must be submitted as one electronic copy, or in a form approved by the director. However, the director may require the directional survey to be filed immediately after completion if the survey is needed to conduct the operation of the director's office in a timely manner. Certified surveys must be submitted via email in one adobe document, with a certification cover page to [certsurvey@nd.gov](mailto:certsurvey@nd.gov).

Survey points shall be of such frequency to accurately determine the entire location of the well bore.

### **Reserve pit**

Please be advised that conditions may be imposed on the use and reclamation of a drilling reserve pit on this site if specific site conditions warrant.

### **Surface casing cement**

Tail cement utilized on surface casing must have a minimum compressive strength of 500 psi within 12 hours, and tail cement utilized on production casing must have a minimum compressive strength of 500 psi before drilling the plug or initiating tests.

### **Logs**

NDAC Section 43-02-03-31 requires the running of a Cement Bond Log from which the presence of cement can be determined in every well in which production or intermediate casing has been set and a Gamma Ray Log must be run from total depth to ground level elevation of the well bore. All logs must be submitted as one paper copy and one digital copy in LAS (Log ASCII) format, or a format approved by the Director. Image logs that include, but are not limited to, Mud Logs, Cement Bond Logs, and Cyberlook Logs, cannot be produced in their entirety as LAS (Log ASCII) files. To create a solution and establish a standard format for industry to follow when submitting image logs, the Director has given approval for the operator to submit an image log as a TIFF (\*.tif) formatted file. The TIFF (\*.tif) format will be accepted only when the log cannot be produced in its entirety as a LAS (Log ASCII) file format. The digital copy may be submitted on a 3.5" floppy diskette, a standard CD, or attached to an email sent to [digitallogs@nd.gov](mailto:digitallogs@nd.gov)

Thank you for your cooperation.

Sincerely,

Nathaniel Erbele  
Petroleum Resource Specialist



# APPLICATION FOR PERMIT TO DRILL HORIZONTAL WELL - FORM 1H

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 54269 (08-2005)

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Type of Work <b>New Location</b>	Type of Well <b>Oil &amp; Gas</b>	Approximate Date Work Will Start <b>06 / 01 / 2011</b>	Confidential Status <b>No</b>
Operator <b>OASIS PETROLEUM NORTH AMERICA LLC</b>		Telephone Number <b>281-404-9491</b>	
Address <b>1001 Fannin Suite 202</b>		City <b>Houston</b>	State <b>TX</b> Zip Code <b>77002</b>

Notice has been provided to the owner of any permanently occupied dwelling within 1,320 feet.  This well is not located within five hundred feet of an occupied dwelling.

## WELL INFORMATION (If more than one lateral proposed, enter data for additional laterals on page 2)

Well Name <b>BRAY</b>			Well Number <b>5301 43-12H</b>				
Surface Footages <b>250 F S L</b>		Qtr-Qtr <b>SWSE</b>	Section <b>12</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>McKenzie</b>	
Longstring Casing Point Footages <b>242 F N L</b>		Qtr-Qtr <b>NWNE</b>	Section <b>13</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>McKenzie</b>	
Longstring Casing Point Coordinates From Well Head <b>492 S</b> From WH <b>0 E</b> From WH		Azimuth <b>180.0 °</b>	Longstring Total Depth <b>11021</b> Feet MD <b>10734</b> Feet TVD				
Bottom Hole Footages From Nearest Section Line <b>201 F S L</b>		Qtr-Qtr <b>SWSE</b>	Section <b>24</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>McKenzie</b>	
Bottom Hole Coordinates From Well Head <b>10578 S</b> From WH <b>0 E</b> From WH		KOP Lateral 1 <b>10256</b> Feet MD	Azimuth Lateral 1 <b>180.0 °</b>	Estimated Total Depth Lateral 1 <b>21107</b> Feet MD <b>10709</b> Feet TVD			
Latitude of Well Head <b>48 ° 04 ' 57.96 "</b>	Longitude of Well Head <b>-103 ° 36 ' 43.25 "</b>	NAD Reference <b>WGS84</b>		Description of Drilling Unit: <b>Section 13 &amp; 24 T153N R101W</b> (Subject to NDIC Approval)			
Ground Elevation <b>2078</b> Feet Above S.L.	Acres in Spacing/Drilling Unit <b>1280</b>	Spacing/Drilling Unit Setback Requirement <b>200</b> Feet N/S <b>1220</b> Feet E/W		Industrial Commission Order <b>14007</b>			
North Line of Spacing/Drilling Unit <b>5279</b> Feet		South Line of Spacing/Drilling Unit <b>5267</b> Feet		East Line of Spacing/Drilling Unit <b>10520</b> Feet		West Line of Spacing/Drilling Unit <b>10553</b> Feet	
Objective Horizons <b>Bakken</b>						Pierre Shale Top <b>1941</b>	
Proposed Surface Casing	Size <b>9 - 5/8 "</b>	Weight <b>36</b> Lb./Ft.	Depth <b>2045</b> Feet	Cement Volume <b>611</b> Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.		
Proposed Longstring Casing	Size <b>7 - "</b>	Weight(s) <b>29/32</b> Lb./Ft.	Longstring Total Depth <b>11021</b> Feet MD <b>10734</b> Feet TVD		Cement Volume <b>771</b> Sacks	Cement Top <b>4933</b> Feet	Top Dakota Sand <b>5433</b> Feet
Base Last Charles Salt (If Applicable) <b>9199</b> Feet		NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.					
Proposed Logs <b>Triple Combo: KOP-KibbyGR/RES-BSCGR-SurfCBL/GR-TOC/GR-BSCMWD GR-KOP-TD</b>							
Drilling Mud Type (Vertical Hole - Below Surface Casing) <b>Invert</b>				Drilling Mud Type (Lateral) <b>Salt Water Gel</b>			
Survey Type in Vertical Portion of Well <b>MWD</b> Every 100 Feet		Survey Frequency: Build Section <b>30</b> Feet		Survey Frequency: Lateral <b>90</b> Feet		Survey Contractor <b>Ryan</b>	

NOTE: A Gamma Ray log must be run to ground surface and a CBL must be run on intermediate or longstring casing string if set.

Surveys are required at least every 30 feet in the build section and every 90 feet in the lateral section of a horizontal well. Measurement inaccuracies are not considered when determining compliance with the spacing/drilling unit boundary setback requirement except in the following scenarios: 1) When the angle between the well bore and the respective boundary is 10 degrees or less; or 2) If Industry standard methods and equipment are not utilized. Consult the applicable field order for exceptions.

If measurement inaccuracies are required to be considered, a 2° MWD measurement inaccuracy will be applied to the horizontal portion of the well bore. This measurement inaccuracy is applied to the well bore from KOP to TD.

**REQUIRED ATTACHMENTS:** Certified surveyor's plat, horizontal section plat, estimated geological tops, proposed mud/cementing plan, directional plot/plan, \$100 fee.

See Page 2 for Comments section and signature block.

**COMMENTS, ADDITIONAL INFORMATION, AND/OR LIST OF ATTACHMENTS**

<b>Additional Attachments: Drill Plan with geological tops/mud Well Summary with casing and cement plans Directional plan/plot and surveyor's plats.</b>					
--	--	--	--	--	--

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 °	Estimated Total Depth Lateral 2 Feet MD		KOP Coordinates From Well Head From WH	
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH			From WH
KOP Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
Bottom Hole Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
					County

Lateral 3

KOP Lateral 3 Feet MD	Azimuth Lateral 3 °	Estimated Total Depth Lateral 3 Feet MD		KOP Coordinates From Well Head From WH	
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH			From WH
KOP Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
Bottom Hole Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
					County

Lateral 4

KOP Lateral 4 Feet MD	Azimuth Lateral 4 °	Estimated Total Depth Lateral 4 Feet MD		KOP Coordinates From Well Head From WH	
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH			From WH
KOP Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
Bottom Hole Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
					County

Lateral 5

KOP Lateral 5 Feet MD	Azimuth Lateral 5 °	Estimated Total Depth Lateral 5 Feet MD		KOP Coordinates From Well Head From WH	
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH			From WH
KOP Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
Bottom Hole Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>
					County

I hereby swear or affirm the information provided is true, complete and correct as determined from all available records.

Date

04 / 21 / 2011

ePermit

Printed Name  
**Brandi Terry**

Title

**Engineering Tech****FOR STATE USE ONLY**

Permit and File Number <b>20864</b>	API Number <b>33 - 053 - 03609</b>
Field <b>WILDCAT</b>	
Pool <b>BAKKEN</b>	Permit Type <b>WILDCAT</b>

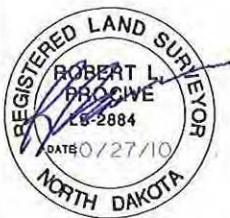
**FOR STATE USE ONLY**

Date Approved <b>5 / 11 / 2011</b>
By <b>Nathaniel Erbele</b>
Title <b>Petroleum Resource Specialist</b>

**WELL LOCATION PLAT**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"BRAY 5301 43-12H"

STAKED ON 10/20/10  
VERTICAL CONTROL DATUM WAS BASED UPON  
CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'  
THIS SURVEY AND PLAT IS BEING PROVIDED AT THE  
REQUEST OF FABIAN KJORSTAD OF OASIS  
PETROLEUM. I CERTIFY THAT THIS PLAT CORRECTLY  
REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY  
SUPERVISION AND IS TRUE AND CORRECT TO  
THE BEST OF MY KNOWLEDGE AND BELIEF.

~~ROBERT L. PROOME LS 2884  
INTERSTATE ENGINEERING INC.~~



 - MONUMENT - RECOVERED  
 - MONUMENT - NOT RECOVERED

FOUND STON

VICINITY MAP



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1



**INTERSTATE  
ENGINEERING**

SHEET M

**Interstate Engineering Inc.**  
P.O. Box 643  
425 East Main Street  
Sidney, Montana 59270  
Ph: (406) 433-5617  
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OASIS PETROLEUM NORTH AMERICA, LLC  
WELL LOCATION PLAT  
SECTION 12, T15N, R101W

**MCKENZIE COUNTY, NORTH DAKOTA**

**Oasis Petroleum  
Well Summary  
Bray 5301 43-12H  
Section 12 T153N R101W  
McKenzie County, ND**

**SURFACE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
9-5/8"	0' to 2,045'	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) a	(psi) b	(1000 lbs) c	
0' to 2,045'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.11	3520 / 3.67	453 / 2.77	

**API Rating & Safety Factor**

- a) Based on full casing evacuation with 9.0 ppg fluid on backside (2045' setting depth).
- b) Burst pressure based on 9 ppg fluid with no fluid on backside (2045' setting depth).
- c) Based on string weight in 9.0 ppg fluid at 2045' TVD plus 100k# overpull.  
(Buoyed weight equals 63k lbs.)

Cement volumes are based on 9-5/8" casing set in 13-1/2" hole with 55% excess to circulate cement back to surface.  
Mix and pump the following slurry.

**Pre-flush (Spacer):      20 bbls fresh water**

**Lead Slurry:**      386 sks (219 bbls) 11.2 lb/gal class "C" conventional system with 94 lb/sk cement, 4% extender, 2% expanding agent, 2% CaCl2 and 0.25 lb/sk lost circulation control agent

**Tail Slurry:**      225 sks (60 bbls) 14.2 lb/gal class "C" conventional system with 94 lb/sk cement, 3% NaCl, and .25 lb/sk lost circulation control agent

**Oasis Petroleum  
Well Summary  
Bray 5301 43-12H  
Section 12 T153N R101W  
McKenzie County, ND**

**INTERMEDIATE CASING AND CEMENT DESIGN**

**Intermediate Casing Design**

<b>Size</b>	<b>Interval</b>	<b>Weight</b>	<b>Grade</b>	<b>Coupling</b>	<b>I.D.</b>	<b>Drift</b>	<b>Make-up Torque (ft-lbs)</b>		
							<b>Minimum</b>	<b>Optimum</b>	<b>Max</b>
7"	0' – 6,700'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770
7"	6,700' – 9,400'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	9,870
7"	9,400' – 11,021'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770

\*\*Special Drift

<b>Interval</b>	<b>Length</b>	<b>Description</b>	<b>Collapse</b>	<b>Burst</b>	<b>Tension</b>
			(psi) a	(psi) b	(1000 lbs) c
0' – 6,700'	6,700'	7", 29#, P-110, LTC, 8rd	8,530 / 2.44	11,220 / 1.19	797 / 2.11
6,700' – 9,400'	2,700'	7", 32#, HCP-110, LTC, 8rd	11,820 / 1.08	12,460 / 1.29	
9,400' – 11,021'	1,620'	7", 29 lb, P-110, LTC, 8rd	8,530 / 1.52	11,220 / 1.16	

**API Rating & Safety Factor**

- a) Collapse Strength Reduction Factor = .963 @ 7,900' & negligible below 9470'. Assume full casing evacuation with 10 ppg fluid on backside (from 0 to 6,700' & 9,400' to 11,021'). And assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals (from 6,700' to 9,400' TVD).
- b) Burst pressure based on 9,000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9.0 ppg fluid on backside—to 10,734' TVD.
- c) Based on string weight in 10 ppg fluid, (278k lbs) plus 100k#.

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with 30% excess.

**Pre-flush (Spacer):**  
**170 bbls** Saltwater  
**20 bbls CW8 System**  
**10 bbls** Fresh Water

**Lead Slurry:** **126 sks** (58 bbls) 11.6 lb/gal class "G" conventional system with 47 lb/sk cement, 10% NaCl, 34 lb/sk extender, 10% D020 extender, 1% D079 extender, 1% anti-settling agent, 1% fluid loss agent, 0.2% anti-foam agent, 0.7% retarder, 0.25 lb/sk lost circulation control agent, and 0.3% dispersant

**Tail Slurry:** **645 sks** (190 bbls) 15.6 lb/gal class "G" conventional system with 94 lb/sk cement, 10% NaCl, 35% Silica, 0.2% fluid loss agent, 0.8% dispersant, 0.25 lb/sk lost circulation control agent and 0.3% retarder

**Oasis Petroleum**  
**Well Summary**  
**Bray 5301 43-12H**  
**Section 12 T153N R101W**  
**McKenzie County, ND**

**PRODUCTION LINER**

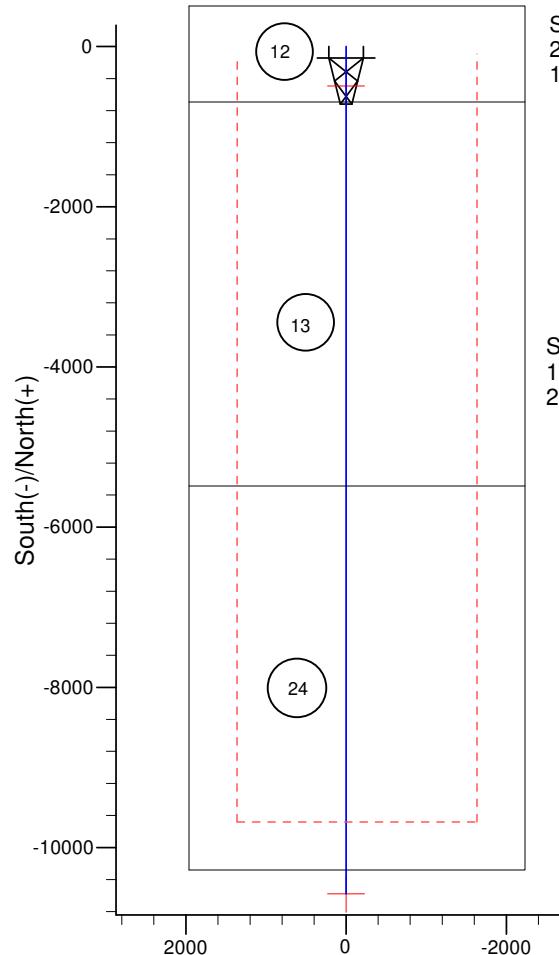
<b>Size</b>	<b>Interval</b>	<b>Weight</b>	<b>Grade</b>	<b>Coupling</b>	<b>I.D.</b>	<b>Drift</b>	<b>Make-up Torque (ft-lbs)</b>		
							<b>Minimum</b>	<b>Optimum</b>	<b>Max</b>
4-1/2"	10,210' to 21,107'	11.6	P-110	LTC	4.000"	3.875"	2,270	3,020	3,780

<b>Interval</b>	<b>Length</b>	<b>Description</b>	<b>Collapse</b>	<b>Burst</b>	<b>Tension</b>
			(psi) <b>a</b>	(psi) <b>b</b>	(1000 lbs) <b>c</b>
10,210' to 21,107'	10,897	4-1/2", 11.6 lb, P-110, LTC, 8rd	7,580 / 1.42	10,690 / 1.10	277 / 1.33

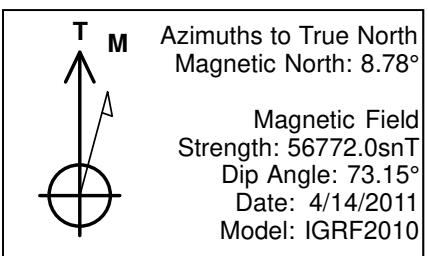
**API Rating & Safety Factor**

- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,734' TVD.
- b) Burst pressure based on 9,000 psi Stimulation pressure with 10.2 ppg internal fluid gradient with 9.0 ppg gradient on backside at 10,734' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 108k lbs.) plus 100k lbs overpull.

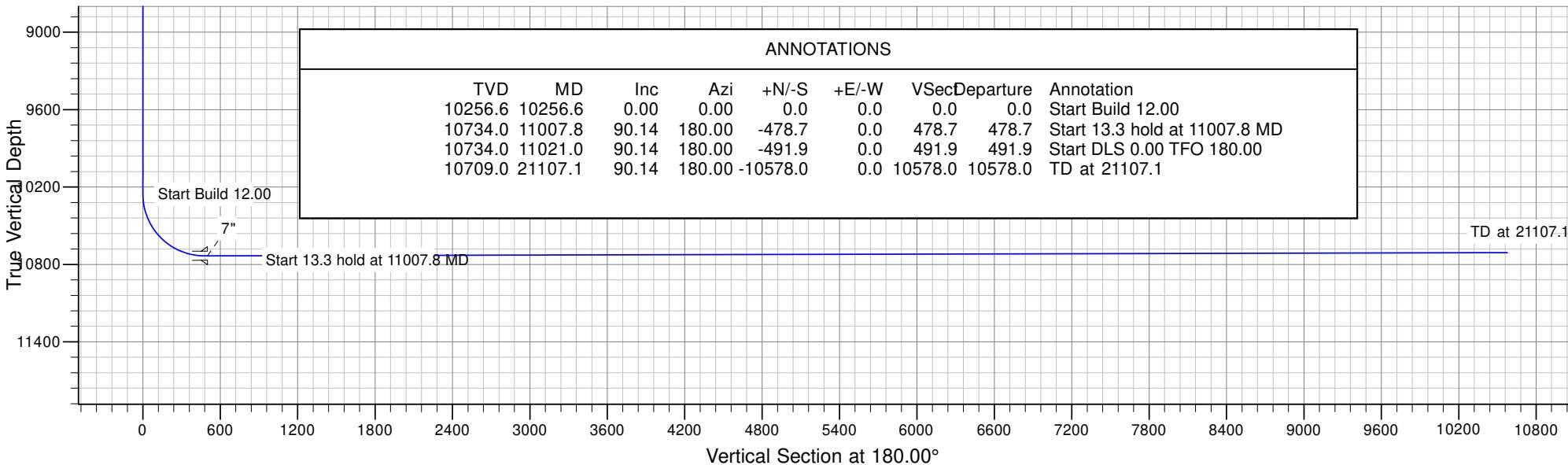
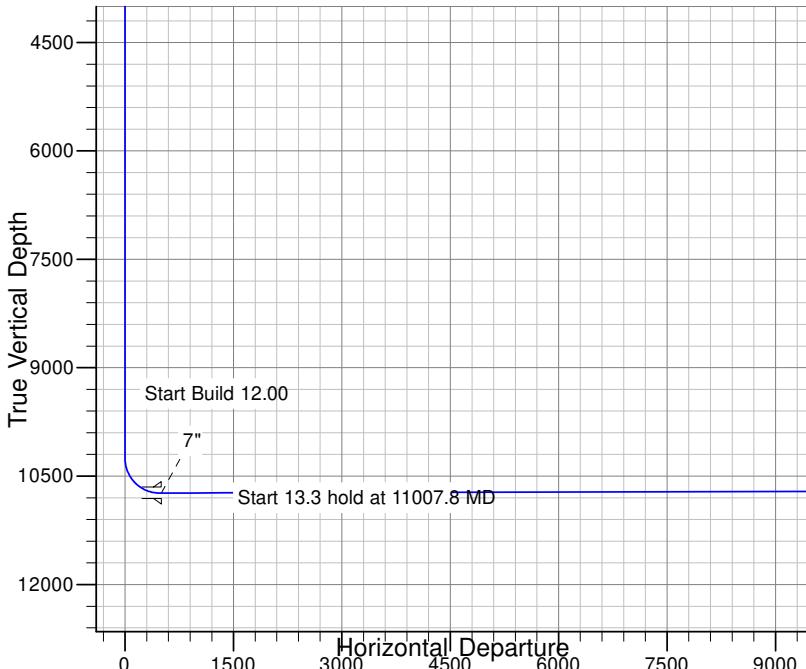
DRILLING PLAN							
PROSPECT/FIELD	Indian Hills	Horizontal Middle Bakken		COUNTY/STATE	McKenzie Co., ND		
OPERATOR	Oasis Operating				RIG	XTC-17	
WELL NO.	5301 43-12H				LEASE	Bray	
LOCATION	SWSE 12-153N-101W	Surface Location (survey plat): 250' frl			1927' fsl		
EST. T.D.	21,107'				GROUND ELEV:	2074	Finished Pad Elev.
TOTAL LATERAL:	10,086' (est)				KB ELEV:	2090.5	Sub Hieght: 16.5
PROGNOSIS:	Based on 2,091' KB(est)			LOGS:	Type	Interval	
MARKER	DEPTH (Surf Loc)	DATUM (Surf Loc)				OH Logs: Triple Combo KOP to Kirby (or min run of 1800' whichever is greater); GR/Res to BSC; GR to surf	
Pierre	NDIC MAP	1,941	150'				CBL/GR: Above top of cement/GR to base of casing
Greenhorn		4,606	-2,516'				MWD GR: KOP to lateral TD
Mowry		5,002	-2,912'				
Dakota		5,433	-3,343'				
Rierdon		6,350	-4,259'				
Dunham Salt		6,869	-4,778'				
Dunham Salt Base		6,936	-4,845'				
Spearfish		6,941	-4,850'				
Pine Salt		7,184	-5,094'				
Pine Salt Base		7,310	-5,219'				
Opeche Salt		7,337	-5,247'				
Opeche Salt Base		7,416	-5,326'				
Broom Creek (Top of Minnelusa Gp.)		7,598	-5,507'				
Amsden		7,640	-5,550'				
Tyler		7,816	-5,726'				
Otter (Base of Minnelusa Gp.)		8,004	-5,913'				
Kibbey		8,353	-6,262'				
Charles Salt		8,499	-6,409'				
UB		9,123	-7,032'				
Base Last Salt		9,199	-7,109'				
Ratcliffe		9,247	-7,157'				
Mission Canyon		9,423	-7,333'				
Lodgepole		9,998	-7,907'				
False Bakken		10,713	-8,613'				
Upper Bakken		10,727	-8,622'				
Middle Bakken		10,734	-8,637'				
Middle Bakken Sand Target		10,734	-8,644'				
Base Middle Bakken Sand Target		10,743	-8,653'				
Lower Bakken		10,763	-8,673'				
Three Forks		10,791	-8,700'				
Dip Rate:	+0.16° or .25° /100' up						
Max. Anticipated BHP:	5709			Surface Formation: Glacial till			
MUD:	Interval	Type	WT	Vis	WL	Remarks	
Surface	0' -	2,045'	FW/Gel - Lime Sweeps	8.6 - 8.9	28-34	NC	Circ Mud Tanks
Intermediate	2,045' -	11,021'	Invert	9.6-10.4	40-60	30+(HPHT)	Circ Mud Tanks
Liner	11,021' -	21,107'	Salt Water	9.3-10.4	28-34	NC	Circ Mud Tanks
CASING:	Size	Wt pcf	Hole	Depth	Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,045'	To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,021'	4933	24	500' above Dakota
Production:	4.5"	11.6#	6"	21,107'	TOL @ 10,211'		50' above KOP
Production Liner:							
<b>PROBABLE PLUGS, IF REQ'D:</b>							
OTHER:	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI	
Surface:	N/A	N/A	250'FSL	1927'FEL	12-T153N-R101W		Survey Company:
KOP:	10,256'	10,266'	250'FSL	1927'FEL	12-T153N-R101W		Build Rate: 12 deg /100'
EOC	11,008'	10,734'	229'FNL	1927'FEL	13-T153N-R101W	180.0	
Casing Point:	11,021'	10,734'	242'FNL	1927'FEL	13-T153N-R101W	180.0	
Middle Bakken Lateral TD:	21,107'	10,709'	200'FSL	1927'FEL	24-T153N-R101W	180.0	
<b>Comments:</b>							
DRILL TO KOP AND LOG.							
DRILL CURVE TO 90 DEG AND 7" CASING POINT							
SET 7" CASING. DRILL MIDDLE BAKKEN LATERAL.							
MWD Surveys will be taken every 100' in vertical hole, and a minimum of every 30' while building curve and every 90' while drilling lateral.							
MWD GR to be run from KOP to Lateral TD.							
GR must be run to ground surface.							
Geology: ACN 11-17-2010	Prepared by: BT_4-14-2011			Engineering: L. Strong 4/18/2011			



Project: McKenzie County, ND  
Site: Sec. 12 T153N R101W  
Well: Bray 5301 43-12H  
Wellbore: OH  
Design: Plan #1



SITE DETAILS: Sec. 12 T153N R101W	
Site Centre Latitude:	48° 4' 57.960 N
Longitude:	103° 36' 43.250 W
Positional Uncertainty:	0.0
Convergence:	-2.32
Local North:	True



# **Oasis**

**McKenzie County, ND  
Sec. 12 T153N R101W  
Bray 5301 43-12H**

**OH**

**Plan: Plan #1**

# **Standard Planning Report**

**21 April, 2011**

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

<b>Project</b>	McKenzie County, ND		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	North Dakota Northern Zone		

<b>Site</b>	Sec. 12 T153N R101W				
<b>Site Position:</b>		<b>Northing:</b>	125,065.82 m	<b>Latitude:</b>	48° 4' 57.940 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	368,244.93 m	<b>Longitude:</b>	103° 36' 41.780 W
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-2.32 °

<b>Well</b>	Bray 5301 43-12H				
<b>Well Position</b>	+N/-S +E/-W	0.0 ft -100.0 ft	<b>Northing:</b> <b>Easting:</b>	125,067.05 m 368,214.48 m	<b>Latitude:</b> <b>Longitude:</b>
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>
					2,074.0 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b> (°)	<b>Dip Angle</b> (°)	<b>Field Strength</b> (nT)
	IGRF2010	4/14/2011	8.78	73.15	56,772

<b>Design</b>	Plan #1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>		<b>PROTOTYPE</b>	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b> (ft)		<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)	<b>Direction</b> (°)
	0.0		0.0	0.0	180.00

<b>Plan Sections</b>										
<b>Measured Depth</b> (ft)	<b>Inclination</b> (°)	<b>Azimuth</b> (°)	<b>Vertical Depth</b> (ft)	<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)	<b>Dogleg Rate</b> (°/100ft)	<b>Build Rate</b> (°/100ft)	<b>Turn Rate</b> (°/100ft)	<b>TFO</b> (°)	<b>Target</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
10,256.6	0.00	0.00	10,256.6	0.0	0.0	0.00	0.00	0.00	0.00	0.00
11,007.8	90.14	180.00	10,734.0	-478.7	0.0	12.00	12.00	0.00	180.00	
11,021.0	90.14	180.00	10,734.0	-491.9	0.0	0.00	0.00	0.00	0.00	Interp @ 10743.0 (Bray 5301 43-12H PB)
21,107.1	90.14	180.00	10,709.0	-10,578.0	0.0	0.00	0.00	0.00	180.00	Bray 5301 43-12H PB

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,941.0	0.00	0.00	1,941.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Pierre</b>									
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,045.0	0.00	0.00	2,045.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>9 5/8"</b>									
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,606.0	0.00	0.00	4,606.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Greenhorn</b>									

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,002.0	0.00	0.00	5,002.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Mowry</b>									
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,433.0	0.00	0.00	5,433.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Dakota</b>									
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,350.0	0.00	0.00	6,350.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Rierdon</b>									
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,869.0	0.00	0.00	6,869.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Dunham Salt</b>									
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,936.0	0.00	0.00	6,936.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Dunham Salt Base</b>									
6,941.0	0.00	0.00	6,941.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Spearfish</b>									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,184.0	0.00	0.00	7,184.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Pine Salt</b>									
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,310.0	0.00	0.00	7,310.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Pine Salt Base</b>									
7,337.0	0.00	0.00	7,337.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Opeche Salt</b>									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,416.0	0.00	0.00	7,416.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Opeche Salt Base</b>									
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,598.0	0.00	0.00	7,598.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Broom Creek (Top of Minnelusa Gp.)</b>									
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,640.0	0.00	0.00	7,640.0	0.0	0.0	0.0	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
<b>Amunden</b>									
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,816.0	0.00	0.00	7,816.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Tyler</b>									
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,004.0	0.00	0.00	8,004.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Otter (Base of Minnelusa Gp.)</b>									
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,353.0	0.00	0.00	8,353.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Kibbey</b>									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,499.0	0.00	0.00	8,499.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Charles Salt</b>									
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00
9,123.0	0.00	0.00	9,123.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>UB</b>									
9,199.0	0.00	0.00	9,199.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Base Last Salt</b>									
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,247.0	0.00	0.00	9,247.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Ratcliffe</b>									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,423.0	0.00	0.00	9,423.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Mission Canyon</b>									
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,998.0	0.00	0.00	9,998.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Lodgepole</b>									
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,256.6	0.00	0.00	10,256.6	0.0	0.0	0.0	0.00	0.00	0.00
<b>Start Build 12.00</b>									
10,275.0	2.21	180.00	10,275.0	-0.4	0.0	0.4	12.00	12.00	0.00
10,300.0	5.21	180.00	10,299.9	-2.0	0.0	2.0	12.00	12.00	0.00
10,325.0	8.21	180.00	10,324.8	-4.9	0.0	4.9	12.00	12.00	0.00
10,350.0	11.21	180.00	10,349.4	-9.1	0.0	9.1	12.00	12.00	0.00
10,375.0	14.21	180.00	10,373.8	-14.6	0.0	14.6	12.00	12.00	0.00
10,400.0	17.21	180.00	10,397.9	-21.4	0.0	21.4	12.00	12.00	0.00

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,425.0	20.21	180.00	10,421.5	-29.4	0.0	29.4	12.00	12.00	0.00
10,450.0	23.21	180.00	10,444.8	-38.6	0.0	38.6	12.00	12.00	0.00
10,475.0	26.21	180.00	10,467.5	-49.1	0.0	49.1	12.00	12.00	0.00
10,500.0	29.21	180.00	10,489.6	-60.7	0.0	60.7	12.00	12.00	0.00
10,525.0	32.21	180.00	10,511.1	-73.5	0.0	73.5	12.00	12.00	0.00
10,550.0	35.21	180.00	10,531.9	-87.4	0.0	87.4	12.00	12.00	0.00
10,575.0	38.21	180.00	10,551.9	-102.3	0.0	102.3	12.00	12.00	0.00
10,600.0	41.21	180.00	10,571.1	-118.3	0.0	118.3	12.00	12.00	0.00
10,625.0	44.21	180.00	10,589.5	-135.2	0.0	135.2	12.00	12.00	0.00
10,650.0	47.21	180.00	10,607.0	-153.1	0.0	153.1	12.00	12.00	0.00
10,675.0	50.21	180.00	10,623.5	-171.9	0.0	171.9	12.00	12.00	0.00
10,700.0	53.21	180.00	10,638.9	-191.5	0.0	191.5	12.00	12.00	0.00
10,725.0	56.21	180.00	10,653.4	-211.9	0.0	211.9	12.00	12.00	0.00
10,750.0	59.21	180.00	10,666.7	-233.1	0.0	233.1	12.00	12.00	0.00
10,775.0	62.21	180.00	10,679.0	-254.9	0.0	254.9	12.00	12.00	0.00
10,800.0	65.21	180.00	10,690.0	-277.3	0.0	277.3	12.00	12.00	0.00
10,825.0	68.21	180.00	10,699.9	-300.2	0.0	300.2	12.00	12.00	0.00
10,833.5	69.23	180.00	10,703.0	-308.1	0.0	308.1	12.00	12.00	0.00
<b>False Bakken</b>									
10,850.0	71.21	180.00	10,708.6	-323.7	0.0	323.7	12.00	12.00	0.00
10,864.3	72.93	180.00	10,713.0	-337.3	0.0	337.3	12.00	12.00	0.00
<b>Upper Bakken</b>									
10,875.0	74.21	180.00	10,716.0	-347.6	0.0	347.6	12.00	12.00	0.00
10,900.0	77.21	180.00	10,722.2	-371.8	0.0	371.8	12.00	12.00	0.00
10,924.5	80.15	180.00	10,727.0	-395.8	0.0	395.8	12.00	12.00	0.00
<b>Middle Bakken</b>									
10,925.0	80.21	180.00	10,727.1	-396.3	0.0	396.3	12.00	12.00	0.00
10,950.0	83.21	180.00	10,730.7	-421.0	0.0	421.0	12.00	12.00	0.00
10,975.0	86.21	180.00	10,733.0	-445.9	0.0	445.9	12.00	12.00	0.00
11,000.0	89.21	180.00	10,734.0	-470.9	0.0	470.9	12.00	12.00	0.00
11,000.8	89.21	180.00	10,734.0	-471.7	0.0	471.7	0.00	0.00	0.00
<b>Middle Bakken Sand Target</b>									
11,007.8	90.14	180.00	10,734.0	-478.7	0.0	478.7	13.32	13.32	0.00
<b>Start 13.3 hold at 11007.8 MD</b>									
11,021.0	90.14	180.00	10,734.0	-491.9	0.0	491.9	0.00	0.00	0.00
<b>Start DLS 0.00 TFO 180.00</b>									
11,030.0	90.14	180.00	10,734.0	-500.9	0.0	500.9	0.00	0.00	0.00
<b>7"</b>									
11,100.0	90.14	180.00	10,733.8	-570.9	0.0	570.9	0.00	0.00	0.00
11,200.0	90.14	180.00	10,733.6	-670.9	0.0	670.9	0.00	0.00	0.00
11,300.0	90.14	180.00	10,733.3	-770.9	0.0	770.9	0.00	0.00	0.00
11,400.0	90.14	180.00	10,733.1	-870.9	0.0	870.9	0.00	0.00	0.00
11,500.0	90.14	180.00	10,732.8	-970.9	0.0	970.9	0.00	0.00	0.00
11,600.0	90.14	180.00	10,732.6	-1,070.9	0.0	1,070.9	0.00	0.00	0.00
11,700.0	90.14	180.00	10,732.3	-1,170.9	0.0	1,170.9	0.00	0.00	0.00
11,800.0	90.14	180.00	10,732.1	-1,270.9	0.0	1,270.9	0.00	0.00	0.00
11,900.0	90.14	180.00	10,731.8	-1,370.9	0.0	1,370.9	0.00	0.00	0.00
12,000.0	90.14	180.00	10,731.6	-1,470.9	0.0	1,470.9	0.00	0.00	0.00
12,100.0	90.14	180.00	10,731.3	-1,570.9	0.0	1,570.9	0.00	0.00	0.00
12,200.0	90.14	180.00	10,731.1	-1,670.9	0.0	1,670.9	0.00	0.00	0.00
12,300.0	90.14	180.00	10,730.8	-1,770.9	0.0	1,770.9	0.00	0.00	0.00
12,400.0	90.14	180.00	10,730.6	-1,870.9	0.0	1,870.9	0.00	0.00	0.00
12,500.0	90.14	180.00	10,730.3	-1,970.9	0.0	1,970.9	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,600.0	90.14	180.00	10,730.1	-2,070.9	0.0	2,070.9	0.00	0.00	0.00
12,700.0	90.14	180.00	10,729.8	-2,170.9	0.0	2,170.9	0.00	0.00	0.00
12,800.0	90.14	180.00	10,729.6	-2,270.9	0.0	2,270.9	0.00	0.00	0.00
12,900.0	90.14	180.00	10,729.3	-2,370.9	0.0	2,370.9	0.00	0.00	0.00
13,000.0	90.14	180.00	10,729.1	-2,470.9	0.0	2,470.9	0.00	0.00	0.00
13,100.0	90.14	180.00	10,728.8	-2,570.9	0.0	2,570.9	0.00	0.00	0.00
13,200.0	90.14	180.00	10,728.6	-2,670.9	0.0	2,670.9	0.00	0.00	0.00
13,300.0	90.14	180.00	10,728.3	-2,770.9	0.0	2,770.9	0.00	0.00	0.00
13,400.0	90.14	180.00	10,728.1	-2,870.9	0.0	2,870.9	0.00	0.00	0.00
13,500.0	90.14	180.00	10,727.8	-2,970.9	0.0	2,970.9	0.00	0.00	0.00
13,600.0	90.14	180.00	10,727.6	-3,070.9	0.0	3,070.9	0.00	0.00	0.00
13,700.0	90.14	180.00	10,727.3	-3,170.9	0.0	3,170.9	0.00	0.00	0.00
13,800.0	90.14	180.00	10,727.1	-3,270.9	0.0	3,270.9	0.00	0.00	0.00
13,900.0	90.14	180.00	10,726.8	-3,370.9	0.0	3,370.9	0.00	0.00	0.00
14,000.0	90.14	180.00	10,726.6	-3,470.9	0.0	3,470.9	0.00	0.00	0.00
14,100.0	90.14	180.00	10,726.3	-3,570.9	0.0	3,570.9	0.00	0.00	0.00
14,200.0	90.14	180.00	10,726.1	-3,670.9	0.0	3,670.9	0.00	0.00	0.00
14,300.0	90.14	180.00	10,725.8	-3,770.9	0.0	3,770.9	0.00	0.00	0.00
14,400.0	90.14	180.00	10,725.6	-3,870.9	0.0	3,870.9	0.00	0.00	0.00
14,500.0	90.14	180.00	10,725.3	-3,970.9	0.0	3,970.9	0.00	0.00	0.00
14,600.0	90.14	180.00	10,725.1	-4,070.9	0.0	4,070.9	0.00	0.00	0.00
14,700.0	90.14	180.00	10,724.8	-4,170.9	0.0	4,170.9	0.00	0.00	0.00
14,800.0	90.14	180.00	10,724.6	-4,270.9	0.0	4,270.9	0.00	0.00	0.00
14,900.0	90.14	180.00	10,724.3	-4,370.9	0.0	4,370.9	0.00	0.00	0.00
15,000.0	90.14	180.00	10,724.1	-4,470.9	0.0	4,470.9	0.00	0.00	0.00
15,100.0	90.14	180.00	10,723.8	-4,570.9	0.0	4,570.9	0.00	0.00	0.00
15,200.0	90.14	180.00	10,723.6	-4,670.9	0.0	4,670.9	0.00	0.00	0.00
15,300.0	90.14	180.00	10,723.4	-4,770.9	0.0	4,770.9	0.00	0.00	0.00
15,400.0	90.14	180.00	10,723.1	-4,870.9	0.0	4,870.9	0.00	0.00	0.00
15,500.0	90.14	180.00	10,722.9	-4,970.9	0.0	4,970.9	0.00	0.00	0.00
15,600.0	90.14	180.00	10,722.6	-5,070.9	0.0	5,070.9	0.00	0.00	0.00
15,700.0	90.14	180.00	10,722.4	-5,170.9	0.0	5,170.9	0.00	0.00	0.00
15,800.0	90.14	180.00	10,722.1	-5,270.9	0.0	5,270.9	0.00	0.00	0.00
15,900.0	90.14	180.00	10,721.9	-5,370.9	0.0	5,370.9	0.00	0.00	0.00
16,000.0	90.14	180.00	10,721.6	-5,470.9	0.0	5,470.9	0.00	0.00	0.00
16,100.0	90.14	180.00	10,721.4	-5,570.9	0.0	5,570.9	0.00	0.00	0.00
16,200.0	90.14	180.00	10,721.1	-5,670.9	0.0	5,670.9	0.00	0.00	0.00
16,300.0	90.14	180.00	10,720.9	-5,770.9	0.0	5,770.9	0.00	0.00	0.00
16,400.0	90.14	180.00	10,720.6	-5,870.9	0.0	5,870.9	0.00	0.00	0.00
16,500.0	90.14	180.00	10,720.4	-5,970.9	0.0	5,970.9	0.00	0.00	0.00
16,600.0	90.14	180.00	10,720.1	-6,070.9	0.0	6,070.9	0.00	0.00	0.00
16,700.0	90.14	180.00	10,719.9	-6,170.9	0.0	6,170.9	0.00	0.00	0.00
16,800.0	90.14	180.00	10,719.6	-6,270.9	0.0	6,270.9	0.00	0.00	0.00
16,900.0	90.14	180.00	10,719.4	-6,370.9	0.0	6,370.9	0.00	0.00	0.00
17,000.0	90.14	180.00	10,719.1	-6,470.9	0.0	6,470.9	0.00	0.00	0.00
17,100.0	90.14	180.00	10,718.9	-6,570.9	0.0	6,570.9	0.00	0.00	0.00
17,200.0	90.14	180.00	10,718.6	-6,670.9	0.0	6,670.9	0.00	0.00	0.00
17,300.0	90.14	180.00	10,718.4	-6,770.9	0.0	6,770.9	0.00	0.00	0.00
17,400.0	90.14	180.00	10,718.1	-6,870.9	0.0	6,870.9	0.00	0.00	0.00
17,500.0	90.14	180.00	10,717.9	-6,970.9	0.0	6,970.9	0.00	0.00	0.00
17,600.0	90.14	180.00	10,717.7	-7,070.9	0.0	7,070.9	0.00	0.00	0.00
17,700.0	90.14	180.00	10,717.4	-7,170.9	0.0	7,170.9	0.00	0.00	0.00
17,800.0	90.14	180.00	10,717.2	-7,270.9	0.0	7,270.9	0.00	0.00	0.00
17,900.0	90.14	180.00	10,716.9	-7,370.9	0.0	7,370.9	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/S (ft)	+E/W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
18,000.0	90.14	180.00	10,716.7	-7,470.9	0.0	7,470.9	0.00	0.00	0.00
18,100.0	90.14	180.00	10,716.4	-7,570.9	0.0	7,570.9	0.00	0.00	0.00
18,200.0	90.14	180.00	10,716.2	-7,670.9	0.0	7,670.9	0.00	0.00	0.00
18,300.0	90.14	180.00	10,715.9	-7,770.9	0.0	7,770.9	0.00	0.00	0.00
18,400.0	90.14	180.00	10,715.7	-7,870.9	0.0	7,870.9	0.00	0.00	0.00
18,500.0	90.14	180.00	10,715.4	-7,970.9	0.0	7,970.9	0.00	0.00	0.00
18,600.0	90.14	180.00	10,715.2	-8,070.9	0.0	8,070.9	0.00	0.00	0.00
18,700.0	90.14	180.00	10,714.9	-8,170.9	0.0	8,170.9	0.00	0.00	0.00
18,800.0	90.14	180.00	10,714.7	-8,270.9	0.0	8,270.9	0.00	0.00	0.00
18,900.0	90.14	180.00	10,714.4	-8,370.9	0.0	8,370.9	0.00	0.00	0.00
19,000.0	90.14	180.00	10,714.2	-8,470.9	0.0	8,470.9	0.00	0.00	0.00
19,100.0	90.14	180.00	10,713.9	-8,570.9	0.0	8,570.9	0.00	0.00	0.00
19,200.0	90.14	180.00	10,713.7	-8,670.9	0.0	8,670.9	0.00	0.00	0.00
19,300.0	90.14	180.00	10,713.5	-8,770.9	0.0	8,770.9	0.00	0.00	0.00
19,400.0	90.14	180.00	10,713.2	-8,870.9	0.0	8,870.9	0.00	0.00	0.00
19,500.0	90.14	180.00	10,713.0	-8,970.9	0.0	8,970.9	0.00	0.00	0.00
19,600.0	90.14	180.00	10,712.7	-9,070.9	0.0	9,070.9	0.00	0.00	0.00
19,700.0	90.14	180.00	10,712.5	-9,170.9	0.0	9,170.9	0.00	0.00	0.00
19,800.0	90.14	180.00	10,712.2	-9,270.9	0.0	9,270.9	0.00	0.00	0.00
19,900.0	90.14	180.00	10,712.0	-9,370.9	0.0	9,370.9	0.00	0.00	0.00
20,000.0	90.14	180.00	10,711.7	-9,470.9	0.0	9,470.9	0.00	0.00	0.00
20,100.0	90.14	180.00	10,711.5	-9,570.9	0.0	9,570.9	0.00	0.00	0.00
20,200.0	90.14	180.00	10,711.2	-9,670.9	0.0	9,670.9	0.00	0.00	0.00
20,300.0	90.14	180.00	10,711.0	-9,770.9	0.0	9,770.9	0.00	0.00	0.00
20,400.0	90.14	180.00	10,710.7	-9,870.9	0.0	9,870.9	0.00	0.00	0.00
20,500.0	90.14	180.00	10,710.5	-9,970.9	0.0	9,970.9	0.00	0.00	0.00
20,600.0	90.14	180.00	10,710.2	-10,070.9	0.0	10,070.9	0.00	0.00	0.00
20,700.0	90.14	180.00	10,710.0	-10,170.9	0.0	10,170.9	0.00	0.00	0.00
20,800.0	90.14	180.00	10,709.8	-10,270.9	0.0	10,270.9	0.00	0.00	0.00
20,900.0	90.14	180.00	10,709.5	-10,370.9	0.0	10,370.9	0.00	0.00	0.00
21,000.0	90.14	180.00	10,709.3	-10,470.9	0.0	10,470.9	0.00	0.00	0.00
21,107.1	90.14	180.00	10,709.0	-10,578.0	0.0	10,578.0	0.00	0.00	0.00
<b>TD at 21107.1</b>									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/S (ft)	+E/W (ft)	Northing (m)	Easting (m)	Latitude	Longitude
Bray 5301 43-12H PBHL - hit/miss target - Shape	0.00	0.00	10,709.0	-10,578.0	0.0	121,845.51	368,084.20	48° 3' 13.546 N	103° 36' 43.253 W
Interp @ 10743.0 (Bray) - plan hits target center - Point	0.00	0.00	10,734.0	-491.9	0.0	124,917.23	368,208.42	48° 4' 53.085 N	103° 36' 43.253 W

## Planning Report

<b>Database:</b>	EDM Network	<b>Local Co-ordinate Reference:</b>	Well Bray 5301 43-12H
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Project:</b>	McKenzie County, ND	<b>MD Reference:</b>	WELL @ 2090.5ft (Original Well Elev)
<b>Site:</b>	Sec. 12 T153N R101W	<b>North Reference:</b>	True
<b>Well:</b>	Bray 5301 43-12H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
2,045.0	2,045.0 9 5/8"		9.625	13.500	
11,030.0	10,734.0 7"		7.000	8.750	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,941.0	1,941.0	Pierre			
4,606.0	4,606.0	Greenhorn			
5,002.0	5,002.0	Mowry			
5,433.0	5,433.0	Dakota			
6,350.0	6,350.0	Rierdon			
6,869.0	6,869.0	Dunham Salt			
6,936.0	6,936.0	Dunham Salt Base			
6,941.0	6,941.0	Spearfish			
7,184.0	7,184.0	Pine Salt			
7,310.0	7,310.0	Pine Salt Base			
7,337.0	7,337.0	Opeche Salt			
7,416.0	7,416.0	Opeche Salt Base			
7,598.0	7,598.0	Broom Creek (Top of Minnelusa Gp.)			
7,640.0	7,640.0	Amsden			
7,816.0	7,816.0	Tyler			
8,004.0	8,004.0	Otter (Base of Minnelusa Gp.)			
8,353.0	8,353.0	Kibbey			
8,499.0	8,499.0	Charles Salt			
9,123.0	9,123.0	UB			
9,199.0	9,199.0	Base Last Salt			
9,247.0	9,247.0	Ratcliffe			
9,423.0	9,423.0	Mission Canyon			
9,998.0	9,998.0	Lodgepole			
10,833.5	10,703.0	False Bakken			
10,864.3	10,713.0	Upper Bakken			
10,924.5	10,727.0	Middle Bakken			
11,000.8	10,734.0	Middle Bakken Sand Target			

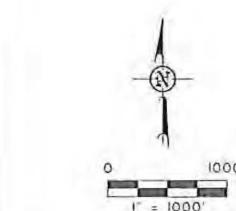
Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
10,256.6	10,256.6	0.0	0.0	Start Build 12.00	
11,007.8	10,734.0	-478.7	0.0	Start 13.3 hold at 11007.8 MD	
11,021.0	10,734.0	-491.9	0.0	Start DLS 0.00 TFO 180.00	
21,107.1	10,709.0	-10,578.0	0.0	TD at 21107.1	

## SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

"BRAY 5301 43-12H"

BRAT 330143-121



-  - MONUMENT - RECOVERED
-  - MONUMENT - NOT RECOVERED



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**Interstate Engineering, Inc.**  
P.O. Box 643  
425 East Main Street  
Sidney, Montana 59270  
Ph. (406) 433-5517  
Fax (406) 433-5618  
[www.engl.com](http://www.engl.com)

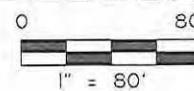
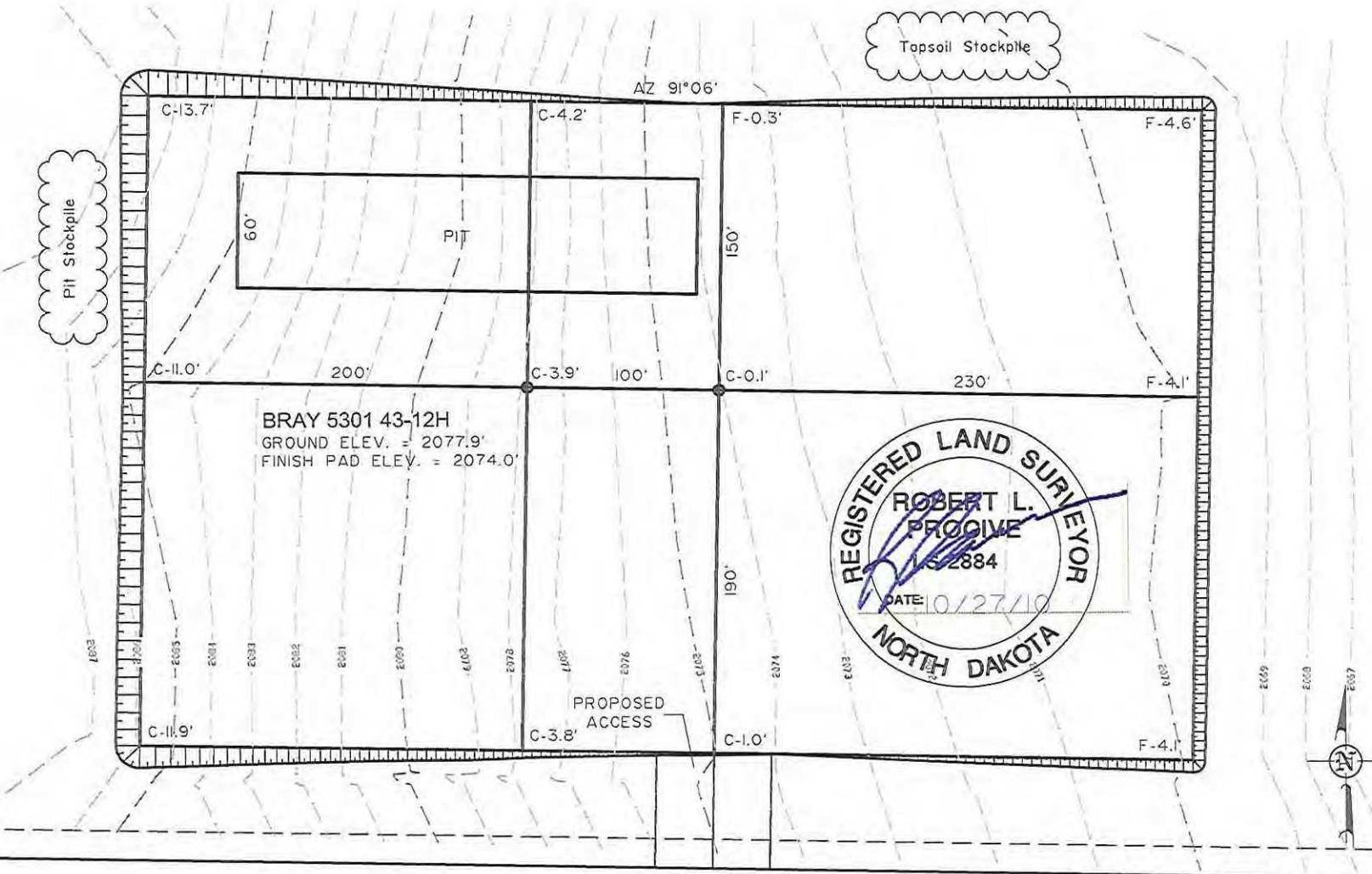
OASIS PETROLEUM NORTH AMERICA, LLC  
SECTION BREAKDOWN  
SECTIONS 12, 13 & 24, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA

Entered By: H.J.G. Project No.: S10-09-107  
Checked By: A.J.H.R.L.P. Date: Oct 2012

# PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"BRAY 5301 43-12H"

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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Project No.	Date	By	Description
1001	10/27/10	R.L.P.	
OASIS PETROLEUM NORTH AMERICA, LLC			
PAD LAYOUT			
SECTION 12, T153N, R101W			
MCKENZIE COUNTY, NORTH DAKOTA			
Drawn By:	H.G.	Project No.:	S109-167
Checked By:	A.J.H.R.P.	Date:	OCT 2010

Interstate Engineering Inc.  
P.O. Box 618  
425 East Main Street  
Sidney, Montana 59270  
Ph. (406) 433-5617  
Fax (406) 433-5618  
[www.interstate-mt.com](http://www.interstate-mt.com)  
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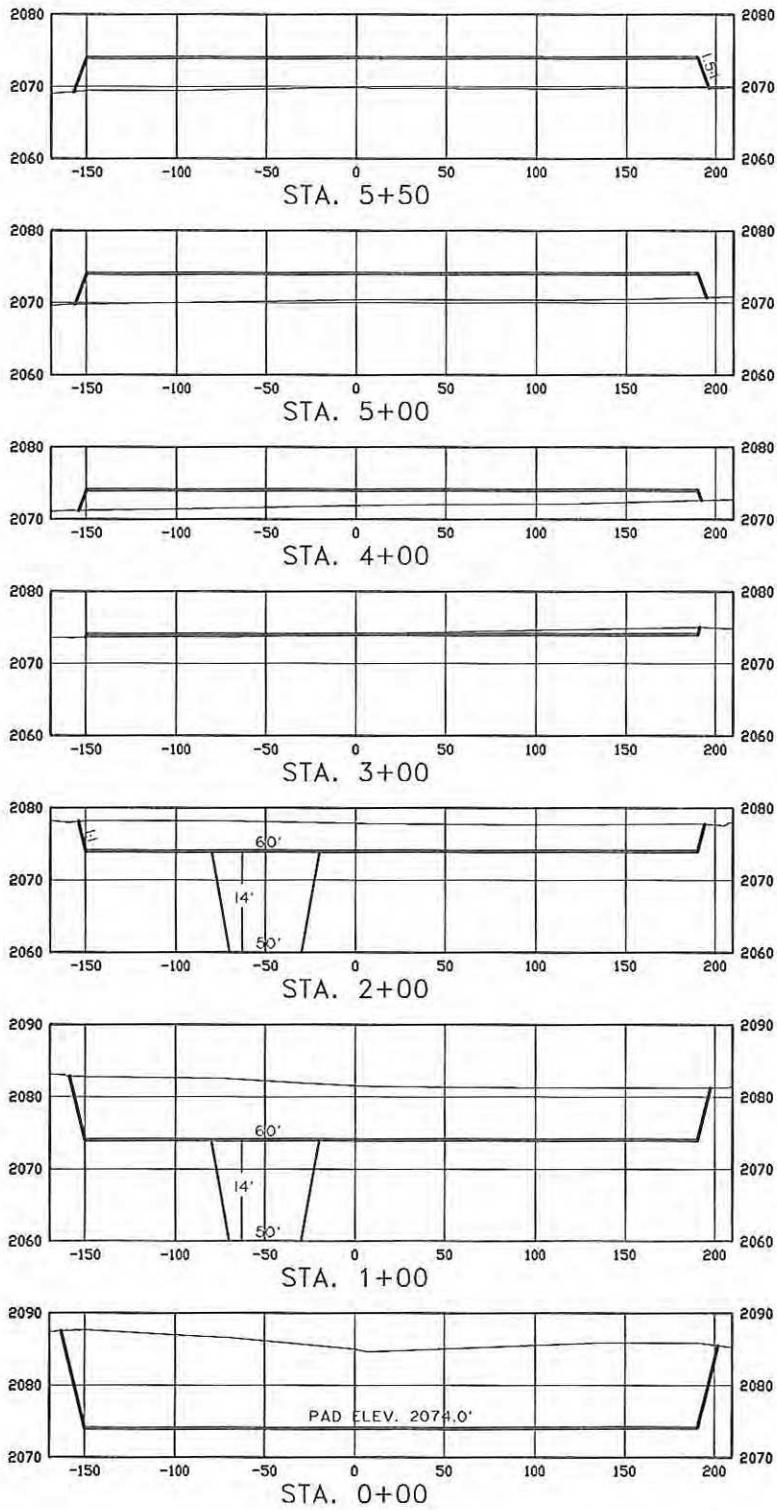
3  
SHEET NO.

# CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

"BRAY 5301 43-12H"

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



SCALE

HORIZ 1'=100'  
VERT 1'=20'

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7



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[www.lengl.com](http://www.lengl.com)  
Other offices in Montana, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
PAD CROSS SECTIONS

SECTION 12, T153N, R101W

MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	H.J.G.	Project No.:	S10-9-167
Checked By:	R.L.P.	Date:	OCT 2010

Revision No.	Date	By	Description

### WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

"BRAY 5301 43-12H"

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2077.9
WELL PAD ELEVATION	2074.0
EXCAVATION	23,860
PLUS PIT	<u>3,150</u>
	27,010
EMBANKMENT	7,965
PLUS SHRINKAGE (30%)	<u>2,390</u>
	10,355
STOCKPILE PIT	3,150
STOCKPILE TOP SOIL (6")	3,695
STOCKPILE FROM PAD	9,810
DISTURBED AREA FROM PAD	4.58 ACRES

NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS NOTED)

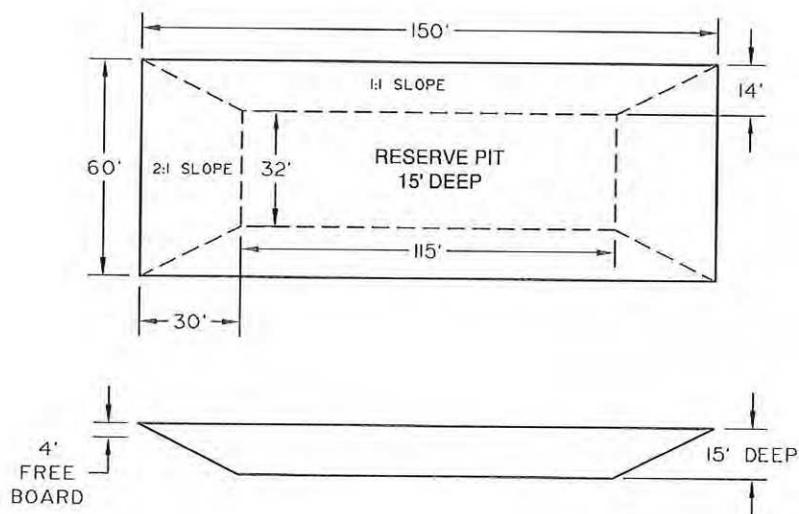
CUT END SLOPES AT 1:1

FILL END SLOPES AT 1.5:1

### WELL SITE LOCATION

1927' FEL

250' FSL



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**3A**



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**ANSCHUTZ EXPLORATION  
QUANTITIES**  
SECTION 8, T141N, R96W  
**DUNN COUNTY, ND**

Project No.	Date	By	Description

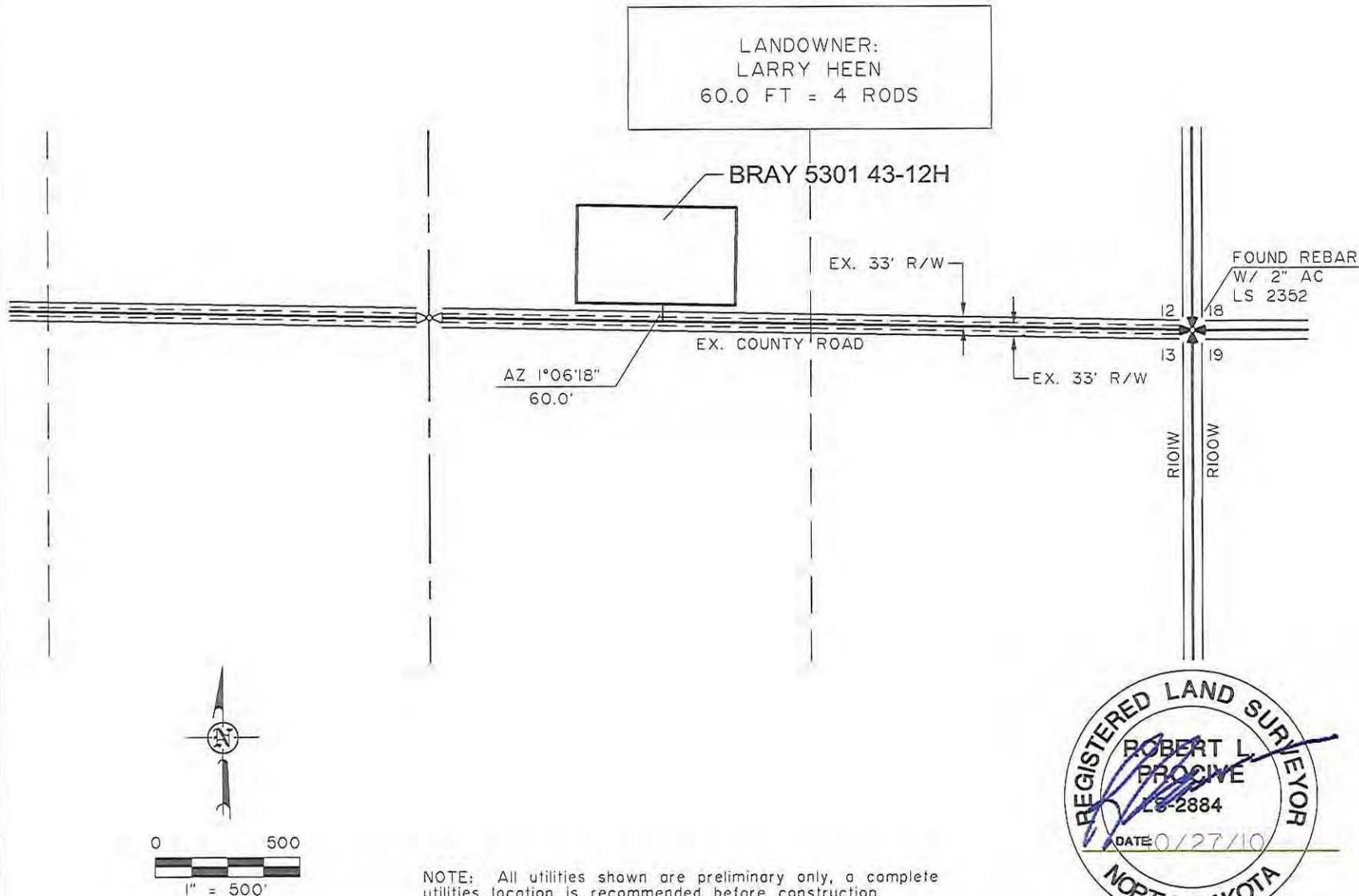
Drawn By: H.J.G. Project No.: B10-08-143  
Checked By: A.S.F. Date: OCT 2010

# ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002

"BRAY 5301 43-12H"

250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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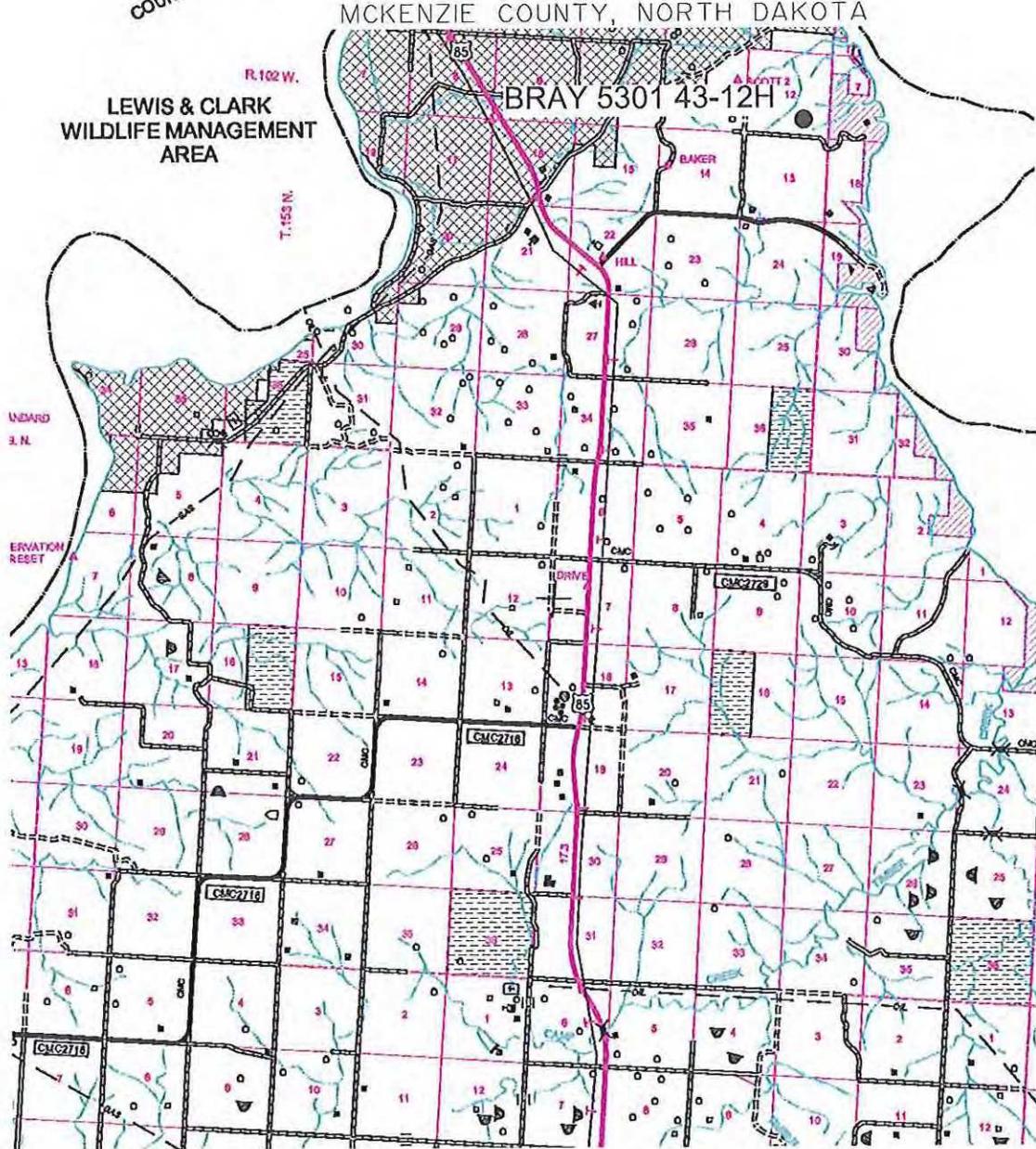
Project No.: S1025-167	Date: OCT 2010
Drawn By: H.J.G.	Checked By: A.J.H.R.P.
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**COUNTY ROAD MAP**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 202 HOUSTON, TX 77002  
"BRAY 5301 43-12H"  
250 FEET FROM SOUTH LINE AND 1927 FEET FROM EAST LINE  
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

OASIS PETROLEUM NORTH AMERICA, LLC  
BRAY 530I 43-I2H  
250' FSL/1927' FEL  
QUAD LOCATION MAP  
SECTION I2, T153N, R101W  
MONTDORF, SULLIVAN, NORTH DAKOTA



SCALE: 1" = 2 MILE

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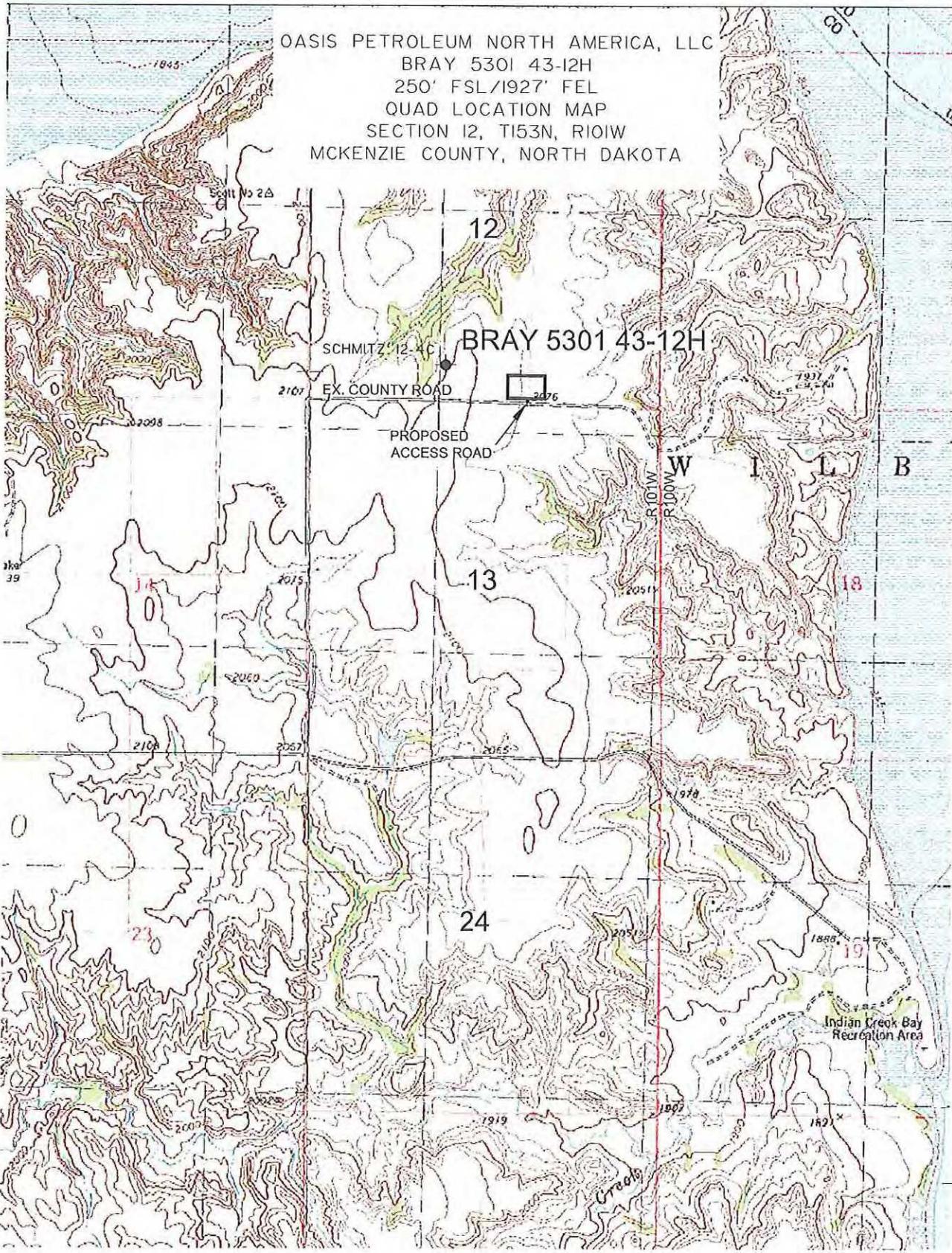
SHEET NO

**Interstate Engineering, Inc.**  
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Sidney, Montana 59270  
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[www.lengl.com](http://www.lengl.com)

#### **Other offices in Minnesota, North Dakota and South Dakota**

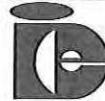
OASIS PETROLEUM NORTH AMERICA, LLC  
COUNTY ROAD MAP  
SECTION 12, T153N, R101W

MCKENZIE COUNTY, NORTH DAKOTA  
Plan By: H.J.G. Project No.: S10-09-167  
Checked By: A.J.H./R.P. Date: OCT 2010



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Chartered in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
 QUAD LOCATION MAP  
 SECTION 12, T153N, R101W  
 MCKENZIE COUNTY, NORTH DAKOTA

Section No.	Date	By	Description
		H.J.G.	Project No.: S10-09-167
		AJH/R.L.P.	Date: OCT 2010