



## 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)

Received

Well File No.

30189

TH

NOV 12 2019

## ND Oil &amp; Gas Division

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL.

Well Name and Number <b>LEWIS FEDERAL 5300 11-31 2B</b>	Qtr-Qtr <b>LOT1</b>	Section <b>153</b>	Township <b>100</b>	Range <b>0</b>	County <b>McKenzie</b>
Operator <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>(281) 404-9573</b>		Field <b>BAKER</b>		
Address <b>1001 Fannin, Suite 1500</b>	<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) 404-9627</b>	% Purchased <b>100%</b>	Date Effective <b>August 5, 2019</b>
Principal Place of Business <b>1001 Fannin, Suite 1500</b>	City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Field Address	City	State	Zip Code
Names of Transporter <b>Hiland Crude, LLC</b>	Telephone Number <b>(918) 588-5000</b>	% Transported <b>95%</b>	Date Effective <b>August 5, 2019</b>
Address <b>8811 South Yale Avenue, Suite 200</b>	City <b>Tulsa</b>	State <b>OK</b>	Zip Code <b>74137</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 <b>August 5, 2019</b>
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective <b>August 5, 2019</b>
Other Transporters Transporting From This Lease <b>Power Energy Logistics, LLC</b>	% Transported <b>5%</b>	Date Effective <b>August 5, 2019</b>
Other Transporters Transporting From This Lease	% Transported	Date Effective <b>August 5, 2019</b>
Comments		

I hereby swear or affirm that all transporters of Bakken Petroleum System oil, listed above implement or adhere to a tariff specification as stringent as the Commission's VPCR<sub>4</sub> requirement.  13.7 VPCR<sub>4</sub> Tariff Specification DAPL Tariff Authority

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date <b>November 5, 2019</b>
Signature 	Printed Name <b>Claudia Arguelles</b>	Title <b>Contracts Administrator</b>

Above Signature Witnessed By:

Signature 	Printed Name <b>Kenzie Buchanan</b>	Witness Title <b>Scheduler</b>
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FOR STATE USE ONLY

Date Approved <b>NOV 15 2019</b>	NDIC CTB NO. <b>200190</b>
By 	
Title <b>Oil &amp; Gas Production Analyst</b>	



**WELL COMPLETION OR RECOMPLETION REPORT - FORM 6**

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

RECEIVED  
M 6

SEP 17 2019

Well File No.  
**30189**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion						
<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> EOR Well	<input type="checkbox"/> Recompletion	<input type="checkbox"/> Deepened Well	<input type="checkbox"/> Added Horizontal Leg	<input type="checkbox"/> Extended Horizontal Leg	
<input type="checkbox"/> Gas Well	<input type="checkbox"/> SWD Well	<input type="checkbox"/> Water Supply Well	<input type="checkbox"/> Other:			
Well Name and Number <b>Lewis Federal 5300 11-31 2B</b>				Spacing Unit Description <b>Sec. 31/32 T153N R100W</b>		
Operator <b>Oasis Petroleum North America</b>		Telephone Number <b>(281) 404-9500</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**

At Surface		Qtr-Qtr	Section	Township	Range	County
1050 F N L	265 F WL	LOT1	31	153 N	100 W	McKenzie
Spud Date	Date TD Reached	Drilling Contractor and Rig Number			KB Elevation (Ft)	Graded Elevation (Ft)
January 25, 2019	February 13, 2019	Nabors B21			2135	2110

Type of Electric and Other Logs Run (See Instructions)

MWD/GR from KOP to TD; CBL from int. TD to surface

**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 1-11160' to 20807'</b>							Name of Zone (If Different from Pool Name)		
Date Well Completed (SEE INSTRUCTIONS) <b>August 2, 2019</b>							Well Status (Producing or Shut-In) <b>producing</b>		
Date of Test <b>08/05/2019</b>	Hours Tested <b>24</b>	Choke Size <b>18 /64</b>	Producing Method <b>flowing</b>		Pumping-Size & Type of Pump				
			Oil (Bbls) <b>548</b>	Gas (MCF) <b>764</b>	Water (Bbls) <b>461</b>	Oil Gravity-API (Corr.) °	Disposition of Gas <b>Sold</b>		
Flowing Tubing Pressure (PSI)		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls) <b>548</b>	Gas (MCF) <b>764</b>	Water (Bbls) <b>461</b>	Gas-Oil Ratio <b>1394</b>	
<b>1700</b>									

## GEOLOGICAL MARKERS

## **PLUG BACK INFORMATION**

CORES CUT

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

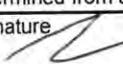
## Drill Stem Test

**Well Specific Stimulation**

Date Stimulated 06/20/2019	Stimulated Formation Bakken		Top (Ft) 11160	Bottom (Ft) 20807	Stimulation Stages 40	Volume 305814	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 6010700	Maximum Treatment Pressure (PSI) 9259		Maximum Treatment Rate (BBLS/Min) 73.0		
Details 100 Mesh: 3586110 40/70 White: 1510300 40/70 CRC: 914290							
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**

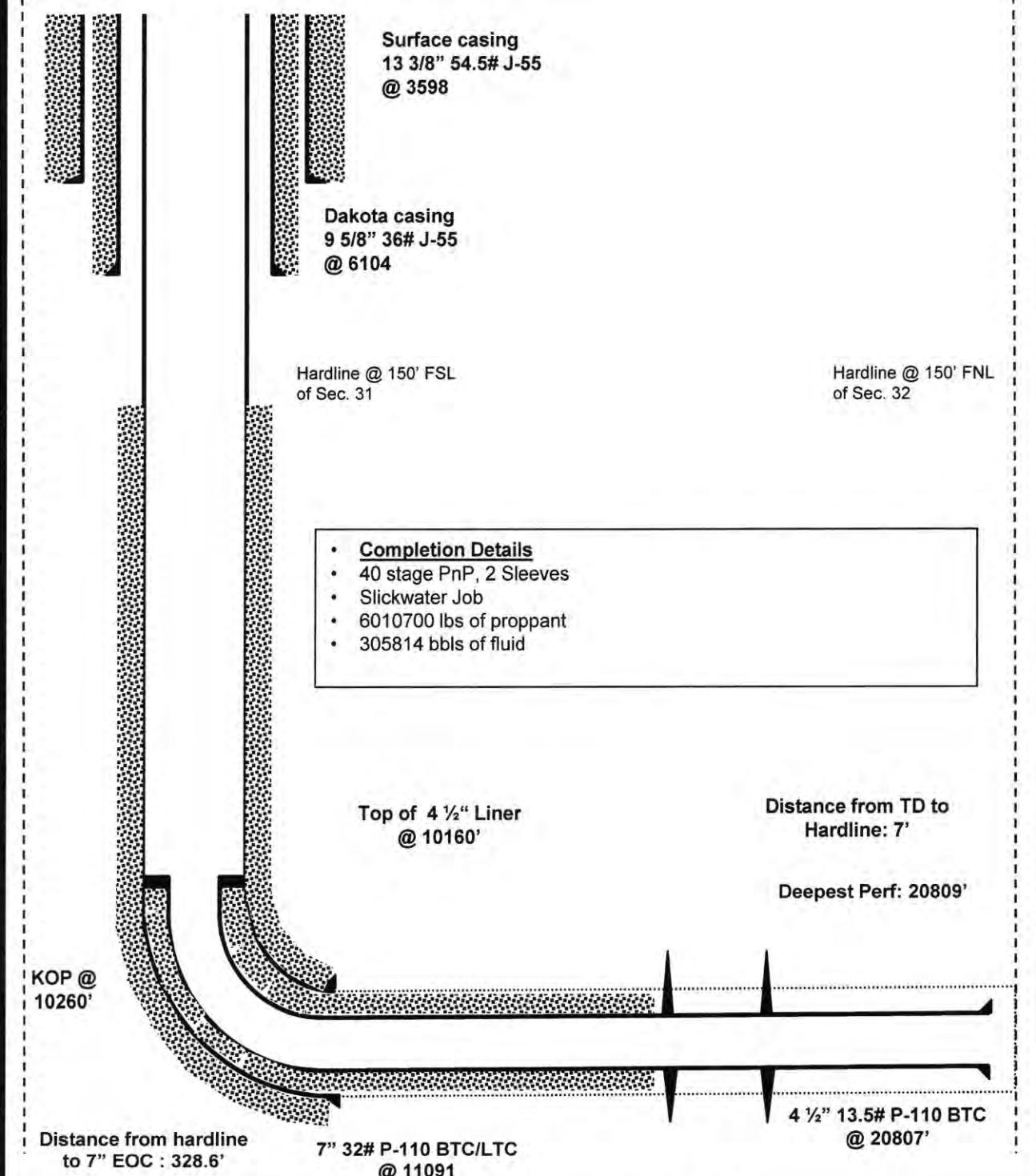
A scab liner was set on this well to raise liner top to approximately 10160'.  
This report provides frac data.

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address <a href="mailto:jswenson@oasispetroleum.com">jswenson@oasispetroleum.com</a>	Date 09/13/2019
Signature 	Printed Name Jennifer Swenson	Title Regulatory Specialist

ELEVATION: 2110' GL

**Lewis Federal 5300 11-31 2B  
Wellbore Schematic**

FORMATION: Bakken



**OASIS PETROLEUM NA LLC**

Lewis Federal 5300 11-31 2B

Wellbore: T153N-R100W Sec. 31 & 32

SHL: 1050' FNL & 265' FEL T153N-R100W Sec. 31

McKenzie County, North Dakota



# 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)

RECEIVED

AUG 22 2019

Well File No.  
**30189**

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 2, 2019</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 checked="" 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 <b>Lewis Federal 5300 11-31 2B</b>					
Footages <b>1050 F N L</b>	<b>256 F W L</b>	Qtr-Qtr <b>LOT1</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 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 immediately, we request CONFIDENTIAL STATUS for the above referenced well.

Date of First Production August 2, 2019.

*off confidential 2/2/20*

Company <b>Oasis Petroleum North America LLC</b>		Telephone Number <b>713-770-6570</b>	
Address <b>1001 Fannin, Suite 1500</b>			
City <b>Houston</b>		State <b>TX</b>	Zip Code <b>77002</b>
Signature <i>Jasmine Crawford</i>		Printed Name <b>Jasmine Crawford</b>	
Title <b>Regulatory Specialist</b>		Date <b>August 13, 2019</b>	
Email Address <b>jcrawford@oasispetroleum.com</b>			

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>8/23/19</i>	
By <i>Abbie Ebel</i>	
Title <b>Petroleum Resource Specialist</b>	

Industrial Commission of North Dakota  
Oil and Gas Division

Well or Facility No  
**30189**

Verbal Approval To Purchase and Transport Oil

Tight Hole No

**OPERATOR**

Operator <b>OASIS PETROLEUM NORTH AMERICA LL</b>	Representative <b>Mike Haase</b>	Rep Phone <b>(701) 570-6752</b>
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**WELL INFORMATION**

Well Name <b>LEWIS FEDERAL 5300 11-31 2B</b>	Inspector <b>Richard Dunn</b>	
Well Location QQ Sec Twp Rng <b>LOT1 31 153 N 100 W</b>	County <b>MCKENZIE</b>	
Footages 1050 Feet From the N Line 265 Feet From the W Line	Field <b>BAKER</b>	
	Pool	
Date of First Production Through Permanent Wellhead	<b>8/5/2019</b>	<b>This Is The First Sales</b>

**PURCHASER / TRANSPORTER**

Purchaser <b>OASIS PETROLEUM MARKETING LLC</b>	Transporter <b>HILAND CRUDE, LLC</b>
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**TANK BATTERY**

<b>Single Well Tank Battery Number : 130189-01</b>
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**SALES INFORMATION** This Is The First Sales

ESTIMATED BARRELS TO BE SOLD	ACTUAL BARRELS SOLD	DATE
15000 BBLS	1860 BBLS	<b>8/5/2019</b>
BBLS	BBLS	

**DETAILS**

Must also forward Forms 6 & 8 to State prior to reaching 15000 Bbl estimate or no later than required time frame for submitting those forms.
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Start Date	<b>8/5/2019</b>
Date Approved	<b>8/9/2019</b>
Approved By	<b>Richard Dunn</b>



**WELL COMPLETION OR RECOMPLETION REPORT - FORM 6**

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

EKT FORM

JUN 19 2019

Well File No.  
**30189**

ND Oil & Gas Division

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion							
<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> EOR Well	<input type="checkbox"/> Recompletion	<input type="checkbox"/> Deepened Well	<input type="checkbox"/> Added Horizontal Leg	<input type="checkbox"/> Extended Horizontal Leg		
<input type="checkbox"/> Gas Well	<input type="checkbox"/> SWD Well	<input type="checkbox"/> Water Supply Well	<input type="checkbox"/> Other:				
Well Name and Number <b>Lewis Federal 5300 11-31 2B</b>				Spacing Unit Description <b>Sec. 31/32 T153N R100W</b>			
Operator <b>Oasis Petroleum North America</b>		Telephone Number <b>(281) 404-9500</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**

At Surface <b>1050</b> <del>973</del> F N L	<b>265</b> <del>235</del> F WL	Qtr-Qtr <b>LOT1</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 W</b>	County <b>McKenzie</b>
Spud Date <b>January 25, 2019</b>	Date TD Reached <b>February 13, 2019</b>	Drilling Contractor and Rig Number <b>Nabors B21</b>			KB Elevation (Ft) <b>2135</b>	Graded Elevation (Ft) <b>2110</b>

Type of Electric and Other Logs Run (See Instructions)

MWD/GR from KOP to TD; CBL from int. TD to surface

## 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)							Name of Zone (If Different from Pool Name)	
<b>Lateral 1-</b>								
Date Well Completed (SEE INSTRUCTIONS)			Producing Method	Pumping-Size & Type of Pump				Well Status (Producing or Shut-In)
Date of Test	Hours Tested	Choke Size <b>/64</b>	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.) °	Disposition of Gas
Flowing Tubing Pressure (PSI)		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio

## 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	Stimulated Formation		Top (Ft)	Bottom (Ft)	Stimulation Stages		Volume	Volume Units Barrels
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								
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**

This is a preliminary completion report. A supplemental report will be filed upon first production of the well.

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.

Email Address  
[jswenson@oasispetroleum.com](mailto:jswenson@oasispetroleum.com)

Date  
06/18/2019

Signature

Printed Name  
Jennifer Swenson

Title  
Regulatory Specialist



7327 West Barton Road  
Casper, WY 82604  
(307)-472-6621 Fax (307) 472-5439

## Survey Certification

<b>Operator</b>	Oasis Petroleum
<b>Well Name &amp; No.</b>	Lewis Federal 5300 11-31 2B
<b>API #</b>	33-053-06549
<b>County &amp; State</b>	McKenzie County, ND
<b>SDI Job #</b>	OP.015962
<b>Rig</b>	Nabors B21
<b>Survey Date</b>	12-Feb-2019

I, Seth M. Burstad, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 20870 feet is true and correct as determined from all available records.

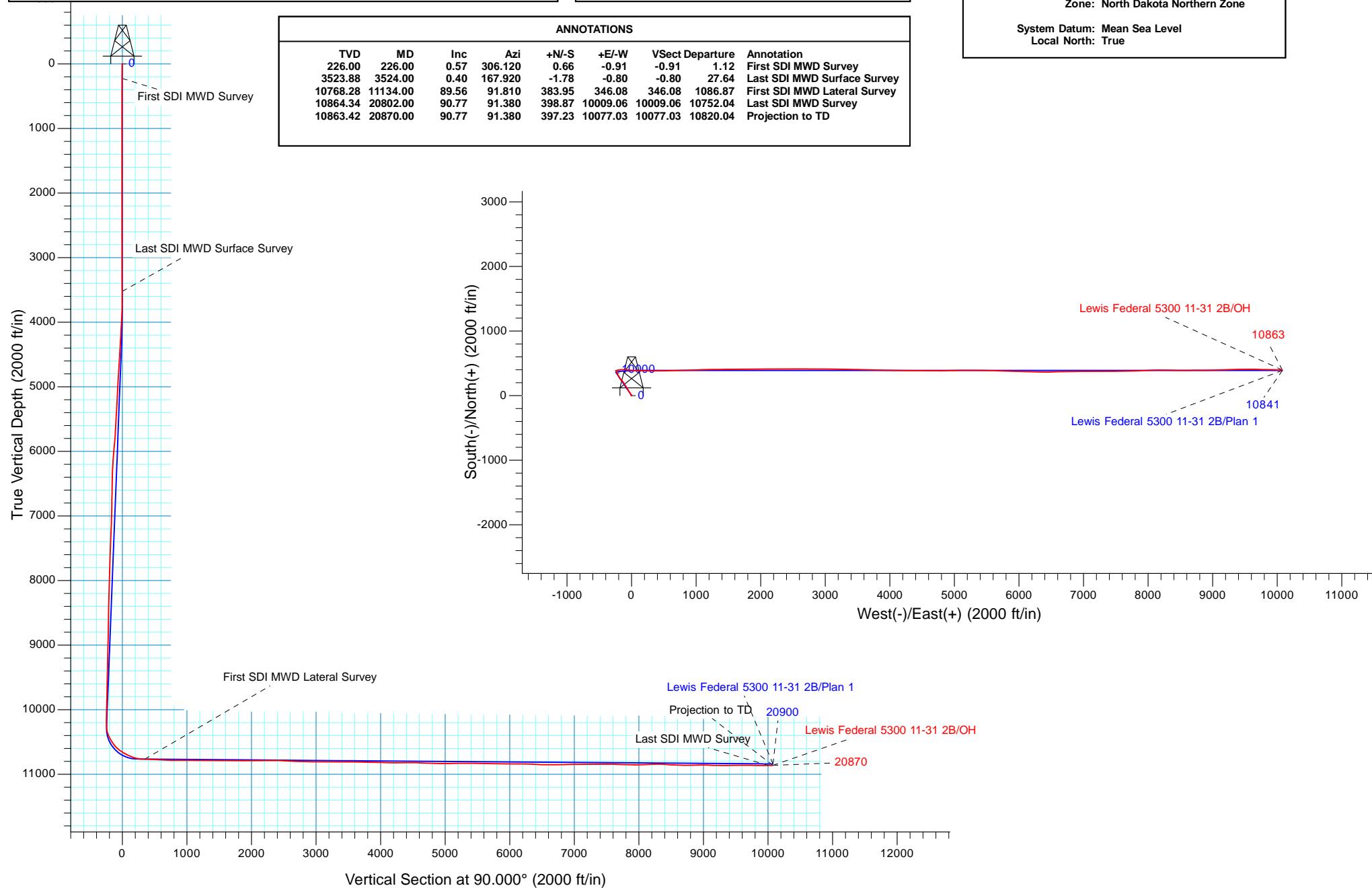
*Seth Burstad* 14-Feb-2019  
Signature Date

**Seth M. Burstad**  
Rockies Region Well Planner  
Scientific Drilling - Rocky Mountain District

WELL DETAILS: Lewis Federal 5300 11-31 2B			
Northing 393162.02	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)	Easting 1209545.85	Latitude 48° 2' 9.300 N      Longitude 103° 36' 11.060 W

Design: OH (Lewis Federal 5300 11-31 2B/OH)
Created By: Seth Burstad

PROJECT DETAILS: McKenzie County, ND
Geodetic System: US State Plane 1983 Datum: North American Datum 1983 Ellipsoid: GRS 1980 Zone: North Dakota Northern Zone  System Datum: Mean Sea Level Local North: True





## Oasis Petroleum

McKenzie County, ND  
Lewis Federal  
Lewis Federal 5300 11-31 2B

OH

Design: OH

## Standard Survey Report

14 February, 2019



[www.scientificdrilling.com](http://www.scientificdrilling.com)



<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

<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>	Lewis Federal, Site Center: Lewis Federal 5300 11-31 2B				
<b>Site Position:</b>		<b>Northing:</b>	393,162.02 usft	<b>Latitude:</b>	48° 2' 9.300 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,209,545.85 usft	<b>Longitude:</b>	103° 36' 11.060 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-2.31 °

<b>Well</b>	Lewis Federal 5300 11-31 2B, 1050' FNL 265' FWL Sec 31 T153N R100W				
<b>Well Position</b>	+N/-S +E/-W	0.00 ft 0.00 ft	<b>Northing:</b> <b>Easting:</b>	393,162.02 usft 1,209,545.85 usft	<b>Latitude:</b> <b>Longitude:</b>
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft	<b>Ground Level:</b>
					2,110.00 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)
	HDGM	11/5/2018	7.88	72.70	55,785

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>		<b>Depth From (TVD)</b> (ft)	<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)	<b>Direction</b> (°)
		0.00	0.00	0.00	90.000

<b>Survey Program</b>		<b>Date</b>	2/14/2019	
<b>From</b> (ft)	<b>To</b> (ft)	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
226.00	3,524.00	Survey #1 - Surface (OH)	MWD+HDGM	OWSG MWD + HDGM
3,524.00	6,023.00	Survey #2 - Vertical (OH)	MWD+HDGM	OWSG MWD + HDGM
6,148.00	11,076.00	Survey #3 - Vertical / Curve (OH)	MWD+HDGM	OWSG MWD + HDGM
11,134.00	20,870.00	Survey #4 - Lateral (OH)	MWD+HDGM	OWSG MWD + HDGM

<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>Vertical Section</b> (ft)	<b>Dogleg Rate</b> (°/100ft)	<b>Build Rate</b> (°/100ft)	<b>Turn Rate</b> (°/100ft)
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
226.00	0.57	306.120	226.00	0.66	-0.91	-0.91	0.25	0.25	0.00
<b>First SDI MWD Survey</b>									
288.00	0.34	294.940	287.99	0.92	-1.32	-1.32	0.40	-0.37	-18.03
381.00	0.26	310.670	380.99	1.18	-1.73	-1.73	0.12	-0.09	16.91
443.00	0.52	315.060	442.99	1.47	-2.04	-2.04	0.42	0.42	7.08
534.00	0.30	1.750	533.99	2.00	-2.32	-2.32	0.42	-0.24	51.31
628.00	0.21	0.720	627.99	2.42	-2.31	-2.31	0.10	-0.10	-1.10

<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

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)	
718.00	0.21	316.340	717.99	2.70	-2.43	-2.43	0.18	0.00	-49.31	
808.00	0.34	1.590	807.99	3.09	-2.53	-2.53	0.27	0.14	50.28	
899.00	0.78	29.060	898.98	3.90	-2.22	-2.22	0.55	0.48	30.19	
989.00	0.67	31.180	988.98	4.88	-1.65	-1.65	0.13	-0.12	2.36	
1,079.00	0.52	22.270	1,078.97	5.71	-1.23	-1.23	0.20	-0.17	-9.90	
1,170.00	0.69	17.850	1,169.97	6.61	-0.90	-0.90	0.19	0.19	-4.86	
1,261.00	0.63	22.140	1,260.96	7.60	-0.55	-0.55	0.09	-0.07	4.71	
1,350.00	0.65	358.870	1,349.95	8.56	-0.37	-0.37	0.29	0.02	-26.15	
1,442.00	0.41	186.790	1,441.95	8.75	-0.42	-0.42	1.15	-0.26	-187.04	
1,532.00	0.26	209.490	1,531.95	8.25	-0.56	-0.56	0.22	-0.17	25.22	
1,622.00	0.37	235.110	1,621.95	7.91	-0.90	-0.90	0.20	0.12	28.47	
1,713.00	0.64	230.240	1,712.95	7.42	-1.53	-1.53	0.30	0.30	-5.35	
1,806.00	0.60	221.430	1,805.94	6.72	-2.25	-2.25	0.11	-0.04	-9.47	
1,899.00	0.64	241.650	1,898.94	6.11	-3.03	-3.03	0.24	0.04	21.74	
1,993.00	0.43	225.640	1,992.93	5.61	-3.75	-3.75	0.27	-0.22	-17.03	
2,086.00	0.50	228.000	2,085.93	5.10	-4.30	-4.30	0.08	0.08	2.54	
2,180.00	0.66	260.260	2,179.92	4.73	-5.13	-5.13	0.38	0.17	34.32	
2,273.00	0.18	148.060	2,272.92	4.52	-5.59	-5.59	0.80	-0.52	-120.65	
2,366.00	0.28	90.670	2,365.92	4.39	-5.28	-5.28	0.26	0.11	-61.71	
2,460.00	0.63	94.640	2,459.92	4.35	-4.54	-4.54	0.37	0.37	4.22	
2,553.00	0.47	122.250	2,552.91	4.10	-3.70	-3.70	0.33	-0.17	29.69	
2,647.00	0.50	101.160	2,646.91	3.82	-2.98	-2.98	0.19	0.03	-22.44	
2,740.00	0.34	121.260	2,739.91	3.59	-2.34	-2.34	0.23	-0.17	21.61	
2,833.00	0.26	156.970	2,832.91	3.26	-2.02	-2.02	0.21	-0.09	38.40	
2,927.00	0.37	130.970	2,926.91	2.86	-1.71	-1.71	0.19	0.12	-27.66	
3,020.00	0.52	173.350	3,019.90	2.25	-1.43	-1.43	0.38	0.16	45.57	
3,113.00	0.30	165.280	3,112.90	1.59	-1.32	-1.32	0.24	-0.24	-8.68	
3,206.00	0.41	162.370	3,205.90	1.04	-1.16	-1.16	0.12	0.12	-3.13	
3,300.00	0.62	176.170	3,299.89	0.21	-1.03	-1.03	0.26	0.22	14.68	
3,393.00	0.63	182.690	3,392.89	-0.80	-1.02	-1.02	0.08	0.01	7.01	
3,486.00	0.35	148.360	3,485.89	-1.56	-0.89	-0.89	0.42	-0.30	-36.91	
3,524.00	0.40	167.920	3,523.88	-1.78	-0.80	-0.80	0.36	0.13	51.47	
Last SDI MWD Surface Survey										
3,605.00	0.51	177.950	3,604.88	-2.42	-0.73	-0.73	0.17	0.14	12.38	
3,667.00	0.36	336.340	3,666.88	-2.52	-0.80	-0.80	1.38	-0.24	255.47	
3,760.00	1.94	323.760	3,759.86	-0.98	-1.85	-1.85	1.71	1.70	-13.53	
3,854.00	4.04	328.360	3,853.73	3.12	-4.52	-4.52	2.25	2.23	4.89	
3,947.00	5.93	329.690	3,946.37	10.06	-8.67	-8.67	2.04	2.03	1.43	
4,041.00	6.72	333.480	4,039.80	19.17	-13.57	-13.57	0.95	0.84	4.03	
4,134.00	7.50	336.380	4,132.08	29.60	-18.44	-18.44	0.92	0.84	3.12	
4,228.00	7.50	333.430	4,225.28	40.71	-23.64	-23.64	0.41	0.00	-3.14	
4,321.00	6.55	325.750	4,317.58	50.52	-29.34	-29.34	1.43	-1.02	-8.26	
4,414.00	5.76	319.420	4,410.05	58.45	-35.36	-35.36	1.12	-0.85	-6.81	
4,508.00	5.83	321.850	4,503.57	65.79	-41.38	-41.38	0.27	0.07	2.59	

<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

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)	
4,602.00	6.14	326.050	4,597.05	73.71	-47.13	-47.13	0.57	0.33	4.47	
4,697.00	6.24	328.670	4,691.50	82.34	-52.66	-52.66	0.32	0.11	2.76	
4,792.00	6.46	331.910	4,785.92	91.46	-57.86	-57.86	0.44	0.23	3.41	
4,887.00	6.36	333.570	4,880.32	100.89	-62.71	-62.71	0.22	-0.11	1.75	
4,982.00	5.51	329.090	4,974.81	109.52	-67.40	-67.40	1.02	-0.89	-4.72	
5,077.00	5.49	331.300	5,069.38	117.41	-71.92	-71.92	0.22	-0.02	2.33	
5,172.00	5.87	334.160	5,163.91	125.77	-76.22	-76.22	0.50	0.40	3.01	
5,267.00	6.09	327.370	5,258.39	134.39	-81.06	-81.06	0.78	0.23	-7.15	
5,361.00	6.57	321.720	5,351.82	142.81	-87.08	-87.08	0.84	0.51	-6.01	
5,457.00	6.02	324.070	5,447.24	151.20	-93.44	-93.44	0.63	-0.57	2.45	
5,551.00	6.04	329.670	5,540.72	159.46	-98.83	-98.83	0.63	0.02	5.96	
5,646.00	6.56	331.180	5,635.15	168.53	-103.97	-103.97	0.57	0.55	1.59	
5,741.00	6.64	329.150	5,729.52	178.00	-109.40	-109.40	0.26	0.08	-2.14	
5,836.00	6.76	322.950	5,823.87	187.17	-115.58	-115.58	0.77	0.13	-6.53	
5,930.00	7.57	323.390	5,917.14	196.56	-122.61	-122.61	0.86	0.86	0.47	
6,023.00	8.46	324.970	6,009.23	207.08	-130.19	-130.19	0.99	0.96	1.70	
6,148.00	7.87	321.760	6,132.96	221.33	-140.76	-140.76	0.60	-0.47	-2.57	
6,210.00	5.30	317.690	6,194.55	226.78	-145.32	-145.32	4.21	-4.15	-6.56	
6,304.00	3.28	315.700	6,288.28	231.92	-150.12	-150.12	2.15	-2.15	-2.12	
6,397.00	2.69	314.340	6,381.15	235.35	-153.54	-153.54	0.64	-0.63	-1.46	
6,490.00	1.81	312.300	6,474.08	237.86	-156.19	-156.19	0.95	-0.95	-2.19	
6,584.00	0.90	297.560	6,568.05	239.20	-157.94	-157.94	1.03	-0.97	-15.68	
6,677.00	0.44	267.330	6,661.05	239.52	-158.94	-158.94	0.61	-0.49	-32.51	
6,771.00	1.06	293.500	6,755.04	239.85	-160.10	-160.10	0.74	0.66	27.84	
6,864.00	1.35	298.880	6,848.02	240.73	-161.85	-161.85	0.33	0.31	5.78	
6,957.00	1.71	308.130	6,940.99	242.11	-163.90	-163.90	0.47	0.39	9.95	
7,051.00	2.38	316.470	7,034.93	244.39	-166.35	-166.35	0.78	0.71	8.87	
7,144.00	2.58	315.700	7,127.84	247.29	-169.14	-169.14	0.22	0.22	-0.83	
7,237.00	4.41	327.300	7,220.66	251.80	-172.53	-172.53	2.10	1.97	12.47	
7,331.00	4.67	328.680	7,314.37	258.11	-176.48	-176.48	0.30	0.28	1.47	
7,424.00	4.58	330.440	7,407.06	264.57	-180.28	-180.28	0.18	-0.10	1.89	
7,518.00	4.40	331.390	7,500.78	271.00	-183.85	-183.85	0.21	-0.19	1.01	
7,612.00	4.13	331.380	7,594.52	277.14	-187.20	-187.20	0.29	-0.29	-0.01	
7,705.00	4.08	332.430	7,687.28	283.01	-190.34	-190.34	0.10	-0.05	1.13	
7,798.00	4.04	335.000	7,780.04	288.91	-193.25	-193.25	0.20	-0.04	2.76	
7,892.00	3.72	328.810	7,873.83	294.52	-196.23	-196.23	0.56	-0.34	-6.59	
7,985.00	3.43	321.450	7,966.65	299.28	-199.53	-199.53	0.58	-0.31	-7.91	
8,078.00	2.92	325.980	8,059.50	303.42	-202.59	-202.59	0.61	-0.55	4.87	
8,172.00	2.30	325.940	8,153.41	306.97	-204.98	-204.98	0.66	-0.66	-0.04	
8,265.00	2.16	324.850	8,246.34	309.94	-207.04	-207.04	0.16	-0.15	-1.17	
8,358.00	2.12	327.330	8,339.27	312.83	-208.97	-208.97	0.11	-0.04	2.67	
8,451.00	1.99	330.500	8,432.21	315.68	-210.70	-210.70	0.19	-0.14	3.41	
8,545.00	1.87	329.310	8,526.16	318.42	-212.28	-212.28	0.13	-0.13	-1.27	

<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

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)	
8,638.00	1.98	334.160	8,619.11	321.17	-213.76	-213.76	0.21	0.12	5.22	
8,731.00	2.45	336.680	8,712.04	324.44	-215.25	-215.25	0.52	0.51	2.71	
8,825.00	2.97	336.370	8,805.93	328.52	-217.02	-217.02	0.55	0.55	-0.33	
8,918.00	3.14	342.980	8,898.80	333.16	-218.73	-218.73	0.42	0.18	7.11	
9,012.00	3.65	336.240	8,992.63	338.36	-220.69	-220.69	0.69	0.54	-7.17	
9,105.00	3.56	338.030	9,085.45	343.75	-222.96	-222.96	0.15	-0.10	1.92	
9,198.00	3.33	336.470	9,178.28	348.90	-225.12	-225.12	0.27	-0.25	-1.68	
9,292.00	3.10	337.500	9,272.13	353.75	-227.18	-227.18	0.25	-0.24	1.10	
9,387.00	2.95	338.710	9,367.00	358.40	-229.05	-229.05	0.17	-0.16	1.27	
9,481.00	2.64	340.170	9,460.89	362.69	-230.67	-230.67	0.34	-0.33	1.55	
9,576.00	2.49	330.440	9,555.79	366.55	-232.43	-232.43	0.48	-0.16	-10.24	
9,670.00	2.63	327.620	9,649.70	370.14	-234.59	-234.59	0.20	0.15	-3.00	
9,765.00	2.47	330.050	9,744.61	373.76	-236.78	-236.78	0.20	-0.17	2.56	
9,860.00	2.29	330.730	9,839.53	377.19	-238.73	-238.73	0.19	-0.19	0.72	
9,955.00	1.88	324.330	9,934.46	380.11	-240.56	-240.56	0.50	-0.43	-6.74	
10,049.00	1.67	321.790	10,028.42	382.44	-242.31	-242.31	0.24	-0.22	-2.70	
10,144.00	1.58	319.640	10,123.38	384.52	-244.01	-244.01	0.11	-0.09	-2.26	
10,191.00	1.43	316.990	10,170.36	385.45	-244.83	-244.83	0.35	-0.32	-5.64	
10,238.00	1.19	308.700	10,217.35	386.18	-245.62	-245.62	0.65	-0.51	-17.64	
10,269.00	1.54	55.910	10,248.35	386.62	-245.52	-245.52	7.12	1.13	345.84	
10,300.00	5.57	77.400	10,279.28	387.18	-243.71	-243.71	13.47	13.00	69.32	
10,332.00	10.18	80.260	10,310.97	387.99	-239.40	-239.40	14.45	14.41	8.94	
10,363.00	15.12	77.340	10,341.21	389.35	-232.75	-232.75	16.06	15.94	-9.42	
10,395.00	19.73	74.060	10,371.73	391.74	-223.48	-223.48	14.72	14.41	-10.25	
10,426.00	23.55	75.140	10,400.54	394.77	-212.46	-212.46	12.39	12.32	3.48	
10,458.00	26.63	77.590	10,429.52	397.95	-199.27	-199.27	10.16	9.63	7.66	
10,489.00	29.38	80.260	10,456.89	400.73	-184.99	-184.99	9.75	8.87	8.61	
10,521.00	31.38	83.270	10,484.49	403.04	-168.98	-168.98	7.85	6.25	9.41	
10,553.00	34.21	89.120	10,511.40	404.15	-151.70	-151.70	13.27	8.84	18.28	
10,584.00	37.20	93.680	10,536.57	403.68	-133.63	-133.63	12.91	9.65	14.71	
10,616.00	40.59	94.600	10,561.48	402.23	-113.59	-113.59	10.75	10.59	2.88	
10,647.00	44.87	94.890	10,584.24	400.49	-92.63	-92.63	13.82	13.81	0.94	
10,679.00	49.19	94.540	10,606.05	398.56	-69.30	-69.30	13.52	13.50	-1.09	
10,710.00	52.98	94.410	10,625.52	396.68	-45.26	-45.26	12.23	12.23	-0.42	
10,742.00	55.78	94.050	10,644.15	394.77	-19.32	-19.32	8.80	8.75	-1.13	
10,773.00	58.26	94.460	10,661.03	392.84	6.61	6.61	8.08	8.00	1.32	
10,804.00	61.30	93.910	10,676.63	390.88	33.32	33.32	9.93	9.81	-1.77	
10,835.00	62.34	93.900	10,691.27	389.02	60.58	60.58	3.35	3.35	-0.03	
10,866.00	65.13	92.230	10,704.98	387.54	88.34	88.34	10.21	9.00	-5.39	
10,897.00	66.31	91.770	10,717.73	386.56	116.58	116.58	4.04	3.81	-1.48	
10,929.00	69.26	90.740	10,729.83	385.91	146.19	146.19	9.69	9.22	-3.22	
10,960.00	70.15	91.050	10,740.58	385.46	175.26	175.26	3.02	2.87	1.00	
10,991.00	73.39	91.080	10,750.28	384.91	204.70	204.70	10.45	10.45	0.10	

<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

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)	
11,023.00	78.40	90.680	10,758.07	384.43	235.72	235.72	15.70	15.66	-1.25	
11,054.00	82.92	89.680	10,763.10	384.34	266.30	266.30	14.92	14.58	-3.23	
11,076.00	84.84	89.330	10,765.45	384.53	288.17	288.17	8.87	8.73	-1.59	
11,134.00	89.56	91.810	10,768.28	383.95	346.08	346.08	9.19	8.14	4.28	
<b>First SDI MWD Lateral Survey</b>										
11,227.00	88.09	89.850	10,770.19	382.60	439.04	439.04	2.63	-1.58	-2.11	
11,319.00	87.05	87.950	10,774.09	384.37	530.94	530.94	2.35	-1.13	-2.07	
11,411.00	86.48	88.060	10,779.28	387.56	622.74	622.74	0.63	-0.62	0.12	
11,504.00	87.69	88.430	10,784.01	390.41	715.57	715.57	1.36	1.30	0.40	
11,596.00	90.30	89.030	10,785.62	392.45	807.53	807.53	2.91	2.84	0.65	
11,688.00	90.33	88.040	10,785.12	394.80	899.49	899.49	1.08	0.03	-1.08	
11,780.00	89.87	88.170	10,784.96	397.84	991.44	991.44	0.52	-0.50	0.14	
11,872.00	88.79	87.880	10,786.03	401.01	1,083.38	1,083.38	1.22	-1.17	-0.32	
11,964.00	90.30	89.130	10,786.76	403.41	1,175.34	1,175.34	2.13	1.64	1.36	
12,055.00	89.73	88.520	10,786.74	405.28	1,266.32	1,266.32	0.92	-0.63	-0.67	
12,148.00	89.36	89.620	10,787.48	406.79	1,359.30	1,359.30	1.25	-0.40	1.18	
12,240.00	90.30	89.760	10,787.75	407.28	1,451.30	1,451.30	1.03	1.02	0.15	
12,332.00	89.50	89.010	10,787.91	408.27	1,543.29	1,543.29	1.19	-0.87	-0.82	
12,427.00	89.40	90.000	10,788.83	409.09	1,638.29	1,638.29	1.05	-0.11	1.04	
12,522.00	89.36	90.040	10,789.85	409.06	1,733.28	1,733.28	0.06	-0.04	0.04	
12,616.00	90.44	90.040	10,790.02	408.99	1,827.28	1,827.28	1.15	1.15	0.00	
12,712.00	90.10	89.570	10,789.56	409.32	1,923.28	1,923.28	0.60	-0.35	-0.49	
12,808.00	91.30	88.410	10,788.39	411.01	2,019.25	2,019.25	1.74	1.25	-1.21	
12,903.00	90.43	89.600	10,786.96	412.66	2,114.22	2,114.22	1.55	-0.92	1.25	
12,997.00	88.93	90.150	10,787.48	412.87	2,208.22	2,208.22	1.70	-1.60	0.59	
13,092.00	89.50	89.620	10,788.78	413.06	2,303.21	2,303.21	0.82	0.60	-0.56	
13,186.00	90.30	88.980	10,788.95	414.21	2,397.20	2,397.20	1.09	0.85	-0.68	
13,282.00	87.15	90.570	10,791.08	414.58	2,493.16	2,493.16	3.68	-3.28	1.66	
13,377.00	86.78	90.250	10,796.11	413.90	2,588.02	2,588.02	0.51	-0.39	-0.34	
13,472.00	87.82	90.360	10,800.59	413.40	2,682.92	2,682.92	1.10	1.09	0.12	
13,567.00	88.36	90.590	10,803.76	412.61	2,777.86	2,777.86	0.62	0.57	0.24	
13,661.00	88.16	90.360	10,806.61	411.83	2,871.81	2,871.81	0.32	-0.21	-0.24	
13,756.00	88.73	90.460	10,809.19	411.15	2,966.78	2,966.78	0.61	0.60	0.11	
13,850.00	90.60	90.440	10,809.74	410.42	3,060.77	3,060.77	1.99	1.99	-0.02	
13,945.00	90.77	89.940	10,808.60	410.10	3,155.76	3,155.76	0.56	0.18	-0.53	
14,039.00	90.94	89.900	10,807.20	410.23	3,249.75	3,249.75	0.19	0.18	-0.04	
14,134.00	88.96	91.640	10,807.28	408.95	3,344.73	3,344.73	2.77	-2.08	1.83	
14,229.00	89.13	92.210	10,808.87	405.76	3,439.66	3,439.66	0.63	0.18	0.60	
14,324.00	89.30	91.370	10,810.17	402.80	3,534.61	3,534.61	0.90	0.18	-0.88	
14,418.00	88.90	91.700	10,811.64	400.28	3,628.56	3,628.56	0.55	-0.43	0.35	
14,513.00	89.30	91.580	10,813.14	397.56	3,723.51	3,723.51	0.44	0.42	-0.13	
14,607.00	88.56	91.170	10,814.89	395.31	3,817.47	3,817.47	0.90	-0.79	-0.44	
14,702.00	89.03	91.310	10,816.89	393.25	3,912.42	3,912.42	0.52	0.49	0.15	
14,796.00	88.79	90.980	10,818.68	391.37	4,006.39	4,006.39	0.43	-0.26	-0.35	

<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

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)	
14,891.00	89.03	90.770	10,820.48	389.92	4,101.36	4,101.36	0.34	0.25	-0.22	
14,985.00	89.43	90.020	10,821.75	389.27	4,195.35	4,195.35	0.90	0.43	-0.80	
15,080.00	90.40	90.570	10,821.89	388.78	4,290.34	4,290.34	1.17	1.02	0.58	
15,175.00	90.67	90.300	10,821.00	388.06	4,385.34	4,385.34	0.40	0.28	-0.28	
15,270.00	90.30	90.570	10,820.20	387.34	4,480.33	4,480.33	0.48	-0.39	0.28	
15,364.00	86.98	90.950	10,822.43	386.10	4,574.28	4,574.28	3.55	-3.53	0.40	
15,458.00	87.56	90.000	10,826.90	385.32	4,668.17	4,668.17	1.18	0.62	-1.01	
15,552.00	87.65	90.310	10,830.83	385.06	4,762.09	4,762.09	0.34	0.10	0.33	
15,646.00	89.16	88.920	10,833.45	385.70	4,856.05	4,856.05	2.18	1.61	-1.48	
15,741.00	89.53	88.950	10,834.54	387.46	4,951.02	4,951.02	0.39	0.39	0.03	
15,836.00	90.84	88.850	10,834.23	389.28	5,046.00	5,046.00	1.38	1.38	-0.11	
15,931.00	91.48	89.020	10,832.31	391.05	5,140.97	5,140.97	0.70	0.67	0.18	
16,026.00	90.30	89.520	10,830.83	392.26	5,235.95	5,235.95	1.35	-1.24	0.53	
16,121.00	90.64	90.120	10,830.05	392.56	5,330.94	5,330.94	0.73	0.36	0.63	
16,216.00	89.36	91.440	10,830.05	391.27	5,425.93	5,425.93	1.94	-1.35	1.39	
16,310.00	88.22	91.090	10,832.04	389.19	5,519.88	5,519.88	1.27	-1.21	-0.37	
16,405.00	89.06	91.180	10,834.29	387.31	5,614.84	5,614.84	0.89	0.88	0.09	
16,499.00	88.56	92.010	10,836.24	384.69	5,708.78	5,708.78	1.03	-0.53	0.88	
16,594.00	89.10	91.890	10,838.18	381.46	5,803.70	5,803.70	0.58	0.57	-0.13	
16,688.00	89.40	91.390	10,839.41	378.77	5,897.66	5,897.66	0.62	0.32	-0.53	
16,783.00	89.36	91.960	10,840.44	376.00	5,992.61	5,992.61	0.60	-0.04	0.60	
16,877.00	89.83	91.870	10,841.11	372.85	6,086.55	6,086.55	0.51	0.50	-0.10	
16,971.00	90.67	91.690	10,840.70	369.93	6,180.51	6,180.51	0.91	0.89	-0.19	
17,066.00	87.82	91.810	10,841.95	367.03	6,275.45	6,275.45	3.00	-3.00	0.13	
17,161.00	86.68	89.870	10,846.51	365.64	6,370.32	6,370.32	2.37	-1.20	-2.04	
17,256.00	88.19	88.760	10,850.76	366.78	6,465.21	6,465.21	1.97	1.59	-1.17	
17,350.00	89.87	88.690	10,852.35	368.87	6,559.17	6,559.17	1.79	1.79	-0.07	
17,445.00	90.07	88.260	10,852.40	371.40	6,654.14	6,654.14	0.50	0.21	-0.45	
17,538.00	90.90	88.210	10,851.61	374.26	6,747.09	6,747.09	0.89	0.89	-0.05	
17,634.00	91.37	89.610	10,849.71	376.09	6,843.05	6,843.05	1.54	0.49	1.46	
17,728.00	90.97	90.720	10,847.79	375.82	6,937.03	6,937.03	1.25	-0.43	1.18	
17,823.00	91.07	89.870	10,846.10	375.33	7,032.01	7,032.01	0.90	0.11	-0.89	
17,917.00	89.50	90.110	10,845.63	375.34	7,126.01	7,126.01	1.69	-1.67	0.26	
18,011.00	89.90	89.990	10,846.12	375.26	7,220.01	7,220.01	0.44	0.43	-0.13	
18,106.00	90.33	89.080	10,845.93	376.03	7,315.00	7,315.00	1.06	0.45	-0.96	
18,202.00	91.34	89.160	10,844.53	377.51	7,410.98	7,410.98	1.06	1.05	0.08	
18,296.00	89.53	89.200	10,843.82	378.85	7,504.96	7,504.96	1.93	-1.93	0.04	
18,390.00	88.83	89.920	10,845.16	379.57	7,598.95	7,598.95	1.07	-0.74	0.77	
18,485.00	87.08	88.630	10,848.55	380.77	7,693.88	7,693.88	2.29	-1.84	1.36	
18,579.00	88.66	89.030	10,852.05	382.69	7,787.79	7,787.79	1.73	1.68	0.43	
18,673.00	89.53	87.650	10,853.53	385.41	7,881.73	7,881.73	1.74	0.93	-1.47	
18,768.00	90.27	87.410	10,853.70	389.51	7,976.65	7,976.65	0.82	0.78	-0.25	
18,863.00	91.54	86.750	10,852.20	394.35	8,071.51	8,071.51	1.51	1.34	-0.69	

<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

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)	
18,958.00	92.42	89.850	10,848.92	397.16	8,166.40	8,166.40	3.39	0.93	3.26	
19,052.00	92.14	91.520	10,845.18	396.04	8,260.31	8,260.31	1.80	-0.30	1.78	
19,115.00	89.83	91.200	10,844.09	394.55	8,323.28	8,323.28	3.70	-3.67	-0.51	
19,146.00	87.96	91.710	10,844.69	393.76	8,354.26	8,354.26	6.25	-6.03	1.65	
19,177.00	85.91	91.330	10,846.35	392.94	8,385.21	8,385.21	6.73	-6.61	-1.23	
19,209.00	85.80	91.350	10,848.66	392.19	8,417.11	8,417.11	0.35	-0.34	0.06	
19,240.00	85.70	91.130	10,850.96	391.52	8,448.02	8,448.02	0.78	-0.32	-0.71	
19,272.00	85.81	91.750	10,853.33	390.72	8,479.92	8,479.92	1.96	0.34	1.94	
19,304.00	86.15	90.600	10,855.57	390.07	8,511.84	8,511.84	3.74	1.06	-3.59	
19,335.00	86.78	90.450	10,857.48	389.78	8,542.78	8,542.78	2.09	2.03	-0.48	
19,367.00	88.22	89.300	10,858.88	389.85	8,574.75	8,574.75	5.76	4.50	-3.59	
19,398.00	88.49	89.050	10,859.77	390.30	8,605.73	8,605.73	1.19	0.87	-0.81	
19,430.00	88.59	88.470	10,860.58	390.99	8,637.71	8,637.71	1.84	0.31	-1.81	
19,461.00	89.73	88.340	10,861.04	391.85	8,668.70	8,668.70	3.70	3.68	-0.42	
19,525.00	90.84	88.400	10,860.72	393.67	8,732.67	8,732.67	1.74	1.73	0.09	
19,619.00	89.90	89.160	10,860.11	395.68	8,826.64	8,826.64	1.29	-1.00	0.81	
19,715.00	91.07	90.800	10,859.30	395.71	8,922.63	8,922.63	2.10	1.22	1.71	
19,809.00	90.20	89.700	10,858.26	395.30	9,016.63	9,016.63	1.49	-0.93	-1.17	
19,905.00	86.85	87.990	10,860.73	397.23	9,112.56	9,112.56	3.92	-3.49	-1.78	
19,968.00	87.55	87.700	10,863.81	399.60	9,175.44	9,175.44	1.20	1.11	-0.46	
20,000.00	89.33	87.480	10,864.68	400.94	9,207.40	9,207.40	5.60	5.56	-0.69	
20,094.00	90.84	87.550	10,864.54	405.02	9,301.30	9,301.30	1.61	1.61	0.07	
20,189.00	90.91	88.670	10,863.09	408.15	9,396.24	9,396.24	1.18	0.07	1.18	
20,283.00	90.03	89.970	10,862.32	409.27	9,490.23	9,490.23	1.67	-0.94	1.38	
20,378.00	91.04	90.940	10,861.43	408.51	9,585.22	9,585.22	1.47	1.06	1.02	
20,473.00	88.16	91.310	10,862.09	406.65	9,680.19	9,680.19	3.06	-3.03	0.39	
20,567.00	90.27	91.770	10,863.38	404.12	9,774.14	9,774.14	2.30	2.24	0.49	
20,662.00	88.59	90.970	10,864.32	401.85	9,869.10	9,869.10	1.96	-1.77	-0.84	
20,757.00	90.70	91.340	10,864.91	399.94	9,964.08	9,964.08	2.25	2.22	0.39	
20,802.00	90.77	91.380	10,864.34	398.87	10,009.06	10,009.06	0.18	0.16	0.09	
<b>Last SDI MWD Survey</b>										
20,870.00	90.77	91.380	10,863.42	397.23	10,077.03	10,077.03	0.00	0.00	0.00	
<b>Projection to TD</b>										

Design Annotations										
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			Comment					
		+N/S (ft)	+E/W (ft)							
226.00	226.00	0.66	-0.91		First SDI MWD Survey					
3,524.00	3,523.88	-1.78	-0.80		Last SDI MWD Surface Survey					
11,134.00	10,768.28	383.95	346.08		First SDI MWD Lateral Survey					
20,802.00	10,864.34	398.87	10,009.06		Last SDI MWD Survey					
20,870.00	10,863.42	397.23	10,077.03		Projection to TD					



## Scientific Drilling, Intl

### Survey Report



<b>Company:</b>	Oasis Petroleum	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Project:</b>	McKenzie County, ND	<b>TVD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Site:</b>	Lewis Federal	<b>MD Reference:</b>	GL 2110' & KB 25' @ 2135.00ft (Nabors B21)
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



## Oasis Petroleum North America, LLC

### Lewis Federal 5300 11-31 2B

1,050' FNL & 265' FWL

Lot 1 Section 31, T153N, R100W

Baker Field / Middle Bakken

McKenzie County, North Dakota

#### **BOTTOM HOLE LOCATION:**

397.23' N & 10,077.03' E of surface or approx.

652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W

#### **Prepared for:**

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**Oasis Petroleum North America, LLC.  
Lewis Federal 5300 11-31 2B  
Well Evaluation**



**Figure 1.** Nabors drilling rig #B21 at the Oasis Petroleum NA, LLC. Lewis Federal 5300 11-31 2B; January 2019, McKenzie County, North Dakota.

### **Introduction**

The Oasis Petroleum NA, LLC. Lewis Federal 5300 11-31 2B is located in Baker Field of the Williston Basin [Lot 1 Section 31, T153N, R101W]. The subject well lies approximately 8 miles south of the town of Williston, in the Indian Hills prospect of McKenzie County, North Dakota (**Figure 1**). The Lewis Federal 5300 11-31 2B is the third of four wells to be drilled on the Lewis Federal 5300 11-31 pad. Due to tight hole conditions the Lewis Federal 5300 11-31 4B was plugged and abandoned. This pad is set up as a 1,280 acre laydown spacing unit, with 500' N/S and 100' E/W drilling setbacks. The subject well is permitted to drill east from the surface location in section 31 into section 32. The well consists of a single Middle Bakken Member lateral, targeting a silty sandstone facies, with intent to intersect porosity and fracture trends enhancing reservoir quality.

## Engineering Operations Overview

The Lewis Federal 5300 11-31 2B was spud on January 25, 2019. The surface hole was drilled with one 17.5" assembly to a depth of 3,600'. The complete BHA accomplishments can be found in an appendix to this report. The 13 3/8" surface casing was set to a depth of 3,598'. Due to the presence of several salt water disposal wells in the immediate area the decision was made to set a 9 5/8" isolation casing string through the Inyan Kara and into the Swift. The isolation portion was drilled without issue to a depth of 6,120'. The 9 5/8" casing was then set to set to a depth of 6,107'. The remainder of the vertical hole was completed with three 8.75" assemblies. The first vertical assembly drilled to a depth of 8,336' before being replaced due to low ROP, the second drilled to a depth of 8,374 when a mud motor failure was experienced, the third vertical assembly drilled to a depth of 10,260' (KOP). The curve assembly consisted of an 8.75" Baker DD505TS PDC bit, a 2.38° NOV mud motor, and Scientific drilling MWD tools. The curve was successfully landed at 11,150' MD and 10,769' TVD, approximately 10' below the Upper Bakken Shale on 6 February 2019. Seven inch diameter 32# P-110 intermediate casing was set to 11,091' MD at landing. The lateral was completed using two 6" assemblies. The first lateral assembly drilled to a depth of 17,478' before a trip was required due to an MWD failure. The second and final lateral assembly reached a total depth of 20,870' on February 13, 2019.

### Offset Control

Offset well data can be found in the 'Control Data' section appended to this report. Offset wells were essential in providing control, making it possible to develop a prognosis of formation tops and curve landing target depth. The three primary offsets were, The *Oasis Petroleum North America, LLC, Wade Federal 5300 41-30 8T3*, the *Oasis Petroleum North America, LLC, Lewis Federal 5300 31-31H*, and the *Oasis Petroleum North America, LLC, Lewis Federal 5300 33-31 3B*. By referencing the gamma signature of these offsets and using formation thicknesses, a model was formed for the target interval pinpointing a strategic landing. Formation thicknesses expressed by gamma ray signatures in these offset wells were compared to gamma data collected during drilling operations in to successfully land the curve.

### Geology

Sample evaluation began in the Otter Formation at 8,200' measured depth (MD). Lagged samples were caught by Sunburst personnel in 30' intervals through the vertical and curve, and 50' intervals in the lateral. Rock samples were evaluated under wet and dry conditions using a stereo zoom binocular microscope for the identification of lithology including the presence of porosity and oil. Only observed prospective intervals are described here, but detailed lithological descriptions for all formations are provided in the 'Lithology' appendix.

The **Mission Canyon Formation** [Mississippian, Madison Group] was logged at 9,464' MD, 9,444' TVD (-7,309' MSL). The Mission Canyon Formation is described as cream, tan, light gray, and light brown gray in color. Samples are predominately microcrystalline and are a firm mudstone (**Figure 2**). The limestone has an earthy, rarely crystalline texture. Also noted in several samples were trace fossil fragments. The limestone is argillaceous in part throughout this interval. In certain areas possible intercrystalline was noted but there was no significant oil staining observed in samples. Throughout the Mission Canyon gas shows are promising, with an average background gasses ~125u with gas shows peaking at 333u.

Figure 2. Wet sample cuttings of lime mudstone from the Mission Canyon.



## The Bakken Formation

The Upper Bakken Shale Member [Mississippian] was recorded at 10,967' MD, 10,743' TVD (-8,608' MSL). Entry into this member is characterized by high gamma counts (>300 API), elevated background gas and increased rates of penetration. While drilling through the Upper Bakken Shale gas a background gas of 1300u was observed, as well as a survey gas of 2319u. The distinct black shale is carbonaceous and *petroliferous*, as well as, hard and platy. Minerals including disseminated/nodular pyrite and trace calcite fracture fill was observed.

The Middle Bakken Member [Mississippian-Devonian] was entered at 11,026' MD, 10,759' TVD (-8,624' MSL). Samples in the Middle Bakken are predominantly a light to medium gray, light brown, and occasionally cream silty sandstone. The silty sandstone is fine to very fine grained, friable to occasionally firm. The Middle Bakken typically contained sub-round to sub-angular grains. Samples are smooth, moderately sorted and poorly cemented by calcite. Rare to trace quantities of disseminated and nodular pyrite is present as was *trace to fair intergranular porosity*. Trace to rare *light-medium brown, spotty oil stain* was visible in many of these samples. While drilling the Middle Bakken background gasses ranged from ~500 to 4500 units while several shows exceeded 5000u.



Figure 3. Wet sample cuttings of silty sandstone from the Middle Bakken.

## Geosteering

Structure maps provided by Oasis Petroleum projected that the structure would be a consistent down dip averaging 89.38° over the course of the lateral. The steering team anticipated the structure to be down at 89.50° the first 4,000' of vertical section, steepening to an 89.12° to 6,000' of vertical section, and remaining near 89.53° for the remainder of the lateral. Due to higher than anticipated build rates through the curve the wellbore landed only 10' into the Middle Bakken and as a result the gamma signatures throughout the middle member were based on offset wells. Upon exiting casing, and drilling down, it became apparent that the gamma signature was very similar to that of the Lewis Federal 5300 31-31H. Since this offset well had the thinnest Middle Bakken (~36') of the three offsets it was determined to steer ahead with an anticipated 36' Middle Bakken, this technique was also used in drilling the Lewis Federal 5300 11-31 3B. The target interval was defined by proximity to the shales and not by an ideal porosity interval. The 16' target began 10' below the Upper Bakken Shale and extended to 10' above the Lower Bakken Shale. Before drilling out of the 7" casing it was determined that the cool C marker in the lower half of the target interval was going to be the most consistent steering guide (**Figure 4**). The cool C marker was contacted several times in the lateral. However, over the course of the lateral the warm B marker and a slightly cool marker near the top of the target interval proved to be the most beneficial. Near 19,050' the wellbore began to build inclination on rotation faster than anticipated and drilled within ~3° of the Upper Bakken Shale. To avoid contact with the upper member a stop card was pulled and time drilling was utilized. Regardless of position in zone the assembly consistently built inclination on rotation. There did not appear to be any noticeable hard streaks or intervals that were more favorable in relation to ROP.

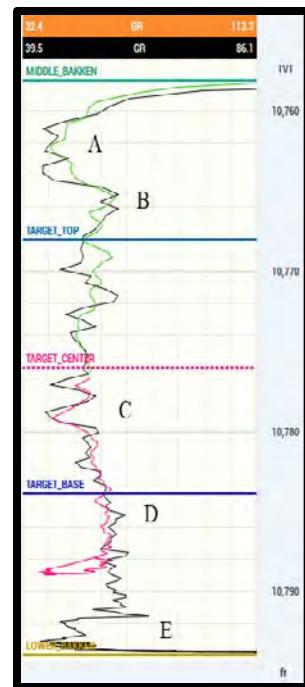


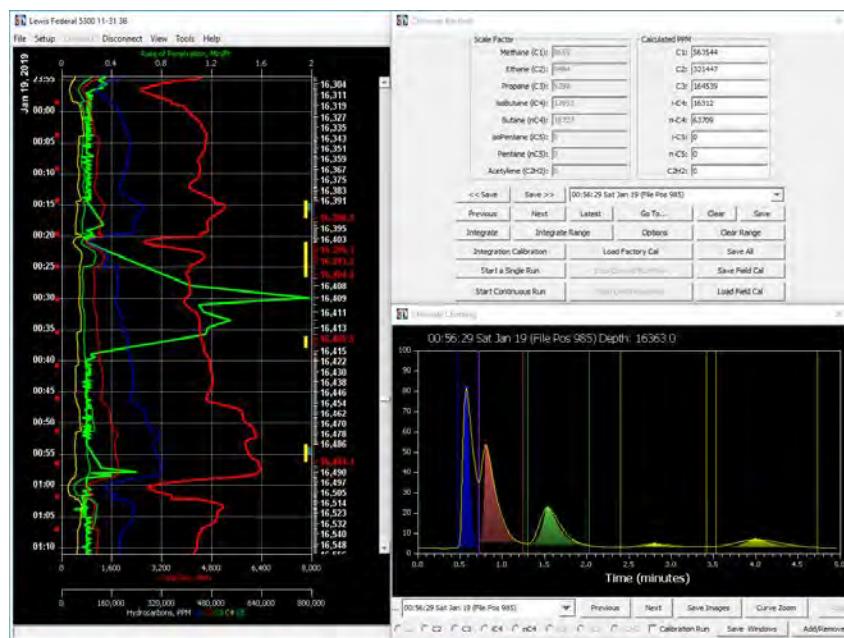
Figure 4. Target definition for the Oasis Petroleum, Lewis Federal 5300 11-31 2B.

The Lewis Federal 5300 11-31 2B had an estimated overall formation dip of approximately -0.59°. Penetration rates, gas shows, gamma ray data, and sample observations were utilized to keep the wellbore in the preferred stratigraphic position within the target zone. Using offset well data provided by Oasis representatives, projected porosity zones were identified and used as preferred drilling areas.

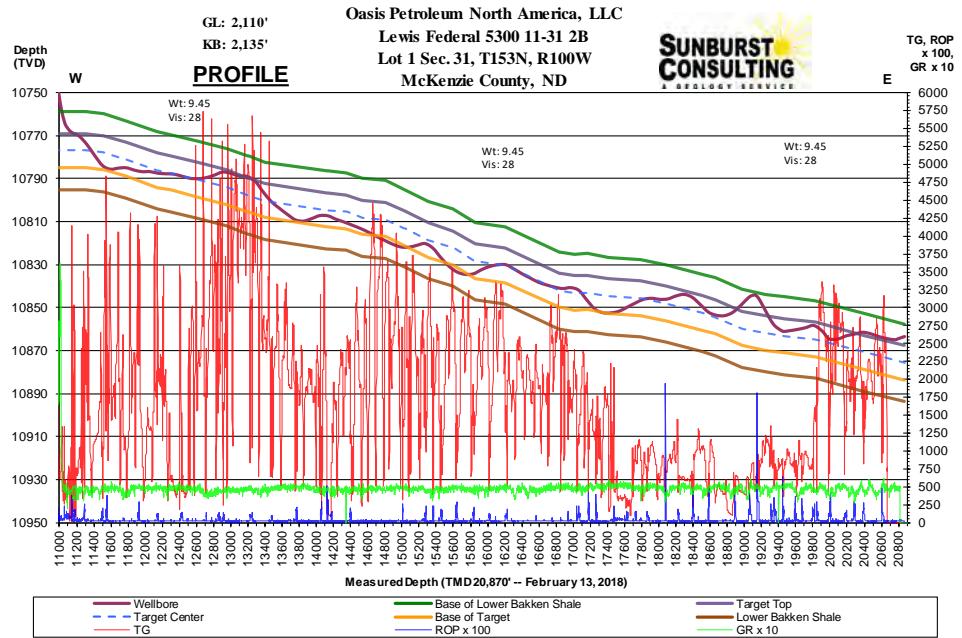
The lateral was drilled in less than 5 days from casing exit to total depth, with two lateral assembly. A total depth of 20,870' MD was achieved at 21:30 hours on February 13, 2019. The wellbore was completed 96.6% within target, opening 9,799' (measurement taken from uncased lateral portion) of potentially productive reservoir rock.

### Hydrocarbon Shows

Gas was continuously recorded from 3,600' to the completion of the lateral, along with the monitoring of free oil at the possum belly and shakers. In the closed mud system, hydrostatic conditions were maintained near balance, this allowed gas and fluid gains from the well to be evaluated. During the vertical, gas shows ranging from 10 to 350 units were noted, against a 9.1 to 12.85 pound per gallon (PPG) diesel-invert, mud weight. Gas shows were significantly higher prior to 17,400'. Chromatography of gas revealed typical concentrations of methane, ethane and propane characteristic of the Middle Bakken (**Figure 5**). Background concentrations in the lateral ranged from 300 to 5000 units, against a 9.45-9.6 PPG saltwater gel drilling fluid (**Figure 6**). Sample cuttings were examined for hydrocarbon “cut” by immersion of trichloroethylene and inspection under a UV fluoroscope. *Fluorescent cuts were generally pale yellow in color and had a diffuse habit at a slow to moderate speed.*



**Figure 5.** Screen shot of gas chromatography portraying total gas values and C<sub>1</sub>-C<sub>4</sub> values, shown in parts per million.



**Figure 6.** Cross-sectional profile of the Lewis Federal 5300 11-31 3B displaying stratigraphic position, total gas, rate of penetration and gamma values.

## Summary

The *Lewis Federal 5300 11-31 2B* is a well in Oasis Petroleum's horizontal Middle Bakken Member development program in McKenzie County, North Dakota. The project was drilled from surface casing to total depth in 20 days. A total depth of 20,870' MD was achieved at 21:30 hours on 13 January 2019. The well-site team worked together to maintain the wellbore in the desired target interval for 96.6% within target, opening 9,779' of potentially productive reservoir rock.

Samples in the Middle Bakken Member are predominantly silty sandstone. These samples are light to medium gray, light brown, and occasionally cream silty sandstone. The silty sandstone is fine to very fine grained. The middle member typically contained sub round and occasionally sub-angular grains. Samples are smooth, moderately sorted and poorly cemented by calcite. Rare quantities of disseminated and nodular pyrite are present as was trace to fair intergranular porosity. Trace to rare light-medium brown, spotty oil stain was visible in many of these samples. The overall hydrocarbon "cuts", gas and hydrocarbon shows were encouraging and indicate an oil and gas rich system in the Middle Bakken Member.

The well should be regarded as an engineering and geological success based on the combination of:

- Maximum exposure to the target
- Minimal days from re-entry to total depth
- No side-tracks, shale strikes, or collision with existing wellbores

The *Oasis Petroleum North America, LLC, Lewis Federal 5300 11-31 2B* awaits completion operations to determine its ultimate production potential and commercial value.

Respectfully,  
**Michelle Baker**  
 Well Site Geosteering Consultant  
 Sunburst Consulting, Inc.  
 15 February 2019

# **WELL DATA SUMMARY**

<b><u>OPERATOR:</u></b>	Oasis Petroleum North America, LLC
<b><u>ADDRESS:</u></b>	1001 Fannin Suite 1500 Houston, TX 77002
<b><u>WELL NAME:</u></b>	Lewis Federal 5300 11-31 2B
<b><u>API #:</u></b>	33-053-06549
<b><u>WELL FILE #:</u></b>	30189
<b><u>SURFACE LOCATION:</u></b>	1,050' FNL & 265' FWL Lot 1 Section 31, T153N, R100W
<b><u>FIELD/ OBJECTIVE:</u></b>	Baker Field / Middle Bakken
<b><u>COUNTY, STATE:</u></b>	McKenzie County, North Dakota
<b><u>RESERVATION:</u></b>	N/A
<b><u>BASIN:</u></b>	Williston Basin
<b><u>WELL TYPE:</u></b>	Horizontal Development
<b><u>ELEVATION:</u></b>	GL: 2,110' KB: 2,135'
<b><u>SPUD DATE:</u></b>	January 25, 2019
<b><u>BOTTOM HOLE LOCATION:</u></b>	397.23' N & 10,077.03' E of surface or approx. 652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W
<b><u>CLOSURE COORDINATES:</u></b>	Closure Azimuth: 87.74° Closure Distance: 10,084.86'
<b><u>TOTAL DEPTH / DATE:</u></b>	20,870' on February 13, 2019 96.6% within target interval
<b><u>TOTAL DRILLING DAYS:</u></b>	20 days
<b><u>PUMP INFO:</u></b>	Stroke length - 12" Liner Inner Diameter - 6" for surface; 5.0" for vertical, curve and lateral
<b><u>COMPANY MEN:</u></b>	Doug Rakstad, Ian Anderson, Mike Ziegler, Mike Crow

**COMPANY GEOLOGIST:** Shea Cook, John O'Donnell

**WELLSITE GEOLOGISTS:** Michelle Baker, Chris Kyler

**ROCK SAMPLING:** 30' from 8,200' - 11,150  
50' from 11,150' - 20,870'

**SAMPLE CUTS:** Trichloroethylene

**GAS DETECTION:** Terra SLS, Inc. TGC - total gas w/ chromatograph  
Serial Number(s): ML-466

**DIRECTIONAL DRILLERS:** RPM Consulting, Pat's Consulting  
Christopher Bohn, Patrick Bidegaray, Jason Strandlien, Willem Zylstra

**MWD:** Scientific Drilling  
James Swartz, Steve Gray

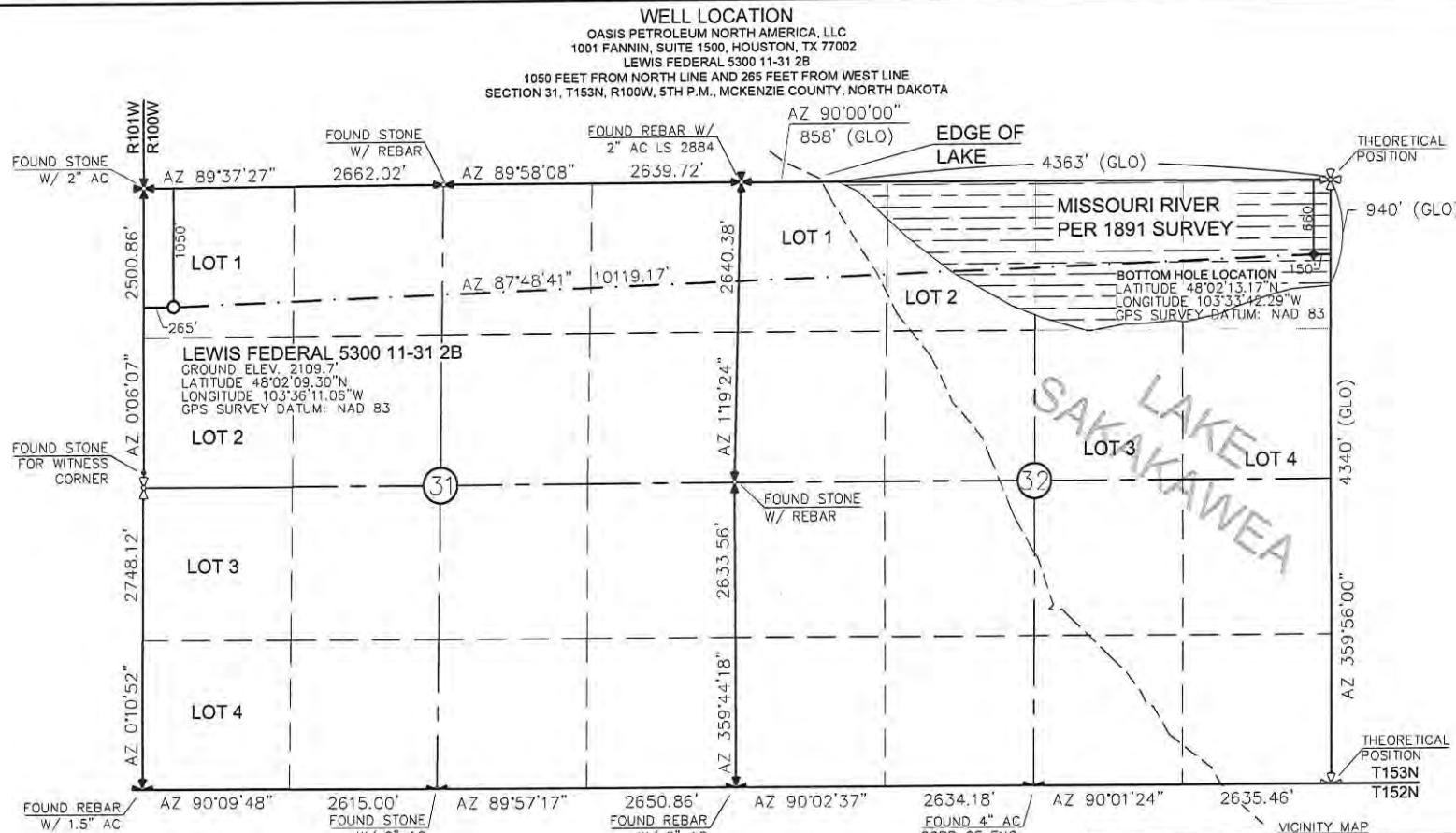
**CASING:** Surface: 13 3/8" 54.5# J-55 set to 3,598'  
Isolation: 9 5/8" 36# J-55 set to 6,107'  
Intermediate: 7" 32# set to 11,091'

**KEY OFFSET WELLS:**

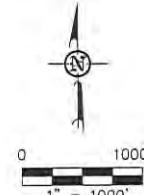
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**Lewis Federal 5300 11-31 3B**  
Lot 1 Section 31, T153N, R100W  
McKenzie County, ND  
**NDIC:** 30197  
**KB:** 2,135'

**Oasis Petroleum North America, LLC**  
**Wade Federal 5300 41-30 8T3**  
Lot 6 Sec. 30, T153N, R100W  
McKenzie County, ND  
**NDIC:** 28558  
**KB:** 2,077'

**Oasis Petroleum North America, LLC**  
**Lewis Federal 5300 31-31H**  
Lot 6 Sec. 30, T153N, R100W  
McKenzie County, ND  
**NDIC:** 20314  
**KB:** 2,185'



THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 3-27-18 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

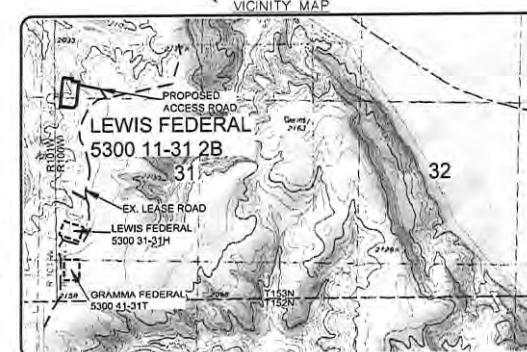


MONUMENT - RECOVERED  
MONUMENT - NOT RECOVERED

DARYL D. KASEMAN LS-3880

STAKED ON 3/26/18  
VERTICAL CONTROL DATUM WAS BASED UPON  
CONTROL POINT 705 WITH AN ELEVATION OF 2158.3'

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MCKENZIE COUNTY, NORTH DAKOTA  
Drawn By: LS-3880 Date: MARCH 2018  
Checked By: DKK Date:

Interstate Engineering, Inc.  
P.O. Box 648  
425 East Main Street  
Sister, Montana 59270  
Ph: (406) 433-4618  
Fax: (406) 433-4618  
www.interstateeng.com  
Offices in Montana, South Dakota and South Dakota



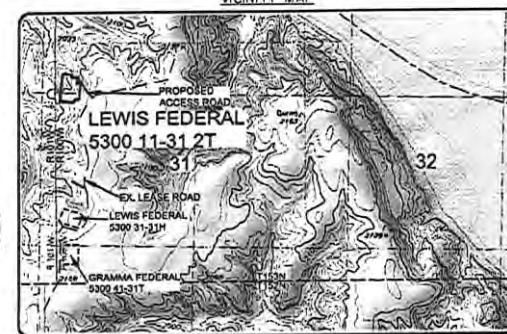
1/9  
SHEET NO.

**SECTION BREAKDOWN**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002  
"LEWIS FEDERAL 5300 11-31 2T"  
973 FEET FROM NORTH LINE AND 235 FEET FROM WEST LINE  
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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OBSERVATIONS. THE ORIGINAL SURVEY OF THIS  
AREA FOR THE GENERAL LAND OFFICE (G.L.O.)  
WAS 1897. THE CORNERS FOUND ARE AS  
INDICATED AND ALL OTHERS ARE COMPUTED FROM  
THOSE CORNERS FOUND AND BASED ON G.L.O.  
DATA. THE MAPPING ANGLE FOR THIS AREA IS  
APPROXIMATELY '003'.



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OASIS PETROLEUM NORTH AMERICA, LLC  
SECTION BREAKDOWN  
SECTIONS 31 & 32, T15N, R10W  
MCKENZIE COUNTY, NORTH DAKOTA

**Interstate Engineering, Inc.**  
P.O. Box 648  
425 East Main Street  
Sedona, Arizona 86336-0648  
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2/8

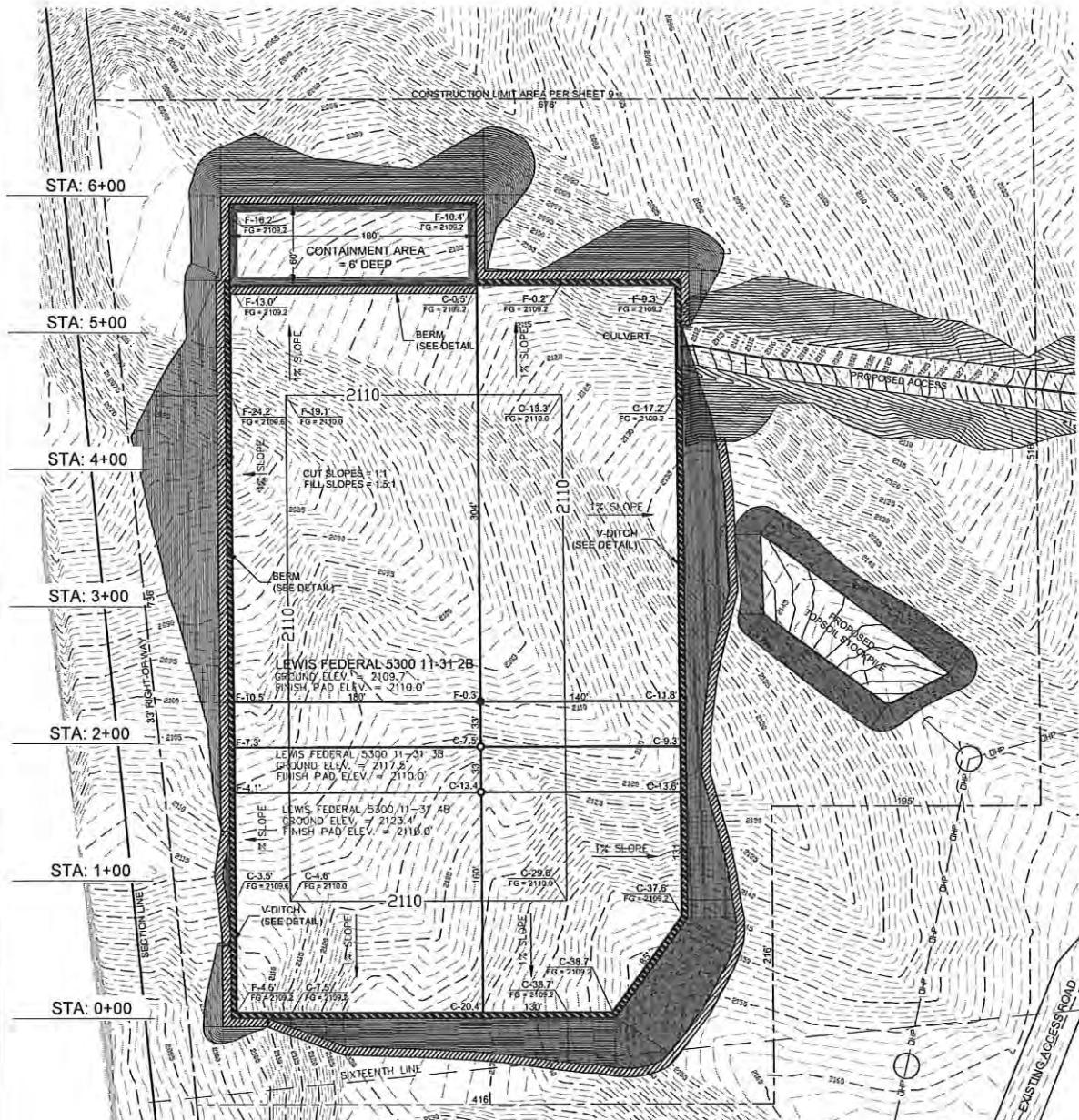
# PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

LEWIS FEDERAL 5300 11-31 2B

1050 FEET FROM NORTH LINE AND 265 FEET FROM WEST LINE  
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

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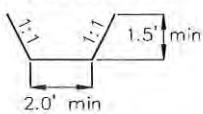
NOTE: Pad dimensions shown are to  
usable area, the v-ditch and berm  
areas shall be built to the outside of  
the pad dimensions.



Proposed Contours

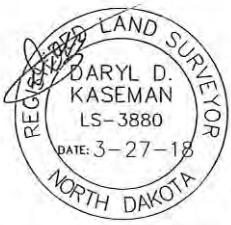
— — — Original Contours

## V-DITCH DETAIL



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

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3/9

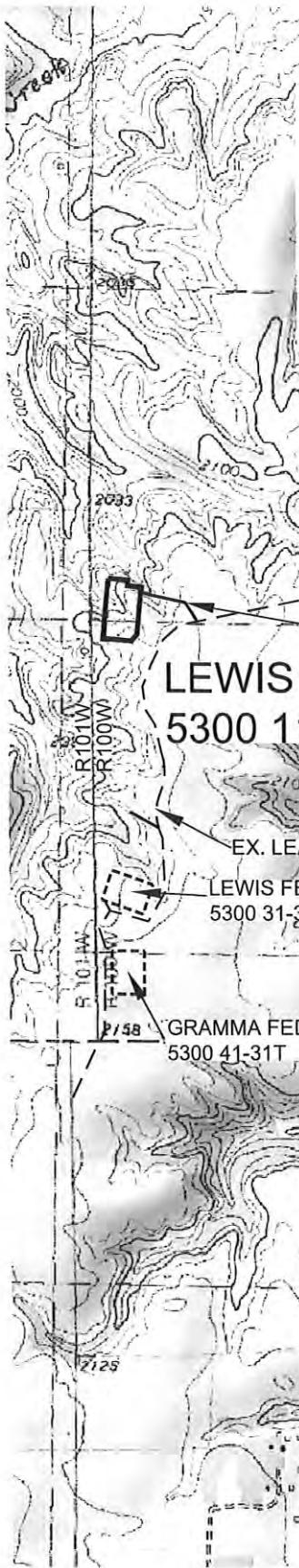
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[www.interstateeng.com](http://www.interstateeng.com)  
Other offices in Montana, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
PAD LAYOUT  
SECTION 31, T153N, R100W, 5TH P.M.,  
MCKENZIE COUNTY, NORTH DAKOTA  
Drawn By J.D.M. Project No S17.05.183  
Checked By D.D.K. Date MARCH 2018

Revision No.	Date	By	Description



OASIS PETROLEUM NORTH AMERICA, LLC  
LEWIS FEDERAL 5300 11-31 4T2  
1038' FNL/230' FWL  
QUAD LOCATION MAP  
SECTION 31, T153N, R100W  
MCKENZIE COUNTY, NORTH DAKOTA

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6/9  
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Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
QUAD LOCATION MAP  
SECTION 31, T153N, R100W  
MCKENZIE COUNTY, NORTH DAKOTA  
Drawn By: B.H.H. Project No.: S13-09-378.03  
Checked By: D.D.K. Date: JAN. 2014

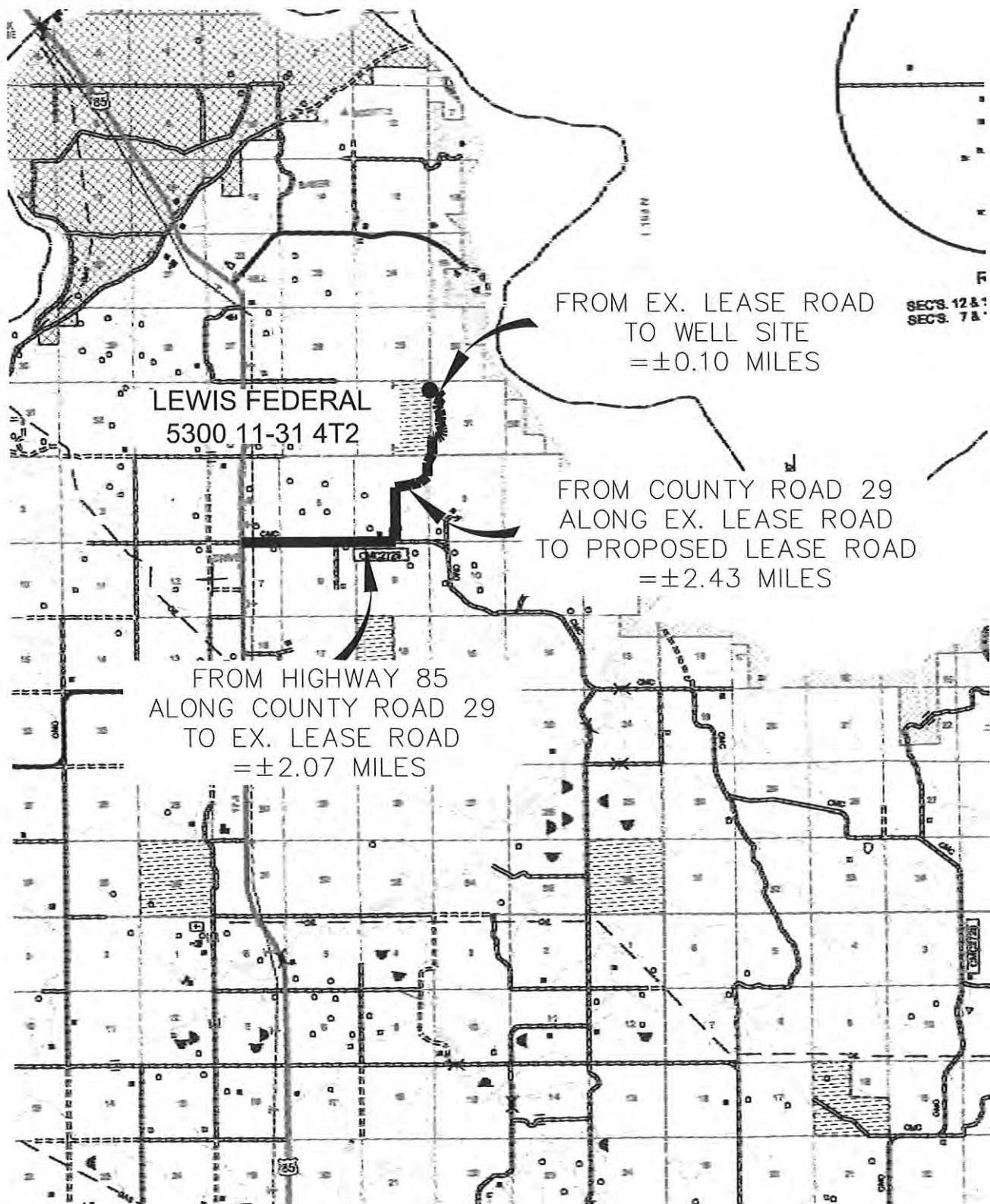
Revision No.	Date	By	Description
REV 1	12/3/14	B.H.H.	REMOVED PIT FROM PAD

# COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

"LEWIS FEDERAL 5300 11-31 4T2"

1038 FEET FROM NORTH LINE AND 230 FEET FROM WEST LINE  
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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OASIS PETROLEUM NORTH AMERICA, LLC  
COUNTY ROAD MAP  
SECTION 31, T153N, R100W  
MCKENZIE COUNTY, NORTH DAKOTA

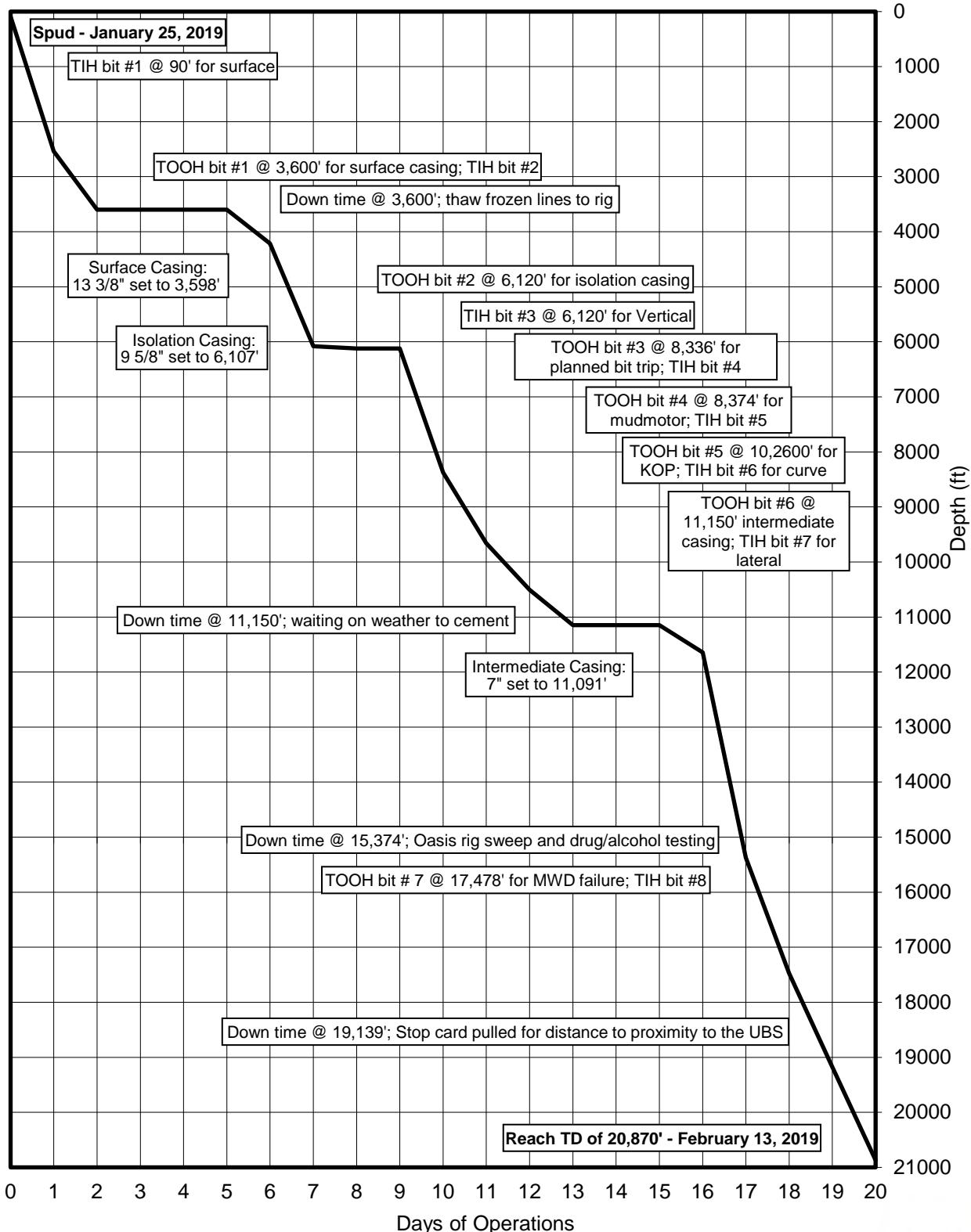
Drawn By:	B.H.H.	Project No.:	S13-09-378.03
Checked By:	D.D.K.	Date:	JAN. 2014

Revision No.	Date	By	Description
REV 1	12/3/14	B.H.H.	REMOVED PIT FROM PAD

# TIME VS. DEPTH

Oasis Petroleum North America, LLC

Lewis Federal 5300 11-31 2B



# MORNING REPORT SUMMARY

Rig Contractor: Nabors B21									Tool Pushers: Todd Miller, Matt Piehl						24 Hr Activity Summary			
Day	Date 2019	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	SPM 3	GPM	24 Hr Activity Summary				Formation
0	1/25	90'	0'	-	-	-	-	-	-	-	-	-	-	Skid rig from Lewis Federal 11-31 3B to Lewis Federal 11-31 2B; prepare rig for drilling; rig up catwalk, mud line, floor equipment, and cellar equipment; rig accepted at 21:00 hours on 01/24/2019; wait on pit cleaners.	-	-	-	-
1	1/26	2,539'	2,449'	1	10	70	7	147	2750	-	110	110	921	Pre-spud meeting; pick up BHA; circulate and condition; warm up mud motor; spud well at 12:30 hours on 1/25/2019; rotary drilling from 90'-882'; service rig; rotary drilling from 882'-2,539'; service rig.	Pierre	-	-	-
2	1/27	3,600'	1,061'	1	10	70	8	147	3000	-	110	110	921	Circulate and condition; rotary drilling from 2,539'-3,472'; circulate and condition; rig service; TOOH; TIH reaming tight spots; rotary drilling from 3,472'-3,600'; circulate and condition; circulate bottoms up 1.5x; rig service; TOOH.	Pierre	-	-	-
3	1/28	3,600'	0'	-	-	-	-	-	-	-	-	-	-	TOOH; lay down BHA; rig service; clean floor in preparation for casing; pre-job safety meeting with Noble Casing; rig up casing crew; run casing; rig down casing crew; hold pre-job safety meeting with cement crew; blow down mud lines; rig up bell extensions, casing elevators, cement crew.	Pierre	-	-	-
4	1/29	3,600'	0'	-	-	-	-	-	-	-	-	-	-	Primary cementing, pre-job safety meeting; rig down cementers; rig down Hoss cellar equipment; install wellheads with welder; clean up spill; nipple up BOPs; rig up B sec, BOP, koomey hoses, mouse hole, kill line, fill line, flow line, turn buckles, choke line; pressure test koomey line; trouble shoot Noble top job equipment; pre-job safety meeting with BOP testers; rig up testers; trouble shoot test plug, test plug not seating.	Pierre	-	-	-
5	1/30	3,600'	0'	-	-	-	-	-	-	-	-	-	-	Test BOPs; attempt to thaw out hole fill abilities; fill hole with salt water truck; trouble shoot test plug seating, each test component required several cycles before a successful test; trouble shoot and test annular; flow line orbital valve failed to test; attempt to thaw mud lines between testing; service rig; test BOPs; rig down BOP testers; working as directed by operator, change orbital valve; thaw out frozen mudline; thaw out frozen kill line; hammer up mud line; hammer up kill line, fill tanks with invert; rig service.	Pierre	-	-	-
6	1/31	4,212'	612'	2	15	45	5	191	5400	95	95	95	829	Test BOPs; thaw and reconnect mud lines; install/remove wear bushing; test BOPs; test orbital valve to 1000 psi; pressure test casing/shoe to 1500 psi; service rig; pick up BHA; TIH; tool orientation; pre job safety with Keene for top job; top cement job; top cement job; TIH; drilling cement out of casing; tag float @ 3,555', tag shoe @ 3,598', rotate ahead to 3,614'; circulate and condition; circulate complete bottoms up; FIT @ 3,614' using 13.8 ppg EMW held to 451 psi; rotary drilling, sliding as needed, from 3,614'-3,828'; service rig; rotary drilling, sliding as needed, from 3,828'-4,212'.	Pierre	-	-	-
7	2/1	6,080'	1,868'	2	10	55	8	159	4750	77	77	77	693	Service rig; rotary drilling, sliding as needed, from 4,212'-5,335'; build volume, weight up mud as per well plan; circulate and condition; record complete slow pump rates; rotary drilling, sliding as needed, from 5,335'-6,080'; back ream hole for casing.	Swift	-	-	-

# MORNING REPORT SUMMARY

Rig Contractor: Nabors B21									Tool Pushers: Todd Miller, Matt Piehl									
Day	Date 2019	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	SPM 3	GPM	24 Hr Activity Summary					
8	2/2	6,120'	40'	2	18	50	14	137	4750	67	67	67	596	Back reaming; TIH; circulate and condition; rotary drill from 6,080'-6,120'; circulate and condition; back reaming; spot pill of LCM; circulate and condition; flow check, no flow; service rig; TOOH; lay down BHA; install/remove wear bushing; working as directed by operator clean up rig floor from wet trip; pre-job safety with casing crew; rig up casing crew; run casing 9 5/8" casing.				Swift
9	2/3	6,120'	0'	3	-	-	-	-	-	-	-	-	-	Run casing; circulate and condition bottoms up; pre-job safety meeting with cementers; pre-job safety on rigging down CRT; rig up cementers; primary cementing; primary cementing; pressure test 6500 PSI, tuned spacer, drop plug, displace, bump plug; pump cement; pressure test casing shoe to 1500 psi; circulate cement and displace ; rig down cementers; working as directed by operator lay down landing joint, rig down bell extensions, casing elevators; install 5" elevators; working as directed by operator install pack off/wear bushing; test pack off; pick up BHA; TIH; rotary drill cement out of casing, tag float at 6,064' and shoe at 6,107'.				Swift
10	2/4	8,374'	2,254'	4	20	45	26	156	4500	68	69	69	599	Circulate and condition bottoms up; FIT using EMW of 13 ppg held to 383 psi against upper pipe and super choke, good test; rotary drilling, sliding as needed, from 6,120'-7,776'; service rig; rotary drilling, sliding as needed, from 7,776'-8,336'; TOOH for planned bit trip; lay down BHA; change out bit; function blinds/HCR; TIH; rotary drilling from 8,336'-8,374'; service rig; circulate.				Otter
11	2/5	9,657'	1,283'	5	35	50	20	145	4200	71	71	71	631	Circulate and condition; build and pump dry job; TOOH for mud motor; install/remove wear bushing; pull rotating head rubber/install trip nipple; TOOH; pre-job safety meeting for BHA; lay down BHA; pre-job safety meeting before trip; TIH; rotary drilling, sliding as needed, from 8,374'-8,614'; rig service; rotary drilling, sliding as needed from 8,614'-9,657'; service rig.				Mission Canyon
12	2/6	10,505'	848'	6	40	50	60	257	3100	58	58	58	513	Rotary drilling, sliding as needed, from 9,667'-10,260'; flow check; pre-job safety meeting for tripping; TOOH, pull 20 wet stands through salts; pump dry job; pull rotating head; TOOH; pre-job safety meeting to lay down BHA; lay down BHA; pre-job safety meeting to rig up wireline; rig up wireline truck and crew; run cement bond logs; lay down 3rd party tools; rig down KLX wireline; pre-job safety meeting for BHA; pick up BHA; TIH; remove trip nipple; install rotating head rubber; slip and cut drill line 12 wraps; TIH; Orientate curve build sliding, rotating as needed, from 10,260'-10,505'.				Lodgepole
13	2/7	11,150'	645'	6	40	50	65	257	3280	58	58	58	513	Build curve sliding, rotating as needed, from 10,505'-11,150'; service top drive; short trip; circulate; TOOH; pre-job safety meeting with casing crew, rig up casing crew, run casing.				Middle Bakken
14	2/8	11,150'	0'	-	-	-	-	-	-	-	-	-	-	Pre-job safety meeting to run casing; run casing; service rig/catwalk; run 7" casing; service rig; rig up cement trucks; wait on outside temperature to rise above -27° F (-40° F wind chill) to pump cement as per Halliburton's policy.				Middle Bakken

# MORNING REPORT SUMMARY

Rig Contractor: Nabors B21									Tool Pushers: Todd Miller, Matt Piehl						24 Hr Activity Summary			
Day	Date 2019	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	SPM 3	GPM	24 Hr Activity Summary				Formation
15	2/9	11,150'	0'	-	-	-	-	-	-	-	-	-	-	Waiting on weather as per Halliburton's policy; pre-job safety meeting to rig down CRT; rig up/down to run casing; rig down CRT; pre-job safety meeting to rig up cementers; rig up cement crew; primary cementing; rig up different elevators; primary cementing; change elevators; working as directed by operator work casing; cementing; rig down Halliburton cementers; nipple down BOPs; clean cellar; rig down mouse hole; rig down flow line; install casing slips inside mouse hole; set 400k string weight into slips; drain and cut casing; layout landing joint; dress casing; install Cactus packoff.				Middle Bakken
16	2/10	11,644'	494'	7	25	45	30	20	3350	-	55	55	325	Working as directed by operator install lower packoff; set stack down and tighten up; install upper packoff and test; nipple up BOPs; hook up flow line; remove wrangler; install turn buckles; install mouse hole and centerstack; pick up tools and garbage; pre-job safety meeting to rig up testers; test BOPs; rig up; make up plug; set plug and fill stack with brine water; test BOPs shell test; pressure test casing shoe to 2500 psi; test BOPS; rig down; install/remove wear bushing; pre-job safety meeting to make up BHA; pick up BHA; service top drive; TIH; test tool; TIH; ream and wash from 10,000' due to high cement plug; drill cement, tag float at 11,000' and shoe at 11,091'; service rig; rotary drill to 11,170'; FIT using 13 ppg EMW held to 1867 psi, good test; rotary drilling, sliding as needed, from 11,170'-11,644'.				Middle Bakken
17	2/11	15,374'	3,730'	7	28	45	30	277	3150	55	-	55	325	Rotary drilling from 11,572'-13,540'; service rig; change 4" on mud pump; rotary drilling, sliding as needed, from 13,540'-15,374'; circulate; ordered to shut down location and stop drilling by Oasis; circulate.				Middle Bakken
18	2/12	17,478'	2,104'	7	28	55	40	275	4000	55	-	55	325	Circulate and condition as per Oasis, shut down drilling for urinary analysis drug testing by Oasis; rig sweep and search with dogs for drugs, alcohol, and firearms; wait on permission from Oasis to go back drilling; rotary drilling, sliding as needed, from 15,374'-17,039'; rig service; rotary drilling, sliding as needed, from 17,039'-17,478'; directional work, trouble shoot MWD tool; spot pill mix and send slug; TOOH for MWD tool failure; remove rotating head rubber; install trip nipple; pre-job safety meeting for BHA; lay down BHA; pick up BHA.				Middle Bakken
19	2/13	19,174'	1,696'	8	28	55	30	276	4100	55	-	55	325	TIH; fill pipe and test tool; slip and cut drilling line 13 wraps; service top drive; TIH; circulate and condition, fill pipe and gas buster, verify returns; rotary drilling, sliding as needed, from 17,478'-18,079'; weighting up premixes to a 13.5 MW; rotary drilling, sliding as needed, from 18,079'-19,139'; geology pulled stop card; circulate and wait on orders; time drill 1 minute per inch for 5', slide drill 30' lowside to 19,174'.				Middle Bakken
20	2/14	20,870'	1,696'	8	28	55	50	276	4500	55	-	55	325	Rotary drilling, sliding as needed, from 19,174'-19,750'; rig service; rotary drilling, sliding as needed, from 19,750-20,870'; reach a TD of 20,870' at 21:30 hours CST on February 13, 2019; wiper trip; circulate bottoms up x2; TOOH.				Middle Bakken

# DAILY MUD SUMMARY

Chemical Company:			Reliable Drilling Fluids LLC				Mud Engineer:			S. Zimmermann			Fresh water in surface; Diesel invert in vertical/curve; Salt water in lateral									
Date 2019	Mud Depth	Mud WT (ppg)	VIS (sec/q t)	PV (cP)	YP (lbs/ 100 ft <sup>2</sup> )	Gels (lbs/ 100 ft <sup>2</sup> )	600/ 300	Oil/ H <sub>2</sub> O (ratio)	Oil/ H <sub>2</sub> O (%)	Cake (API/ HTHP)	Solids (%)	Cor. Solids (%)	Alk	pH	Excess Lime (lb/bbl)	Cl <sup>-</sup> (mg/L)	LGS/ HGS (%)	Salinity (ppm)	Electrical Stability	Mud loss (bbls)	Mud Gain (bbls)	
01/25	450'	8.4	26	2	1	1/1/1	5/3	-	-/99	-	0.1	-	0.1	8.5	0	800	0.06/0	-	-	-	-	
01/26	2,900'	9.1	29	3	3	3/3/3	9/6	-	-/95	-	5	-	0.1	8.5	0	700	4.97/0	-	-	-	-	
01/27	3,600'	9.1	29	3	3	3/3/3	9/6	-	-/95	-	5	-	0.1	8.5	0	700	4.97/0	-	-	-	-	
01/28	3,600'	9.1	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
01/29	3,600'	9.1	29	Change from fresh water to OBM																		
01/30	3,600'	9.1	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
01/31	5,335'	12.8	55	21	19	11/17/19	61/40	75/25	58/19	2	12	21.79	2.1	-	2.72	20k	4.27/17.52	147829	797			
02/01	3,120'	12.8	55	40	30	18/25/5	110/70	71/29	55/23	2	22	20.73	2	-	2.59	21k	3.34/17.39	130790	600	-	-	
02/02	6,120'	12.8	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02/03	6,120'	12.8	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02/04	8,374'	10.85	50	15	8	9/13/18	38/23	78/22	64/18	3	18	15.88	2.2	-	2.85	35k	6.48/9.4	242679	965	-	-	
02/05	10,260'	10.35	45	11	8	8/12/16	29/18	83/17	68/14.5	3	16.5	14.62	2.2	-	2.85	31k	5.46/9.16	260536	1045	-	-	
02/06	10,900'	10.35	45	11	8	8/12/16	29/18	83/17	68/14.5	3	16.5	14.62	2.2	-	2.85	31k	5.46/9.16	260536	1045	-	-	
02/07	11,150'	10.75	62	14	12	11/16/20	40/26	80/20	66/17	3	17	15.13	2.5	-	3.24	31k	3.96/11.17	231075	1090	-	-	
02/08	11,150'	10.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02/09	11,150'		Change from OBM to salt water																			
02/10	13,540'	9.5	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02/11	16,227'	9.45	28	1	1	1/1/1	3/2	-	1/98	-	1	-	-	9.5	-	105k	-	-	-	-	-	
02/12	17,478'	9.55	28	1	1	1/1/1	3/2	-	1/97	-	2	-	-	9	-	109k	-	-	-	-	-	
02/13	20,000'	9.6	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02/14	20,870'	9.6	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

## BOTTOM HOLE ASSEMBLY RECORD

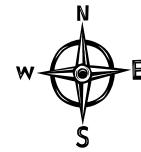
Bit Data											Motor Data							Reason For Removal
Bit #	Size (in.)	Type	Make	Model	Depth In	Depth Out	Footage	Hours	Σ hrs	Vert. Dev.	Make	Model	Lobe	Stage	Bend	Rev/Gal		
1	17 1/2	PDC	Varel	VTD619SHX	90'	3,600'	3,510'	33.0	33	Surface	Stickman	Predator	5/6	6.0	2.0°	0.16	TD surface	
2	12 1/4	PDC	Ultera	SPL616	3,600'	6,120'	2,520'	21.0	54	Vertical	Stickman	Predator	5/6	6.0	2.0°	0.16	TD isolation portion	
3	8 3/4	PDC	Smith	XS616	6,120'	8,336'	2,216'	14.0	68	Vertical	Cavare	-	7/8	8.5	1.50°	0.26	Planned bit trip	
4	8 3/4	PDC	Smith	XS616	8,336'	8,374'	38'	1.0	69	Vertical	Cavare	-	7/8	8.5	1.50°	0.26	Motor failure	
5	8 3/4	PDC	Reed	TKC66	8,374'	10,260'	1,886'	18.0	87	Vertical	NOV	-	7/8	5.7	1.50°	0.23	TD vertical	
6	8 3/4	PDC	Baker	DD505TS	10,260'	11,150'	890'	14.0	101	Curve	NOV	-	4/5	7.0	2.38°	0.5	TD curve	
7	6	PDC	Security	GTD54HE	11,150'	17,478'	6,328'	30.0	131	Lateral	Discovery	-	7/8	10.6	1.50°	0.85	MWD failure	
8	6	PDC	Smith	LP1890	17,478'	20,870'	3,392'	29.0	160	Lateral	Discovery	-	7/8	10.6	1.50°	0.85	TD lateral	



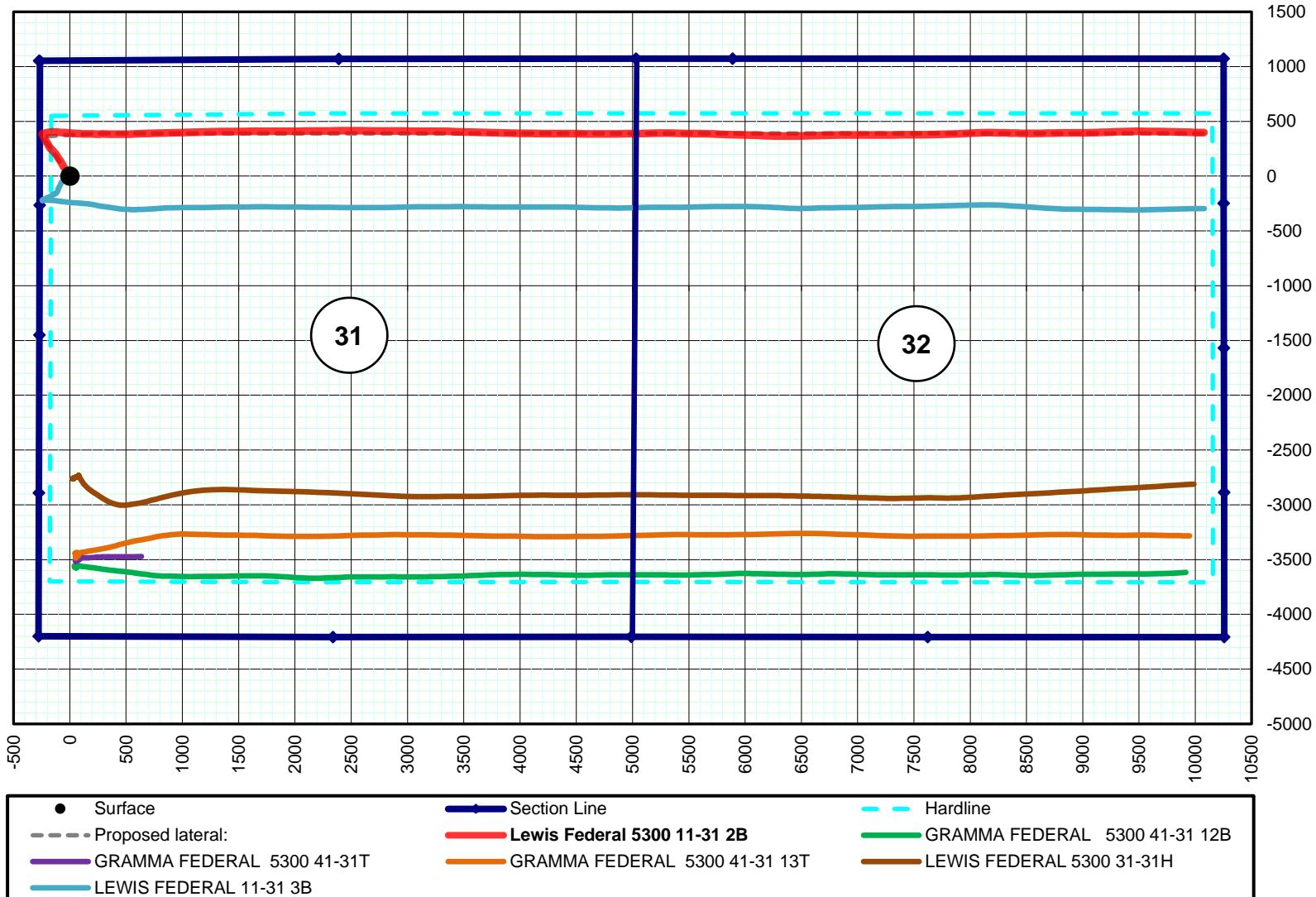
Note: 1,280 acre  
laydown spacing unit  
with 500' N/S & 100' E/W

## PLAN VIEW

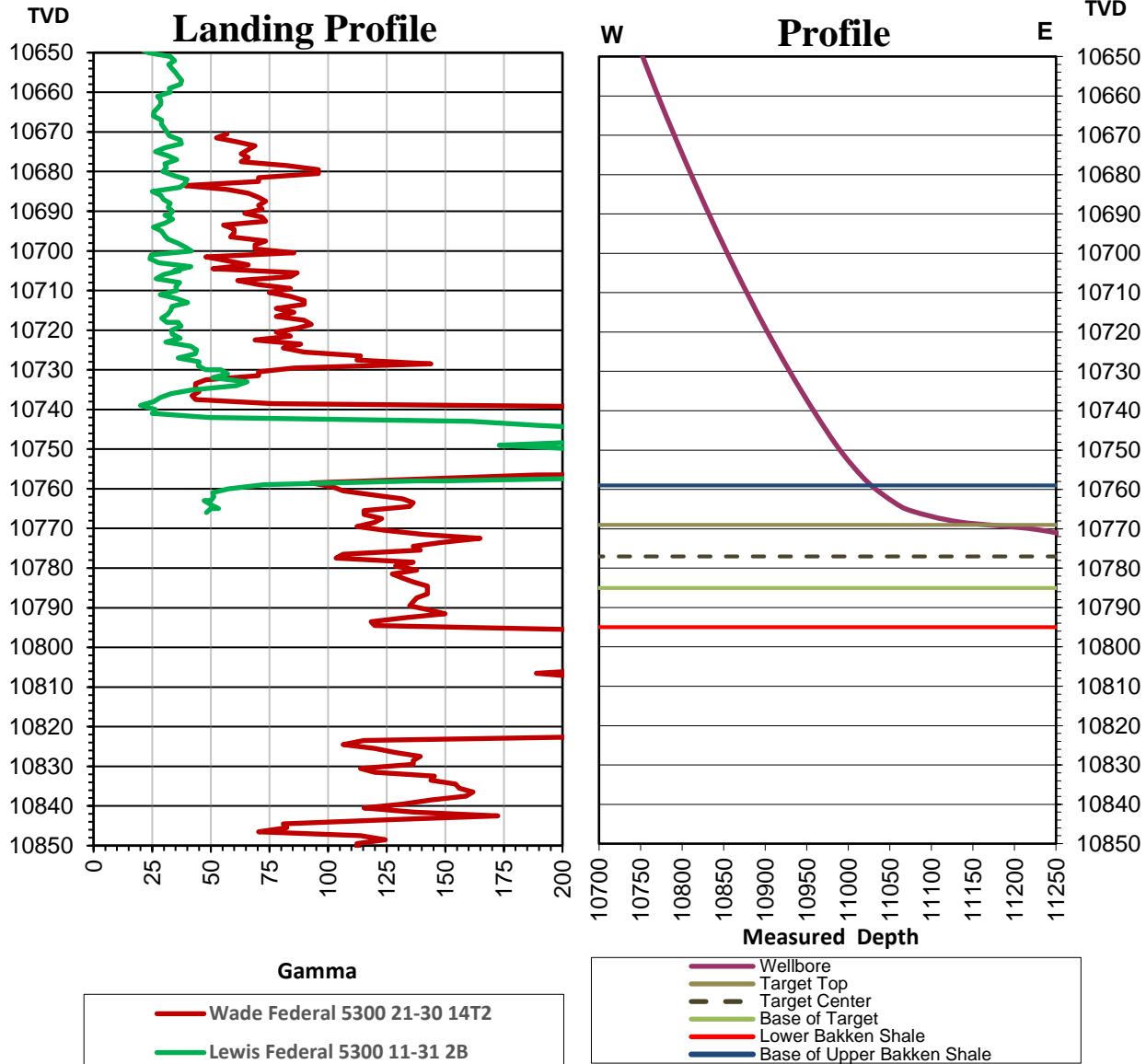
Oasis Petroleum North America, LLC  
Lewis Federal 5300 11-31 2B  
1,050' FNL & 265' FWL  
Lot 1 Sec. 31, T153N, R100W



**Bottom Hole Location**  
397.23' N & 10,077.03' E  
of surface location or  
652.77' FNL & 180.71' FEL  
Lot 4 Sec. 32, T153N, R100W



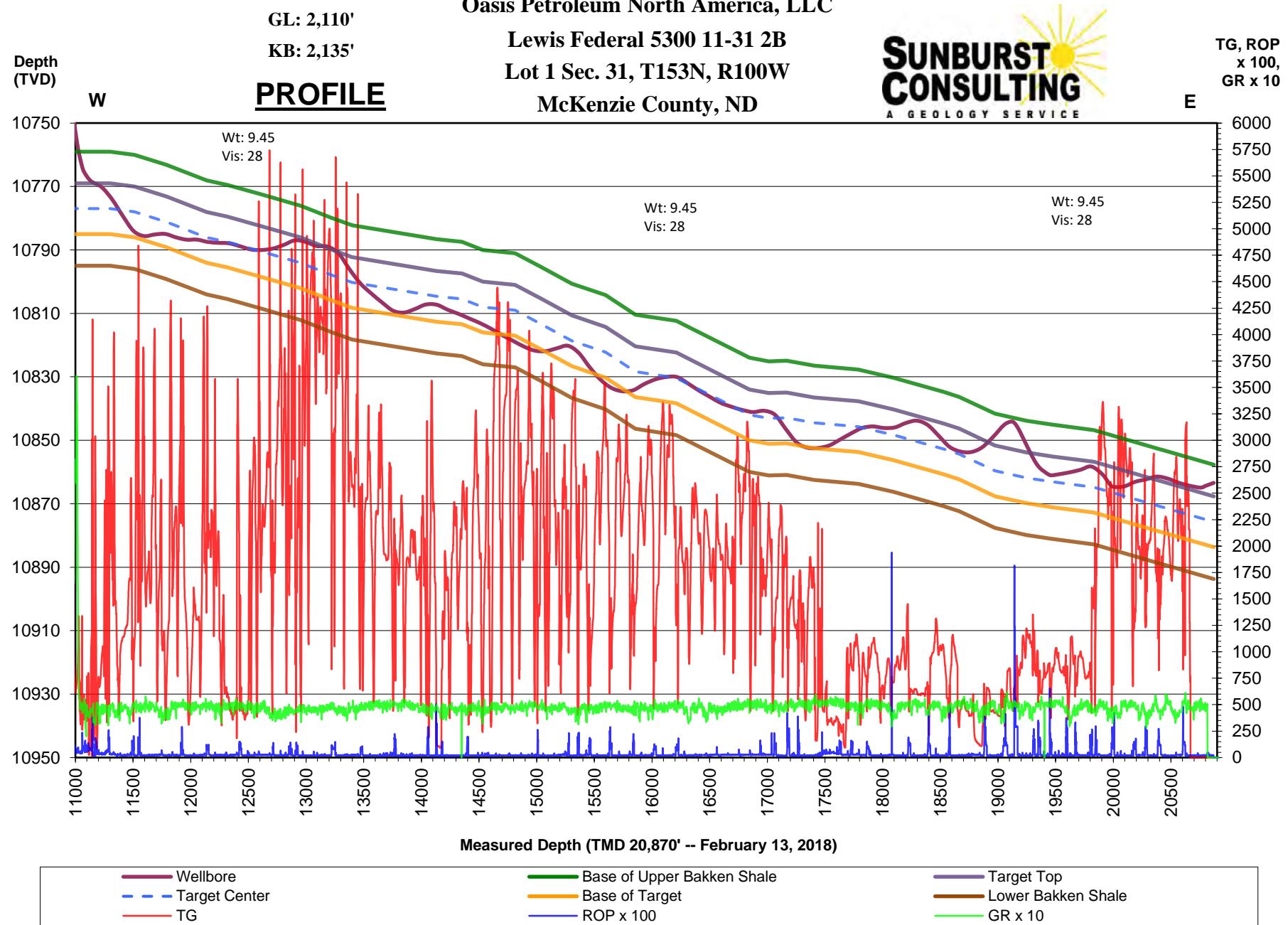
**Lewis Federal 5300 11-31 2B**  
**257' FNL & 1,817' FEL**  
**Lot 1 Sec. 31, T153N, R100W**  
**McKenzie County, ND**



# LANDING PROJECTION

Formation/ Zone:	Proposed Landing Target From:			
	Lewis Federal 5300 11-31 3B	Wade Federal 5300 41-30 8T3	Lewis Federal 5300 31-31H	Average of Offset Wells
Pierre	10,778'	-	10,746'	10,762'
Greenhorn	10,771'	10,762'	10,796'	10,776'
Mowry (Dakota Group)	10,779'	10,767'	10,790'	10,779'
Inyan Kara (Dakota Group)	10,780'	10,737'	10,751'	10,756'
Swift (Base Dakota Group)	10,775'	10,753'	10,801'	10,776'
Rierdon	10,784'	10,748'	10,867'	10,800'
Dunham Salt	10,765'	10,730'	10,846'	10,780'
Dunham Salt Base	10,782'	10,740'	10,799'	10,774'
Pine Salt	10,777'	10,766'	10,769'	10,771'
Pine Salt Base	10,764'	10,771'	10,737'	10,757'
Opeche Salt	10,775'	10,785'	10,763'	10,774'
Opeche Salt Base	10,775'	10,772'	10,748'	10,765'
Amsden	10,767'	10,779'	10,749'	10,765'
Tyler	10,768'	10,766'	10,740'	10,758'
Otter/Base Minnelusa	10,773'	10,774'	10,748'	10,765'
Kibbey "Lime"	10,768'	10,766'	10,745'	10,760'
Charles Salt	10,764'	10,769'	10,741'	10,758'
Base Last Salt	10,771'	10,773'	10,759'	10,767'
Mission Canyon	10,774'	10,767'	10,759'	10,767'
Lodgepole	10,773'	10,767'	10,765'	10,768'
Lodgepole A	10,768'	10,764'	10,766'	10,766'
Lodgepole B	10,767'	10,755'	10,747'	10,756'
Lodgepole C	10,765'	10,763'	10,765'	10,765'
Lodgepole D	10,779'	10,776'	10,786'	10,780'
Lodgepole E	10,774'	10,776'	10,780'	10,777'
Lodgepole F	10,774'	10,776'	10,781'	10,777'
False Bakken	10,773'	10,778'	10,781'	10,777'
Upper Bakken Shale	10,774'	10,780'	10,779'	10,778'
Middle Bakken	10,777'	10,780'	10,780'	10,779'
Target Top	10,777'	10,778'	10,778'	10,778'
Target Landing	10,777'	10,777'	10,777'	10,777'

Current Landing Target (18' below the base of the UBS): **10,777'**



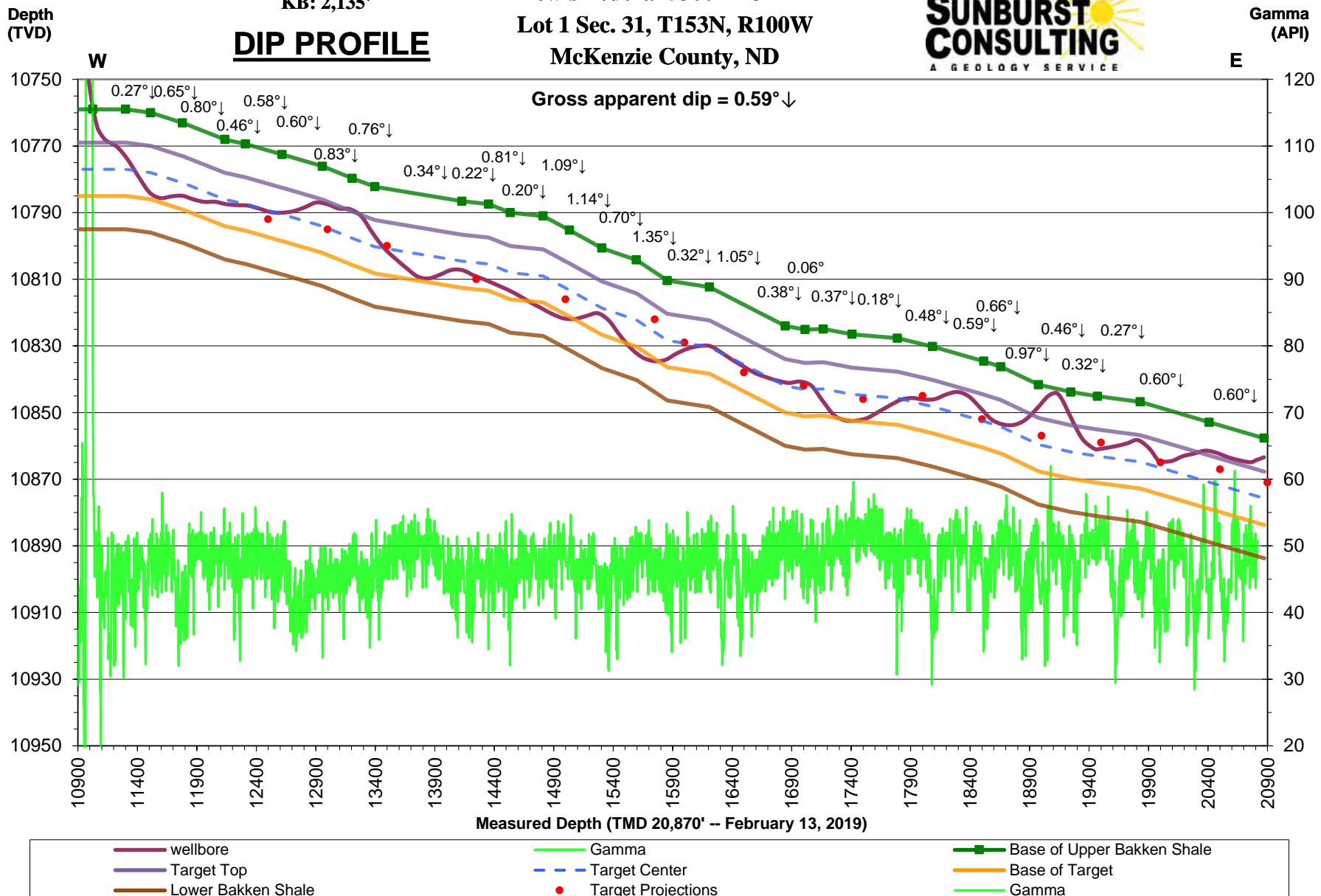
GL: 2,110'  
KB: 2,135'

## DIP PROFILE

Oasis Petroleum North America, LLC  
Lewis Federal 5300 11-31 2B  
Lot 1 Sec. 31, T153N, R100W  
McKenzie County, ND



Gamma  
(API)



wellbore  
Target Top  
Lower Bakken Shale

Gamma  
Target Center  
Target Projections

Base of Upper Bakken Shale  
Base of Target  
Gamma

WELL

## Lewis Federal 5300 11-31 2B



API  
33-053-06549-00-00

TYPEWELL  
07248-CND

FIELD  
Baker

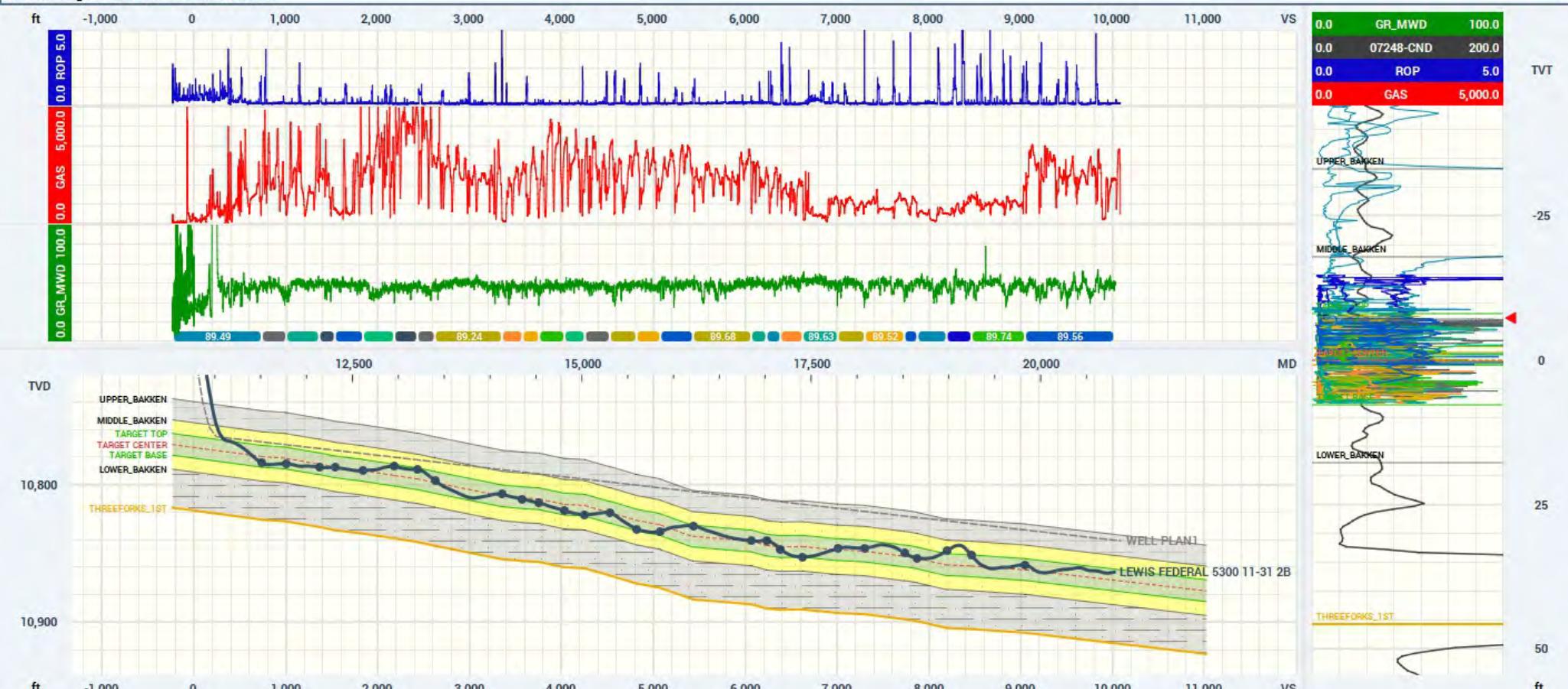
INTERPRETER

DATE

2/18/2019 2:22 PM

VS AZIMUTH  
87.78°

## Geosteering - Lewis Federal 5300 11-31 2B



Wellbore Last Survey Position  
2.2 below  
13.6 above

Target Top  
Target Base

## Last Surveys

MD	INCL	AZIM	TVD	VS	DLS
20,757.0	90.70	91.3	10,864.1	9,972.1	2.3
20,802.0	90.77	91.4	10,863.6	10,017.0	0.2

Last Segment Dip  
89.56°

## Interval

Total MD  
Total VS  
In-Zone %  
Average Dip  
Exit/Enter in

Target Top -  
Target Base  
9,354.8  
9,344.0  
96.6%  
89.4  
104.4

COMMENTS

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 11-31 2B
Surface Coordinates:	1,050' FNL & 265' FWL
Surface Location:	Lot 1 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	397.23' N & 10,077.03' E of surface location or 652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W



Kick-off: 2/6/2019  
Finish: 2/16/2019

Directional Supervision:  
Scientific MWD, RPM DI

GL:	2,110'
KB:	2,135'

### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE			E-W	SECT	DLS/ 100
			AZM	TVD	N-S			
Tie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	226.00	0.57	306.12	226.00	0.66	-0.91	-0.88	0.25
2	288.00	0.34	294.94	287.99	0.92	-1.32	-1.29	0.40
3	381.00	0.26	310.67	380.99	1.18	-1.73	-1.69	0.12
4	443.00	0.52	315.06	442.99	1.47	-2.04	-1.98	0.42
5	534.00	0.30	1.75	533.99	2.00	-2.32	-2.24	0.42
6	628.00	0.21	0.72	627.99	2.42	-2.31	-2.22	0.10
7	718.00	0.21	316.34	717.99	2.70	-2.43	-2.32	0.18
8	808.00	0.34	1.59	807.99	3.09	-2.53	-2.41	0.27
9	899.00	0.78	29.06	898.98	3.90	-2.22	-2.07	0.55
10	989.00	0.67	31.18	988.98	4.88	-1.65	-1.46	0.13
11	1079.00	0.52	22.27	1078.97	5.71	-1.23	-1.00	0.20
12	1170.00	0.69	17.85	1169.97	6.61	-0.90	-0.65	0.19
13	1261.00	0.63	22.14	1260.96	7.60	-0.55	-0.25	0.09
14	1350.00	0.65	358.87	1349.95	8.56	-0.37	-0.04	0.29
15	1442.00	0.41	186.79	1441.95	8.75	-0.42	-0.08	1.15
16	1532.00	0.26	209.49	1531.95	8.25	-0.56	-0.24	0.22
17	1622.00	0.37	235.11	1621.95	7.91	-0.90	-0.59	0.20
18	1713.00	0.64	230.24	1712.95	7.42	-1.53	-1.24	0.30
19	1806.00	0.60	221.43	1805.94	6.72	-2.25	-1.99	0.11
20	1899.00	0.64	241.65	1898.94	6.11	-3.03	-2.79	0.24
21	1993.00	0.43	225.64	1992.93	5.61	-3.75	-3.52	0.27
22	2086.00	0.50	228.00	2085.93	5.10	-4.30	-4.10	0.08
23	2180.00	0.66	260.26	2179.92	4.73	-5.13	-4.95	0.38
24	2273.00	0.18	148.06	2272.92	4.52	-5.59	-5.41	0.80
25	2366.00	0.28	90.67	2365.92	4.39	-5.28	-5.11	0.26
26	2460.00	0.63	94.64	2459.92	4.35	-4.54	-4.36	0.37
27	2553.00	0.47	122.25	2552.91	4.10	-3.70	-3.54	0.33
28	2647.00	0.50	101.16	2646.91	3.82	-2.98	-2.83	0.19
29	2740.00	0.34	121.26	2739.91	3.59	-2.34	-2.20	0.23
30	2833.00	0.26	156.97	2832.91	3.26	-2.02	-1.90	0.21
31	2927.00	0.37	130.97	2926.91	2.86	-1.71	-1.60	0.19
32	3020.00	0.52	173.35	3019.90	2.25	-1.43	-1.35	0.38
33	3113.00	0.30	165.28	3112.90	1.59	-1.32	-1.26	0.24
34	3206.00	0.41	162.37	3205.90	1.04	-1.16	-1.12	0.12
35	3300.00	0.62	176.17	3299.89	0.21	-1.03	-1.02	0.26
36	3393.00	0.63	182.69	3392.89	-0.80	-1.02	-1.05	0.08

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 11-31 2B
Surface Coordinates:	1,050' FNL & 265' FWL
Surface Location:	Lot 1 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	397.23' N & 10,077.03' E of surface location or 652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W



Kick-off: 2/6/2019  
Finish: 2/16/2019

Directional Supervision:  
Scientific MWD, RPM DI

GL:	2,110'
KB:	2,135'

#### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE				DLS/ 100
			AZM	TVD	N-S	E-W	
37	3486.00	0.35	148.36	3485.89	-1.56	-0.89	-0.95 0.42
38	3524.00	0.40	167.92	3523.88	-1.78	-0.80	-0.87 0.36
39	3605.00	0.51	177.95	3604.88	-2.42	-0.73	-0.82 0.17
40	3667.00	0.36	336.34	3666.88	-2.52	-0.80	-0.90 1.38
41	3760.00	1.94	323.76	3759.86	-0.98	-1.85	-1.88 1.71
42	3854.00	4.04	328.36	3853.73	3.12	-4.52	-4.40 2.25
43	3947.00	5.93	329.69	3946.37	10.06	-8.67	-8.27 2.04
44	4041.00	6.72	333.48	4039.80	19.17	-13.57	-12.82 0.95
45	4134.00	7.50	336.38	4132.08	29.60	-18.44	-17.28 0.92
46	4228.00	7.50	333.43	4225.28	40.71	-23.64	-22.04 0.41
47	4321.00	6.55	325.75	4317.58	50.52	-29.34	-27.36 1.43
48	4414.00	5.76	319.42	4410.05	58.45	-35.36	-33.07 1.12
49	4508.00	5.83	321.85	4503.57	65.79	-41.38	-38.80 0.27
50	4602.00	6.14	326.05	4597.05	73.71	-47.13	-44.24 0.57
51	4697.00	6.24	328.67	4691.50	82.34	-52.66	-49.43 0.32
52	4792.00	6.46	331.91	4785.92	91.46	-57.86	-54.27 0.44
53	4887.00	6.36	333.57	4880.32	100.89	-62.71	-58.76 0.22
54	4982.00	5.51	329.09	4974.81	109.52	-67.40	-63.11 1.02
55	5077.00	5.49	331.30	5069.38	117.41	-71.92	-67.32 0.22
56	5172.00	5.87	334.16	5163.91	125.77	-76.22	-71.30 0.50
57	5267.00	6.09	327.37	5258.39	134.39	-81.06	-75.79 0.78
58	5361.00	6.57	321.72	5351.82	142.81	-87.08	-81.48 0.84
59	5457.00	6.02	324.07	5447.24	151.20	-93.44	-87.51 0.63
60	5551.00	6.04	329.67	5540.72	159.46	-98.83	-92.57 0.63
61	5646.00	6.56	331.18	5635.15	168.53	-103.97	-97.36 0.57
62	5741.00	6.64	329.15	5729.52	178.00	-109.40	-102.42 0.26
63	5836.00	6.76	322.95	5823.87	187.17	-115.58	-108.25 0.77
64	5930.00	7.57	323.39	5917.14	196.56	-122.61	-114.90 0.86
65	6023.00	8.46	324.97	6009.23	207.08	-130.19	-122.07 0.99
66	6148.00	7.87	321.76	6132.96	221.33	-140.76	-132.09 0.60
67	6210.00	5.30	317.69	6194.55	226.78	-145.32	-136.43 4.21
68	6304.00	3.28	315.70	6288.28	231.92	-150.12	-141.02 2.15
69	6397.00	2.69	314.34	6381.15	235.35	-153.54	-144.31 0.64
70	6490.00	1.81	312.30	6474.08	237.86	-156.19	-146.86 0.95
71	6584.00	0.90	297.56	6568.05	239.20	-157.94	-148.56 1.03
72	6677.00	0.44	267.33	6661.05	239.52	-158.94	-149.55 0.61
73	6771.00	1.06	293.50	6755.04	239.85	-160.10	-150.69 0.74

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 11-31 2B
Surface Coordinates:	1,050' FNL & 265' FWL
Surface Location:	Lot 1 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	397.23' N & 10,077.03' E of surface location or 652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W



Kick-off: 2/6/2019  
Finish: 2/16/2019

Directional Supervision:  
Scientific MWD, RPM DI

GL:	2,110'
KB:	2,135'

#### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE				DLS/ 100
			AZM	TVD	N-S	E-W	
74	6864.00	1.35	298.88	6848.02	240.73	-161.85	-152.40 0.33
75	6957.00	1.71	308.13	6940.99	242.11	-163.90	-154.40 0.47
76	7051.00	2.38	316.47	7034.92	244.39	-166.35	-156.76 0.78
77	7144.00	2.58	315.70	7127.84	247.29	-169.14	-159.43 0.22
78	7237.00	4.41	327.30	7220.66	251.80	-172.53	-162.65 2.10
79	7331.00	4.67	328.68	7314.37	258.11	-176.48	-166.35 0.30
80	7424.00	4.58	330.44	7407.06	264.57	-180.28	-169.89 0.18
81	7518.00	4.40	331.39	7500.78	271.00	-183.85	-173.22 0.21
82	7612.00	4.13	331.38	7594.52	277.14	-187.20	-176.33 0.29
83	7705.00	4.08	332.43	7687.28	283.01	-190.34	-179.23 0.10
84	7798.00	4.04	335.00	7780.04	288.91	-193.25	-181.92 0.20
85	7892.00	3.72	328.81	7873.83	294.52	-196.23	-184.68 0.56
86	7985.00	3.43	321.45	7966.65	299.28	-199.53	-187.78 0.58
87	8078.00	2.92	325.98	8059.50	303.42	-202.59	-190.68 0.61
88	8172.00	2.30	325.94	8153.41	306.97	-204.98	-192.94 0.66
89	8265.00	2.16	324.85	8246.34	309.94	-207.04	-194.88 0.16
90	8358.00	2.12	327.33	8339.27	312.83	-208.97	-196.70 0.11
91	8451.00	1.99	330.50	8432.21	315.68	-210.70	-198.31 0.19
92	8545.00	1.87	329.31	8526.16	318.42	-212.28	-199.79 0.13
93	8638.00	1.98	334.16	8619.11	321.17	-213.76	-201.16 0.21
94	8731.00	2.45	336.68	8712.04	324.44	-215.25	-202.52 0.52
95	8825.00	2.97	336.37	8805.93	328.52	-217.02	-204.13 0.55
96	8918.00	3.14	342.98	8898.80	333.16	-218.73	-205.66 0.42
97	9012.00	3.65	336.24	8992.63	338.36	-220.69	-207.42 0.69
98	9105.00	3.56	338.03	9085.45	343.75	-222.96	-209.48 0.15
99	9198.00	3.33	336.47	9178.28	348.90	-225.12	-211.44 0.27
100	9292.00	3.10	337.50	9272.13	353.75	-227.18	-213.31 0.25
101	9387.00	2.95	338.71	9367.00	358.40	-229.05	-215.00 0.17
102	9481.00	2.64	340.17	9460.89	362.69	-230.67	-216.44 0.34
103	9576.00	2.49	330.44	9555.79	366.55	-232.43	-218.05 0.48
104	9670.00	2.63	327.62	9649.70	370.14	-234.59	-220.07 0.20
105	9765.00	2.47	330.05	9744.61	373.76	-236.78	-222.12 0.20
106	9860.00	2.29	330.73	9839.52	377.19	-238.73	-223.94 0.19
107	9955.00	1.88	324.33	9934.46	380.11	-240.56	-225.66 0.50
108	10049.00	1.67	321.79	10028.42	382.44	-242.31	-227.31 0.24
109	10144.00	1.58	319.64	10123.38	384.52	-244.01	-228.94 0.11
110	10191.00	1.43	316.99	10170.36	385.45	-244.83	-229.72 0.35



Operator:	Oasis Petroleum North America, LLC
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County, State:	McKenzie County, ND
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Kick-off: 2/6/2019  
Finish: 2/16/2019

Directional Supervision:  
Scientific MWD, RPM DI

GL:	2,110'
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#### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE				DLS/ 100
			AZM	TVD	N-S	E-W	
111	10238.00	1.19	308.70	10217.35	386.18	-245.62	-230.47 0.65
112	10269.00	1.54	55.91	10248.34	386.62	-245.52	-230.36 7.12
113	10300.00	5.57	77.40	10279.28	387.18	-243.71	-228.53 13.47
114	10332.00	10.18	80.26	10310.97	387.99	-239.40	-224.19 14.45
115	10363.00	15.12	77.34	10341.21	389.35	-232.75	-217.50 16.06
116	10395.00	19.73	74.06	10371.73	391.74	-223.48	-208.14 14.72
117	10426.00	23.55	75.14	10400.54	394.77	-212.46	-197.01 12.39
118	10458.00	26.63	77.59	10429.52	397.95	-199.27	-183.71 10.16
119	10489.00	29.38	80.26	10456.89	400.73	-184.99	-169.33 9.75
120	10521.00	31.38	83.27	10484.49	403.04	-168.98	-153.24 7.85
121	10553.00	34.21	89.12	10511.40	404.15	-151.70	-135.93 13.27
122	10584.00	37.20	93.68	10536.57	403.68	-133.63	-117.89 12.91
123	10616.00	40.59	94.60	10561.48	402.23	-113.59	-97.93 10.75
124	10647.00	44.87	94.89	10584.24	400.49	-92.63	-77.05 13.82
125	10679.00	49.19	94.54	10606.05	398.56	-69.30	-53.81 13.52
126	10710.00	52.98	94.41	10625.52	396.68	-45.26	-29.86 12.23
127	10742.00	55.78	94.05	10644.15	394.77	-19.32	-4.02 8.80
128	10773.00	58.26	94.46	10661.03	392.84	6.61	21.82 8.08
129	10804.00	61.30	93.91	10676.63	390.88	33.32	48.44 9.93
130	10835.00	62.34	93.90	10691.27	389.02	60.58	75.61 3.35
131	10866.00	65.13	92.23	10704.98	387.54	88.34	103.28 10.21
132	10897.00	66.31	91.77	10717.73	386.56	116.58	131.46 4.04
133	10929.00	69.26	90.74	10729.83	385.91	146.19	161.03 9.69
134	10960.00	70.15	91.05	10740.58	385.46	175.26	190.06 3.02
135	10991.00	73.39	91.08	10750.28	384.91	204.70	219.46 10.45
136	11023.00	78.40	90.68	10758.07	384.43	235.72	250.43 15.70
137	11054.00	82.92	89.68	10763.10	384.34	266.30	280.99 14.92
138	11076.00	84.84	89.33	10765.45	384.53	288.17	302.85 8.87
139	11134.00	89.56	91.81	10768.28	383.95	346.08	360.69 9.19
140	11227.00	88.09	89.85	10770.19	382.60	439.04	453.54 2.63
141	11319.00	87.05	87.95	10774.09	384.37	530.94	545.43 2.35
142	11411.00	86.48	88.06	10779.28	387.56	622.74	637.28 0.63
143	11504.00	87.69	88.43	10784.01	390.41	715.57	730.16 1.36
144	11596.00	90.30	89.03	10785.62	392.45	807.53	822.12 2.91
145	11688.00	90.33	88.04	10785.12	394.80	899.49	914.11 1.08
146	11780.00	89.87	88.17	10784.96	397.84	991.44	1006.11 0.52
147	11872.00	88.79	87.88	10786.03	401.01	1083.38	1098.10 1.22



Operator:	Oasis Petroleum North America, LLC
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County, State:	McKenzie County, ND
Bottom Hole Location:	397.23' N & 10,077.03' E of surface location or 652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W



Kick-off: 2/6/2019  
Finish: 2/16/2019

Directional Supervision:  
Scientific MWD, RPM DI

GL:	2,110'
KB:	2,135'

#### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE		N-S	E-W	SECT	DLS/ 100
			AZM	TVD				
148	11964.00	90.30	89.13	10786.76	403.41	1175.34	1190.09	2.13
149	12055.00	89.73	88.52	10786.74	405.28	1266.32	1281.07	0.92
150	12148.00	89.36	89.62	10787.48	406.79	1359.30	1374.04	1.25
151	12240.00	90.30	89.76	10787.75	407.28	1451.30	1465.99	1.03
152	12332.00	89.50	89.01	10787.91	408.27	1543.29	1557.95	1.19
153	12427.00	89.40	90.00	10788.82	409.09	1638.29	1652.90	1.05
154	12522.00	89.36	90.04	10789.85	409.06	1733.28	1747.82	0.06
155	12616.00	90.44	90.04	10790.02	408.99	1827.28	1841.75	1.15
156	12712.00	90.10	89.57	10789.56	409.32	1923.28	1937.69	0.60
157	12808.00	91.30	88.41	10788.39	411.01	2019.25	2033.66	1.74
158	12903.00	90.43	89.60	10786.96	412.66	2114.22	2128.62	1.55
159	12997.00	88.93	90.15	10787.48	412.87	2208.22	2222.55	1.70
160	13092.00	89.50	89.62	10788.78	413.06	2303.21	2317.48	0.82
161	13186.00	90.30	88.98	10788.95	414.21	2397.20	2411.45	1.09
162	13282.00	87.15	90.57	10791.08	414.58	2493.16	2507.35	3.68
163	13377.00	86.78	90.25	10796.11	413.90	2588.02	2602.12	0.51
164	13472.00	87.82	90.36	10800.59	413.40	2682.92	2696.92	1.10
165	13567.00	88.36	90.59	10803.76	412.61	2777.86	2791.76	0.62
166	13661.00	88.16	90.36	10806.61	411.83	2871.81	2885.61	0.32
167	13756.00	88.73	90.46	10809.19	411.15	2966.78	2980.48	0.61
168	13850.00	90.60	90.44	10809.74	410.42	3060.77	3074.37	1.99
169	13945.00	90.77	89.94	10808.60	410.10	3155.76	3169.28	0.56
170	14039.00	90.94	89.90	10807.20	410.23	3249.75	3263.20	0.19
171	14134.00	88.96	91.64	10807.28	408.95	3344.73	3358.06	2.77
172	14229.00	89.13	92.21	10808.86	405.76	3439.66	3452.80	0.63
173	14324.00	89.30	91.37	10810.17	402.80	3534.61	3547.56	0.90
174	14418.00	88.90	91.70	10811.64	400.28	3628.56	3641.34	0.55
175	14513.00	89.30	91.58	10813.14	397.56	3723.51	3736.12	0.44
176	14607.00	88.56	91.17	10814.89	395.31	3817.47	3829.91	0.90
177	14702.00	89.03	91.31	10816.89	393.25	3912.42	3924.72	0.52
178	14796.00	88.79	90.98	10818.68	391.37	4006.39	4018.54	0.43
179	14891.00	89.03	90.77	10820.48	389.92	4101.36	4113.39	0.34
180	14985.00	89.43	90.02	10821.75	389.27	4195.35	4207.28	0.90
181	15080.00	90.40	90.57	10821.89	388.78	4290.34	4302.18	1.17
182	15175.00	90.67	90.30	10821.00	388.06	4385.34	4397.08	0.40
183	15270.00	90.30	90.57	10820.20	387.34	4480.33	4491.97	0.48
184	15364.00	86.98	90.95	10822.43	386.10	4574.28	4585.81	3.55



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County, State:	McKenzie County, ND
Bottom Hole Location:	397.23' N & 10,077.03' E of surface location or 652.77' FNL & 180.71' FEL Lot 4 Sec. 32, T153N, R100W



Kick-off: 2/6/2019  
Finish: 2/16/2019

Directional Supervision:  
Scientific MWD, RPM DI

GL:	2,110'
KB:	2,135'

### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE		N-S	E-W	SECT	DLS/ 100
			AZM	TVD				
185	15458.00	87.56	90.00	10826.90	385.32	4668.17	4679.59	1.18
186	15552.00	87.65	90.31	10830.83	385.06	4762.09	4773.43	0.34
187	15646.00	89.16	88.92	10833.45	385.70	4856.05	4867.34	2.18
188	15741.00	89.53	88.95	10834.54	387.46	4951.02	4962.32	0.39
189	15836.00	90.84	88.85	10834.23	389.28	5046.00	5057.30	1.38
190	15931.00	91.48	89.02	10832.31	391.05	5140.97	5152.26	0.70
191	16026.00	90.30	89.52	10830.83	392.26	5235.95	5247.21	1.35
192	16121.00	90.64	90.12	10830.05	392.56	5330.94	5342.15	0.73
193	16216.00	89.36	91.44	10830.05	391.27	5425.93	5437.01	1.94
194	16310.00	88.22	91.09	10832.04	389.19	5519.88	5530.82	1.27
195	16405.00	89.06	91.18	10834.29	387.31	5614.84	5625.63	0.89
196	16499.00	88.56	92.01	10836.24	384.69	5708.78	5719.40	1.03
197	16594.00	89.10	91.89	10838.18	381.46	5803.70	5814.12	0.58
198	16688.00	89.40	91.39	10839.41	378.77	5897.66	5907.90	0.62
199	16783.00	89.36	91.96	10840.44	376.00	5992.61	6002.68	0.60
200	16877.00	89.83	91.87	10841.10	372.85	6086.55	6096.43	0.51
201	16971.00	90.67	91.69	10840.69	369.93	6180.51	6190.20	0.91
202	17066.00	87.82	91.81	10841.95	367.03	6275.45	6284.95	3.00
203	17161.00	86.68	89.87	10846.50	365.64	6370.32	6379.70	2.37
204	17256.00	88.19	88.76	10850.76	366.78	6465.21	6474.57	1.97
205	17350.00	89.87	88.69	10852.35	368.87	6559.17	6568.54	1.79
206	17445.00	90.07	88.26	10852.40	371.40	6654.14	6663.53	0.50
207	17538.00	90.90	88.21	10851.61	374.26	6747.09	6756.52	0.89
208	17634.00	91.37	89.61	10849.71	376.09	6843.05	6852.48	1.54
209	17728.00	90.97	90.72	10847.79	375.82	6937.03	6946.38	1.25
210	17823.00	91.07	89.87	10846.10	375.33	7032.01	7041.27	0.90
211	17917.00	89.50	90.11	10845.63	375.34	7126.01	7135.20	1.69
212	18011.00	89.90	89.99	10846.12	375.26	7220.01	7229.13	0.44
213	18106.00	90.33	89.08	10845.93	376.03	7315.00	7324.08	1.06
214	18202.00	91.34	89.16	10844.53	377.51	7410.98	7420.04	1.06
215	18296.00	89.53	89.20	10843.82	378.85	7504.96	7514.01	1.93
216	18390.00	88.83	89.92	10845.16	379.57	7598.95	7607.95	1.07
217	18485.00	87.08	88.63	10848.55	380.77	7693.88	7702.85	2.29
218	18579.00	88.66	89.03	10852.05	382.69	7787.79	7796.77	1.73
219	18673.00	89.53	87.65	10853.53	385.41	7881.73	7890.75	1.74
220	18768.00	90.27	87.41	10853.70	389.51	7976.65	7985.75	0.82
221	18863.00	91.54	86.75	10852.20	394.35	8071.51	8080.73	1.51



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Kick-off: 2/6/2019  
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#### Minimum Curvature Method (SPE-3362)

[North and East are positive and South and West are negative]

Vertical Section Azimuth: 87.78

No.	MD	INC	TRUE		N-S	E-W	SECT	DLS/
			AZM	TVD				100
222	18958.00	92.42	89.85	10848.92	397.16	8166.40	8175.65	3.39
223	19052.00	92.14	91.52	10845.18	396.04	8260.31	8269.45	1.80
224	19115.00	89.83	91.20	10844.09	394.55	8323.28	8332.32	3.70
225	19146.00	87.96	91.71	10844.69	393.76	8354.26	8363.25	6.25
226	19177.00	85.91	91.33	10846.35	392.94	8385.21	8394.13	6.73
227	19209.00	85.80	91.35	10848.66	392.19	8417.11	8425.99	0.35
228	19240.00	85.70	91.13	10850.96	391.52	8448.02	8456.85	0.78
229	19272.00	85.81	91.75	10853.33	390.72	8479.92	8488.69	1.96
230	19304.00	86.15	90.60	10855.57	390.07	8511.84	8520.56	3.74
231	19335.00	86.78	90.45	10857.48	389.78	8542.78	8551.46	2.09
232	19367.00	88.22	89.30	10858.88	389.85	8574.75	8583.41	5.76
233	19398.00	88.49	89.05	10859.77	390.30	8605.73	8614.39	1.19
234	19430.00	88.59	88.47	10860.58	390.99	8637.71	8646.37	1.84
235	19461.00	89.73	88.34	10861.04	391.85	8668.70	8677.37	3.70
236	19525.00	90.84	88.40	10860.72	393.67	8732.67	8741.36	1.74
237	19619.00	89.90	89.16	10860.11	395.68	8826.64	8835.35	1.29
238	19715.00	91.07	90.80	10859.30	395.71	8922.63	8931.27	2.10
239	19809.00	90.20	89.70	10858.26	395.30	9016.63	9025.17	1.49
240	19905.00	86.85	87.99	10860.73	397.23	9112.56	9121.10	3.92
241	19968.00	87.55	87.70	10863.81	399.60	9175.44	9184.03	1.20
242	20000.00	89.33	87.48	10864.68	400.94	9207.40	9216.02	5.60
243	20094.00	90.84	87.55	10864.54	405.02	9301.30	9310.01	1.61
244	20189.00	90.91	88.67	10863.09	408.15	9396.24	9405.00	1.18
245	20283.00	90.03	89.97	10862.32	409.27	9490.23	9498.96	1.67
246	20378.00	91.04	90.94	10861.43	408.51	9585.22	9593.85	1.47
247	20473.00	88.16	91.31	10862.09	406.65	9680.19	9688.67	3.06
248	20567.00	90.27	91.77	10863.38	404.12	9774.14	9782.46	2.30
249	20662.00	88.59	90.97	10864.32	401.85	9869.10	9877.26	1.96
250	20757.00	90.70	91.34	10864.91	399.94	9964.08	9972.09	2.25
251	20802.00	90.77	91.38	10864.34	398.87	10009.06	10017.00	0.18
252	20870.00	90.77	91.38	10863.42	397.23	10077.03	10084.86	0.00



# FORMATION TOPS & STRUCTURAL RELATIONSHIPS

Operator: Well Name: Location: Elevation:	Subject Well:								Offset Wells:		
	Oasis Petroleum North America, LLC Lewis Federal 5300 11-31 2B 1,050' FNL & 265' FWL Lot 1 Section 31, T153N, R100W								Dip To Lewis Federal 5300 11-31 3B	Dip To Wade Federal 5300 41-30 8T3	Dip To Lewis Federal 5300 31-31H
Formation/ Marker	Prog. Top	Prog. Datum (MSL)	Driller's Depth Top (MD)	Driller's Depth Top (TVD)	Datum (MSL)	Interval Thickness	Thickness to Target	Dip To Prog.			
Pierre	1,985'	150'	1,931'	1,931'	204'	2,690'	8,846'	54'	-2'	-	22'
Greenhorn	4,615'	-2,480'	4,626'	4,621'	-2,486'	409'	6,156'	-6'	5'	9'	-28'
Mowry (Dakota Group)	5,023'	-2,888'	5,037'	5,030'	-2,895'	400'	5,747'	-7'	-3'	4'	-22'
Inyan Kara (Dakota Group)	5,446'	-3,311'	5,440'	5,430'	-3,295'	477'	5,347'	16'	-4'	34'	17'
Swift (Base Dakota Group)	5,890'	-3,755'	5,920'	5,907'	-3,772'	544'	4,870'	-17'	1'	18'	-33'
Rierdon	6,443'	-4,308'	6,467'	6,451'	-4,316'	467'	4,326'	-8'	-8'	23'	-99'
Dunham Salt	6,920'	-4,785'	6,934'	6,918'	-4,783'	66'	3,859'	2'	11'	41'	-78'
Dunham Salt Base	6,980'	-4,845'	7,000'	6,984'	-4,849'	279'	3,793'	-4'	-6'	31'	-31'
Pine Salt	7,255'	-5,120'	7,279'	7,263'	-5,128'	38'	3,514'	-8'	-1'	5'	-1'
Pine Salt Base	7,311'	-5,176'	7,318'	7,301'	-5,166'	134'	3,476'	10'	12'	0'	31'
Opeche Salt	7,427'	-5,292'	7,452'	7,435'	-5,300'	15'	3,342'	-8'	1'	-14'	5'
Opeche Salt Base	7,470'	-5,335'	7,467'	7,450'	-5,315'	234'	3,327'	20'	1'	-1'	20'
Amsden	7,671'	-5,536'	7,701'	7,684'	-5,549'	144'	3,093'	-13'	9'	-8'	19'
Tyler	7,834'	-5,699'	7,845'	7,828'	-5,693'	235'	2,949'	6'	8'	5'	28'
Otter/Base Minnelusa	8,060'	-5,925'	8,081'	8,063'	-5,928'	339'	2,714'	-3'	3'	-3'	20'
Kibbey "Lime"	8,406'	-6,271'	8,421'	8,402'	-6,267'	146'	2,375'	4'	8'	5'	23'
Charles Salt	8,553'	-6,418'	8,567'	8,548'	-6,413'	688'	2,229'	5'	12'	2'	27'
Base Last Salt	9,237'	-7,102'	9,255'	9,236'	-7,101'	208'	1,541'	1'	5'	-2'	9'
Mission Canyon	9,440'	-7,305'	9,464'	9,444'	-7,309'	568'	1,333'	-4'	2'	4'	9'
Lodgepole	10,014'	-7,879'	10,033'	10,012'	-7,877'	73'	765'	2'	3'	4'	3'
Lodgepole A	10,086'	-7,951'	10,106'	10,085'	-7,950'	52'	692'	1'	8'	7'	2'
Lodgepole B	10,142'	-8,007'	10,158'	10,137'	-8,002'	68'	640'	5'	9'	16'	21'
Lodgepole C	10,237'	-8,102'	10,226'	10,205'	-8,070'	208'	572'	32'	11'	8'	3'
Lodgepole D	10,413'	-8,278'	10,440'	10,413'	-8,278'	166'	364'	0'	-3'	-5'	-18'
Lodgepole E	10,558'	-8,423'	10,640'	10,579'	-8,444'	71'	198'	-21'	2'	-5'	-12'
Lodgepole F	10,649'	-8,514'	10,753'	10,650'	-8,515'	82'	127'	-1'	2'	-5'	-13'
False Bakken	10,731'	-8,596'	10,936'	10,732'	-8,597'	11'	45'	-1'	3'	-7'	-13'
Upper Bakken Shale	10,742'	-8,607'	10,967'	10,743'	-8,608'	16'	34'	-1'	2'	-9'	-11'
Middle Bakken	10,756'	-8,621'	11,026'	10,759'	-8,624'	10'	18'	-3'	-1'	-9'	-12'
Target Top	10,766'	-8,631'	11,150'	10,769'	-8,634'	8'	8'	-3'	-1'	-7'	-10'
Target Landing	10,774'	-8,639'	-	10,777'	-8,642'	8'	0'	-3'	-1'	-6'	-9'
Target Base	10,782'	-8,647'	-	10,785'	-8,650'	10'	-8'	-3'	-1'	-5'	-8'
Lower Bakken Shale	10,792'	-8,657'	-	10,795'	-8,660'	-	-18'	-3'	-1'	-1'	-7'

# CONTROL DATA

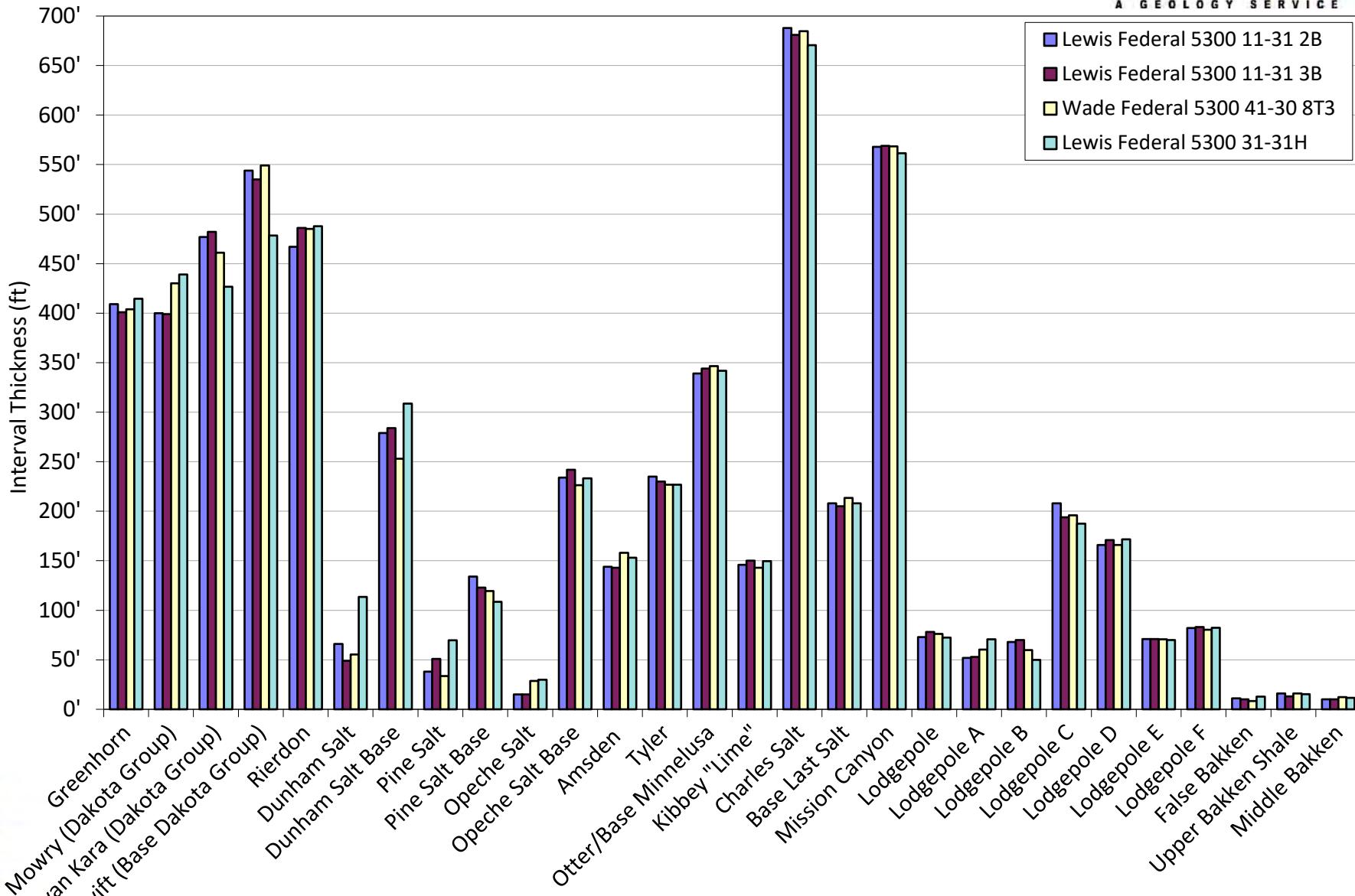
Operator:	Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC			
	Lewis Federal 5300 11-31 3B				Wade Federal 5300 41-30 8T3				Lewis Federal 5300 31-31H			
Well Name:	Lot 1 Section 31, T153N, R100W McKenzie County, ND shares pad with subject well				Lot 6 Sec. 30, T153N, R100W McKenzie County, ND 0.4 miles N of subject well				Lot 6 Sec. 30, T153N, R100W McKenzie County, ND 0.5 miles S of subject well			
	Elevation:	KB: 2,135'	NDIC: 30197		KB: 2,077'	NDIC: 28558			KB: 2,185'	NDIC: 20314		
Formation/ Zone	Driller's (TVD)	Datum (MSL)	Interval Thickness	Thickness to Target	Driller's (TVD)	Datum (MSL)	Interval Thickness	Thickness to Target	E-Log (TVD)	Datum (MSL)	Interval Thickness	Thickness to Target
Pierre	1,929'	206'	2,697'	8,847'	-	-	-	-	2,003'	182'	2,640'	8,815'
Greenhorn	4,626'	-2,491'	401'	6,150'	4,572'	-2,495'	404'	6,141'	4,643'	-2,458'	414'	6,175'
Mowry (Dakota Group)	5,027'	-2,892'	399'	5,749'	4,976'	-2,899'	430'	5,737'	5,058'	-2,873'	439'	5,760'
Inyan Kara (Dakota Group)	5,426'	-3,291'	482'	5,350'	5,406'	-3,329'	461'	5,307'	5,497'	-3,312'	427'	5,321'
Swift (Base Dakota Group)	5,908'	-3,773'	535'	4,868'	5,867'	-3,790'	549'	4,846'	5,924'	-3,739'	478'	4,894'
Rierdon	6,443'	-4,308'	486'	4,333'	6,416'	-4,339'	485'	4,297'	6,402'	-4,217'	488'	4,416'
Dunham Salt	6,929'	-4,794'	49'	3,847'	6,901'	-4,824'	55'	3,812'	6,890'	-4,705'	113'	3,928'
Dunham Salt Base	6,978'	-4,843'	284'	3,798'	6,957'	-4,880'	253'	3,756'	7,003'	-4,818'	309'	3,815'
Pine Salt	7,262'	-5,127'	51'	3,514'	7,210'	-5,133'	33'	3,503'	7,312'	-5,127'	70'	3,506'
Pine Salt Base	7,313'	-5,178'	123'	3,463'	7,243'	-5,166'	119'	3,470'	7,382'	-5,197'	109'	3,436'
Opeche Salt	7,436'	-5,301'	15'	3,340'	7,363'	-5,286'	29'	3,350'	7,490'	-5,305'	30'	3,328'
Opeche Salt Base	7,451'	-5,316'	242'	3,325'	7,391'	-5,314'	226'	3,322'	7,520'	-5,335'	233'	3,298'
Amsden	7,693'	-5,558'	143'	3,083'	7,618'	-5,541'	158'	3,095'	7,753'	-5,568'	153'	3,065'
Tyler	7,836'	-5,701'	230'	2,940'	7,775'	-5,698'	227'	2,938'	7,906'	-5,721'	227'	2,912'
Otter/Base Minnelusa	8,066'	-5,931'	344'	2,710'	8,002'	-5,925'	346'	2,711'	8,133'	-5,948'	342'	2,685'
Kibbey "Lime"	8,410'	-6,275'	150'	2,366'	8,349'	-6,272'	143'	2,364'	8,475'	-6,290'	150'	2,343'
Charles Salt	8,560'	-6,425'	681'	2,216'	8,492'	-6,415'	685'	2,221'	8,625'	-6,440'	671'	2,193'
Base Last Salt	9,241'	-7,106'	205'	1,535'	9,176'	-7,099'	213'	1,537'	9,295'	-7,110'	208'	1,523'
Mission Canyon	9,446'	-7,311'	569'	1,330'	9,390'	-7,313'	568'	1,323'	9,503'	-7,318'	561'	1,315'
Lodgepole	10,015'	-7,880'	78'	761'	9,958'	-7,881'	76'	755'	10,065'	-7,880'	72'	753'
Lodgepole A	10,093'	-7,958'	53'	683'	10,034'	-7,957'	60'	679'	10,137'	-7,952'	71'	681'
Lodgepole B	10,146'	-8,011'	70'	630'	10,095'	-8,018'	60'	618'	10,208'	-8,023'	50'	610'
Lodgepole C	10,216'	-8,081'	194'	560'	10,155'	-8,078'	196'	558'	10,258'	-8,073'	187'	560'
Lodgepole D	10,410'	-8,275'	171'	366'	10,350'	-8,273'	166'	363'	10,445'	-8,260'	172'	373'
Lodgepole E	10,581'	-8,446'	71'	195'	10,516'	-8,439'	71'	197'	10,617'	-8,432'	70'	201'
Lodgepole F	10,652'	-8,517'	83'	124'	10,587'	-8,510'	80'	126'	10,687'	-8,502'	82'	131'
False Bakken	10,735'	-8,600'	10'	41'	10,667'	-8,590'	8'	46'	10,769'	-8,584'	13'	49'
Upper Bakken Shale	10,745'	-8,610'	13'	31'	10,676'	-8,599'	16'	37'	10,782'	-8,597'	15'	36'
Middle Bakken	10,758'	-8,623'	10'	18'	10,692'	-8,615'	12'	21'	10,797'	-8,612'	12'	21'
Target Top	10,768'	-8,633'	8'	8'	10,704'	-8,627'	9'	9'	10,809'	-8,624'	9'	9'
Target Landing	10,776'	-8,641'	8'	0'	10,713'	-8,636'	9'	0'	10,818'	-8,633'	9'	0'
Target Base	10,784'	-8,649'	10'	-8'	10,722'	-8,645'	14'	-9'	10,827'	-8,642'	11'	-9'
Lower Bakken Shale	10,794'	-8,659'		-18'	10,736'	-8,659'		-23'	10,838'	-8,653'		-20'

Projected Depths



## INTERVAL THICKNESS

Oasis Petroleum North America, LLC - Lewis Federal 5300 11-31 2B



# LITHOLOGY

Oasis Petroleum North America, LLC  
Lewis Federal 5300 11-31 2B

Sunburst geologists caught 20' sample intervals from 4,570'-4,790'; 30' sample intervals from 8,200' to 11,150'; and 50' sample intervals to the TD of the lateral at 20,870'. 10' spot samples were caught through the vertical, curve, and lateral as needed. Formation tops and lithologic markers have been inserted into the sample descriptions below for reference. Samples were examined wet and dry under a binocular microscope. Sample fluorescent cuts are masked by invert mud through intermediate casing. Quantifiers in order of increasing abundance are trace, rare, occasional, common and abundant.

**Vertical Log Descriptions:** MD / TVD (MSL Datum)

**Drilling in the Pierre Formation [Upper Montana Group]**

4,570-4,590 SHALE: light-medium gray, firm, occasional soft, sub platy, rare sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

4,590-4,610 SHALE: light-medium gray, firm, occasional soft, sub platy, rare sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

**Greenhorn [Upper Colorado Group]** **4,626' MD / 4,621' TVD (-2,486')**

4,610-4,630 SHALE: light-medium gray, firm, occasional soft, sub platy, rare sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

4,630-4,650 SHALE: medium gray, firm, rare soft, sub platy, rare sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain; trace LIMESTONE: mudstone, light gray, cream, rare medium gray, trace dark gray, microcrystalline, earthy texture, firm, occasional friable, earthy texture, calcareous, trace intercrystalline porosity, no visible oil stain

4,650-4,670 SHALE: medium-dark gray, friable, occasional firm, sub platy, common sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain; trace LIMESTONE: mudstone, off white, cream, light gray, microcrystalline, earthy texture, firm, occasional friable, earthy texture, calcareous, trace intercrystalline porosity, no visible oil stain

4,670-4,690 SHALE: medium gray, friable, sub platy, common sub blocky, earthy texture, no visible porosity, no visible oil stain; very trace LIMESTONE: mudstone, cream, light-medium gray, microcrystalline, earthy texture, firm, trace friable, earthy texture, calcareous, trace intercrystalline porosity, no visible oil stain

4,690-4,710 SHALE: light-medium gray, firm, occasional friable, trace hard, sub platy, rare sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

4,710-4,730 SHALE: medium gray, firm, sub platy, rare sub blocky, earthy texture, no visible porosity, no visible oil stain; trace LIMESTONE: mudstone, off white, cream, microcrystalline, earthy texture, firm, earthy texture, calcareous, rare disseminated pyrite, possible intercrystalline porosity, no visible oil stain

4,730-4,750 SHALE: medium gray, firm, sub platy, rare sub blocky, earthy texture, no visible porosity, no visible oil stain; trace LIMESTONE: mudstone, off white, cream, microcrystalline, earthy texture, firm, earthy texture, calcareous, rare disseminated pyrite, possible intercrystalline porosity, no visible oil stain

4,750-4,770 SHALE: light-medium gray, firm, sub platy, rare sub blocky, earthy texture, no visible porosity, no visible oil stain; trace LIMESTONE: mudstone, cream, occasional light gray, rare light-medium brown gray, microcrystalline, earthy texture, firm, rare friable, earthy texture, calcareous, rare disseminated pyrite, possible intercrystalline porosity, no visible oil stain

4,770-4,790 SHALE: medium gray, firm, sub platy, common sub blocky, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

**Drilling in the Otter Formation [Mississippian Big Snowy Group]**

8,200-8,230 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,230-8,260 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: gray-light gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,260-8,290 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: light gray-gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,290-8,320 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,320-8,336 No sample

8,336-8,350 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,350-8,380 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,380-8,410 SILTSTONE: light red orange, gray, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; common SILTY SANDSTONE: gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

**Kibbey "Lime" [Mississippian Big Snowy Group]**

**8,421' MD / 8,402' TVD (-6,267')**

8,410-8,440 SILTSTONE and SILTY SANDSTONE: as above; ANHYDRITE off white, microcrystalline, soft, chalky, massive, anhedral, amorphous; no visible porosity, no visible oil stain;

8,440-8,470 SILTSTONE: dark orange, firm, sub blocky, calcareous cement, poorly-moderately cemented, no visible porosity; rare SILTY SANDSTONE: light gray, cream, trace medium gray, very fine grained, firm, calcareous, poorly-moderately cemented, no visible porosity

8,470-8,500 SILTSTONE: dark orange, firm, trace friable, sub blocky, calcareous cement, poorly-moderately cemented, no visible porosity; rare SILTY SANDSTONE: light-medium gray, very fine grained, friable, calcareous, poorly-moderately cemented, no visible porosity, no visible oil stain; trace ANHYDRITE off white, microcrystalline, soft, chalky, massive, anhedral, amorphous; no visible porosity, no visible oil stain

8,500-8,530 SILTSTONE: red brown, dark rounded, firm, sub blocky, calcareous cement, poorly-moderately cemented, no visible porosity; trace SILTY SANDSTONE: light-medium gray, very fine grained, friable, calcareous, poorly-moderately cemented, no visible porosity, no visible oil stain

8,530-8,560 SILTSTONE: orange brown, soft, blocky-sub platy, calcareous cement, well sorted, no visible porosity

**Charles Formation [Mississippian Madison Group]**

**8,567' MD / 8,548' TVD (-6,413')**

8,560-8,590 LIMESTONE: mudstone, cream, light gray, microcrystalline, firm, earthy texture, no visible porosity, no visible oil stain; rare SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,590-8,620 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; rare LIMESTONE: mudstone, light-medium gray, common tan, microcrystalline, firm, trace friable, earthy texture, no visible porosity, no visible oil stain

8,620-8,650 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,650-8,680 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; r LIMESTONE: mudstone, cream, rare light-medium gray, trace light brown gray, microcrystalline, firm, earthy texture, no visible porosity, no visible oil stain

8,680-8,710 SALT: milky white, rare translucent firm, hard, crystalline, massive, anhedral, no visible porosity

8,710-8,740 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,740-8,770 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; rare LIMESTONE: mudstone, light-medium gray, common tan, microcrystalline, firm, trace friable, earthy texture, no visible porosity, no visible oil stain

8,770-8,800 ARGILLACEOUS LIMESTONE: mudstone, medium-dark gray, light gray, rare cream, microcrystalline, firm, earthy texture, occasional crystalline texture, no visible porosity; occasional SALT: translucent-transparent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,800-8,830 SALT: translucent-transparent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; ARGILLACEOUS LIMESTONE: mudstone, medium-dark gray, light gray, rare cream, microcrystalline, firm, earthy texture, occasional crystalline texture, no visible porosity

8,830-8,860 SALT: translucent-transparent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; ARGILLACEOUS LIMESTONE: mudstone, medium-dark gray, light gray, rare cream, microcrystalline, firm, earthy texture, occasional crystalline texture, no visible porosity

8,860-8,890 LIMESTONE: mudstone, medium-light gray, light brown gray, tan, earthy texture, firm, dolomitic in part, argillaceous in part, no visible porosity; rare ANHYDRITE: milky white, cream, rare light gray, microcrystalline, soft, amorphous, no visible porosity; rare SALT: as above

8,890-8,920 SALT: translucent-transparent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; LIMESTONE: mudstone, medium gray, light gray, earthy texture, firm, argillaceous in part, no visible porosity; rare ANHYDRITE: milky white, cream, rare light gray, microcrystalline, soft, amorphous, no visible porosity

8,920-8,950 SALT: translucent-transparent, rare milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; very trace ANHYDRITE: as above

**Base of Last Salt [Charles Formation]** **9.255' MD / 9.236' TVD (-7,101')**

9,250-9,280 LIMESTONE-ARGILLACEOUS LIMESTONE: mudstone, tan, light-medium gray, rare dark gray, microcrystalline, firm, trace friable, dense, earthy texture, rare crystalline texture, no visible porosity, no visible oil stain

9,280-9,310 LIMESTONE: mudstone, tan, cream, light-medium gray, microcrystalline, firm, trace friable, dense, earthy texture, common crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,310-9,340 LIMESTONE: mudstone, light-medium gray, occasional cream, rare tan, microcrystalline, firm, trace friable, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,340-9,370 LIMESTONE: mudstone, light-medium gray, occasional cream, rare tan, microcrystalline, firm, trace friable, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,370-9,400 LIMESTONE: mudstone, light-medium gray, occasional cream, rare tan, microcrystalline, firm, trace friable, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,400-9,430 LIMESTONE: mudstone, tan, cream, microcrystalline, firm, trace friable, dense, earthy texture, common crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,430-9,460 LIMESTONE: mudstone, off white-light gray, microcrystalline, firm-friable, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

**Mission Canyon [Mississippian Madison Group]** **9.464' MD / 9.444' TVD (-7,309')**

9,460-9,490 LIMESTONE: mudstone, dark cream-off white, common tan-light brown, microcrystalline, firm, dense, earthy-crystalline texture, argillaceous in part, trace free clear calcite, possible intercrystalline porosity, no visible oil stain

9,490-9,520 LIMESTONE: mudstone, dark cream-off white, common tan-light brown, microcrystalline, firm, dense, earthy-crystalline texture, argillaceous in part, trace free clear calcite, possible intercrystalline porosity, no visible oil stain

9,520-9,550 LIMESTONE: mudstone, tan, cream, light-medium gray, microcrystalline, firm, trace friable, dense, earthy texture, common crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,550-9,580 LIMESTONE: mudstone, dark cream-off white, common tan-light brown, microcrystalline, firm, dense, earthy-crystalline texture, argillaceous in part, trace free clear calcite, possible intercrystalline porosity, no visible oil stain

9,580-9,610 LIMESTONE: mudstone, cream-gray, gray-brown, microcrystalline, firm-hard, dense-banded, crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,610-9,640 LIMESTONE: mudstone, dark cream-off white, common tan-light brown, microcrystalline, firm, dense, earthy-crystalline texture, argillaceous in part, trace free clear calcite, possible intercrystalline porosity, no visible oil stain

9,640-9,670 LIMESTONE: mudstone, cream, tan-light brown, microcrystalline, firm, dense, earthy-crystalline texture, argillaceous in part, trace free clear calcite, possible intercrystalline porosity, no visible oil stain

9,670-9,700 LIMESTONE: mudstone, cream-gray, light brown, microcrystalline, firm, trace friable, dense-banded, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,700-9,730 LIMESTONE: mudstone, cream-gray, light brown, microcrystalline, firm, trace friable, dense-banded, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,730-9,760 LIMESTONE: mudstone, brown-gray brown, rare gray, microcrystalline, firm, dense, earthy-crystalline texture, , no visible porosity, no visible oil stain

9,760-9,790 LIMESTONE: mudstone, brown-gray brown, rare gray, microcrystalline, firm, dense, earthy-crystalline texture, , no visible porosity, no visible oil stain

9,790-9,820 LIMESTONE: mudstone, cream-gray, light brown, microcrystalline, firm, trace friable, dense-banded, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,820-9,850 LIMESTONE: mudstone, cream-gray, light brown, microcrystalline, firm, trace friable, dense-banded, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,850-9,880 LIMESTONE: mudstone, cream-tan, rare light brown, trace light gray, microcrystalline, firm, trace friable, dense-banded, crystalline texture, no visible porosity, no visible oil stain

9,880-9,910 LIMESTONE: mudstone, cream-tan, rare light brown, trace light gray, microcrystalline, firm, trace friable, dense-banded, crystalline texture, no visible porosity, no visible oil stain

9,910-9,940 LIMESTONE: mudstone, cream, light brown, microcrystalline, firm, trace friable, dense, crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,940-9,970 LIMESTONE: mudstone, light-medium, cream, tan, microcrystalline, firm, trace friable, dense, crystalline texture, occasional earthy texture, no visible porosity, no visible oil stain

9,970-10,000 LIMESTONE: mudstone, light-medium, cream, tan, microcrystalline, firm, trace friable, dense, crystalline texture, occasional earthy texture, no visible porosity, no visible oil stain

10,000-10,030 LIMESTONE-ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, light brown, rare tan, dark gray, microcrystalline, firm, occasional friable dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

**Lodgepole Formation [Mississippian Madison Group]**

**10.033' MD / 10.012' TVD (-7,877')**

10,030-10,060 ARGILLACEOUS LIMESTONE: mudstone, light-dark gray, rare cream, microcrystalline, firm, dense, earthy texture, rare disseminated pyrite, no visible porosity, no visible oil stain

10,060-10,090 ARGILLACEOUS LIMESTONE: mudstone, medium-dark gray, common light brown gray, rare cream, microcrystalline, firm, dense, earthy texture, rare disseminated pyrite, no visible porosity, no visible oil stain

10,090-10,120 ARGILLACEOUS LIMESTONE: mudstone, light-dark gray, rare cream, microcrystalline, firm, dense, earthy texture, rare disseminated pyrite, no visible porosity, no visible oil stain

10,120-10,150 ARGILLACEOUS LIMESTONE: mudstone, light-dark gray, rare cream, microcrystalline, firm, dense, earthy texture, rare disseminated pyrite, no visible porosity, no visible oil stain

10,150-10,180 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, trace cream-tan, trace dark gray, microcrystalline, firm, dense, earthy texture, rare disseminated pyrite, no visible porosity, no visible oil stain

10,180-10,260 No sample

**Horizontal Log Descriptions:**

**MD / TVD (MSL Datum)**

10,260-10,270 ARGILLACEOUS LIMESTONE: mudstone, dark brown, medium-light gray, rare cream, rare calcite fill, firm, trace hard, microcrystalline texture, earthy texture, no visible porosity, no visible oil stain

10,270-10,300 ARGILLACEOUS LIMESTONE: mudstone, dark brown, medium-light gray, rare cream, rare calcite fill, firm, trace hard, microcrystalline texture, earthy texture, no visible porosity, no visible oil stain

10,300-10,330 ARGILLACEOUS LIMESTONE: mudstone, dark brown, medium-light gray, rare cream, rare calcite fill, firm, trace hard, microcrystalline texture, earthy texture, no visible porosity, no visible oil stain

10,330-10,360 ARGILLACEOUS LIMESTONE: mudstone, dark brown, medium-light gray, rare cream, rare calcite fill, firm, trace hard, microcrystalline texture, earthy texture, no visible porosity, no visible oil stain

10,360-10,390 ARGILLACEOUS LIMESTONE: mudstone, dark brown, medium-light gray, rare cream, rare calcite fill, firm, trace hard, microcrystalline texture, earthy texture, no visible porosity, no visible oil stain

10,390-10,420 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,420-10,450 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,450-10,480 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,480-10,510 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,510-10,540 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,540-10,570 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,570-10,600 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,600-10,630 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,630-10,660 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,660-10,690 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,690-10,720 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,720-10,750 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,750-10,780 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, firm, earthy texture, no visible porosity, no visible oil stain

10,780-10,810 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,810-10,840 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,840-10,870 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,870-10,900 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

10,900-10,930 ARGILLACEOUS LIMESTONE: mudstone, medium-light gray, firm, earthy texture, no visible porosity, no visible oil stain

**False Bakken / Lodgepole Formation****10,936' MD / 10,732' TVD (-8,597')**

10,930-10,960 ARGILLACEOUS LIMESTONE-LIMESTONE: mudstone, medium-light gray, tan gray, off white, firm, earthy texture, no visible porosity, no visible oil stain; SHALE: gray black, hard, brittle, blocky, carbonaceous, petroliferous, pyritic, no visible porosity, possible fracture porosity, dark brown even oil stain

**Upper Bakken Shale Member /Mississippian-Bakken Formation]****10,967' MD / 10,743' TVD (-8,608')**

10,960-10,990 SHALE: black, hard, brittle, blocky, carbonaceous, petroliferous, pyritic, no visible porosity, possible fracture porosity, dark brown even oil stain

10,990-11,020 SHALE: black, hard, brittle, blocky, carbonaceous, petroliferous, pyritic, no visible porosity, possible fracture porosity, dark brown even oil stain

**Middle Bakken Member /Mississippian-Devonian Bakken Formation]****11,026' MD / 10,759' TVD (-8,624')**

11,020-11,050 SILTY SANDSTONE: light-medium gray, light brown gray-light brown, firm, friable, fine grained, sub rounded, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; SHALE: as above

11,050-11,080 SILTY SANDSTONE: light-medium gray, light brown gray-light brown, firm, friable, fine grained, sub rounded, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain

11,080-11,150 No sample

11,150-11,200 SILTY SANDSTONE: light-medium gray, light brown gray-light brown, firm, friable, fine grained, sub rounded, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain

11,200-11,250 SILTY SANDSTONE: light gray, medium-dark gray, rare light brown gray, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,250-11,300 SILTY SANDSTONE: light gray, medium-dark gray, rare light brown gray, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,300-11,350 SILTY SANDSTONE: light brown gray, light brown, medium-light gray, rare cream, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,350-11,400 SILTY SANDSTONE: light brown gray, light brown, medium-light gray, rare cream, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,400-11,450 SILTY SANDSTONE: light brown gray, light brown, medium-light gray, rare cream, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,450-11,500 SILTY SANDSTONE: light brown gray, light brown, medium-light gray, rare cream, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,500-11,550 SILTY SANDSTONE: light brown gray, light brown, medium-light gray, rare cream, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,550-11,600 SILTY SANDSTONE: light brown gray-light brown, rare medium-light gray, rare cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,600-11,650 SILTY SANDSTONE: light-medium brown, brown gray, rare medium-light gray, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, rare light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,650-11,700 SILTY SANDSTONE: light brown gray-light brown, rare medium-light gray, rare cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,700-11,750 SILTY SANDSTONE: light-medium brown, brown gray, rare medium-light gray, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, rare light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,750-11,800 SILTY SANDSTONE: light-medium brown, brown gray-gray, trace cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, rare light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,800-11,850 SILTY SANDSTONE: light brown gray-light brown, rare medium-light gray, rare cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,850-11,900 SILTY SANDSTONE: light-medium brown, brown gray, rare medium-light gray, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, rare light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,900-11,950 SILTY SANDSTONE: light brown gray-light brown, rare medium-light gray, rare cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,950-12,000 SILTY SANDSTONE: light-medium brown, brown gray-gray, trace cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, rare light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,000-12,050 SILTY SANDSTONE: light-medium brown, brown gray, rare medium-light gray, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, rare light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,050-12,100 SILTY SANDSTONE: light brown gray-light brown, rare medium-light gray, rare cream, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence





13,400-13,450 SILTY SANDSTONE: medium-dark gray, rare light brown gray, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,450-13,500 SILTY SANDSTONE: medium-dark gray, rare light brown gray, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,500-13,550 SILTY SANDSTONE: medium-dark gray, rare light brown gray, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,550-13,600 SILTY SANDSTONE: light brown-gray, medium-dark gray, rare light brown gray, firm, trace hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,600-13,650 SILTY SANDSTONE: light brown, light brown gray, light-medium gray, off white, cream, firm, trace hard, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,650-13,700 SILTY SANDSTONE: light brown, light brown gray, light-medium gray, off white, cream, firm, trace hard, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,700-13,750 SILTY SANDSTONE: light brown gray, occasional medium-light gray, rare light brown gray, trace dark gray, firm, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,750-13,800 SILTY SANDSTONE: light brown gray, occasional light brown gray, rare medium-light gray, trace dark gray, firm, fine grained, sub rounded, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,800-13,850 SILTY SANDSTONE: light gray, off white, rare light brown gray, firm, rare hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

13,850-13,900 SILTY SANDSTONE: light gray, off white, rare light brown gray, firm, rare hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

13,900-13,950 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

13,950-14,000 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,000-14,050 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,050-14,100 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,100-14,150 SILTY SANDSTONE: light gray, off white, rare light brown gray, firm, rare hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

14,150-14,200 SILTY SANDSTONE: light gray, off white, rare light brown gray, firm, rare hard, fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

14,200-14,250 SILTY SANDSTONE: light brown gray, light brown, rare medium-light gray, trace off white, firm, fine-very fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

14,250-14,300 SILTY SANDSTONE: light brown gray, light brown, rare medium-light gray, trace off white, firm, fine-very fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

14,300-14,350 SILTY SANDSTONE: light brown gray, light brown, rare medium-light gray, trace off white, firm, fine-very fine grained, sub rounded, rare sub angular, moderately-poorly sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

14,350-14,400 SILTY SANDSTONE: light-medium gray, occasional light brown gray, rare dark gray, firm, trace hard, fine grained, sub rounded, trace sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,400-14,450 SILTY SANDSTONE: light-medium gray, occasional light brown gray, rare dark gray, firm, trace hard, fine grained, sub rounded, trace sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,450-14,500 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,500-14,550 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,550-14,600 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,600-14,650 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,650-14,700 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,700-14,750 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,705-14,800 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

14,800-14,850 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,850-14,900 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,900-14,950 SILTY SANDSTONE: off white, light gray, occasional light brown, trace medium-dark gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,950-15,000 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,000-15,050 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,050-15,100 SILTY SANDSTONE: light brown, tan, light-medium gray, rare off white, firm, fine grained, sub rounded, trace sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,100-15,150 SILTY SANDSTONE: light brown, tan, light-medium gray, rare off white, firm, fine grained, sub rounded, trace sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,150-15,200 SILTY SANDSTONE: light brown, tan, light-medium gray, rare off white, firm, fine grained, sub rounded, trace sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,200-15,250 SILTY SANDSTONE: light brown, tan, light-medium gray, rare off white, firm, fine grained, sub rounded, trace sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,250-15,300 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,300-15,350 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,350-15,400 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,400-15,450 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,450-15,500 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,500-15,550 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,550-15,600 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,600-15,650 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,650-15,700 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,700-15,750 SILTY SANDSTONE: light-medium gray, light brown gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

15,750-15,800 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,800-15,850 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,850-15,900 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,900-15,950 SILTY SANDSTONE: medium-light brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,950-16,000 SILTY SANDSTONE: medium-light brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

16,000-16,050 SILTY SANDSTONE: light-medium gray brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,050-16,100 SILTY SANDSTONE: light-medium gray brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,100-16,150 SILTY SANDSTONE: medium-light brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

16,150-16,200 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,200-16,250 SILTY SANDSTONE: light brown gray, light-medium brown, rare medium-light gray, firm, very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

16,250-16,300 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,300-16,350 SILTY SANDSTONE: light brown gray, light-medium brown, rare medium-light gray, firm, very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

16,350-16,400 SILTY SANDSTONE: light brown gray, light-medium brown, rare medium-light gray, firm, very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,400-16,450 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,450-16,500 SILTY SANDSTONE: light brown gray, light-medium brown, rare medium-light gray, firm, very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

16,500-16,550 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,550-16,600 SILTY SANDSTONE: light brown gray, light-medium brown, rare medium-light gray, firm, very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

16,600-16,650 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,650-16,700 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,700-16,750 SILTY SANDSTONE: light brown gray, light-medium brown, rare medium-light gray, firm, very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow-light green diffuse cut fluorescence

16,750-16,800 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,800-16,850 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

16,850-16,900 SILTY SANDSTONE: medium gray, brown-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; moderately pale yellow-grain diffuse cut fluorescence

16,900-16,950 SILTY SANDSTONE: dark gray, brown-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; moderately pale yellow-grain diffuse cut fluorescence

16,950-17,000 SILTY SANDSTONE: dark gray, brown-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; moderately pale yellow-grain diffuse cut fluorescence

17,000-17,050 SILTY SANDSTONE: dark gray, brown-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; moderately pale yellow-grain diffuse cut fluorescence

17,050-17,100 SILTY SANDSTONE: dark gray, brown-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; moderately pale yellow-grain diffuse cut fluorescence

17,100-17,150 SILTY SANDSTONE: dark brown-gray, tan-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow-grain diffuse cut fluorescence

17,150-17,200 SILTY SANDSTONE: dark brown-gray, tan-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow-grain diffuse cut fluorescence

17,200-17,250 SILTY SANDSTONE: dark brown-gray, tan-gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow-grain diffuse cut fluorescence

17,250-17,300 SILTY SANDSTONE: light-dark gray, gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

17,300-17,350 SILTY SANDSTONE: light-dark gray, gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

17,350-17,400 SILTY SANDSTONE: light-dark gray, gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

17,400-17,450 SILTY SANDSTONE: light-dark gray, gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

17,450-17,500 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, trace clear free calcite, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,500-17,550 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence.

17,550-17,600 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,600-17,650 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence.

17,650-17,700 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,700-17,750 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence.

17,750-17,800 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,800-17,850 SILTY SANDSTONE: light-medium brown, brown gray, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,850-17,900 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,900-17,950 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

17,950-18,000 SILTY SANDSTONE: light-medium brown gray, brown, rare gray, firm, fine grained, sub rounded, occasional sub angular, moderately-poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

18,000-18,050 SILTY SANDSTONE: light-dark gray, gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

18,050-18,100 SILTY SANDSTONE: light-dark gray, gray, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderately pale yellow diffuse cut fluorescence

18,100-18,150 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown gray, light brown, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,150-18,200 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown gray, light brown, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,200-18,250 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown gray, occasional light brown, rare medium-light gray, trace off white, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,250-18,300 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown gray, occasional light brown, rare medium-light gray, trace off white, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,300-18,350 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown gray, occasional light brown, rare medium-light gray, trace off white, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,350-18,400 Sample moderately contaminated with lube; SILTY SANDSTONE: medium-light gray, occasional light brown gray, trace dark gray, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,400-18,450 Sample moderately contaminated with lube; SILTY SANDSTONE: medium-light gray, occasional light brown gray, trace dark gray, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,450-18,500 Sample moderately contaminated with lube; SILTY SANDSTONE: medium-light gray, occasional light brown gray, trace dark gray, firm, fine-very fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,500-18,550 Sample moderately contaminated with lube; SILTY SANDSTONE: off white, tan, light gray, rare light brown gray, trace dark gray, firm, fine-very fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,550-18,600 Sample moderately contaminated with lube; SILTY SANDSTONE: off white, tan, light gray, rare light brown gray, trace dark gray, firm, fine-very fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,600-18,650 Sample moderately contaminated with lube; SILTY SANDSTONE: off white, tan, light gray, rare light brown gray, trace dark gray, firm, fine-very fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,650-18,700 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown, medium-light gray, rare off white, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,700-18,750 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown, medium-light gray, rare off white, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,750-18,800 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown, medium-light gray, rare off white, firm, fine grained, sub rounded, occasional sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,800-18,850 Sample moderately contaminated with lube; SILTY SANDSTONE: light brown gray, occasional light brown, rare medium-dark gray, firm, fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,850-18,900 Sample moderately contaminated with lube; SILTY SANDSTONE: medium-light gray, light brown, rare cream, firm, fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; contaminated cut fluorescence

18,900-18,950 Sample moderately contaminated with lube; SILTY SANDSTONE: medium-light gray, light brown, rare cream, firm, fine grained, sub rounded, rare sub angular, moderately sorted, calcareous cement, moderately cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; contaminated cut fluorescence







20,800-20,870 Sample contaminated with lube; SILTY SANDSTONE: light-medium gray, off white, firm, fine-very fine grained, sub rounded, moderately sorted, calcareous cement, moderately-poorly cemented, rare disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence



# 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)

Received

Well File No.  
**30189**

JAN 10 2019

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>January 14, 2018</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	

ND Oil & Gas DIVISION	
<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input checked="" 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	

Well Name and Number <b>Lewis Federal 5300 11-31 2B</b>					
Footages <b>1050 F N L</b>	<b>265 F W L</b>	Qtr-Qtr <b>Lot 2</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 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 respectfully requests to amend the surface casing depth to 3600' MD (previously 2136') due to potential flowback in the Dakota formation. In order to counteract projected flowback at surface, Oasis needs to increase mud weight, and lowering the surface casing point will allow this to be performed safely.

Attached are revised drill plans reflecting the amended casing points, cement volumes, and other related volumes.

DV tool will not be used per Jennifer.

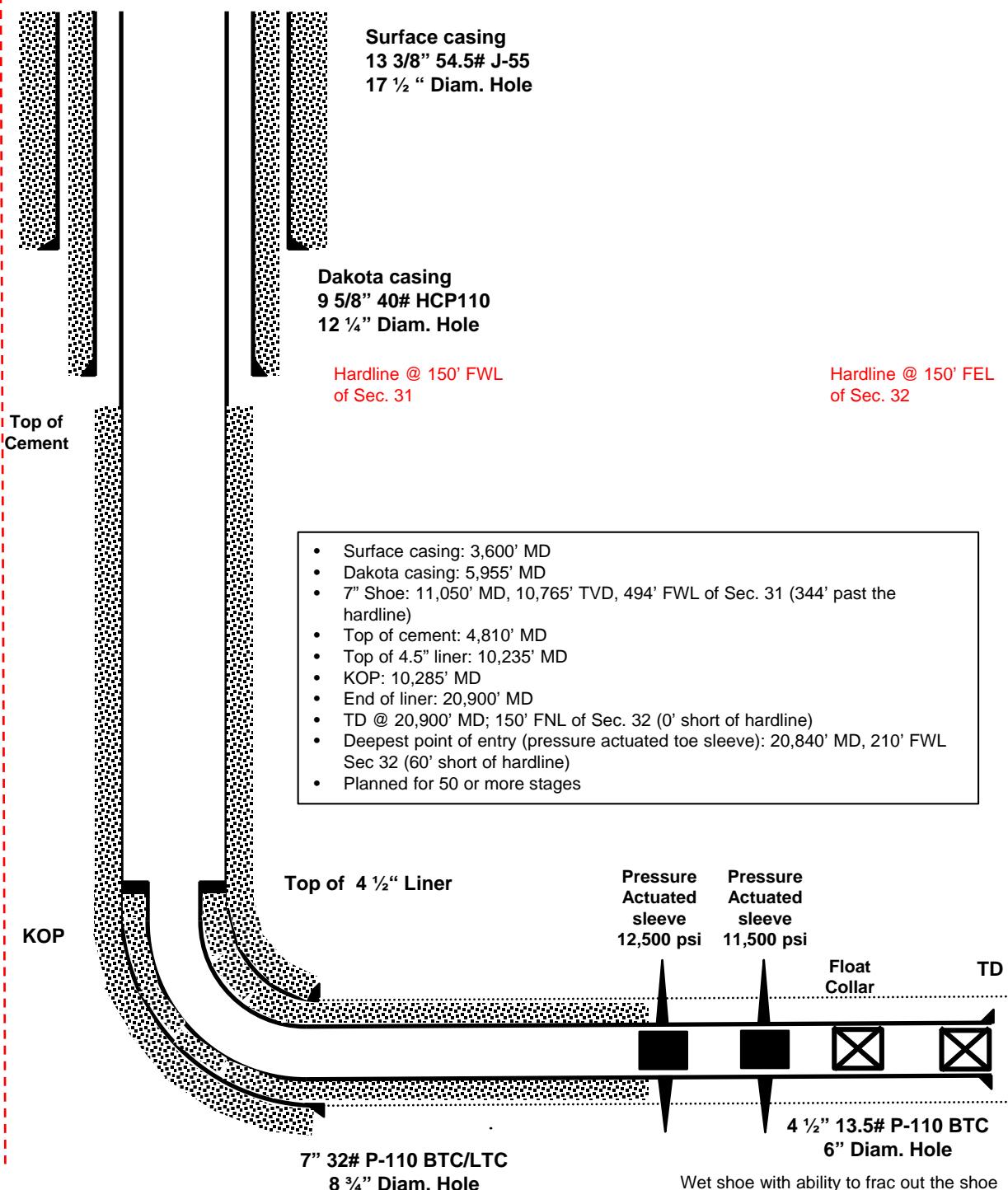
Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9436</b>	
Address <b>1001 Fannin St, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Jennifer Swenson</b>	
Title <b>Regulatory Specialist</b>	Date <b>January 10, 2019</b>	
Email Address <b>jswenson@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>1/15/2019</b>	
By 	
Title <b>DAVID BURNS</b>	
Engineering Technician	

ELEVATION: 2,110' SL

## Lewis Federal 5300 11-31 2B Proposed Wellbore Schematic

FORMATION: Bakken



OASIS PETROLEUM NA LLC

Lewis Federal 5300 11-31 2B

Wellbore: T153N-R100W Sec. 31 & 32

SHL: 1050' FNL & 265' FWL T153N-R100W Sec. 31

Williams County, North Dakota

Updated: 4-12-2018 TR

DRILLING PLAN							
OPERATOR	Oasis Petroleum			COUNTY/STATE	McKenzie Co., ND		
WELL NAME	Lewis Federal 5300 11-31 2B			RIG	-		
WELL TYPE	Middle Bakken			Surface Location (survey plat):	1050' FNL		
LOCATION	T153N R100W S31 NWNW			FNL/FWL	265' FWL		
EST. T.D.	20,900'			FINISH PAD ELEV:	2,110'		
TOTAL LATERAL:	9,850'			KB ELEV:	2,135'		
MARKER	MD	TVD	Subsea TVD	LOGS:	Type	Interval	
Pierre	NDIC MAP	1,985	150'	OH Logs: Triple Combo			KOP to Kibbey (or min run of 1800' whichever is greater)
Greenhorn		4,596	-2,461'	GR/Resistivity			Bottom of surface casing
Mowry (Dakota Group)		5,010	-2,875'	GR			To surface
Inyan Kara (Dakota Group)		5,432	-3,297'	CND			Through Dakota Group (Inyan Kara Sands)
Swift (Base Dakota Group)		5,855	-3,720'	CBL/GR:			Above top of cement/GR to base of casing
Rierdon		6,371	-4,236'	MWD GR:			KOP to lateral TD
Dunham Salt		6,898	-4,763'				
Dunham Salt Base		6,955	-4,820'				
Pine Salt		7,262	-5,127'	DEVIATION:			
Pine Salt Base		7,323	-5,188'	Surf: 3 deg. max., 1 deg / 100'; svry every 500'			
Opeche Salt		7,441	-5,306'	Prod: 5 deg. max., 1 deg / 100'; svry every 100'			
Opeche Salt Base		7,467	-5,332'				
Amsden		7,663	-5,528'	DST'S:			
Tyler		7,851	-5,716'				
Otter/Base Minnelusa		8,069	-5,934'				
Kibbey Lime		8,416	-6,281'				
Charles Salt		8,562	-6,427'	CORES:			
Base Last Salt		9,233	-7,098'	Core Planned? NO			
Mission Canyon		9,447	-7,312'				
Lodgepole		10,006	-7,871'	Core Type: -			
False Bakken		10,720	-8,585'				
Upper Bakken Shale		10,730	-8,595'	Formations/Depths:			
Middle Bakken		10,746	-8,611'				
Target Top		10,756	-8,621'				
Target Landing		10,765	-8,630'	MUDLOGGING:			
Target Base		10,774	-8,639'	Company: TBD			
Lower Bakken		10,784	-8,649'	Starting Depth: Begin 200' above Kibbey			
-		-	-				
-		-	-	Sample Protocol: 30' samples in curve, 50' samples in lateral			
-		-	-				
-		-	-	BOP: 11" 5000 psi blind, pipe & annular			
-		-	-				
Est. Average Dip Rate:	89.56						
Max. Anticipated BHP:	4,698'			Surface Formation: Glacial till			
MUD:	Interval	Type	WT	Vis	WL	Remarks	
Surface:	0' -	3,600' FW/Gel Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks	
Intermediate:	3,600' -	11,050' Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks	
Laterals:	11,050' -	20,900' Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks	
CASING:	Size	Wt ppf	Hole	Depth	Cement	WOC	Remarks
Surface:	13-3/8"	54.5#	17-1/2"	3,600'	To Surface	12 hours	1,600' into Pierre
Intermediate: (Dakota)	9-5/8"	40#	12-1/4"	5,955'	To Surface	24 hours	Set Casing across Dakota
Intermediate:	7"	32#	8-3/4"	11,050'	4810	24 hours	200' above Mowry
Production Liner:	4.5"	13.5#	6"	20,900'	10235		50' above KOP
PROBABLE PLUGS, IF REQ'D:							
OTHER:	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI	
Surface:	3,600'	3,600'	1050 FNL	265 FWL	Sec 31 T153N R100W	-	Survey Company:
KOP:	10,285'	10,270'	689 FNL	21 FWL	Sec 31 T153N R100W	-	Build Rate: 12 deg /100'
EOC:	11,050'	10,765'	660 FNL	494 FWL	Sec 31 T153N R100W	90.0	
Casing Point:	11,050'	10,765'	660 FNL	494 FWL	Sec 31 T153N R100W	90.0	
TD:	20,900'	10,841'	660 FNL	150 FEL	Sec 32 T153N R100W	90.0	
<b>Comments:</b>							
<b>Request waiver of open hole logs. Justification well: Lewis Federal 5300 31-31H (33053034330000) ~0.54 miles S of SHL</b>							
The above open hole logs will be run if Oasis does not submit and receive an approved logging waiver from the NDIC.							
<b>Currently planned for 50 stages. No frac string planned. 4-1/2" cemented liner completed using plug &amp; perf method</b>							
Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.							
68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2) 68476-30-2 (Primary Name: Fuel oil No. 2)							
68476-31-3 (Primary Name: Fuel oil, No. 4) 8008-20-6 (Primary Name: Kerosene)							
 Geology: LRH		4/3/2018		Engineering: TR 4/12/18			
Revision:		Revision:		Revision:			
Revision 2:		Revision 2:		Revision 2:			

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**SURFACE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
13-3/8"	0' - 3600'	54.5	J-55	STC	12.615"	12.459"

Interval	Description	Collapse (psi) / a	Burst (psi) / b	Tension (1000 lbs) / c
0' - 3600'	13-3/8", 54.5#, J-55, LTC, 8rd	1130 / 0.67	2730 / 1.12	514 / 1.90

**API Rating & Safety Factor**

- a) Collapse based on full casing evacuation with 9 ppg fluid on backside (3600' setting depth).
- b) Burst pressure based on 13 ppg fluid with no fluid on backside (3600' setting depth).
- c) Based on string weight in 9 ppg fluid at 3600' TVD plus 100k# overpull. (Buoyed weight equals 169k lbs.)

Cement volumes are based on 13-3/8" casing set in 17-1/2 " hole with 60% excess to circulate cement back to surface.  
Mix and pump the following slurry.

**Pre-flush (Spacer):      20 bbls** fresh water

**Lead Slurry:**      **1262 sks** (652 bbls), 11.5 lb/gal, 2.97 cu. Ft./sk Varicem Cement with 0.125 il/sk Lost Circulation Additive

**Tail Slurry:**      **349 sks** (72 bbls), 13.0 lb/gal, 2.01 cu.ft./sk Varicem with .125 lb/sk Lost Circulation Agent

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**Contingency INTERMEDIATE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
9-5/8"	0' - 5955'	40	J-55	LTC	8.921"	8.765"

Interval	Description	Collapse (psi) / a	Burst (psi) / b	Tension (1000 lbs) / c
0' - 5955'	9-5/8", 40#, HCP110, BTC	3530 / 4.01	7870 / 3.08	1260 / 4.19

**API Rating & Safety Factor**

- a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (5955' setting depth).
- b) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000psi and a subsequent breakdown at the 9-5/8" shoe, based on a 15.2#/ft fracture gradient. Backup of 9 ppg fluid..
- c) Tension based on string weight in 10.4 ppg fluid at 5955' TVD plus 100k# overpull. (Buoyed weight equals 200k lbs.)

Cement volumes are based on 9-5/8" casing set in 12-1/4 " hole with 10% excess to circulate cement back to surface.

**Pre-flush (Spacer):**    **20 bbls** Chem wash

**Lead Slurry:**        **545 sks** (281 bbls), 2.90 ft3/sk, 11.5 lb/gal Conventional system with 94 lb/sk cement, 4% D079 extender, 2% D053 expanding agent, 2% CaCl2 and 0.250 lb/sk D130 lost circulation control agent.

**Tail Slurry:**        **594 sks** (123 bbls), 1.16 ft3/sk 15.8 lb/gal Conventional system with 94 lb/sk cement, 0.25% CaCl2, and 0.250 lb/sk lost circulation control agent

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**INTERMEDIATE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift**
7"	0' - 11050'	32	HCP-110	BTC/LTC	6.094"	6.000"**

\*\*Special Drift 7"32# to 6.0"

Interval	Length	Description	Collapse (psi) a	Burst (psi) b	Tension (1000 lbs) / c
0' - 5000'	5000'	7", 32#, HCP-110, BTC, 8rd	11820 / 2.11*	12460 / 1.28	897 / 2.24
5000' - 11050'	6050'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.06**	12460 / 1.30	

**API Rating & Safety Factor**

- a) \*Assume full casing evacuation with 10 ppg fluid on backside. \*\*Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.
- b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10765' TVD.
- c) Based on string weight in 10 ppg fluid, (300k lbs buoyed weight) plus 100k lbs overpull.

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with 30% excess.

Mix and pump the following slurry

**Pre-flush (Spacer):**                   **100 bbls** Saltwater  
**20 bbls** Tuned Spacer III

**Lead Slurry:**                           **218 sks** (101 bbls), 11.8 ppg, 2.55 cu. ft./sk Econocem Cement with .3% Fe-2 and .25 lb/sk Lost Circulation Additive

**Tail Slurry:**                           **569 sks** (166 bbls), 14.0 ppg, 1.55 cu. ft./sk Extendcem System with .2% HR-5 Retarder and .25 lb/sk Lost Circulation Additive

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**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>
4-1/2"	10235' - 20900'	13.5	P-110	GB CD BTC	3.920"	3.795"

<b>Interval</b>	<b>Length</b>	<b>Description</b>	<b>Collapse</b>	<b>Burst</b>	<b>Tension</b>
10235' - 20900'	10665	4-1/2", 13.5 lb, P-110, GB CD BTC	(psi) a 10670 / 1.99	(psi) b 12410 / 1.28	(1000 lbs) c 443 / 1.98

**API Rating & Safety Factor**

- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10841' TVD.
- b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10841' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 123k lbs.) plus 100k lbs overpull.

Cement volumes are estimates based on 4-1/2" casing hung from 7" casing, and into 6" OH. 20% excess.  
 Mix and pump the cement slurry. Follow cement with liner dart and then saltwater displacement

<b>Pre-flush (Spacer):</b>	<b>20 bbls</b> Viscous spacer
<b>Cement Slurry:</b>	<b>726 sks</b> (197 bbls), 14.3ppg, 1.52 cu/ft/sk conventional system with 20% silica flour
<b>Displacement</b>	<b>272 bbls</b> Based on 53 ft shoe track and 4" drill pipe from surface to top of liner 4" DP: 0ft to 10235ft @ 0.011bbl/ft 4.5" casing: 10235ft to 20847ft; 0.0149bbl/ft



# 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)

RECEIVED  
JAN - 6 2019

Well File No.  
**30189**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Notice of Intent

Approximate Start Date

**January 3, 2019**

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

Waiver from tubing/packer requirement

## Well Name and Number

**Lewis Federal 5300 11-31 2B**

Footages <del>1050</del> <b>973</b>	<del>205</del> <b>235</b>	Qtr-Qtr F N L	Section LOT 1	Township <b>153 N</b>	Range <b>100 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 a variance to NDAC 43-02-03-21 for the tubing/packer requirement: 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# and 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 flowback 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>281-404-9436</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>Jennifer Swenson</b>	
Title <b>Regulatory Specialist</b>	Date <b>January 3, 2019</b>	
Email Address <b>jswenson@oasispetroleum.com</b>		

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>January 10, 2019</b>	
By 	
Title <b>PETROLEUM ENGINEER</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)

Received

Well File No.  
30189

Dec 12 2018

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>December 11, 2018</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>APD Renewal</b>

Well Name and Number <b>Lewis Federal 5300 11-21 2T</b>		<b>31</b>	<b>Lot 1</b>	
Footages <b>1050</b>	<b>265</b>	Qtr-Qtr <b>973 F N L</b>	Section <b>235 F W L</b>	Township <b>NWWNW</b>
			<b>31</b>	Range <b>153 N 100 W</b>
Field <b>Baker</b>	Pool <b>Bakken</b>			County <b>McKenzie</b>

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

Name of Contractor(s)			
Address		City	State
			Zip Code

## DETAILS OF WORK

Oasis Petroleum requests a permit renewal for above referenced well. There are no changes to the current drill plan.

Please use the credit card on file for the \$100.00 application processing fee.

*Permit Expires 12/11/19*

Company <b>Oasis Petroleum North America LLC</b>		Telephone Number <b>281-404-9436</b>	
Address <b>1001 Fannin St, Suite 1500</b>			
City <b>Houston</b>		State <b>TX</b>	Zip Code <b>77002</b>
Signature 		Printed Name <b>Jennifer Swenson</b>	
Title <b>Regulatory Specialist</b>	Date <b>December 11, 2018</b>		
Email Address <b>jswenson@oasispetroleum.com</b>			

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>12/12/18</b>	
By 	
Title <b>Engineering Technician</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.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

30189

November 13, 2018

OASIS PETRO NO AMER  
1001 FANNIN STE 1500  
HOUSTON, TX 77002

RE: LEWIS FEDERAL 5300 11-31 2B  
LOT1 Sec. 31-153N-100W  
MCKENZIE COUNTY  
WELL FILE NO. 30189

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire December 11, 2018.

Permits to drill are only valid for one year in the State of North Dakota. If you would like to renew for another year, please submit a Form 4 along with the \$100.00 filing fee. Alternatively, you may elect to send in a Form 4 cancelling the permit. If you have any questions, please contact Todd Holweger.

Sincerely,

  
Rachel Morris  
Administrative Assistant



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

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.  
**30189**

APR 18 2018

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>April 30, 2018</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	

**ND Oil & Gas Division**

- |   |  |
|---|--|
| <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 checked="" type="checkbox"/> Change Production Method |
| <input type="checkbox"/> Temporarily Abandon  | <input type="checkbox"/> Reclamation                         |
| <input type="checkbox"/> Other                | <b>SHL and BHL Changes</b>                                   |

Well Name and Number  
**Lewis Federal 5300 11-31 2B**

Footages	Qtr-Qtr	Section	Township	Range
973 F N L	235 F W L	LOT1	31	153 N 100 W
Field Baker	Pool Bakken		County McKenzie	

**24-HOUR PRODUCTION RATE**

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

Name of Contractor(s)

Address

City

State

Zip Code

**DETAILS OF WORK**

Oasis Petroleum respectfully requests the following changes to the above referenced permitted well:

**SHL change: 1050' FNL & 265' FWL Lot 2 Sec. 31 T153N R100W (Previously 973' FNL & 235' FWL Lot 1 Sec. 31 T153N R100W)**

**BHL change: 660' FSL & 150' FEL NENE Sec. 32 T153N R100W (Previously 551' FNL & 212' FEL NENE Sec. 32 T153N R100W)**

Oasis must submit plat of production CTB within 30 days of 4-24-2018.

**TD Change: 20900' MD / 10841' TVD (Previously 20772' MD / 10924' TVD)**

**Please see attached supporting documents.**

The East 150' setback is based on a production liner cemented in the lateral with a wet shoe and the ability to frac out the shoe.

Must run a CBL on the 9-5/8" intermediate string which is proposed to isolate the Dakota Group prior to running 7" casing.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9494</b>	
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature <i>Sadie Goodrum</i>	Printed Name <b>Sadie Goodrum</b>	
Title <b>Regulatory Specialist II</b>	Date <b>April 16, 2018</b>	
Email Address <b>sgoodrum@oasispetroleum.com</b>		

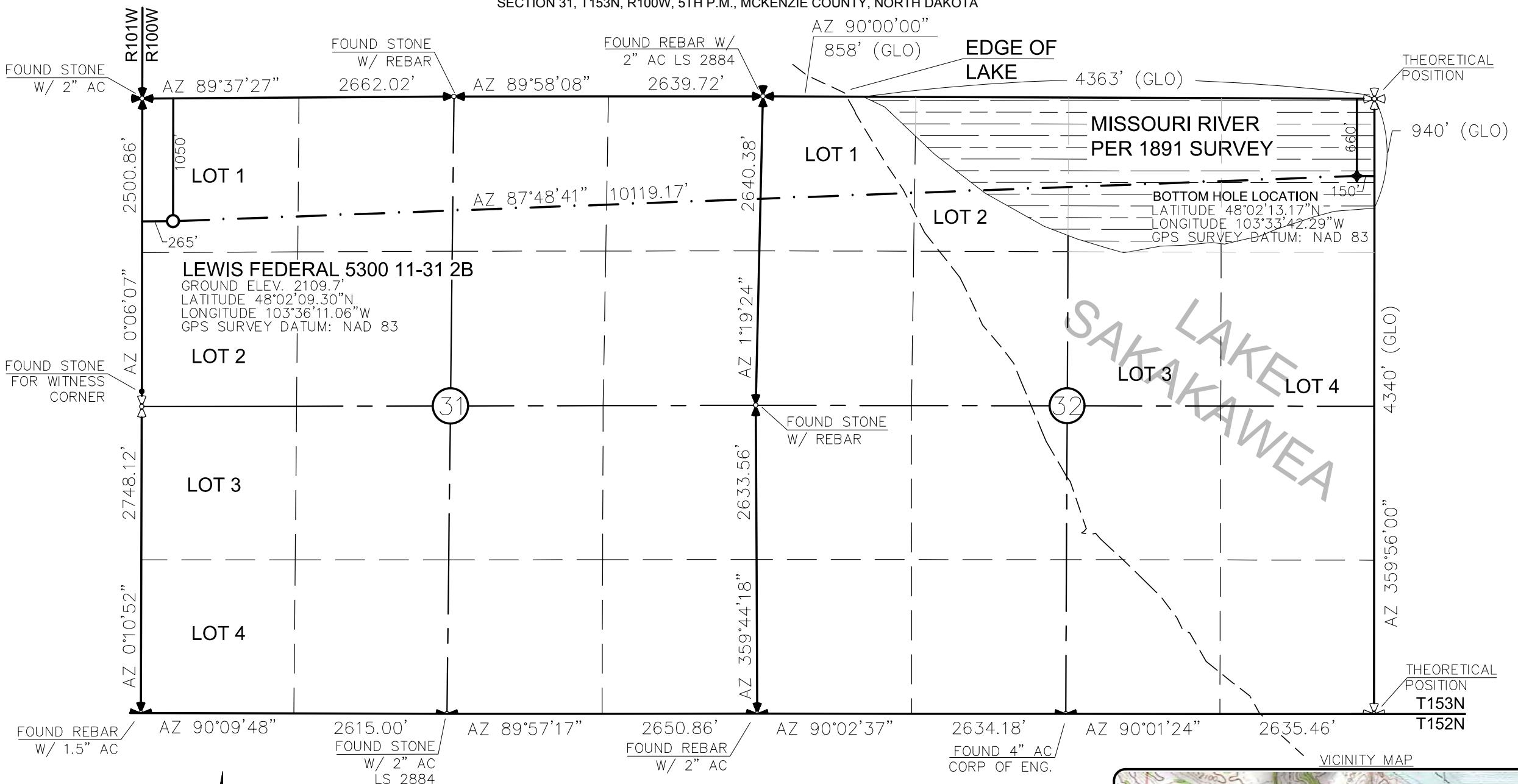
**FOR STATE USE ONLY**

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>4/24/2018</b>	
By <i>Dal Brune</i>	
Title <b>Engineering Tech.</b>	

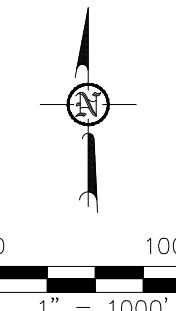
## WELL LOCATION

OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

LEWIS FEDERAL 5300 11-31 2B  
1050 FEET FROM NORTH LINE AND 265 FEET FROM WEST LINE  
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



THIS DOCUMENT WAS ORIGINALLY  
ISSUED AND SEALED BY DARYL D.  
KASEMAN, PLS, REGISTRATION  
NUMBER 3880 ON 3-27-18  
AND THE ORIGINAL DOCUMENTS  
ARE STORED AT THE OFFICES OF  
INTERSTATE ENGINEERING, INC.

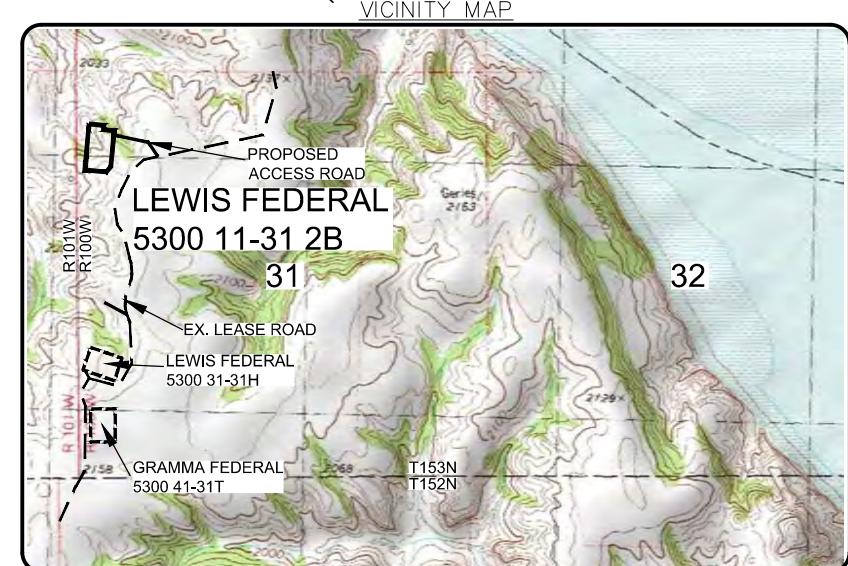
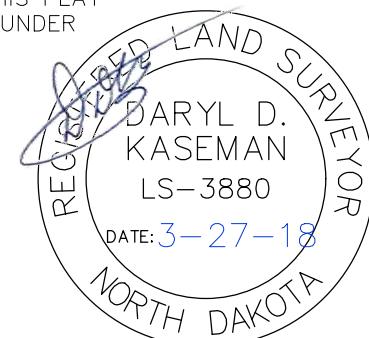


 — MONUMENT — RECOVERED  
 — MONUMENT — NOT RECOVERED

STAKED ON 3/26/18  
VERTICAL CONTROL DATUM WAS BASED UPON  
CONTROL POINT 705 WITH AN ELEVATION OF 2158.3'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF JOHN LEE 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.

DARYL D. KASEMAN LS-3880



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1/9

SECTION 31, T153N, R100W, 5TH P.M.,		MCKENZIE COUNTY, NORTH DAKOTA	
Drawn By:	J.D.M.	Project No.:	S17-09-183
Checked By:	D.D.K.	Date:	MARCH 2018

**INTERSTATE ENGINEERING**  
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DRILLING PLAN									
OPERATOR	Oasis Petroleum			COUNTY/STATE	McKenzie Co., ND				
WELL NAME	Lewis Federal 5300 11-31 2B			RIG	-				
WELL TYPE	Middle Bakken								
LOCATION	T153N R100W S31 NWNW	Surface Location (survey plat):		1050' FNL	265' FWL				
EST. T.D.	20,900'			FINISH PAD ELEV:		2,110'	Sub Height: 25'		
TOTAL LATERAL:	9,850'			KB ELEV:		2,135'			
MARKER	NDIC MAP	TVD	Subsea TVD	LOGS:	Type	Interval			
Pierre		1,985	150'	OH Logs: Triple Combo GR/Resistivity GR CND	CBL/GR: MWD GR:	KOP to Kibbey (or min run of 1800' whichever is greater)			
Greenhorn		4,596	-2,461'			Bottom of surface casing			
Mowry (Dakota Group)		5,010	-2,875'			To surface			
Inyan Kara (Dakota Group)		5,432	-3,297'			Through Dakota Group (Inyan Kara Sands)			
Swift (Base Dakota Group)		5,855	-3,720'			Above top of cement/GR to base of casing			
Rierdon		6,371	-4,236'			KOP to lateral TD			
Dunham Salt		6,898	-4,763'						
Dunham Salt Base		6,955	-4,820'						
Pine Salt		7,262	-5,127'						
Pine Salt Base		7,323	-5,188'			Surf: 3 deg. max., 1 deg / 100'; svry every 500'			
Opeche Salt		7,441	-5,306'			Prod: 5 deg. max., 1 deg / 100'; svry every 100'			
Opeche Salt Base		7,467	-5,332'						
Amsden		7,663	-5,528'						
Tyler		7,851	-5,716'						
Otter/Base Minnelusa		8,069	-5,934'						
Kibbey Lime		8,416	-6,281'						
Charles Salt		8,562	-6,427'						
Base Last Salt		9,233	-7,098'						
Mission Canyon		9,447	-7,312'			Core Planned? NO			
Lodgepole		10,006	-7,871'			Core Type: -			
False Bakken		10,720	-8,585'						
Upper Bakken Shale		10,730	-8,595'						
Middle Bakken		10,746	-8,611'			Formations/Depths:			
Target Top		10,756	-8,621'						
Target Landing		10,765	-8,630'						
Target Base		10,774	-8,639'			Company: TBD			
Lower Bakken		10,784	-8,649'			Starting Depth: Begin 200' above Kibbey			
-		-	-			Sample Protocol: 30' samples in curve, 50' samples in lateral			
-		-	-						
-		-	-						
-		-	-						
-		-	-						
-		-	-						
Est. Average Dip Rate: 89.56				MUDLOGGING:					
Max. Anticipated BHP: 4,698'		Surface Formation: Glacial till							
MUD:	Interval	Type	WT	VIS	WL	Remarks			
Surface:	0' -	2,135'	FW/Gel Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks		
Intermediate:	2,135' -	11,050'	Invert	9.5-10.4	40-50	30+HHhp	Circ Mud Tanks		
Laterals:	11,050' -	20,900'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks		
CASING:	Size	Wt pcf	Hole	Depth	Cement	WOC	Remarks		
Surface:	13-3/8"	54.5#	17-1/2"	2,135'	To Surface	12 hours	150' into Pierre		
Intermediate: (Dakota)	9-5/8"	36#	12-1/4"	5,955'	To Surface	24 hours	Set Casing across Dakota		
Intermediate:	7"	32#	8-3/4"	11,050'	4810	24 hours	200' above Mowry		
Production Liner:	4.5"	13.5#	6"	20,900'	10235		50' above KOP		
PROBABLE PLUGS, IF REQ'D:									
OTHER:	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI			
Surface:	2,135'	2,135'	1050 FNL	265 FWL	Sec 31 T153N R100W	-	Survey Company: Build Rate: 12 deg /100'		
KOP:	10,285'	10,270'	689 FNL	21 FWL	Sec 31 T153N R100W	-			
EOC:	11,050'	10,765'	660 FNL	494 FWL	Sec 31 T153N R100W	90.0			
Casing Point:	11,050'	10,765'	660 FNL	494 FWL	Sec 31 T153N R100W	90.0			
TD:	20,900'	10,841'	660 FNL	150 FEL	Sec 32 T153N R100W	90.0			
Comments:									
<b>Request waiver of open hole logs. Justification well: Lewis Federal 5300 31-31H (33053034330000) ~0.54 miles S of SHL</b>									
The above open hole logs will be run if Oasis does not submit and receive an approved logging waiver from the NDIC.									
<b>Currently planned for 50 stages. No frac string planned. 4-1/2" cemented liner completed using plug &amp; perf method</b>									
Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.									
68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2) 68476-30-2 (Primary Name: Fuel oil No. 2)									
68476-31-3 (Primary Name: Fuel oil, No. 4) 8008-20-6 (Primary Name: Kerosene)									
Geology: LRH		4/3/2018		Engineering: TR 4/12/18					
Revision:				Revision:					
Revision 2:				Revision 2:					

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**SURFACE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
13-3/8"	0' - 2135'	54.5	J-55	STC	12.615"	12.459"

Interval	Description	Collapse (psi) / a	Burst (psi) / b	Tension (1000 lbs) / c
0' - 2135'	13-3/8", 54.5#, J-55, LTC, 8rd	1130 / 1.13	2730 / 1.89	514 / 2.56

**API Rating & Safety Factor**

- a) Collapse based on full casing evacuation with 9 ppg fluid on backside (2135' setting depth).
- b) Burst pressure based on 13 ppg fluid with no fluid on backside (2135' setting depth).
- c) Based on string weight in 9 ppg fluid at 2135' TVD plus 100k# overpull. (Buoyed weight equals 100k lbs.)

Cement volumes are based on 13-3/8" casing set in 17-1/2 " hole with 60% excess to circulate cement back to surface.

Mix and pump the following slurry.

**Pre-flush (Spacer):**      **20 bbls** fresh water

**Lead Slurry:**      **720 sks** (372 bbls), 11.5 lb/gal, 2.97 cu. Ft./sk Varicem Cement with 0.125 gal/sk Lost Circulation Additive

**Tail Slurry:**      **300 sks** (62 bbls), 13.0 lb/gal, 2.01 cu.ft./sk Varicem with .125 lb/sk Lost Circulation Agent

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**Contingency INTERMEDIATE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
9-5/8"	0' - 5955'	36	J-55	LTC	8.921"	8.765"

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 5955'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.29	3520 / 1.38	453 / 1.61

**API Rating & Safety Factor**

- a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (5955' setting depth).
- b) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000psi and a subsequent breakdown at the 9-5/8" shoe, based on a 15.2#/ft fracture gradient. Backup of 9 ppg fluid..
- c) Tension based on string weight in 10.4 ppg fluid at 5955' TVD plus 100k# overpull. (Buoyed weight equals 180k lbs.)

Cement volumes are based on 9-5/8" casing set in 12-1/4 " hole with 10% excess to circulate cement back to surface.

**Pre-flush (Spacer):    20 bbls** Chem wash

**Lead Slurry:**    **517 sks** (267 bbls), 2.90 ft3/sk, 11.5 lb/gal Conventional system with 94 lb/sk cement, 4% D079 extender, 2% D053 expanding agent, 2% CaCl2 and 0.250 lb/sk D130 lost circulation control agent.

**Tail Slurry:**    **594 sks** (123 bbls), 1.16 ft3/sk 15.8 lb/gal Conventional system with 94 lb/sk cement, 0.25% CaCl2, and 0.250 lb/sk lost circulation control agent

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

INTERMEDIATE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift**
7"	0' - 11050'	32	HCP-110	BTC/LTC	6.094"	6.000***

\*\*Special Drift 7"32# to 6.0"

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) / c
0' - 5000'	5000'	7", 32#, HCP-110, BTC, 8rd	11820 / 2.11*	12460 / 1.28	897 / 2.24
5000' - 11050'	6050'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.06**	12460 / 1.30	

API Rating & Safety Factor

- a) \*Assume full casing evacuation with 10 ppg fluid on backside. \*\*Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.
- b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10765' TVD.
- c) Based on string weight in 10 ppg fluid, (300k lbs buoyed weight) plus 100k lbs overpull.

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with 30% excess.

Mix and pump the following slurry

**Pre-flush (Spacer):**

**100 bbls** Saltwater

**20 bbls** Tuned Spacer III

**Lead Slurry:**

**218 sks** (101 bbls), 11.8 ppg, 2.55 cu. ft./sk Econocem Cement with .3% Fe-2 and .25 lb/sk Lost Circulation Additive

**Tail Slurry:**

**569 sks** (166 bbls), 14.0 ppg, 1.55 cu. ft./sk Extendcem System with .2% HR-5 Retarder and .25 lb/sk Lost Circulation Additive

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2B**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
4-1/2"	10235' - 20900'	13.5	P-110	GB CD BTC	3.920"	3.795"

Interval	Length	Description	Collapse	Burst	Tension
10235' - 20900'	10665	4-1/2", 13.5 lb, P-110, GB CD BTC	(psi) a 10670 / 1.99	(psi) b 12410 / 1.28	(1000 lbs) c 443 / 1.98

API Rating & Safety Factor

- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10841' TVD.
- b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10841' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 123k lbs.) plus 100k lbs overpull.

Cement volumes are estimates based on 4-1/2" casing hung from 7" casing, and into 6" OH. 20% excess.

Mix and pump the cement slurry. Follow cement with liner dart and then saltwater displacement

**Pre-flush (Spacer):** **20 bbls** Viscous spacer

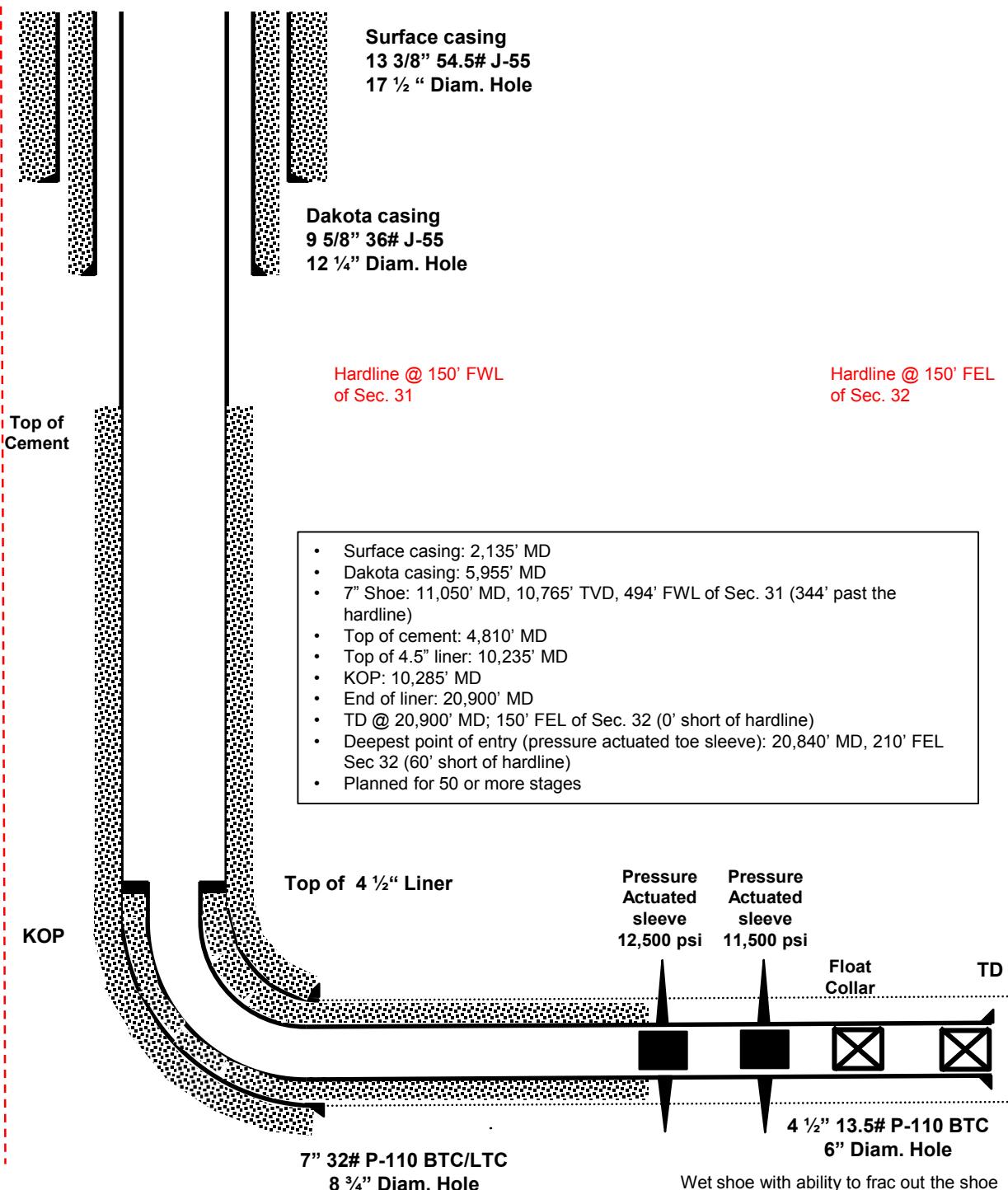
**Cement Slurry:** **726 sks** (197 bbls), 14.3ppg, 1.52 cu/ft/sk conventional system with  
20% silica flour

**Displacement** **272 bbls** Based on 53 ft shoe track and 4" drill pipe from surface to top of liner  
4" DP: 0ft to 10235ft @ 0.011bbl/ft  
4.5" casing: 10235ft to 20847ft; 0.0149bbl/ft

ELEVATION: 2,110' SL

## Lewis Federal 5300 11-31 2B Proposed Wellbore Schematic

FORMATION: Bakken



OASIS PETROLEUM NA LLC

Lewis Federal 5300 11-31 2B

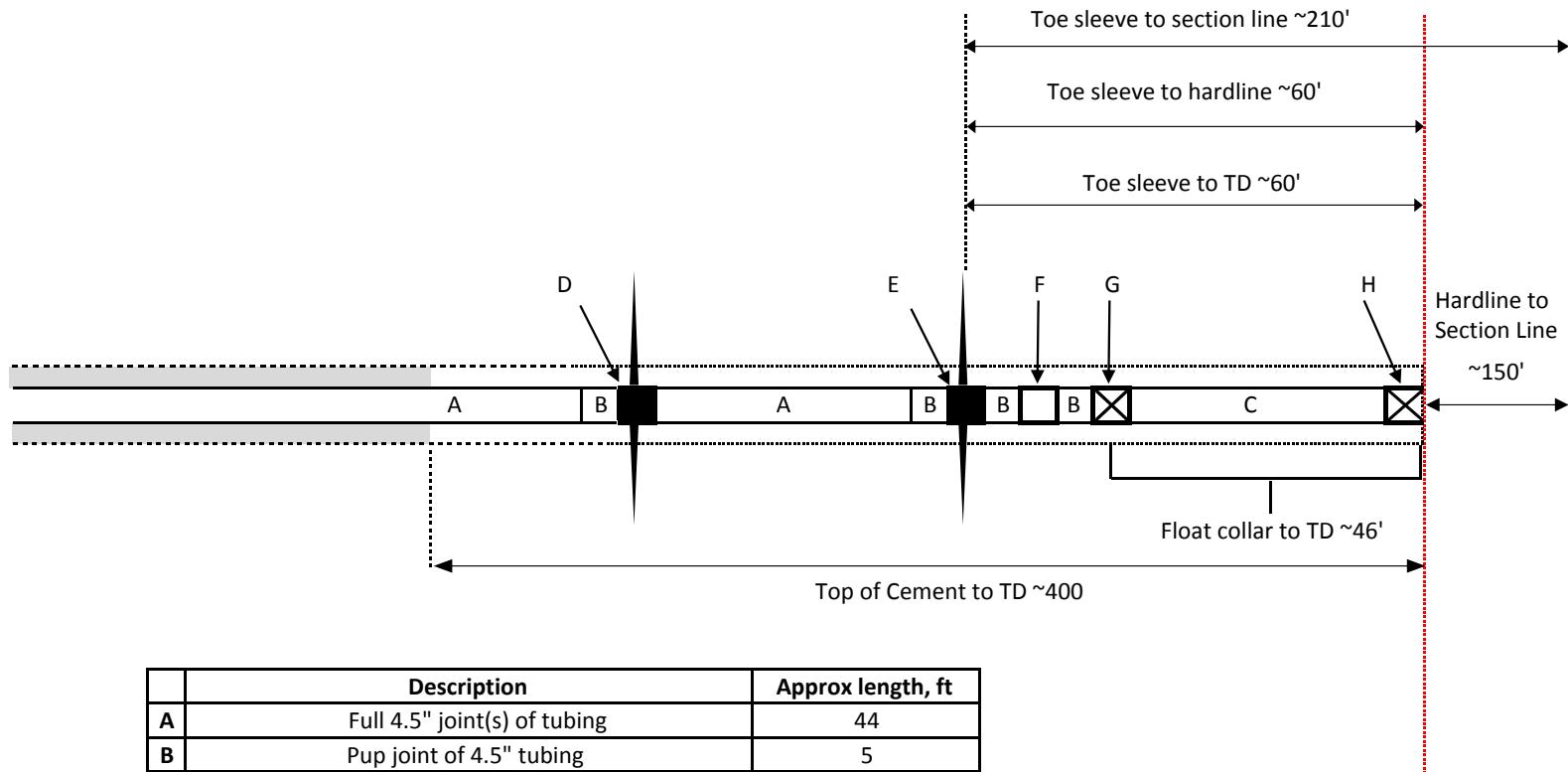
Wellbore: T153N-R100W Sec. 31 & 32

SHL: 1050' FNL & 265' FWL T153N-R100W Sec. 31

Williams County, North Dakota

Updated: 4-12-2018 TR

## Lewis Federal 5300 11-31 2B planned toe completion

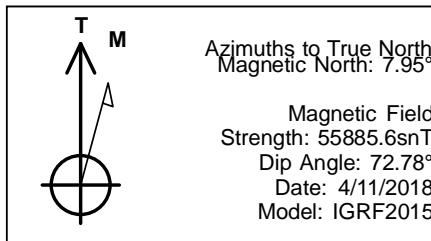
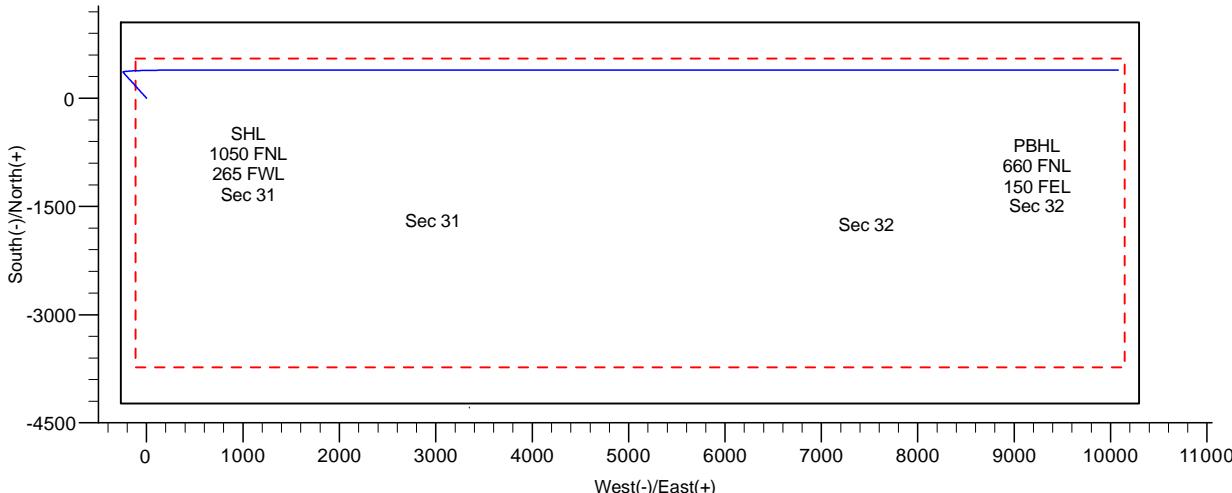


	Description	Approx length, ft
A	Full 4.5" joint(s) of tubing	44
B	Pup joint of 4.5" tubing	5
C	Full 4.5" joint of tubing, with NO cement	44
D	Pressure actuated sleeve, 12,500psi absolute	7
E	Pressure actuated sleeve, 11,500psi absolute	5
F	Landing collar	2
G	Float collar	2
H	Float shoe	2

\*First stage to be pumped out of sleeves labeled "D" and "E." Acid used as necessary to break down formation

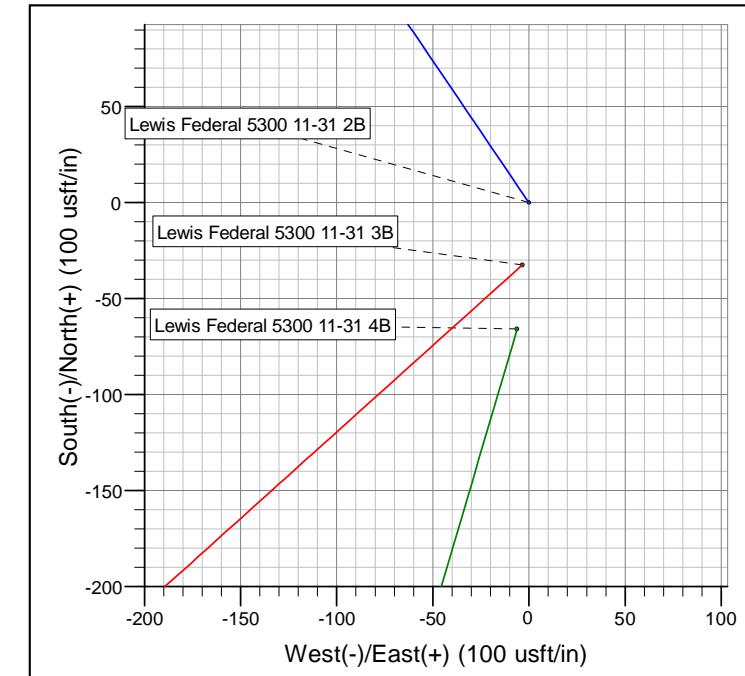
\*Diagram not to scale

Project: Indian Hills  
 Site: 153N-100W-31/32  
 Well: Lewis Federal 5300 11-31 2B  
 Wellbore: Lewis Federal 5300 11-31 2B  
 Design: Design #1



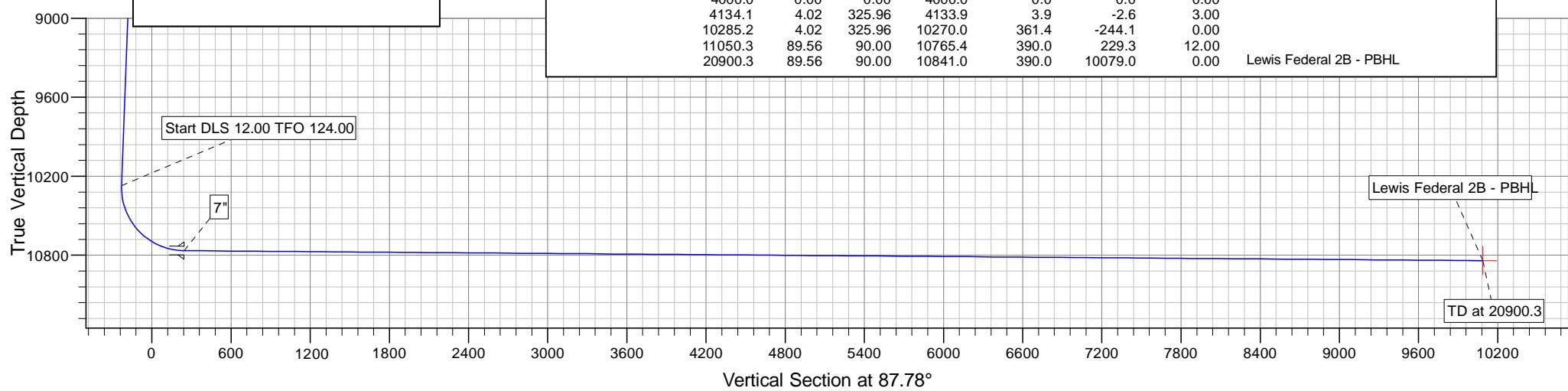
### WELL DETAILS: Lewis Federal 5300 11-31 2B

Northing 393162.02	Ground Level: 2110.0
Easting 1209545.85	Latitude 48° 2' 9.300 N
	Longitude 103° 36' 11.060 W



CASING DETAILS			
TVD	MD	Name	Size
2135.0	2135.0	13 3/8"	13.375
5950.4	5955.0	9 5/8"	9.625
10765.4	11050.3	7"	7.000

SECTION DETAILS								
MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	Target	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	
4000.0	0.00	0.00	4000.0	0.0	0.0	0.00	0.00	
4134.1	4.02	325.96	4133.9	3.9	-2.6	3.00		
10285.2	4.02	325.96	10270.0	361.4	-244.1	0.00		
11050.3	89.56	90.00	10765.4	390.0	229.3	12.00		
20900.3	89.56	90.00	10841.0	390.0	10079.0	0.00	Lewis Federal 2B - PBHL	



# **Oasis**

**Indian Hills**

**153N-100W-31/32**

**Lewis Federal 5300 11-31 2B**

**Lewis Federal 5300 11-31 2T**

**Lewis Federal 5300 11-31 2B**

**Plan: Design #1**

# **Standard Planning Report**

**12 April, 2018**

# Oasis Petroleum

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2135.0usft
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2135.0usft
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2B		
<b>Design:</b>	Design #1		

<b>Project</b>	Indian Hills
<b>Map System:</b>	US State Plane 1983
<b>Geo Datum:</b>	North American Datum 1983
<b>Map Zone:</b>	North Dakota Northern Zone

<b>Site</b>	153N-100W-31/32
<b>Site Position:</b>	Northing: 390,397.86 usft
<b>From:</b>	Easting: 1,209,464.32 usft
<b>Position Uncertainty:</b>	Slot Radius: 13.200 in

Latitude: 48° 1' 42.010 N  
Longitude: 103° 36' 10.620 W  
Grid Convergence: -2.31 °

<b>Well</b>	Lewis Federal 5300 11-31 2B, DEV
<b>Well Position</b>	+N/S 2,765.2 usft   Northing: 393,162.02 usft   Latitude: 48° 2' 9.300 N +E/-W -29.9 usft   Easting: 1,209,545.85 usft   Longitude: 103° 36' 11.060 W
<b>Position Uncertainty</b>	2.0 usft   Wellhead Elevation: Ground Level: 2,110.0 usft

<b>Wellbore</b>	Lewis Federal 5300 11-31 2B
<b>Magnetics</b>	Model Name: IGRF2015   Sample Date: 4/11/2018   Declination: 7.95   Dip Angle: 72.78   Field Strength: 55,886

<b>Design</b>	Design #1
<b>Audit Notes:</b>	
<b>Version:</b>	
<b>Vertical Section:</b>	
Phase: PROTOTYPE   Tie On Depth: 0.0	
Depth From (TVD) +N/S (usft)   +E/-W (usft)   Direction (°)	
0.0   0.0   0.0   87.78	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,134.1	4.02	325.96	4,133.9	3.9	-2.6	3.00	3.00	0.00	325.96	
10,285.2	4.02	325.96	10,270.0	361.4	-244.1	0.00	0.00	0.00	0.00	
11,050.3	89.56	90.00	10,765.4	390.0	229.3	12.00	11.18	16.21	124.00	
20,900.3	89.56	90.00	10,841.0	390.0	10,079.0	0.00	0.00	0.00	0.00	Lewis Federal 2B - PE

# Oasis Petroleum

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2135.0usft
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2135.0usft
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2B		
<b>Design:</b>	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
<b>Start Build 3.00</b>										
4,100.0	3.00	325.96	4,100.0	2.2	-1.5	-1.4	3.00	3.00	0.00	
4,134.1	4.02	325.96	4,133.9	3.9	-2.6	-2.5	3.00	3.00	0.00	
<b>Start 6151.2 hold at 4134.1 MD</b>										
4,200.0	4.02	325.96	4,199.7	7.7	-5.2	-4.9	0.00	0.00	0.00	
4,300.0	4.02	325.96	4,299.5	13.5	-9.1	-8.6	0.00	0.00	0.00	
4,400.0	4.02	325.96	4,399.2	19.4	-13.1	-12.3	0.00	0.00	0.00	
4,500.0	4.02	325.96	4,499.0	25.2	-17.0	-16.0	0.00	0.00	0.00	
4,600.0	4.02	325.96	4,598.7	31.0	-20.9	-19.7	0.00	0.00	0.00	
4,700.0	4.02	325.96	4,698.5	36.8	-24.9	-23.4	0.00	0.00	0.00	
4,800.0	4.02	325.96	4,798.3	42.6	-28.8	-27.1	0.00	0.00	0.00	
4,900.0	4.02	325.96	4,898.0	48.4	-32.7	-30.8	0.00	0.00	0.00	
5,000.0	4.02	325.96	4,997.8	54.2	-36.6	-34.5	0.00	0.00	0.00	
5,100.0	4.02	325.96	5,097.5	60.0	-40.6	-38.2	0.00	0.00	0.00	
5,200.0	4.02	325.96	5,197.3	65.8	-44.5	-41.9	0.00	0.00	0.00	
5,300.0	4.02	325.96	5,297.0	71.7	-48.4	-45.6	0.00	0.00	0.00	
5,400.0	4.02	325.96	5,396.8	77.5	-52.3	-49.3	0.00	0.00	0.00	
5,500.0	4.02	325.96	5,496.5	83.3	-56.3	-53.0	0.00	0.00	0.00	
5,600.0	4.02	325.96	5,596.3	89.1	-60.2	-56.7	0.00	0.00	0.00	
5,700.0	4.02	325.96	5,696.0	94.9	-64.1	-60.4	0.00	0.00	0.00	
5,800.0	4.02	325.96	5,795.8	100.7	-68.0	-64.1	0.00	0.00	0.00	
5,900.0	4.02	325.96	5,895.5	106.5	-72.0	-67.8	0.00	0.00	0.00	
5,955.0	4.02	325.96	5,950.4	109.7	-74.1	-69.8	0.00	0.00	0.00	
<b>9 5/8"</b>										
6,000.0	4.02	325.96	5,995.3	112.3	-75.9	-71.5	0.00	0.00	0.00	
6,100.0	4.02	325.96	6,095.0	118.1	-79.8	-75.2	0.00	0.00	0.00	
6,200.0	4.02	325.96	6,194.8	124.0	-83.7	-78.9	0.00	0.00	0.00	
6,300.0	4.02	325.96	6,294.6	129.8	-87.7	-82.6	0.00	0.00	0.00	
6,400.0	4.02	325.96	6,394.3	135.6	-91.6	-86.3	0.00	0.00	0.00	
6,500.0	4.02	325.96	6,494.1	141.4	-95.5	-90.0	0.00	0.00	0.00	
6,600.0	4.02	325.96	6,593.8	147.2	-99.5	-93.7	0.00	0.00	0.00	
6,700.0	4.02	325.96	6,693.6	153.0	-103.4	-97.4	0.00	0.00	0.00	
6,800.0	4.02	325.96	6,793.3	158.8	-107.3	-101.1	0.00	0.00	0.00	
6,900.0	4.02	325.96	6,893.1	164.6	-111.2	-104.8	0.00	0.00	0.00	
7,000.0	4.02	325.96	6,992.8	170.4	-115.2	-108.5	0.00	0.00	0.00	
7,100.0	4.02	325.96	7,092.6	176.3	-119.1	-112.2	0.00	0.00	0.00	
7,200.0	4.02	325.96	7,192.3	182.1	-123.0	-115.9	0.00	0.00	0.00	
7,300.0	4.02	325.96	7,292.1	187.9	-126.9	-119.6	0.00	0.00	0.00	
7,400.0	4.02	325.96	7,391.8	193.7	-130.9	-123.3	0.00	0.00	0.00	
7,500.0	4.02	325.96	7,491.6	199.5	-134.8	-127.0	0.00	0.00	0.00	
7,600.0	4.02	325.96	7,591.4	205.3	-138.7	-130.7	0.00	0.00	0.00	
7,700.0	4.02	325.96	7,691.1	211.1	-142.6	-134.4	0.00	0.00	0.00	
7,800.0	4.02	325.96	7,790.9	216.9	-146.6	-138.1	0.00	0.00	0.00	
7,900.0	4.02	325.96	7,890.6	222.7	-150.5	-141.8	0.00	0.00	0.00	
8,000.0	4.02	325.96	7,990.4	228.6	-154.4	-145.5	0.00	0.00	0.00	
8,100.0	4.02	325.96	8,090.1	234.4	-158.3	-149.2	0.00	0.00	0.00	
8,200.0	4.02	325.96	8,189.9	240.2	-162.3	-152.9	0.00	0.00	0.00	
8,300.0	4.02	325.96	8,289.6	246.0	-166.2	-156.6	0.00	0.00	0.00	
8,400.0	4.02	325.96	8,389.4	251.8	-170.1	-160.3	0.00	0.00	0.00	
8,500.0	4.02	325.96	8,489.1	257.6	-174.1	-164.0	0.00	0.00	0.00	
8,600.0	4.02	325.96	8,588.9	263.4	-178.0	-167.7	0.00	0.00	0.00	
8,700.0	4.02	325.96	8,688.6	269.2	-181.9	-171.4	0.00	0.00	0.00	

# Oasis Petroleum

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2135.0usft
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2135.0usft
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2B		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,800.0	4.02	325.96	8,788.4	275.0	-185.8	-175.1	0.00	0.00	0.00
8,900.0	4.02	325.96	8,888.2	280.9	-189.8	-178.8	0.00	0.00	0.00
9,000.0	4.02	325.96	8,987.9	286.7	-193.7	-182.5	0.00	0.00	0.00
9,100.0	4.02	325.96	9,087.7	292.5	-197.6	-186.2	0.00	0.00	0.00
9,200.0	4.02	325.96	9,187.4	298.3	-201.5	-189.9	0.00	0.00	0.00
9,300.0	4.02	325.96	9,287.2	304.1	-205.5	-193.5	0.00	0.00	0.00
9,400.0	4.02	325.96	9,386.9	309.9	-209.4	-197.2	0.00	0.00	0.00
9,500.0	4.02	325.96	9,486.7	315.7	-213.3	-200.9	0.00	0.00	0.00
9,600.0	4.02	325.96	9,586.4	321.5	-217.2	-204.6	0.00	0.00	0.00
9,700.0	4.02	325.96	9,686.2	327.4	-221.2	-208.3	0.00	0.00	0.00
9,800.0	4.02	325.96	9,785.9	333.2	-225.1	-212.0	0.00	0.00	0.00
9,900.0	4.02	325.96	9,885.7	339.0	-229.0	-215.7	0.00	0.00	0.00
10,000.0	4.02	325.96	9,985.4	344.8	-232.9	-219.4	0.00	0.00	0.00
10,100.0	4.02	325.96	10,085.2	350.6	-236.9	-223.1	0.00	0.00	0.00
10,200.0	4.02	325.96	10,185.0	356.4	-240.8	-226.8	0.00	0.00	0.00
10,285.2	4.02	325.96	10,270.0	361.4	-244.1	-230.0	0.00	0.00	0.00
<b>Start DLS 12.00 TFO 124.00</b>									
10,300.0	3.37	351.81	10,284.7	362.2	-244.5	-230.3	12.00	-4.43	175.21
10,400.0	11.99	74.10	10,383.9	368.0	-234.9	-220.5	12.00	8.62	82.30
10,500.0	23.74	82.42	10,478.9	373.5	-204.8	-190.2	12.00	11.76	8.31
10,600.0	35.65	85.37	10,565.6	378.5	-155.7	-140.9	12.00	11.91	2.95
10,700.0	47.61	86.98	10,640.3	382.9	-89.5	-74.6	12.00	11.95	1.61
10,800.0	59.58	88.07	10,699.5	386.3	-9.2	5.7	12.00	11.97	1.09
10,900.0	71.55	88.91	10,740.8	388.6	81.6	96.6	12.00	11.98	0.85
11,000.0	83.53	89.65	10,762.3	389.8	179.1	194.0	12.00	11.98	0.73
11,050.3	89.56	90.00	10,765.4	390.0	229.3	244.2	12.00	11.98	0.70
<b>Start 9850.0 hold at 11050.3 MD - 7"</b>									
11,100.0	89.56	90.00	10,765.7	390.0	279.0	293.8	0.01	0.01	0.00
11,200.0	89.56	90.00	10,766.5	390.0	379.0	393.7	0.00	0.00	0.00
11,300.0	89.56	90.00	10,767.3	390.0	478.9	493.7	0.00	0.00	0.00
11,400.0	89.56	90.00	10,768.0	390.0	578.9	593.6	0.00	0.00	0.00
11,500.0	89.56	90.00	10,768.8	390.0	678.9	693.5	0.00	0.00	0.00
11,600.0	89.56	90.00	10,769.6	390.0	778.9	793.4	0.00	0.00	0.00
11,700.0	89.56	90.00	10,770.3	390.0	878.9	893.4	0.00	0.00	0.00
11,800.0	89.56	90.00	10,771.1	390.0	978.9	993.3	0.00	0.00	0.00
11,900.0	89.56	90.00	10,771.9	390.0	1,078.9	1,093.2	0.00	0.00	0.00
12,000.0	89.56	90.00	10,772.7	390.0	1,178.9	1,193.1	0.00	0.00	0.00
12,100.0	89.56	90.00	10,773.4	390.0	1,278.9	1,293.0	0.00	0.00	0.00
12,200.0	89.56	90.00	10,774.2	390.0	1,378.9	1,393.0	0.00	0.00	0.00
12,300.0	89.56	90.00	10,775.0	390.0	1,478.9	1,492.9	0.00	0.00	0.00
12,400.0	89.56	90.00	10,775.7	390.0	1,578.9	1,592.8	0.00	0.00	0.00
12,500.0	89.56	90.00	10,776.5	390.0	1,678.9	1,692.7	0.00	0.00	0.00
12,600.0	89.56	90.00	10,777.3	390.0	1,778.9	1,792.7	0.00	0.00	0.00
12,700.0	89.56	90.00	10,778.0	390.0	1,878.9	1,892.6	0.00	0.00	0.00
12,800.0	89.56	90.00	10,778.8	390.0	1,978.9	1,992.5	0.00	0.00	0.00
12,900.0	89.56	90.00	10,779.6	390.0	2,078.9	2,092.4	0.00	0.00	0.00
13,000.0	89.56	90.00	10,780.3	390.0	2,178.9	2,192.3	0.00	0.00	0.00
13,100.0	89.56	90.00	10,781.1	390.0	2,278.9	2,292.3	0.00	0.00	0.00
13,200.0	89.56	90.00	10,781.9	390.0	2,378.9	2,392.2	0.00	0.00	0.00
13,300.0	89.56	90.00	10,782.6	390.0	2,478.9	2,492.1	0.00	0.00	0.00
13,400.0	89.56	90.00	10,783.4	390.0	2,578.9	2,592.0	0.00	0.00	0.00
13,500.0	89.56	90.00	10,784.2	390.0	2,678.9	2,692.0	0.00	0.00	0.00
13,600.0	89.56	90.00	10,784.9	390.0	2,778.9	2,791.9	0.00	0.00	0.00
13,700.0	89.56	90.00	10,785.7	390.0	2,878.9	2,891.8	0.00	0.00	0.00

# Oasis Petroleum

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2135.0usft
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2135.0usft
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2B		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,800.0	89.56	90.00	10,786.5	390.0	2,978.9	2,991.7	0.00	0.00	0.00
13,900.0	89.56	90.00	10,787.2	390.0	3,078.9	3,091.6	0.00	0.00	0.00
14,000.0	89.56	90.00	10,788.0	390.0	3,178.9	3,191.6	0.00	0.00	0.00
14,100.0	89.56	90.00	10,788.8	390.0	3,278.9	3,291.5	0.00	0.00	0.00
14,200.0	89.56	90.00	10,789.5	390.0	3,378.9	3,391.4	0.00	0.00	0.00
14,300.0	89.56	90.00	10,790.3	390.0	3,478.9	3,491.3	0.00	0.00	0.00
14,400.0	89.56	90.00	10,791.1	390.0	3,578.9	3,591.3	0.00	0.00	0.00
14,500.0	89.56	90.00	10,791.8	390.0	3,678.9	3,691.2	0.00	0.00	0.00
14,600.0	89.56	90.00	10,792.6	390.0	3,778.9	3,791.1	0.00	0.00	0.00
14,700.0	89.56	90.00	10,793.4	390.0	3,878.8	3,891.0	0.00	0.00	0.00
14,800.0	89.56	90.00	10,794.2	390.0	3,978.8	3,990.9	0.00	0.00	0.00
14,900.0	89.56	90.00	10,794.9	390.0	4,078.8	4,090.9	0.00	0.00	0.00
15,000.0	89.56	90.00	10,795.7	390.0	4,178.8	4,190.8	0.00	0.00	0.00
15,100.0	89.56	90.00	10,796.5	390.0	4,278.8	4,290.7	0.00	0.00	0.00
15,200.0	89.56	90.00	10,797.2	390.0	4,378.8	4,390.6	0.00	0.00	0.00
15,300.0	89.56	90.00	10,798.0	390.0	4,478.8	4,490.6	0.00	0.00	0.00
15,400.0	89.56	90.00	10,798.8	390.0	4,578.8	4,590.5	0.00	0.00	0.00
15,500.0	89.56	90.00	10,799.5	390.0	4,678.8	4,690.4	0.00	0.00	0.00
15,600.0	89.56	90.00	10,800.3	390.0	4,778.8	4,790.3	0.00	0.00	0.00
15,700.0	89.56	90.00	10,801.1	390.0	4,878.8	4,890.2	0.00	0.00	0.00
15,800.0	89.56	90.00	10,801.8	390.0	4,978.8	4,990.2	0.00	0.00	0.00
15,900.0	89.56	90.00	10,802.6	390.0	5,078.8	5,090.1	0.00	0.00	0.00
16,000.0	89.56	90.00	10,803.4	390.0	5,178.8	5,190.0	0.00	0.00	0.00
16,100.0	89.56	90.00	10,804.1	390.0	5,278.8	5,289.9	0.00	0.00	0.00
16,200.0	89.56	90.00	10,804.9	390.0	5,378.8	5,389.9	0.00	0.00	0.00
16,300.0	89.56	90.00	10,805.7	390.0	5,478.8	5,489.8	0.00	0.00	0.00
16,400.0	89.56	90.00	10,806.4	390.0	5,578.8	5,589.7	0.00	0.00	0.00
16,500.0	89.56	90.00	10,807.2	390.0	5,678.8	5,689.6	0.00	0.00	0.00
16,600.0	89.56	90.00	10,808.0	390.0	5,778.8	5,789.5	0.00	0.00	0.00
16,700.0	89.56	90.00	10,808.7	390.0	5,878.8	5,889.5	0.00	0.00	0.00
16,800.0	89.56	90.00	10,809.5	390.0	5,978.8	5,989.4	0.00	0.00	0.00
16,900.0	89.56	90.00	10,810.3	390.0	6,078.8	6,089.3	0.00	0.00	0.00
17,000.0	89.56	90.00	10,811.0	390.0	6,178.8	6,189.2	0.00	0.00	0.00
17,100.0	89.56	90.00	10,811.8	390.0	6,278.8	6,289.2	0.00	0.00	0.00
17,200.0	89.56	90.00	10,812.6	390.0	6,378.8	6,389.1	0.00	0.00	0.00
17,300.0	89.56	90.00	10,813.4	390.0	6,478.8	6,489.0	0.00	0.00	0.00
17,400.0	89.56	90.00	10,814.1	390.0	6,578.8	6,588.9	0.00	0.00	0.00
17,500.0	89.56	90.00	10,814.9	390.0	6,678.8	6,688.9	0.00	0.00	0.00
17,600.0	89.56	90.00	10,815.7	390.0	6,778.8	6,788.8	0.00	0.00	0.00
17,700.0	89.56	90.00	10,816.4	390.0	6,878.8	6,888.7	0.00	0.00	0.00
17,800.0	89.56	90.00	10,817.2	390.0	6,978.8	6,988.6	0.00	0.00	0.00
17,900.0	89.56	90.00	10,818.0	390.0	7,078.8	7,088.5	0.00	0.00	0.00
18,000.0	89.56	90.00	10,818.7	390.0	7,178.8	7,188.5	0.00	0.00	0.00
18,100.0	89.56	90.00	10,819.5	390.0	7,278.7	7,288.4	0.00	0.00	0.00
18,200.0	89.56	90.00	10,820.3	390.0	7,378.7	7,388.3	0.00	0.00	0.00
18,300.0	89.56	90.00	10,821.0	390.0	7,478.7	7,488.2	0.00	0.00	0.00
18,400.0	89.56	90.00	10,821.8	390.0	7,578.7	7,588.2	0.00	0.00	0.00
18,500.0	89.56	90.00	10,822.6	390.0	7,678.7	7,688.1	0.00	0.00	0.00
18,600.0	89.56	90.00	10,823.3	390.0	7,778.7	7,788.0	0.00	0.00	0.00
18,700.0	89.56	90.00	10,824.1	390.0	7,878.7	7,887.9	0.00	0.00	0.00
18,800.0	89.56	90.00	10,824.9	390.0	7,978.7	7,987.8	0.00	0.00	0.00
18,900.0	89.56	90.00	10,825.6	390.0	8,078.7	8,087.8	0.00	0.00	0.00
19,000.0	89.56	90.00	10,826.4	390.0	8,178.7	8,187.7	0.00	0.00	0.00
19,100.0	89.56	90.00	10,827.2	390.0	8,278.7	8,287.6	0.00	0.00	0.00

# Oasis Petroleum

## Planning Report

<b>Database:</b> OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Company:</b> Oasis	<b>TVD Reference:</b>	WELL @ 2135.0usft
<b>Project:</b> Indian Hills	<b>MD Reference:</b>	WELL @ 2135.0usft
<b>Site:</b> 153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b> Lewis Federal 5300 11-31 2B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b> Lewis Federal 5300 11-31 2B		
<b>Design:</b> Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
19,200.0	89.56	90.00	10,827.9	390.0	8,378.7	8,387.5	0.00	0.00	0.00
19,300.0	89.56	90.00	10,828.7	390.0	8,478.7	8,487.5	0.00	0.00	0.00
19,400.0	89.56	90.00	10,829.5	390.0	8,578.7	8,587.4	0.00	0.00	0.00
19,500.0	89.56	90.00	10,830.2	390.0	8,678.7	8,687.3	0.00	0.00	0.00
19,600.0	89.56	90.00	10,831.0	390.0	8,778.7	8,787.2	0.00	0.00	0.00
19,700.0	89.56	90.00	10,831.8	390.0	8,878.7	8,887.1	0.00	0.00	0.00
19,800.0	89.56	90.00	10,832.5	390.0	8,978.7	8,987.1	0.00	0.00	0.00
19,900.0	89.56	90.00	10,833.3	390.0	9,078.7	9,087.0	0.00	0.00	0.00
20,000.0	89.56	90.00	10,834.1	390.0	9,178.7	9,186.9	0.00	0.00	0.00
20,100.0	89.56	90.00	10,834.9	390.0	9,278.7	9,286.8	0.00	0.00	0.00
20,200.0	89.56	90.00	10,835.6	390.0	9,378.7	9,386.8	0.00	0.00	0.00
20,300.0	89.56	90.00	10,836.4	390.0	9,478.7	9,486.7	0.00	0.00	0.00
20,400.0	89.56	90.00	10,837.2	390.0	9,578.7	9,586.6	0.00	0.00	0.00
20,500.0	89.56	90.00	10,837.9	390.0	9,678.7	9,686.5	0.00	0.00	0.00
20,600.0	89.56	90.00	10,838.7	390.0	9,778.7	9,786.4	0.00	0.00	0.00
20,700.0	89.56	90.00	10,839.5	390.0	9,878.7	9,886.4	0.00	0.00	0.00
20,800.0	89.56	90.00	10,840.2	390.0	9,978.7	9,986.3	0.00	0.00	0.00
20,900.0	89.56	90.00	10,841.0	390.0	10,078.7	10,086.2	0.00	0.00	0.00
20,900.3	89.56	90.00	10,841.0	390.0	10,079.0	10,086.5	0.00	0.00	0.00
<b>TD at 20900.3</b>									

Design Targets									
Target Name									
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
Lewis Federal 2B - PBH	0.00	0.00	10,841.0	390.0	10,079.0	393,145.62	1,219,632.38	48° 2' 13.122 N	103° 33' 42.744 W
- plan hits target center									
- Point									

Casing Points									
Measured Depth (usft)	Vertical Depth (usft)	Name				Casing Diameter (in)	Hole Diameter (in)		
2,135.0	2,135.0	13 3/8"				13.375	17.500		
5,955.0	5,950.4	9 5/8"				9.625	12.250		
11,050.3	10,765.4	7"				7.000	8.750		

# Oasis Petroleum

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2B
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2135.0usft
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2135.0usft
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2B		
<b>Design:</b>	Design #1		

### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,985.0	1,985.0	Pierre			
4,597.3	4,596.0	Greenhorn			
5,012.3	5,010.0	Mowry (Dakota Group)			
5,435.3	5,432.0	Inyan Kara (Dakota Group)			
5,859.4	5,855.0	Swift (Base Dakota Group)			
6,376.6	6,371.0	Rierdon			
6,904.9	6,898.0	Dunham Salt			
6,962.1	6,955.0	Dunham Salt Base			
7,269.8	7,262.0	Pine Salt			
7,331.0	7,323.0	Pine Salt Base			
7,449.3	7,441.0	Opeche Salt			
7,475.3	7,467.0	Opeche Salt Base			
7,671.8	7,663.0	Amsden			
7,860.3	7,851.0	Tyler			
8,078.8	8,069.0	Otter/Base Minnelusa			
8,426.7	8,416.0	Kibbey Lime			
8,573.0	8,562.0	Charles Salt			
9,245.7	9,233.0	Base Last Salt			
9,460.2	9,447.0	Mission Canyon			
10,020.6	10,006.0	Lodgepole			
10,844.0	10,720.0	False Bakken			
10,868.9	10,730.0	Upper Bakken Shale			
10,917.4	10,746.0	Middle Bakken			
10,959.2	10,756.0	Target Top			
11,035.1	10,765.0	Target Landing			
12,175.7	10,774.0	Target Base			
13,477.9	10,784.0	Lower Bakken			

### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			Comment
		+N/-S (usft)	+E/-W (usft)		
4,000.0	4,000.0	0.0	0.0		Start Build 3.00
4,134.1	4,133.9	3.9	-2.6		Start 6151.2 hold at 4134.1 MD
10,285.2	10,270.0	361.4	-244.1		Start DLS 12.00 TFO 124.00
11,050.3	10,765.4	390.0	229.3		Start 9850.0 hold at 11050.3 MD
20,900.3	10,841.0	390.0	10,079.0		TD at 20900.3



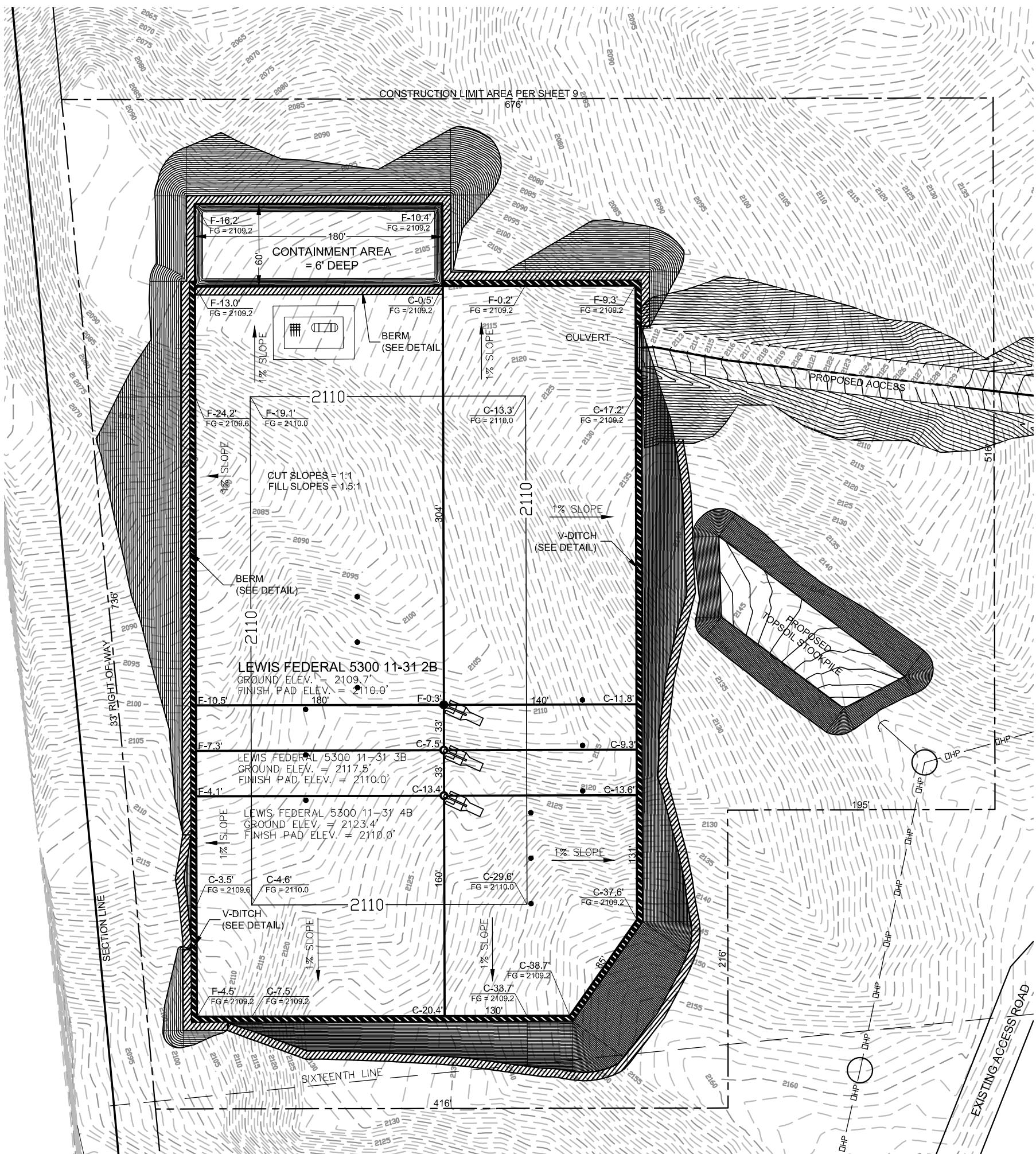
THIS DOCUMENT WAS ORIGINALLY  
ISSUED AND SEALED BY DARYL D  
KASEMAN, PLS, REGISTRATION  
NUMBER 3880 ON 3-27-18  
AND THE ORIGINAL DOCUMENTS  
ARE STORED AT THE OFFICES OF  
INTERSTATE ENGINEERING, INC.

## PRODUCTION LAYOUT

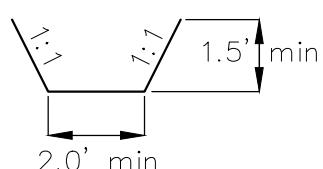
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002  
LEWIS FEDERAL 5300 11-31 2B

LEWIS FEDERAL 5300 11-31 2B

1050 FEET FROM NORTH LINE AND 265 FEET FROM WEST LINE  
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



#### V-DITCH DETAIL

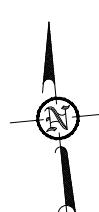


The diagram illustrates two types of terrain features: a berm and a ditch. Each feature is shown with two parallel lines representing the 'Proposed Contours' and a dashed line representing the 'Original Contours'. The berm is depicted as a raised area with diagonal hatching, while the ditch is a depression with vertical hatching.

**NOTE:** Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

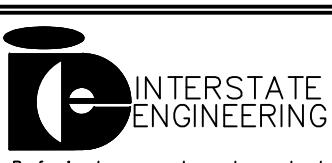
NOTE: All utilities shown are preliminary only, a complete utility location is recommended before construction.

A circular stamp with the following text:  
REGISTRATION  
LAND SURVEYOR  
DARYL D.  
KASEMAN  
LS-3880  
DATE: 3-27-18  
NORTH DAKOTA



© 2018 INTERSTATE ENGINEERING, INC.

4/9



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.interstateeng.com](http://www.interstateeng.com)

OASIS PETROLEUM NORTH AMERICA, LLC  
PRODUCTION LAYOUT

SECTION 31, T155N, R100W, S11TF.M.,  
MCKENZIE COUNTY, NORTH DAKOTA



## **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)

APR 18 2018

Well File No.  
**30189**

ND Oil & Gas  
Division

**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>April 30, 2018</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	<u>Name Change</u>

Well Name and Number <b>Lewis Federal 5300 11-31 2T</b>									
Footages			Qtr-Qtr		Section	Township		Range	
973 F N L	253 F W L		LOT1		31	153 N		100 W	
Field	Pool				County				
Baker	Bakken				McKenzie				

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 respectfully request approval to make the following change to the above referenced well:

**Name Change: Lewis Federal 5300 11-31 2B (Previously Lewis Federal 5300 11-31 2T).**

**Please utilize credit card on file for the associated fees.**

Company <b>Oasis Petroleum North America LLC</b>		Telephone Number <b>281 404-9494</b>
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>		State <b>TX</b>
Signature <i>Sadie Goodrum</i>		Printed Name <b>Sadie Goodrum</b>
Title <b>Regulatory Specialist II</b>		Date <b>April 18, 2018</b>
Email Address <b>sgoodrum@oasispetroleum.com</b>		

<b>FOR STATE USE ONLY</b>	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date	4-24-2018
By	<i>D. Burns</i>
Title	<b>DAVID BURNS</b> <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)

Received

Well File No.  
30189

DEC 19 2017

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 22, 2018</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

ND Oil & Gas Division	
<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>APD Renewal</b>

Well Name and Number <b>Lewis Federal 5300 11-21 2T</b>					
Footages <b>973 F N L</b>	<b>235 F W L</b>	Qtr-Qtr <b>NNNW</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 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 requests a permit renewal for above referenced well. There are no changes to the current drill plan.

Please use the credit card on file for the \$100.00 application processing fee.

See attached supporting document gas capture plan.

cc \$100.00 12/21/17  
Inv# 58318

Permit Expires 12/11/18.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9436</b>	
Address <b>1001 Fannin St, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Jennifer Swenson</b>	
Title <b>Regulatory Specialist</b>	Date <b>December 19, 2017</b>	
Email Address <b>iswenson@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>12/19/17</b>	
By 	
Title <b>Engineering Technician</b>	

**GAS CAPTURE PLAN AFFIDAVIT**

STATE OF TEXAS                    §  
    §  
COUNTY OF HARRIS                §

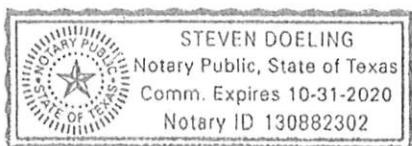
Robert Eason, being duly sworn, states as follows:

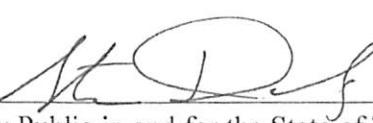
1. I am employed by Oasis Petroleum North America LLC (“Oasis”) as Marketing Manager, I’m over the age of 21 and have personal knowledge of the matters set forth in this affidavit.
2. This affidavit is submitted in conjunction with the Application for Permit to Drill for the Lewis Federal 5300 11-31 2T well, with a surface location in Lot 1 of Section 31, Township 153 North, Range 100 West, McKenzie County, North Dakota (the “Well”).
3. Oasis currently anticipates that gas to be produced from the Well will be gathered by Hiland Partners (the “Gathering Company”). Oasis has advised the Gathering Company of its intent to drill the Well and has advised the Gathering Company that it currently anticipates that the Well will be completed in ~ December 2018, with an initial gas production rate of approximately 1,024 mcf/day.



\_\_\_\_\_  
Robert H. Eason  
Marketing Manager

Subscribed and sworn to before me this 7<sup>th</sup> day of December, 2017.



  
\_\_\_\_\_  
Notary Public in and for the State of Texas

## GAS CAPTURE PLAN – OASIS PETROLEUM

### Lewis Federal 5300 11-31 2T

#### Section 31-T153N-R100W

Baker Field

McKenzie County, North Dakota

Anticipated first flow date	~ December 2018
Gas Gatherer:	Kinder Morgan
Gas to be processed at*:	Hiland Operated Watford City Plant
Maximum Daily Capacity of Existing Gas Line*:	36,000 MCFD
Current Throughput of Existing Gas Line*:	26,600 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	36,000 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	24,500 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	No expansion plans in this area.
Gas Plant Capacity:	95,000 MCFD
Map:	Attached
Affidavit:	Attached

\*Provided by Gatherer

#### Flowback Strategy

Total Number of Wells at Location:	10
Multi-Well Start-up Plan:	Initial production from the 1st new well at the CTB is anticipated in December 2017 with each following well making 1 <sup>st</sup> production every 5th day thereafter.

Estimated Flow Rate:	Lewis Federal 5300 11-31 2T		Lewis 5300 11-31 CTB (10 wells)	
	MCFD	BOPD	MCFD	BOPD
30 Days:	634	634	4,703	4,851
60 Days:	481	481	6,422	6,609
180 Days:	276	276	3,175	3,277

#### Oasis Flaring Percentage

Oasis % of Gas Flared:	Statewide	Baker Field
	13%	1%

\*Flared percentage reflects November 2017 with estimated 14 day flowback exemptions

#### Alternatives to Flaring

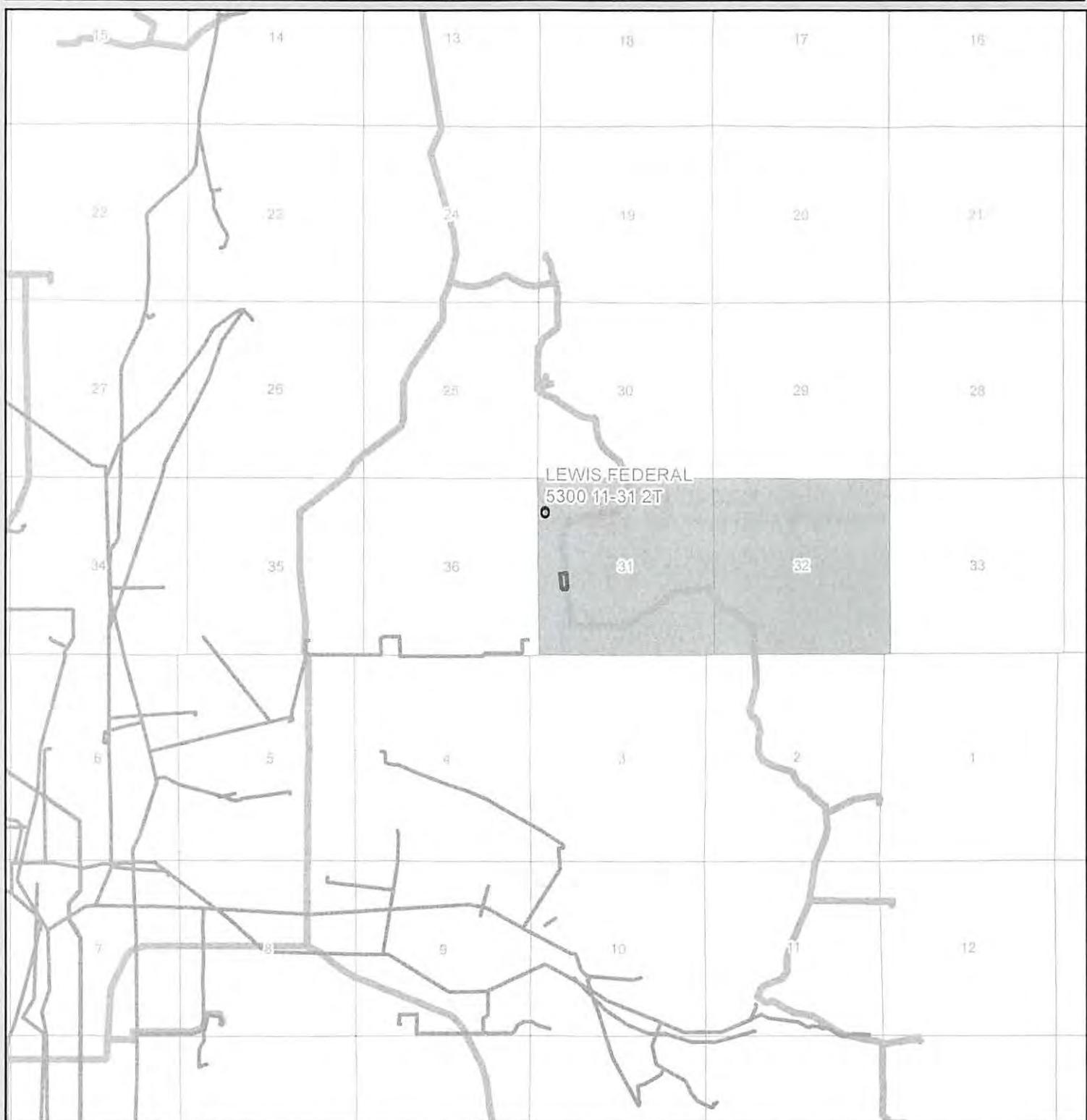
The installation of a temporary gas liquification unit recovering >50% of C3+ NGLs for an estimated reduction in flared volumes of ~30%.

Gas Capture Plan - Detail View

LEWIS FEDERAL 5300 11-31 2T

Section 31 T153N R100W

McKenzie County, North Dakota

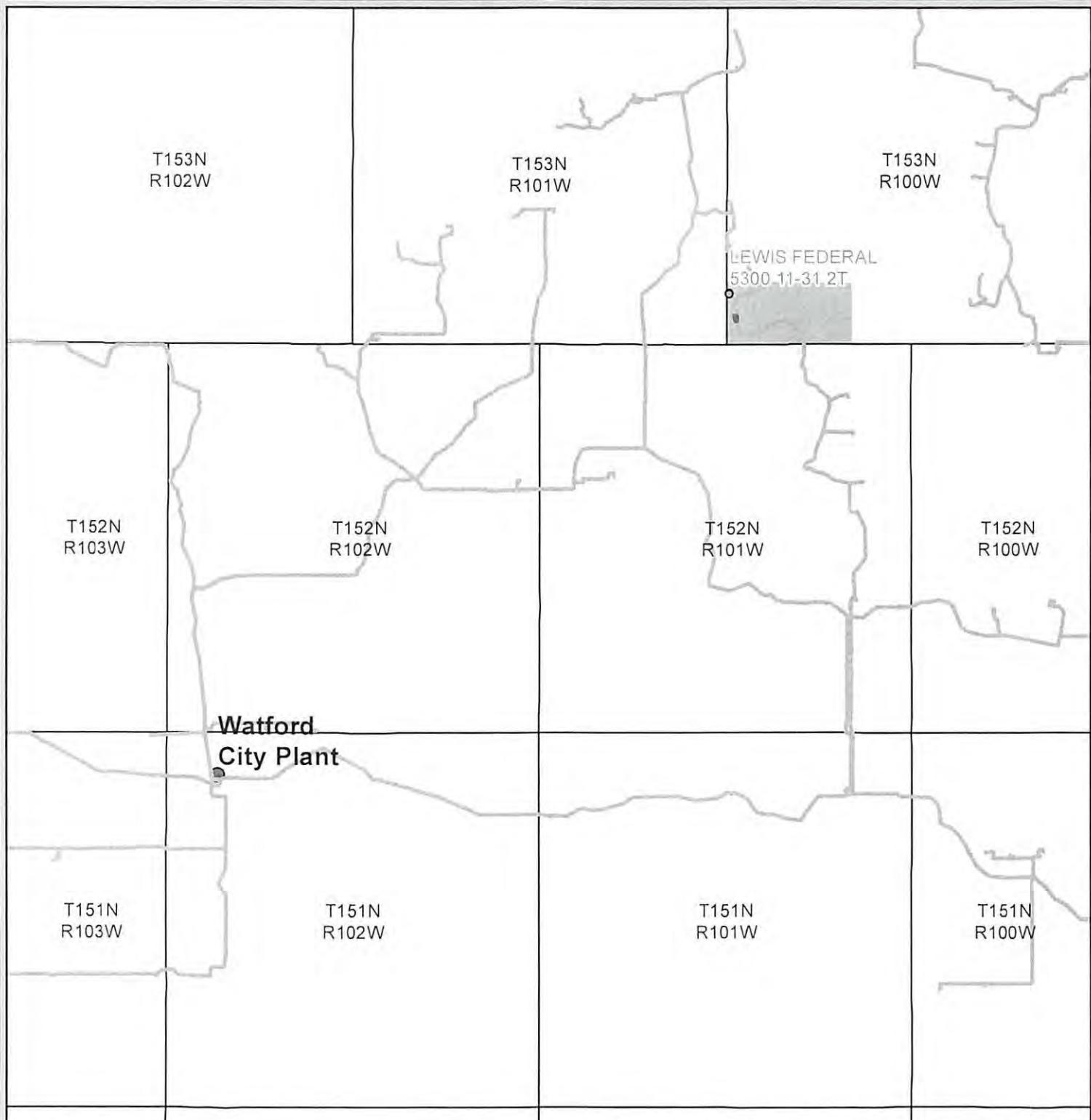


- CTB Outline
- Proposed Well
- Hiland Gas Line
- Oneok Gas Line

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant

**OASIS**  
PETROLEUM

**Gas Capture Plan - Overview**  
LEWIS FEDERAL 5300 11-31 2T  
Section 31 T153N R100W  
McKenzie County, North Dakota



CTB Outline

Hiland Gas Line

● Processing Plant

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant

**OASIS**  
PETROLEUM



# 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.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

30189

November 13, 2017

OASIS PETRO NO AMER  
1001 FANNIN STE 1500  
HOUSTON, TX 77002

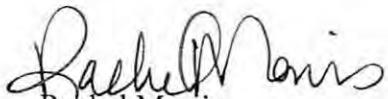
RE: LEWIS FEDERAL 5300 11-31 2T  
LOT1 Sec. 31-153N-100W  
MCKENZIE COUNTY  
WELL FILE NO. 30189

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire December 12, 2017.

Permits to drill are only valid for one year in the State of North Dakota. If you would like to renew for another year, please submit a Form 4 along with the \$100.00 filing fee. Alternatively, you may elect to send in a Form 4 cancelling the permit. If you have any questions, please contact Todd Holweger.

Sincerely,

  
Rachel Morris  
Administrative Assistant



## 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)

Received

Well File No.  
**30189**

JAN - 3 2017

**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 22, 2016</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	

ND Oil & Gas  
Division

- | <b>DIVISION</b>                               |   |
|---|---|
| <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>APD Renewal</b>                                |

Well Name and Number  
**Lewis Federal 5300 11-21 2T**

Lot 1

## **Footages**

Qtr-Qtr

973 F N L 235

NWNW

### Field

100

**Name of Contractor(s)**

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

**Address**

City

**State**

**Zip Code**

### DETAILS OF WORK

Oasis Petroleum requests a permit renewal for above referenced well. There are no changes to the current drill plan.

Please use the credit card on file for the \$100.00 application processing fee.

**See attached supporting document gas capture plan.**

Dmv#50142

Permit Expenses 12/11/17. cc \$100.00 1/5/17 to

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9436</b>	
Address <b>1001 Fannin St, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Jennifer Swenson</b>	
Title <b>Regulatory Specialist</b>	Date <b>January 3, 2017</b>	
Email Address <b>jswenson@oasispetroleum.com</b>		

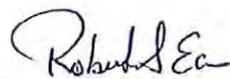
FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date	1/03/17
By	<i>Alice D. Welton</i>
Title	Engineering Technician

**GAS CAPTURE PLAN AFFIDAVIT**

STATE OF TEXAS                   §  
   §  
COUNTY OF HARRIS               §

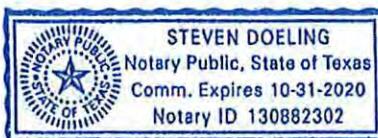
Robert Eason, being duly sworn, states as follows:

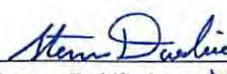
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2. This affidavit is submitted in conjunction with the Application for Permit to Drill for the Lewis Federal 5300 11-31 2T well, with a surface location in Lot 1 of Section 31, Township 153 North, Range 100 West, McKenzie County, North Dakota (the "Well").
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\_\_\_\_\_  
Robert H. Eason  
Marketing Manager

Subscribed and sworn to before me this 15<sup>th</sup> day of November, 2016.



  
\_\_\_\_\_  
Notary Public in and for the State of Texas

## GAS CAPTURE PLAN – OASIS PETROLEUM

### Lewis Federal 5300 11-31 2T

Section 31-T153N-R100W

Baker Field

McKenzie County, North Dakota

Anticipated first flow date	~ December 2017
Gas Gatherer:	Kinder Morgan
Gas to be processed at*:	Hiland Operated Watford City Plant
Maximum Daily Capacity of Existing Gas Line*:	36,000 MCFD
Current Throughput of Existing Gas Line*:	36,000 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	36,000 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	31,275 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	No expansion plans in this area.
Gas Plant Capacity:	95,000 MCFD
Map:	Attached
Affidavit:	Attached
*Provided by Gatherer	

### Flowback Strategy

Total Number of Wells at Location:	10
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30 Days:	634	634	4,703	4,851
60 Days:	481	481	6,422	6,609
180 Days:	276	276	3,175	3,277

### Oasis Flaring Percentage

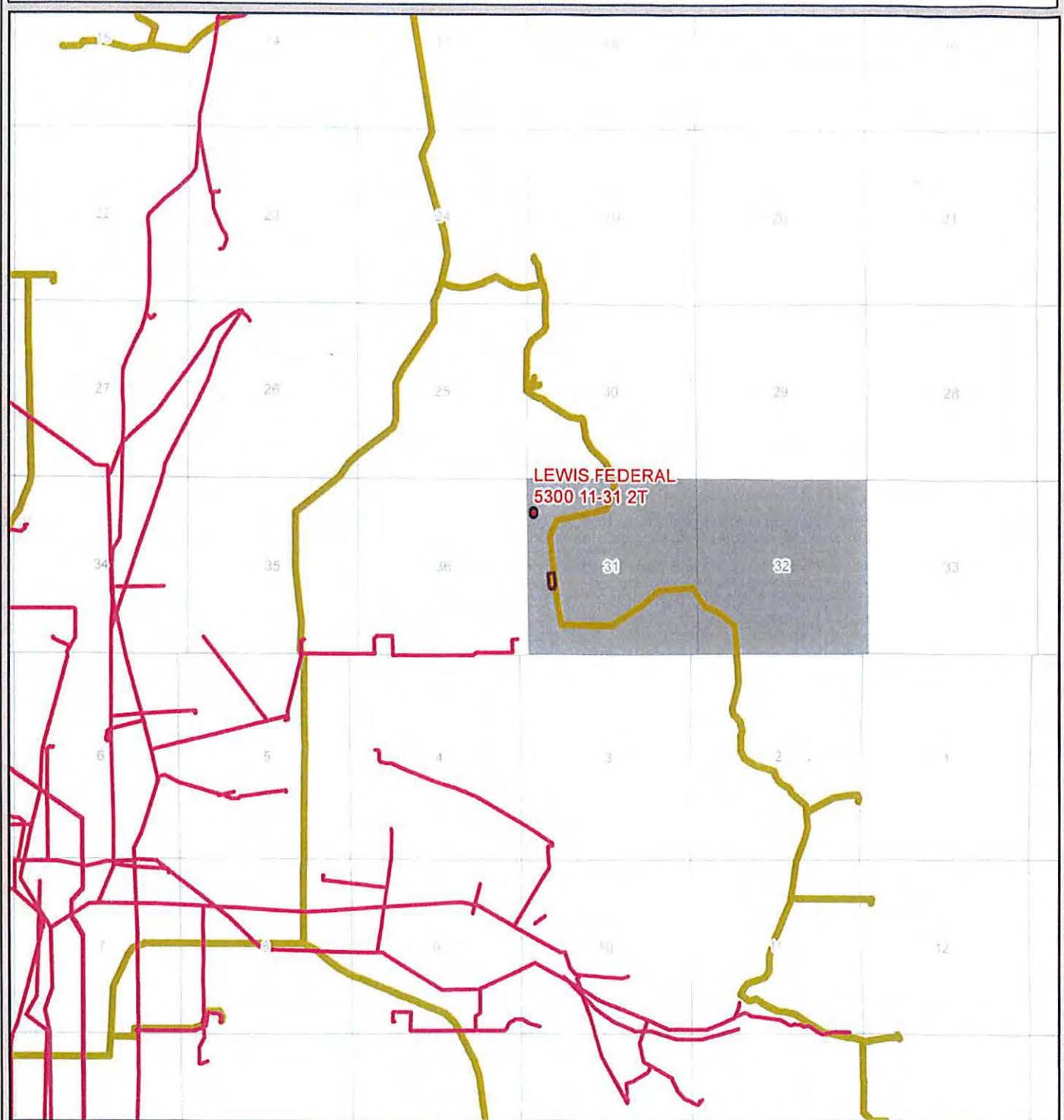
	Statewide	Baker Field
Oasis % of Gas Flared:	12%	10%

\*Flared percentage reflects October 2016

### Alternatives to Flaring

The installation of a temporary gas liquification unit recovering >50% of C3+ NGLs for an estimated reduction in flared volumes of ~30%.

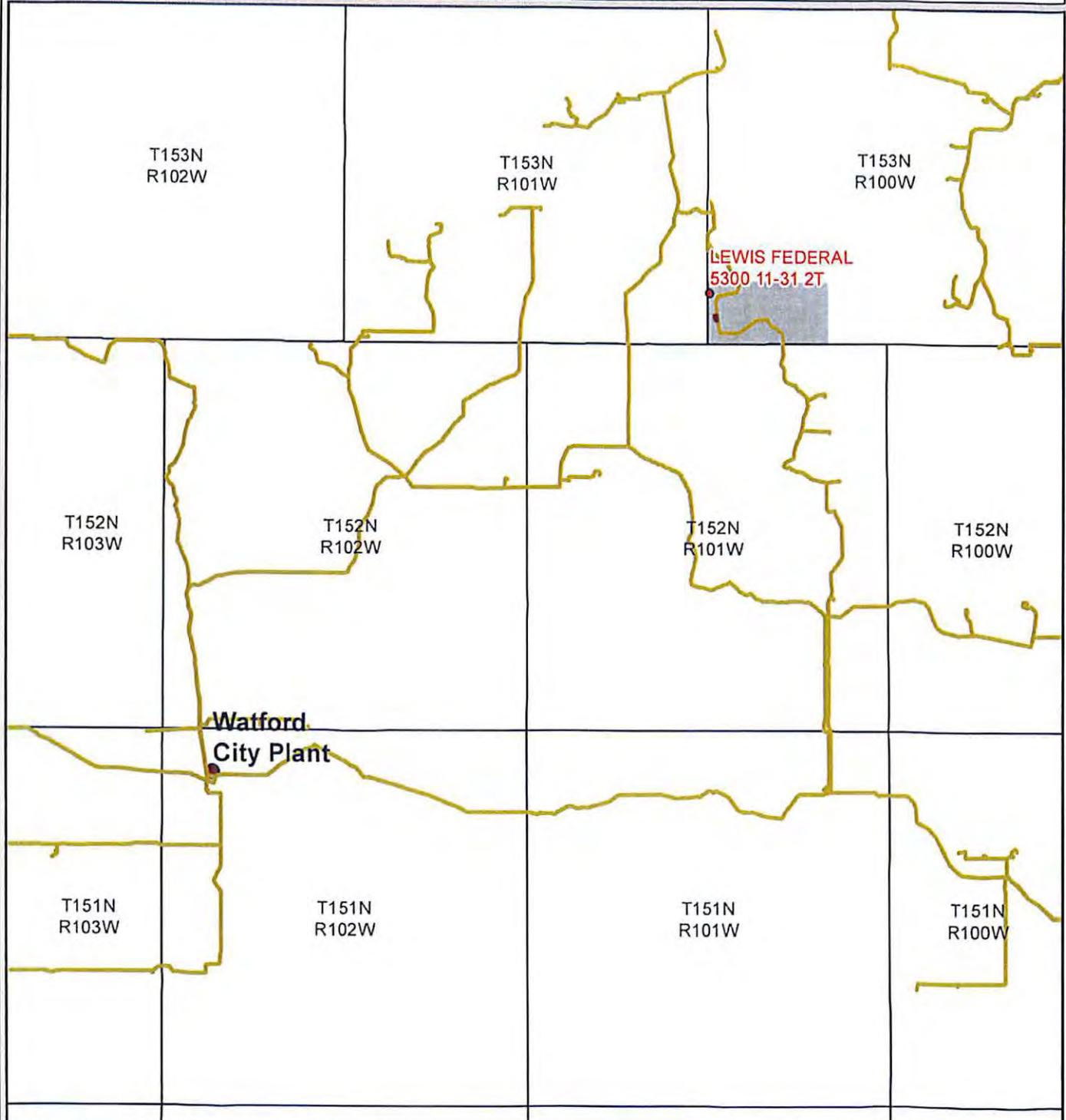
Gas Capture Plan - Detail View  
LEWIS FEDERAL 5300 11-31 2T  
Section 31 T153N R100W  
McKenzie County, North Dakota



Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant



Gas Capture Plan - Overview  
LEWIS FEDERAL 5300 11-31 2T  
Section 31 T153N R100W  
McKenzie County, North Dakota



- CTB Outline
- Hiland Gas Line
- Processing Plant

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant





# 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)

Received

Well File No.  
**30189**

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

NOV 23 2016

ND Oil & Gas Division

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>November 22, 2016</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>APD Renewal</b>                                |

Well Name and Number  
**Lewis Federal 5300 11-21 2T**

*Lot 1*

Footages <b>973 F N L</b>	Qtr-Qtr <b>235 F W L NWNW</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 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

Name of Contractor(s)

Address

City

State

Zip Code

## DETAILS OF WORK

Oasis Petroleum requests a permit renewal for above referenced well. There are no changes to the current drill plan.

Please use the credit card on file for the \$100.00 application processing fee.

See attached supporting document gas capture plan.

*Dmv#50042*

*Permit Expires 12/11/17.*

*cc \$100.00 12/14/16 th*

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>281-404-9436</b>	
Address <b>1001 Fannin St, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Jennifer Swenson</b>	
Title <b>Regulatory Specialist</b>	Date <b>November 22, 2016</b>	
Email Address <b>jswenson@oasispetroleum.com</b>		

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>12/12/16</i>	
By <i>Alice D. Webber</i>	
Title <b>Engineering Technician</b>	

**GAS CAPTURE PLAN AFFIDAVIT**

STATE OF TEXAS                   §  
   §  
COUNTY OF HARRIS               §

Robert Eason, being duly sworn, states as follows:

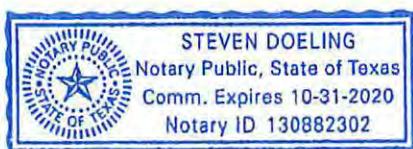
1. I am employed by Oasis Petroleum North America LLC ("Oasis") as Marketing Manager, I'm over the age of 21 and have personal knowledge of the matters set forth in this affidavit.
2. This affidavit is submitted in conjunction with the Application for Permit to Drill for the Lewis Federal 5300 11-31 2T well, with a surface location in Lot 1 of Section 31, Township 153 North, Range 100 West, McKenzie County, North Dakota (the "Well").
3. Oasis currently anticipates that gas to be produced from the Well will be gathered by Hiland Partners (the "Gathering Company"). Oasis has advised the Gathering Company of its intent to drill the Well and has advised the Gathering Company that it currently anticipates that the Well will be completed in ~ December 2017, with an initial gas production rate of approximately 1024 mcf/day.

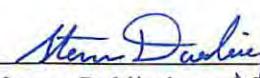


---

Robert H. Eason  
Marketing Manager

Subscribed and sworn to before me this 15<sup>th</sup> day of November, 2016.



  
\_\_\_\_\_  
Notary Public in and for the State of Texas

## GAS CAPTURE PLAN – OASIS PETROLEUM

### Lewis Federal 5300 11-31 2T

**Section 31-T153N-R100W**

**Baker Field**

**McKenzie County, North Dakota**

Anticipated first flow date	~ December 2017
Gas Gatherer:	Kinder Morgan
Gas to be processed at*:	Hiland Operated Watford City Plant
Maximum Daily Capacity of Existing Gas Line*:	36,000 MCFD
Current Throughput of Existing Gas Line*:	36,000 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	36,000 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	31,275 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	No expansion plans in this area.
Gas Plant Capacity:	95,000 MCFD
Map:	Attached
Affidavit:	Attached

\*Provided by Gatherer

### Flowback Strategy

Total Number of Wells at Location:	10
Multi-Well Start-up Plan:	Initial production from the 1st new well at the CTB is anticipated in December 2017 with each following well making 1 <sup>st</sup> production every 5th day thereafter.

Estimated Flow Rate:	<u>Lewis Federal 5300 11-31 2T</u>		<u>Lewis 5300 11-31 CTB (10 wells)</u>	
	<u>MCFD</u>	<u>BOPD</u>	<u>MCFD</u>	<u>BOPD</u>
30 Days:	634	634	4,703	4,851
60 Days:	481	481	6,422	6,609
180 Days:	276	276	3,175	3,277

### Oasis Flaring Percentage

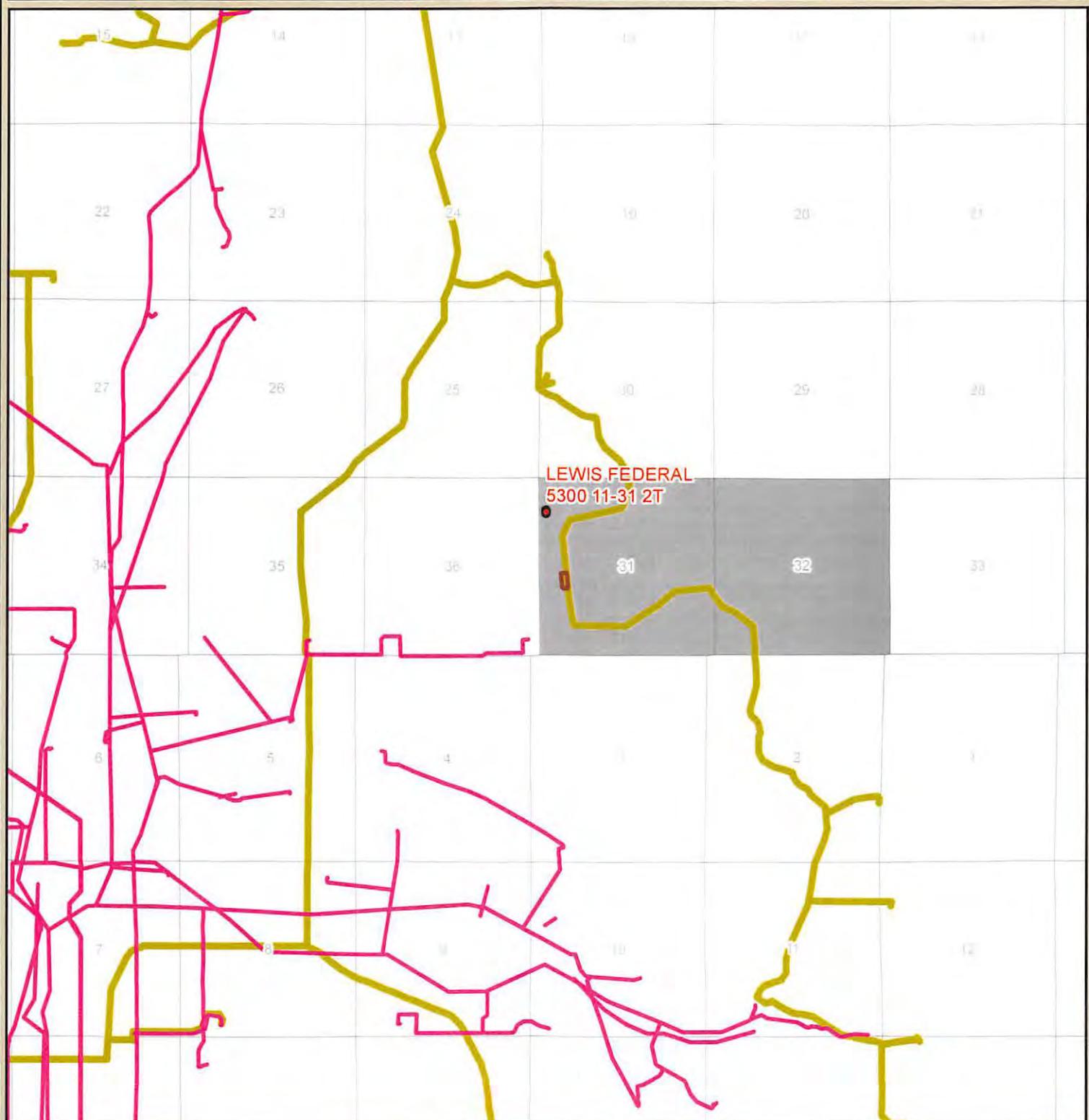
Oasis % of Gas Flared:	Statewide 12%	Baker Field 10%
------------------------	------------------	--------------------

\*Flared percentage reflects October 2016

### Alternatives to Flaring

The installation of a temporary gas liquification unit recovering >50% of C3+ NGLs for an estimated reduction in flared volumes of ~30%.

Gas Capture Plan - Detail View  
LEWIS FEDERAL 5300 11-31 2T  
Section 31 T153N R100W  
McKenzie County, North Dakota

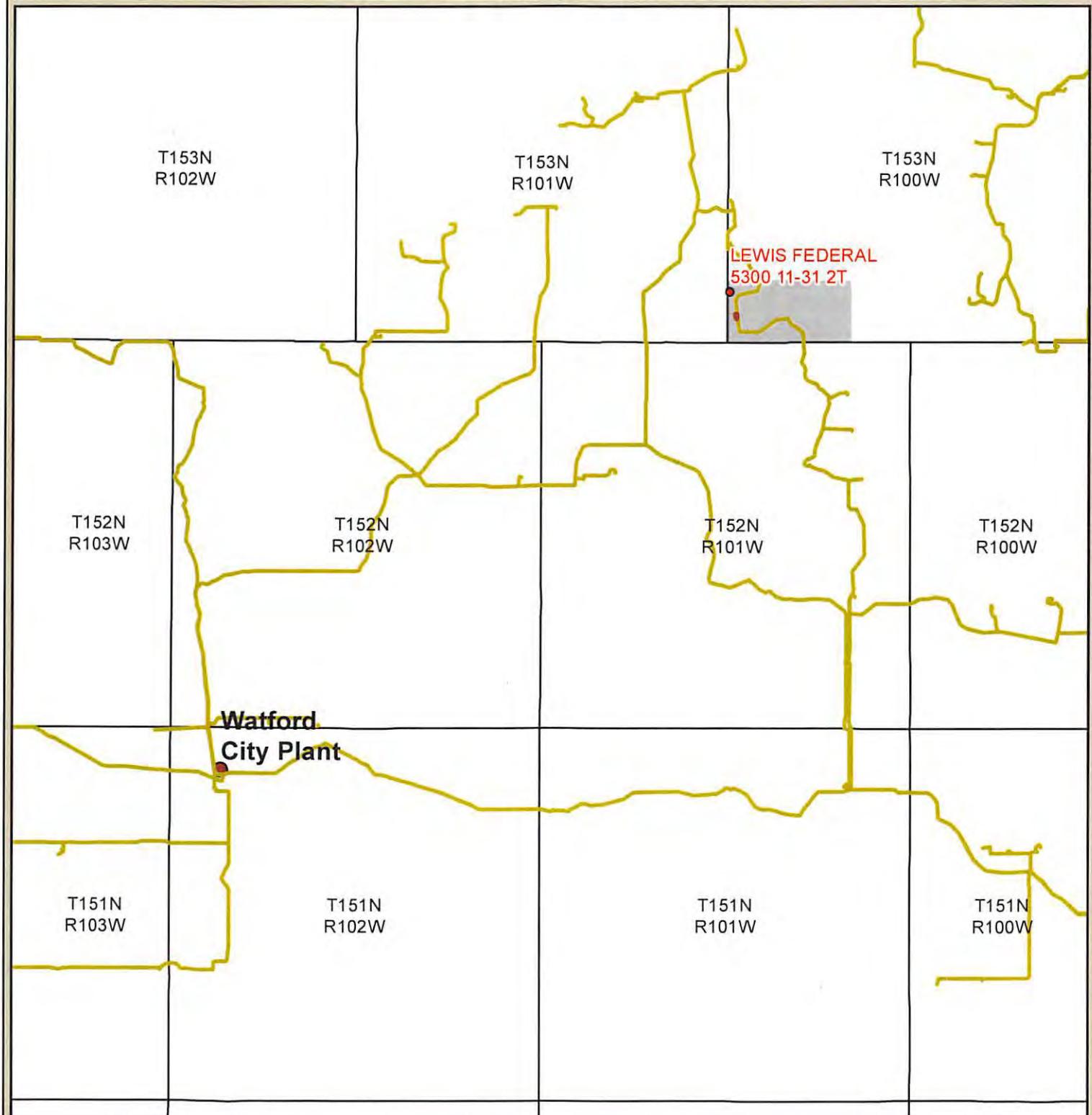


- CTB Outline
- Proposed Well
- Hiland Gas Line
- Oneok Gas Line

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant



Gas Capture Plan - Overview  
LEWIS FEDERAL 5300 11-31 2T  
Section 31 T153N R100W  
McKenzie County, North Dakota



- CTB Outline
- Hiland Gas Line
- Processing Plant

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant





# 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.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

30189

November 7, 2016

OASIS PETRO NO AMER  
1001 FANNIN STE 1500  
HOUSTON, TX 77002

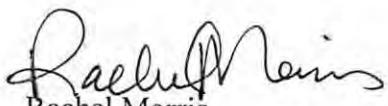
RE: LEWIS FEDERAL 5300 11-31 2T  
LOT1 Sec. 31-153N-100W  
MCKENZIE COUNTY  
WELL FILE NO. 30189

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire December 11, 2016.

Permits to drill are only valid for one year in the State of North Dakota. If you would like to renew for another year, please submit a Form 4 along with the \$100.00 filing fee. Alternatively, you may elect to send in a Form 4 cancelling the permit. If you have any questions, please contact Todd Holweger.

Sincerely,

  
Rachel Morris  
Administrative Assistant



## 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 8749 (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>December 11, 2015</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 checked="" type="checkbox"/> Other	<b>APD Renewal</b>

Well Name and Number <b>Lewis Federal 5300 11-31 2T</b>					
Footages 973 F N L	235 F W L	Qtr-Qtr Lot 1	Section 31	Township 163 N	Range 100 W
Field Baker	Pool Bakken			County McKenzie	

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 requests the above referenced well be renewed. There are no planned changes to the current drill plan.

Please use the credit card on file for the \$100.00 application processing fee.

See attached gas capture plan.

Permit Expires 12/11/16. CC 100.00 12-14-15 KB

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>(281) 404-9652</b>	
Address <b>1001 Fannin St, Suite 1500</b>		
City <b>Houston</b>	State <b>TX</b>	Zip Code <b>77002</b>
Signature 	Printed Name <b>Victoria Siemieniewski</b>	
Title <b>Regulatory Specialist</b>	Date <b>December 1, 2015</b>	
Email Address <b>vsiemieniewski@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>12/11/15</b>	
By 	
Title <b>Engineering Technician</b>	

## **GAS CAPTURE PLAN AFFIDAVIT**

**STATE OF TEXAS** §  
**COUNTY OF HARRIS** §

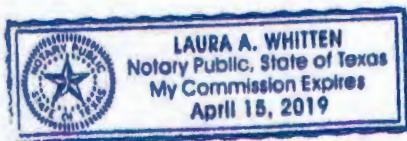
**Robert Eason, being duly sworn, states as follows:**

1. I am employed by Oasis Petroleum North America LLC ("Oasis") as Marketing Manager, I'm over the age of 21 and have personal knowledge of the matters set forth in this affidavit.
  2. This affidavit is submitted in conjunction with the Application for Permit to Drill for the Lewis Federal 5300 11-31 2T well, with a surface location in the NW NW of Section 31, Township 153 North, Range 100 West, McKenzie County, North Dakota (the "Well").
  3. Oasis currently anticipates that gas to be produced from the Well will be gathered by Hiland Partners (the "Gathering Company"). Oasis has advised the Gathering Company of its intent to drill the Well and has advised the Gathering Company that it currently anticipates that the Well will be completed in November 2016, with an initial gas production rate of approximately 840 mcf/day.

**Robert H. Eason**  
**Marketing Manager**

**Robert H. Eason**  
**Marketing Manager**

Subscribed and sworn to before me this 1<sup>st</sup> day of December, 2015.



**Notary Public in and for the State of Texas**

## GAS CAPTURE PLAN – OASIS PETROLEUM

### Lewis Federal 5300 11-31 2T

Section 31-T153N-R100W

Baker Field

McKenzie County, North Dakota

Anticipated first flow date

Nov-16

Gas Gatherer:

Hiland Partners

Gas to be processed at\*:

Watford City Plant

Maximum Daily Capacity of Existing Gas Line*:	91,500 MCFD
Current Throughput of Existing Gas Line*:	70,000 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	91,500 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	82,000 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	There are no plans for expansion at this time.

Map: Attached

Affidavit: Attached

\*Provided by Gatherer

### Flowback Strategy

Total Number of Wells at Location:

7

Multi-Well Start-up Plan: Initial production from the 1st new well at the CTB is anticipated November 2016 with each following well making 1st production every 5th day thereafter

Estimated Flow Rate:

Lewis Federal 5300 11-31 2T

Lewis Federal 5300 31-32 CTB (7 wells)

	<u>MCFD</u>	<u>BOPD</u>	
30 Days:	603	670	MCFD
60 Days:	483	536	3,695
180 Days:	295	328	4,106

	<u>MCFD</u>	<u>BOPD</u>
30 Days:	4,026	4,473
60 Days:	2,265	2,517

### Oasis Flaring Percentage

	<u>Statewide</u>	<u>Baker Field</u>
Oasis % of Gas Flared:	9%	25%

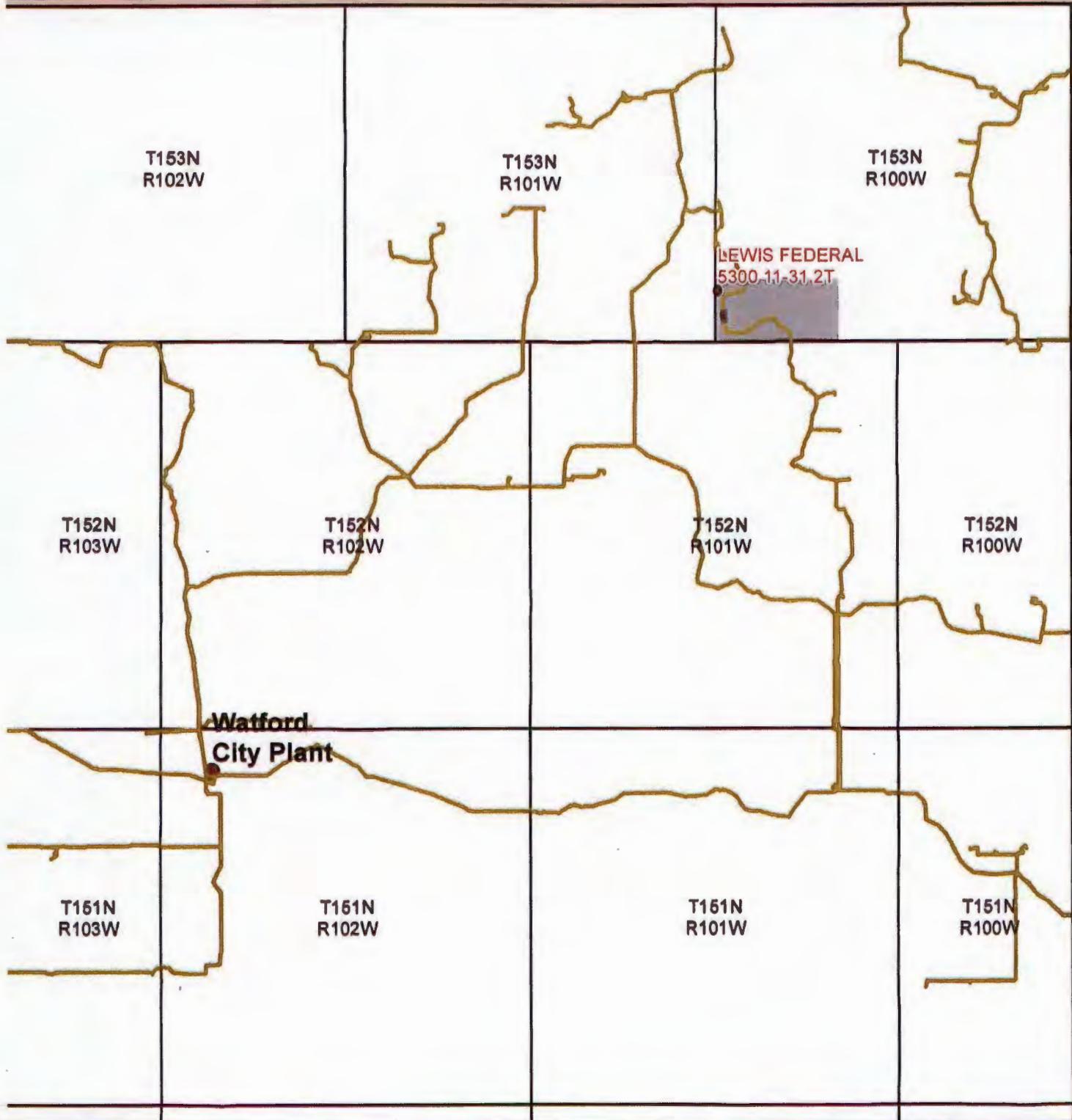
\*Flared percentage reflects October 2015

### Alternatives to Flaring

The installation of a temporary gas liquification unit recovering >50% of C3+ NGLs for an estimated reduction in flared volumes of ~30%

Source: Oasis Marketing (281) 404-9661

**Gas Capture Plan - Overview**  
**LEWIS FEDERAL 5300 11-31 2T**  
**Section 31 T153N R100W**  
**McKenzie County, North Dakota**



CTB Outline

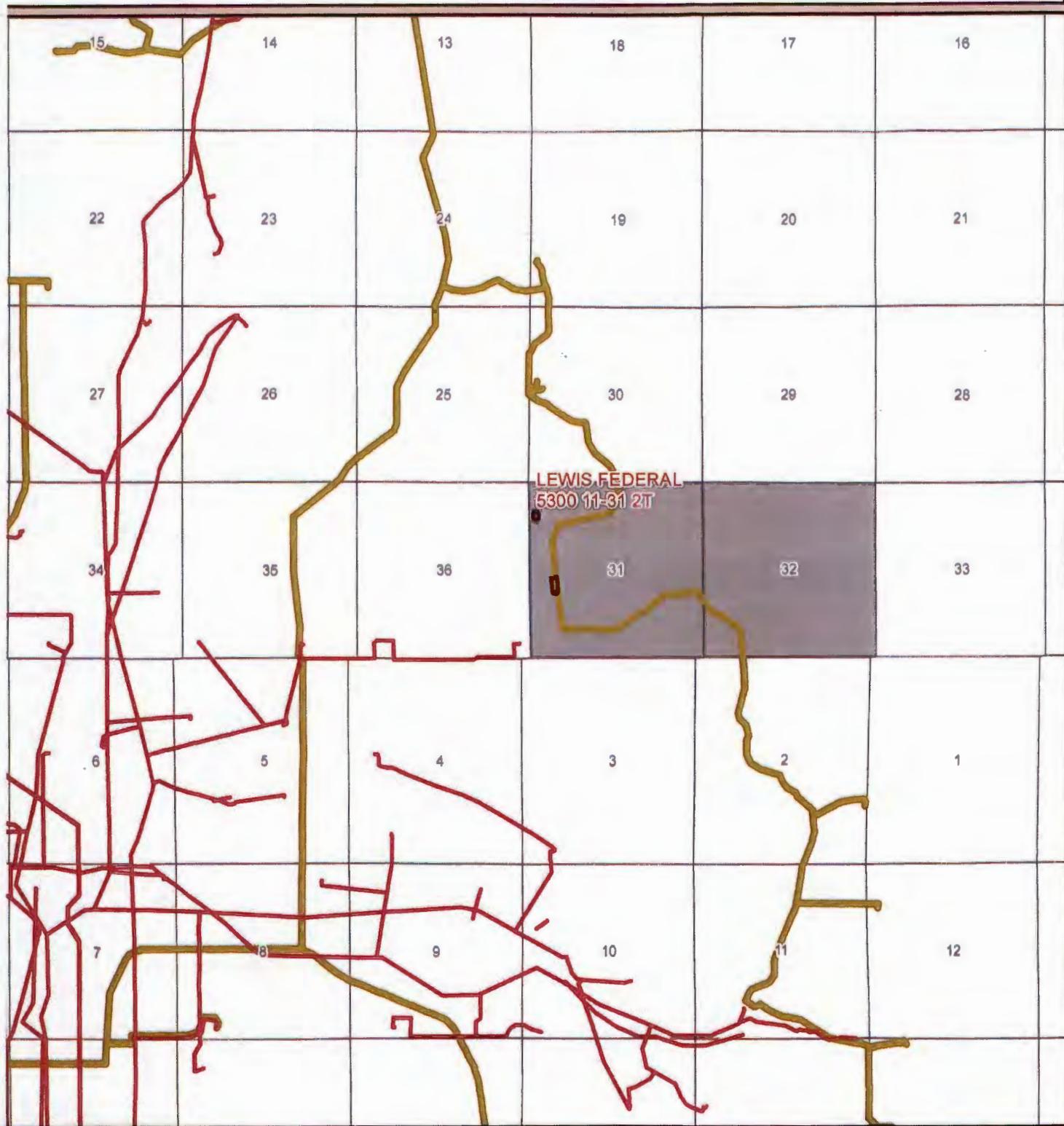
Hiland Gas Line

● Processing Plant

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant

**OASIS**  
PETROLEUM

**Gas Capture Plan - Detail View**  
**LEWIS FEDERAL 5300 11-31 2T**  
**Section 31 T153N R100W**  
**McKenzie County, North Dakota**



- CTB Outline
- Proposed Well
- Hiland Gas Line
- Oneck Gas Line

Gas Gatherer: Hiland Partners, LP  
Gas to be processed at: Watford City Plant

**OASIS**  
PETROLEUM



# **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.dmr.nd.gov/oilgas](http://www.dmr.nd.gov/oilgas)

30189

November 9, 2015

OASIS PETRO NO AMER  
1001 FANNIN STE 1500  
HOUSTON, TX 77002

RE: LEWIS FEDERAL 5300 11-31 2T  
LOT1 Sec. 31-153N-100W  
MCKENZIE COUNTY  
WELL FILE NO. 30189

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire December 11, 2015.

Permits to drill are only valid for one year in the State of North Dakota. If you would like to renew for another year, please submit a Form 4 along with the \$100.00 filing fee. Alternatively, you may elect to send in a Form 4 cancelling the permit. If you have any questions, please contact Todd Holweger.

Sincerely,

  
Rachel Morris  
Administrative Assistant



# Oil and Gas Division

30189

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

## Department of Mineral Resources

Lynn D. Helms - Director

## North Dakota Industrial Commission

[www.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

BRANDI TERRY  
OASIS PETROLEUM NORTH AMERICA LLC  
1001 FANNIN STE 1500  
HOUSTON, TX 77002 USA

Date: 12/15/2014

**RE: CORES AND SAMPLES**

Well Name: **LEWIS FEDERAL 5300 11-31 2T** Well File No.: **30189**  
Location: **LOT1 31-153-100** County: **MCKENZIE**  
Permit Type: **Development - HORIZONTAL**  
Field: **BAKER** Target Horizon: **THREE FORKS B1**

Dear BRANDI TERRY:

North Dakota Century Code 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 under North Dakota Century Code: Section 38-08-04 and North Dakota Administrative Code: Section 43-02-03-38.1.
- 2) Samples: The Operator is to begin collecting sample drill cuttings no lower than the:  
**Base of the Last Charles Salt**
  - Sample cuttings shall be collected at:
    - o 30' maximum intervals through all vertical and build sections.
    - o 100' maximum intervals through any horizontal sections.
  - Samples must be washed, dried, placed in standard sample envelopes (3" x 4.5"), packed in the correct order into standard sample boxes (3.5" x 5.25" x 15.25").
  - Samples boxes are to be carefully identified with a label that indicates the operator, well name, well file number, American Petroleum Institute (API) number, location and depth of samples; and forwarded in to the state core and sample library within 30 days of the completion of drilling operations.
- 3) Cores: Any cores cut shall be preserved in correct order, boxed in standard core boxes (4.5", 4.5", 35.75"), and the entire core forwarded to the state core and samples library within 180 days of completion of drilling operations. Any extension of time must have approval on a Form 4 Sundry Notice.

All cores, core chips, and samples must be shipped, prepaid, to the state core and samples library at the following address:

**ND Geological Survey Core Library  
2835 Campus Road, Stop 8156  
Grand Forks, ND 58202**

North Dakota Century Code 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

Stephen Fried  
Geologist



## 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.  
**30189**

**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 1, 2014</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>Waiver to rule Rule 43-02-03-31</b>	

**Well Name and Number**  
**Lewis Federal 5300 11-31 2T**

Lat 1

### **Footages**

Qtr-Qtr Se

973 F N L      235 F W L ~~NW~~

Township	Range
----------	-------

**153 N**      **100 W**

Field	Pool
S	N

**County**

 Bakken

McKenzie

#### **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:**

#20314

~~The Lewis Federal 5300 31-31H 2,850' S of surface location located within a mile of the subject well.~~

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>281-404-9563</b>
Address <b>1001 Fannin, Suite 1500</b>		
City <b>Houston</b>		State <b>TX</b>
Signature		Printed Name <b>Heather McCowan</b>
Title <b>Heather McCowan</b>		Date <b>March 25, 2014</b>
Email Address <b>hmccowan@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date	12-11-2014
By	
Title	Stephen Fried Geologist



## 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.  
**30189**

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

Notice of Intent

Approximate Start Date  
**December 16, 2014**

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 Program

Spill Report

Redrilling or Repair

Shooting

Casing or Liner

Acidizing

Plug Well

Fracture Treatment

Supplemental History

Change Production Method

Temporarily Abandon

Reclamation

Other

**Offsite Cutting Pit Request**

Well Name and Number

**Lewis Federal 5300 11-31 2T**

Footages <b>973 F N L</b>	Qtr-Qtr <b>235 F W L</b>	Section <b>NWNW</b>	Township <b>31</b>	Range <b>153 N 100 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 respectfully requests approval to utilize an off-site drill cuttings pit for the above well. See attached off-site cutting pit plat and landowner agreement. Cuttings from the following wells are also planned to be disposed of in the same pit:

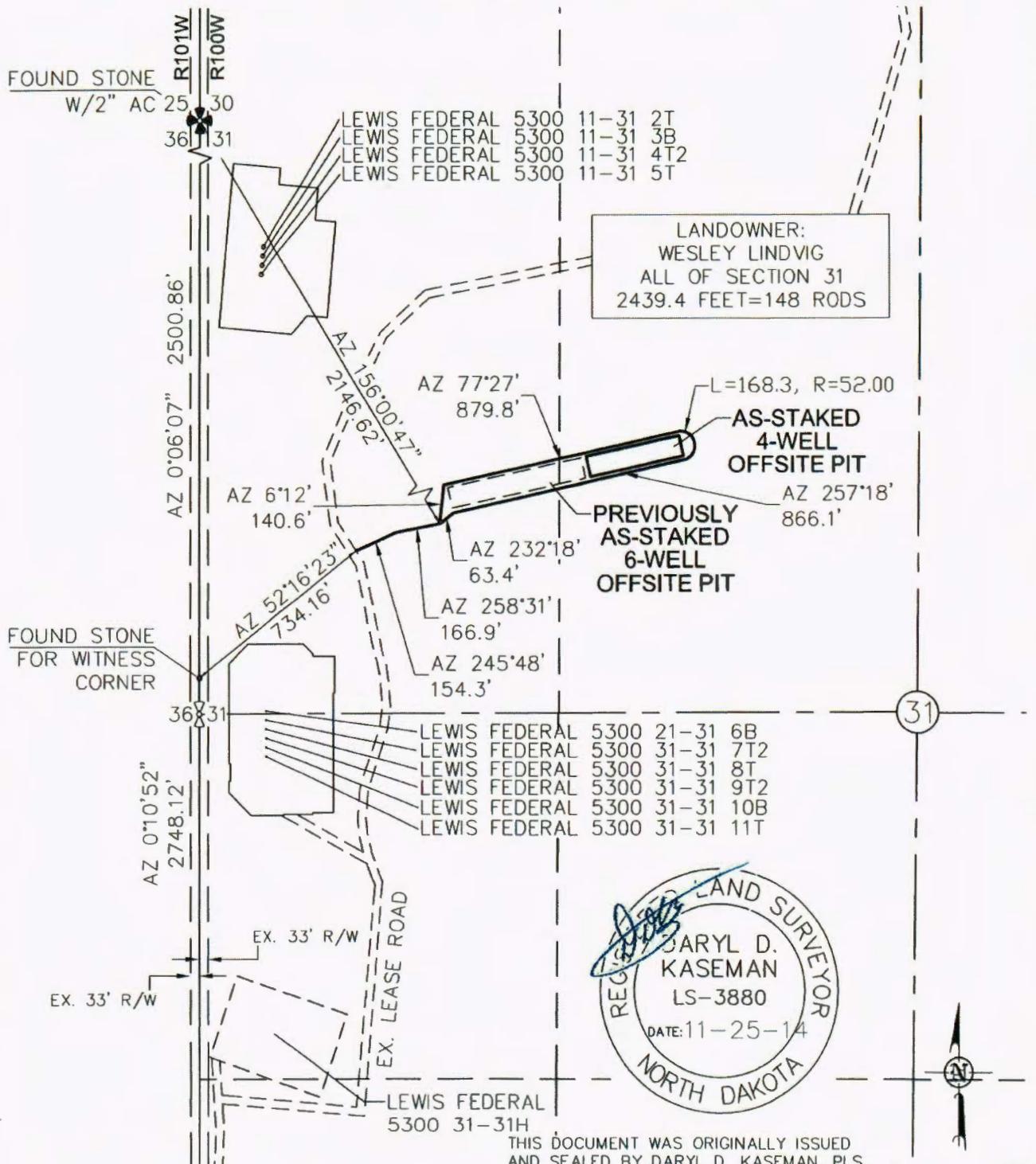
**Lewis Federal 5300 11-31 3B (File No. 30188)  
Lewis Federal 5300 11-31 4T2 (File No. 30187)  
Lewis Federal 5300 11-31 5T (File No. 30186)**

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>(281) 404-9500</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>Victoria Siemieniewski</b>	
Title <b>Regulatory Specialist</b>	Date <b>December 15, 2014</b>	
Email Address <b>vsiemieniewski@oasispetroleum.com</b>		

### FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>12-18-14</b>	
By 	
Title <b>Congresswoman</b>	

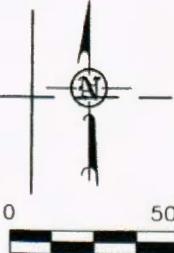
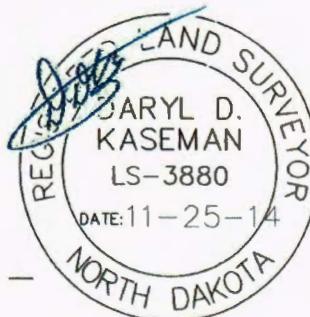
**ACCESS APPROACH**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002  
"AS-STAKED OFFSITE PIT FOR LEWIS FEDERAL 5300 11-31 2T, 3B, 4T2, 5T"  
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

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THIS DOCUMENT WAS ORIGINALLY ISSUED  
AND SEALED BY DARYL D. KASEMAN, PLS,  
REGISTRATION NUMBER 3880  
ON 11-25-14 AND THE ORIGINAL  
DOCUMENTS ARE STORED AT THE OFFICES  
OF INTERSTATE ENGINEERING, INC.



0                  500  
  
1" = 500'

3/3





**INTERSTATE**  
ENGINEERING

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.interstateeng.com](http://www.interstateeng.com)

OASIS PETROLEUM NORTH AMERICA, LLC  
ACCESS APPROACH  
SECTION 31 T153N R100W

**SECTION 31, T155N, R100W  
MCKENZIE COUNTY, NORTH DAKOTA**

Own By: J.D.M. Project No.: S13-09-378.06

## OFF-SITE PIT AGREEMENT

In consideration of the sum of [REDACTED] paid by Oasis Petroleum North America LLC ("Oasis") the undersigned surface owners, Wesley and Barbara Lindvig, husband and wife, whose address is 14075 41<sup>st</sup> St. NW, Alexander, ND 5883 for themselves and their heirs, successors, administrators and assigns, hereby acknowledge the receipt and sufficiency of said payment in full and complete settlement for and as a release of all claim for loss, damage or injury to the hereafter described surface property arising out of the off-site cuttings pit, in which the cuttings from the Lewis Federal 5300 11-31 2T, Lewis Federal 5300 11-31 3B, Lewis Federal 5300 11-31 4T2, Lewis Federal 5300 11-31 5T wells will be buried, located on the approximately two and one half (2.5) acre tract of land identified on the plat attached hereto as Exhibit "A" and which is situated on the following described real property located in McKenzie County, State of North Dakota, towit:

Township 153 North, Range 100 West, 5<sup>th</sup> P.M.  
Section 31: SE/4NW/4

The undersigned knows that Oasis Petroleum North America LLC is the operator and will be drilling the Lewis Federal 5300 11-31 2T, Lewis Federal 5300 11-31 3B, Lewis Federal 5300 11-31 4T2, Lewis Federal 5300 11-31 5T wells. The undersigned further states that they are fully aware that the cuttings generated from the drilling of the Lewis Federal 5300 11-31 2T, Lewis Federal 5300 11-31 3B, Lewis Federal 5300 11-31 4T2, Lewis Federal 5300 11-31 5T wells will be buried in the pit on the above described location.

Dated this 9<sup>th</sup> day of November, 2014.

SURFACE OWNER(S)

Wesley Lindvig

Wesley Lindvig

Barbara L. Lindvig

Barbara Lindvig

ACKNOWLEDGMENT INDIVIDUAL

State of North Dakota )

)

County of McKenzie )

BE IT REMEMBERED, That on this 9 day of ~~November~~<sup>December</sup>, 2014 before me, a Notary Public, in and for said County and State, personally appeared Wesley and Barbara Lindvig, husband and wife, to me known to be the identical persons described in and who executed the within and foregoing instrument and acknowledged to me to that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my official signature and affixed my notarial seal, the day and year last above written.

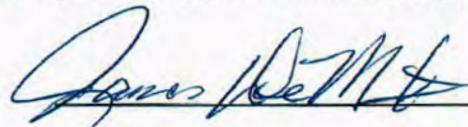
My Commission expires:

JAMES DEMORRETT

Notary Public

State of North Dakota

My Commission Expires Aug. 16, 2018



Notary Public



## 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.  
30189

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 1, 2014</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 <b>Lewis Federal 5300 11-31 2T</b>					
Footages	Qtr-Qtr	Section	Township	Range	
973 F N L 235 F WL	NWNW	31	153 N	100 W	
Field	Pool	County			
	Bakken	McKenzie			

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

Name of Contractor(s) <b>Advanced Energy Services</b>			
Address	City	State	Zip Code

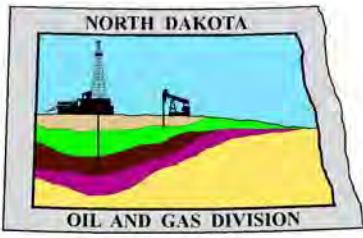
### DETAILS OF WORK

Oasis Petroleum North America LLC requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis Petroleum North America LLC 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 Petroleum North America LLC understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The drilling pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis Petroleum North America LLC 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.

Oasis must notify NDIC Field Inspector Richard Dunn @701-770-3554 with spud and TD.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>(281) 404-9563</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>HEATHER MCCOWAN</b>	
Title <b>REGULATORY ASSISTANT</b>	Date <b>March 25, 2014</b>	
Email Address <b>hmccowan@oasispetroleum.com</b>		

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>12/11/2014</b>	
By <b>David Burns</b>	
Title <b>Engineering Tech.</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](http://www.oilgas.nd.gov)

December 11, 2014

Heather McCowan  
Regulatory Assistant  
OASIS PETROLEUM NORTH AMERICA LLC  
1001 Fannin Suite 1500  
Houston, TX 77002

**RE: HORIZONTAL WELL  
LEWIS FEDERAL 5300 11-31 2T  
LOT1 Section 31-153N-100W  
McKenzie County  
Well File # 30189**

Dear Heather:

Pursuant to Commission Order No. 23752, 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 **500' setback** from the north & south boundaries and **200' setback** from the east & west boundaries within the 1280 acre spacing unit consisting of Sections 31 & 32 T153N R100W. **Tool error is not required pursuant to order.**

**PERMIT STIPULATIONS:** Effective June 1, 2014, a covered leak-proof container (with placard) for filter sock disposal must be maintained on the well site beginning when the well is spud, and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. OASIS PETRO NO AMER must contact NDIC Field Inspector Richard Dunn at 701-770-3554 prior to location construction.

### Drilling pit

NDAC 43-02-03-19.4 states that "a pit may be utilized to bury drill cuttings and solids generated during well drilling and completion operations, providing the pit can be constructed, used and reclaimed in a manner that will prevent pollution of the land surface and freshwaters. Reserve and circulation of mud system through earthen pits are prohibited. All pits shall be inspected by an authorized representative of the director prior to lining and use. Drill cuttings and solids must be stabilized in a manner approved by the director prior to placement in a cuttings pit."

### Form 1 Changes & Hard Lines

Any changes, shortening of casing point or lengthening at Total Depth must have prior approval by the NDIC. The proposed directional plan is at a legal location. Based on the azimuth of the proposed lateral the maximum legal coordinates from the well head are: 473 N & 10097 E.

### 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.

### **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.

Specifically, the Horizontal and Directional well survey frequency is 100 feet in the vertical, 30 feet in the curve (or when sliding) and 90 feet in the lateral.

### **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 (1) a suite of open hole logs from which formation tops and porosity zones can be determined, (2) a Gamma Ray Log run from total depth to ground level elevation of the well bore, and (3) a log from which the presence and quality of cement can be determined (Standard CBL or Ultrasonic cement evaluation log) in every well in which production or intermediate casing has been set, this log must be run prior to completing the well. All logs run must be submitted free of charge, as one digital TIFF (tagged image file format) copy and one digital LAS (log ASCII) formatted copy. Digital logs may be submitted on a standard CD, DVD, or attached to an email sent to [digitallogs@nd.gov](mailto:digitallogs@nd.gov)

Thank you for your cooperation.

Sincerely,

David Burns  
Engineering Technician



# 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>11 / 1 / 2014</b>	Confidential Status <b>No</b>
Operator <b>OASIS PETROLEUM NORTH AMERICA LLC</b>		Telephone Number <b>281-404-9563</b>	
Address <b>1001 Fannin Suite 1500</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>LEWIS FEDERAL</b>			Well Number <b>5300 11-31 2T</b>				
Surface Footages <b>973 F N L      235 F W L</b>		Qtr-Qtr <b>LOT1</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 W</b>	County <b>McKenzie</b>	
Longstring Casing Point Footages <b>722 F N L      679 F W L</b>		Qtr-Qtr <b>LOT1</b>	Section <b>31</b>	Township <b>153 N</b>	Range <b>100 W</b>	County <b>McKenzie</b>	
Longstring Casing Point Coordinates From Well Head <b>251 N From WH      444 E From WH</b>		Azimuth <b>65.61 °</b>	Longstring Total Depth <b>11116 Feet MD      10833 Feet TVD</b>				
Bottom Hole Footages From Nearest Section Line <b>551 F N L      212 F E L</b>		Qtr-Qtr <b>NENE</b>	Section <b>32</b>	Township <b>153 N</b>	Range <b>100 W</b>	County <b>Williams</b>	
Bottom Hole Coordinates From Well Head <b>422 N From WH      10075 E From WH</b>		KOP Lateral 1 <b>10356 Feet MD</b>	Azimuth Lateral 1 <b>90 °</b>	Estimated Total Depth Lateral 1 <b>20772 Feet MD      10924 Feet TVD</b>			
Latitude of Well Head <b>48 ° 02 ' 10.06 "</b>	Longitude of Well Head <b>-103 ° 36 ' 11.55 "</b>	NAD Reference <b>NAD83</b>		Description of Spacing Unit: <b>Sections 31 &amp; 32 T153N R100W</b> (Subject to NDIC Approval)			
Ground Elevation <b>2098 Feet Above S.L.</b>	Acres in Spacing/Drilling Unit <b>1280</b>	Spacing/Drilling Unit Setback Requirement <b>500 Feet N/S      200 Feet E/W</b>		Industrial Commission Order <b>23752</b>			
North Line of Spacing/Drilling Unit <b>10522 Feet</b>	South Line of Spacing/Drilling Unit <b>10535 Feet</b>	East Line of Spacing/Drilling Unit <b>5280 Feet</b>		West Line of Spacing/Drilling Unit <b>5248 Feet</b>			
Objective Horizons <b>Three Forks B1</b>						Pierre Shale Top <b>1984</b>	
Proposed Surface Casing	Size <b>9 - 5/8 "</b>	Weight <b>36 Lb./Ft.</b>	Depth <b>2100 Feet</b>	Cement Volume <b>1184 Sacks</b>	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>32 Lb./Ft.</b>	Longstring Total Depth <b>11116 Feet MD      10833 Feet TVD</b>		Cement Volume <b>769 Sacks</b>	Cement Top <b>4885 Feet</b>	Top Dakota Sand <b>5385 Feet</b>
Base Last Charles Salt (If Applicable) <b>9230 Feet</b>		NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.					
Proposed Logs <b>Triple Combo: KOP to Kibby GR/Res to BSC GR to surf CND through the Dakota</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 Every 100 Feet</b>		Survey Frequency: Build Section <b>30 Feet</b>		Survey Frequency: Lateral <b>90 Feet</b>		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****Documents forwarded by email: Drill plan with drilling fluids, Well Summary with casing/cement plans, Directional Plan & Plot, Plats**

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 °	Estimated Total Depth Lateral 2 Feet MD      Feet TVD			KOP Coordinates From Well Head From WH      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>	County	
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      Feet TVD			KOP Coordinates From Well Head From WH      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>	County	
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      Feet TVD			KOP Coordinates From Well Head From WH      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>	County	
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      Feet TVD			KOP Coordinates From Well Head From WH      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>	County	
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

3 / 24 / 2014

ePermit

Printed Name  
**Heather McCowan**Title  
**Regulatory Assistant****FOR STATE USE ONLY**

Permit and File Number <b>30189</b>	API Number <b>33 - 053 - 06549</b>
Field <b>BAKER</b>	
Pool <b>BAKKEN</b>	Permit Type <b>DEVELOPMENT</b>

**FOR STATE USE ONLY**

Date Approved <b>12 / 11 / 2014</b>
By <b>David Burns</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.  
30189

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 1, 2014</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 <b>Lewis Federal 5300 11-31 2T</b>					
Footages	Qtr-Qtr	Section	Township	Range	
973 F N L 235 F WL	NWNW	31	153 N	100 W	
Field	Pool	County			
	Bakken	McKenzie			

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

Name of Contractor(s) <b>Advanced Energy Services</b>			
Address	City	State	Zip Code

### DETAILS OF WORK

Oasis Petroleum North America LLC requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis Petroleum North America LLC 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 Petroleum North America LLC understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The drilling pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis Petroleum North America LLC 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.

Oasis must notify NDIC Field Inspector Richard Dunn @701-770-3554 with spud and TD.

Company <b>Oasis Petroleum North America LLC</b>	Telephone Number <b>(281) 404-9563</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>HEATHER MCCOWAN</b>	
Title <b>REGULATORY ASSISTANT</b>	Date <b>March 25, 2014</b>	
Email Address <b>hmccowan@oasispetroleum.com</b>		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>12/11/2014</b>	
By <b>David Burns</b>	
Title <b>Engineering Tech.</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](http://www.oilgas.nd.gov)

April 9, 2014

**RE: Filter Socks and Other Filter Media  
Leakproof Container Required  
Oil and Gas Wells**

Dear Operator,

North Dakota Administrative Code Section 43-02-03-19.2 states in part that all waste material associated with exploration or production of oil and gas must be properly disposed of in an authorized facility in accord with all applicable local, state, and federal laws and regulations.

Filtration systems are commonly used during oil and gas operations in North Dakota. The Commission is very concerned about the proper disposal of used filters (including filter socks) used by the oil and gas industry.

Effective June 1, 2014, a container must be maintained on each well drilled in North Dakota beginning when the well is spud and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. The on-site container must be used to store filters until they can be properly disposed of in an authorized facility. Such containers must be:

- leakproof to prevent any fluids from escaping the container
- covered to prevent precipitation from entering the container
- placard to indicate only filters are to be placed in the container

If the operator will not utilize a filtration system, a waiver to the container requirement will be considered, but only upon the operator submitting a Sundry Notice (Form 4) justifying their request.

As previously stated in our March 13, 2014 letter, North Dakota Administrative Code Section 33-20-02.1-01 states in part that every person who transports solid waste (which includes oil and gas exploration and production wastes) is required to have a valid permit issued by the North Dakota Department of Health, Division of Waste Management. Please contact the Division of Waste Management at (701) 328-5166 with any questions on the solid waste program. Note oil and gas exploration and production wastes include produced water, drilling mud, invert mud, tank bottom sediment, pipe scale, filters, and fly ash.

Thank you for your cooperation.

Sincerely,

*Bruce E. Hicks*

Assistant Director

DRILLING PLAN									
OPERATOR	Oasis Petroleum			COUNTY/STATE	McKenzie Co., ND				
WELL NAME	Lewis Federal 5300 11-31 2T			RIG	N/A				
WELL TYPE	Horizontal Three Forks			LOCATION	NW NW 31-153N-100W				
EST. T.D.	20,772'			Surface Location (survey plat):	973' FNL	235' FWL			
TOTAL LATERAL:	9,656'			GROUND ELEV:	2,112'	Sub Height: 22'			
MARKER	TVD	Subsea TVD	LOGS:	Type	Interval				
Pierre	NDIC MAP	1,984		150	OH Logs: Request Log waiver based on the Lewis Federal 5300 31-31H 2,850' S of surface location				
Greenhorn		4,584		-2,450	CBL/GR: Above top of cement/GR to base of casing				
Mowry		4,997		-2,863	MWD GR: KOP to lateral TD				
Dakota		5,385		-3,251					
Rierdon		6,347		-4,213	DEVIATION:	Surf: 3 deg. max., 1 deg / 100'; svry every 500' Prod: 5 deg. max., 1 deg / 100'; svry every 100'			
Dunham Salt		6,877		-4,743					
Dunham Salt Base		6,947		-4,813					
Pine Salt		7,249		-5,115					
Pine Salt Base		7,314		-5,180					
Opeche Salt		7,380		-5,246					
Opeche Salt Base		7,471		-5,337					
Amsden		7,693		-5,559					
Tyler		7,841		-5,707					
Otter/Base Minnelusa		8,065		-5,931	DST'S:	None planned			
Kibbey Lime		8,408		-6,274					
Charles Salt		8,561		-6,427	CORES:	None planned			
Base Last Salt		9,230		-7,096					
Mission Canyon		9,446		-7,312					
Lodgepole		9,987		-7,853					
False Bakken		10,716		-8,582					
Upper Bakken Shale		10,728		-8,594	MUDLOGGING:	Two-Man: Begin 200' above Kibbey 30' samples in curve and lateral			
Middle Bakken		10,744		-8,610					
Lower Bakken Shale		10,780		-8,646					
Pronghorn		10,789		-8,655					
Threeforks		10,810		-8,676					
Threeforks(Top of Target)		10,821		-8,687					
Threeforks(Base of Target)		10,833		-8,699					
Claystone		10,833		-8,699	BOP:	11" 5000 psi blind, pipe & annular			
Est. Dip Rate:	-0.54								
Max. Anticipated BHP:	4694				Surface Formation: Glacial till				
MUD:	Interval	Type	WT	Vis	WL	Remarks			
Surface:	0' -	2,100' FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks			
Intermediate:	2,100' -	11,116' Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks			
Laterl:	11,116' -	20,772' Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks			
CASING:	Size	Wt ppf	Hole	Depth	Cement	WOC	Remarks		
Surface:	9-5/8"	36#	13-1/2"	2,100'	To Surface	12	100' into Pierre		
Intermediate:	7"	29/32#	8-3/4"	11,116'	4885	24	500' above Dakota		
Production Liner:	4.5"	11.6#	6"	20,772'	TOL @ 10,306'		50' above KOP		
PROBABLE PLUGS, IF REQ'D:									
OTHER:	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	ΔZ	Survey Company: Build Rate: 12 deg /100'		
Surface:	2,100	2,100	973' FNL	235' FWL	31-T153N-R100W				
KOP:	10,356'	10,356'	923' FNL	235' FWL	31-T153N-R100W				
EOC:	11,101'	10,833'	728' FNL	666' FWL	31-T153N-R100W				
Casing Point:	11,116'	10,833'	721' FNL	680' FWL	31-T153N-R100W				
Middle Bakken Lateral TD:	20,772'	10,924'	551' FNL	210' FEL	32-T153N-R100W				
Comments:									
Request Log waiver based on the Lewis Federal 5300 31-31H 2,850' S of surface location									
No frac string planned									
35 packers & 15 sleeves									
Oasis Petroleum does not use diesel fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.									
68334-30-5	Fuels, diesel								
68476-34-6	Fuels, diesel, No. 2								
68476-34-6	Fuel oil No. 2								
68476-31-3	Fuel Oil No. 4								
8008-20-6	Kerosene								
Geology: N. Gabelman	1/22/2014		Engineering: A. Soto 3/13/14						



**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2T**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**SURFACE CASING AND CEMENT DESIGN**

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
13-3/8"	0' to <b>2100</b>	54.5	J-55	STC	12.615"	12.459"	4,100	5,470	6,840

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' to <b>2100</b>	13-3/8", 54.5#, J-55, STC, 8rd	1400 / 2.04	2730 / 2.76	689 / 3.45

**API Rating & Safety Factor**

- a) Based on full casing evacuation with 9 ppg fluid on backside (2100' setting depth).
- b) Burst pressure based on 9 ppg fluid with no fluid on backside (2100' setting depth).
- c) Based on string weight in 9 ppg fluid at 2100' TVD plus 100k# overpull. (Buoyed weight equals 99k lbs.)

Cement volumes are based on 9-5/8" casing set in 13-1/2" hole with **40%** excess to circulate cement back to surface.  
Mix and pump the following slurry.

**Pre-flush (Spacer):      10 bbls** fresh water

**Lead Slurry:**      **884 sks** (313 bbls) Conventional system with 75 lb/sk cement, 2% extender, 10% expanding agent, 2% CaCl2 and 0.5 lb/sk lost circulation control agent

**Tail Slurry:**      **300 sks** (62 bbls) Conventional system with 94 lb/sk cement, 0.2% CaCl2, and .3 lb/sk lost circulation control agent

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2T**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

**CONTINGENCY 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>
9-5/8"	0' - 6400'	40	L-80	LTC	8.835"	8.75"**	5,450	7,270	9,090

\*\*Special Drift

<b>Interval</b>	<b>Description</b>	<b>Collapse</b>	<b>Burst</b>	<b>Tension</b>
		(psi) a	(psi) b	(1000 lbs) c
0' - 6400'	9-5/8", 40#, HCP-110, LTC, 8rd	3090 / 3.71*	5750 / 1.24	837 / 3.86

**API Rating & Safety Factor**

- a) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000psi and a subsequent breakdown at the 9-5/8" shoe, based on a 13.5#/ft fracture gradient. Backup of 9 ppg fluid.
- b) Collapse pressure based on 11.5ppg fluid on backside and 9ppg fluid inside of casing.
- c) Yield based on string weight in 10 ppg fluid, (217k lbs buoyed weight) plus 100k lbs overpull.

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with **30%** excess.

**Pre-flush (Spacer):**      **20 bbls** Chem wash

**Lead Slurry:**      **592 sks** (210 bbls) Conventional system with 75 lb/sk cement, 0.5lb/sk lost circulation, 10% expanding agent, 2% extender, 2% CaCl<sub>2</sub>, 0.2% anti foam, and 0.4% fluid loss

**Tail Slurry:**      **521 sks** (108 bbls) Conventional system with 94 lb/sk cement, 0.3% anti-settling agent, 0.3% fluid loss agent, 0.3 lb/sk lost circulation control agent, 0.2% anti foam, and 0.1% retarder

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2T**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

INTERMEDIATE CASING AND CEMENT DESIGN

Intermediate Casing Design

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
7"	0' - 11116'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	11210

\*\*Special Drift

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' - 11116'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.09*	12460 / 1.28	897 / 2.23
6677' - 9230'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.06**	12460 / 1.30	

API Rating & Safety Factor

- a) \*Assume full casing evacuation with 10 ppg fluid on backside. \*\*Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.
- b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10833' TVD.
- c) Based on string weight in 10 ppg fluid, (301k lbs buoyed weight) plus 100k lbs overpull.

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with **30%** excess.

**Pre-flush (Spacer):**      **20 bbls** Chem wash  
**70 bbls** 10.6# Scavenger

**Lead Slurry:**      **184 sks** (85 bbls) Conventional system with 24 lb/sk cement, 54lb/sk extender, 3% KCl, 0.5% viscosifier, 0.2% anti foam, 0.5lb/sk lost circulation

**Tail Slurry:**      **585 sks** (171 bbls) Conventional system with 94 lb/sk cement, 3% KCl, 35% Silica, 0.2% fluid loss agent, 0.5 lb/sk lost circulation control agent and 0.4% retarder

**Oasis Petroleum**  
**Well Summary**  
**Lewis Federal 5300 11-31 2T**  
**Section 31 T153N R100W**  
**McKenzie County, ND**

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Estimated Torque
4-1/2"	10306' - 20805'	13.5	P-110	BTC	3.920"	3.795"	4500

Interval	Description	Collapse (psi) a	Burst (psi) b	Tension (1000 lbs) c
10306' - 20772'	4-1/2", 13.5 lb, P-110, BTC, 8rd	10670 / 1.97	12410 / 1.28	443 / 2.01

API Rating & Safety Factor

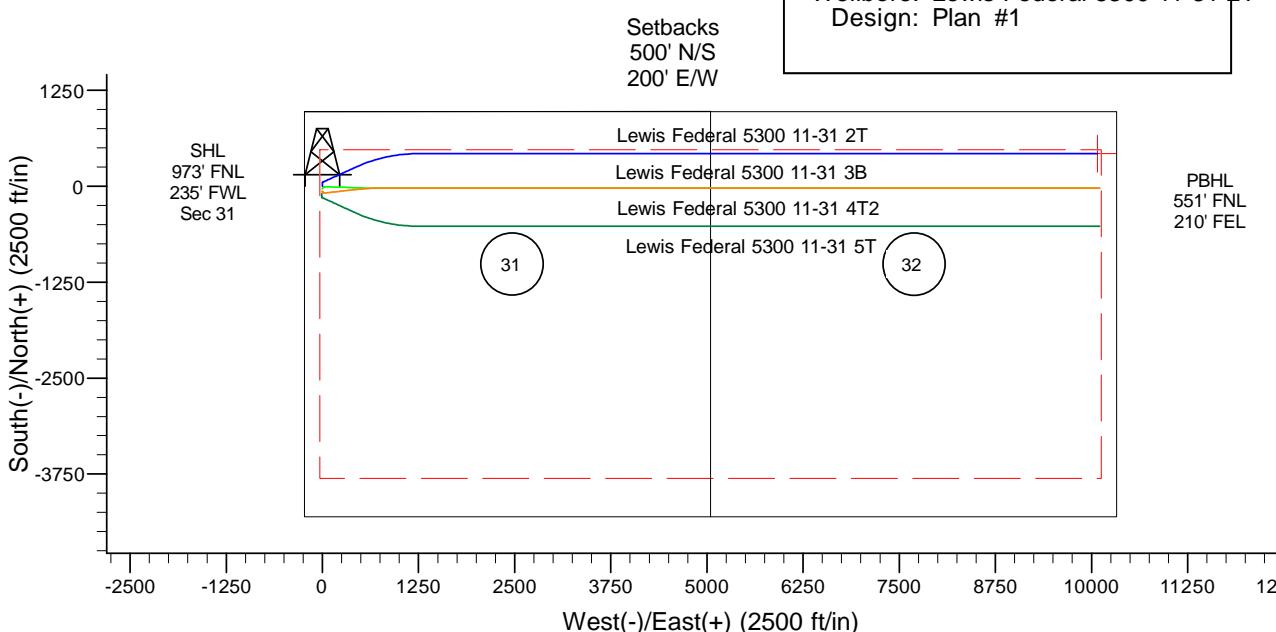
- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10925' TVD.  
Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient
- b) and 9 ppg external fluid gradient @ 10924' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 120k lbs.) plus 100k lbs overpull.



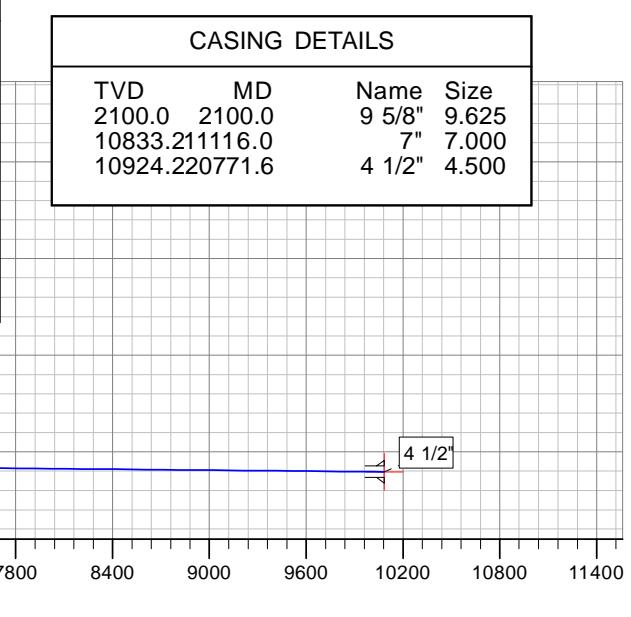
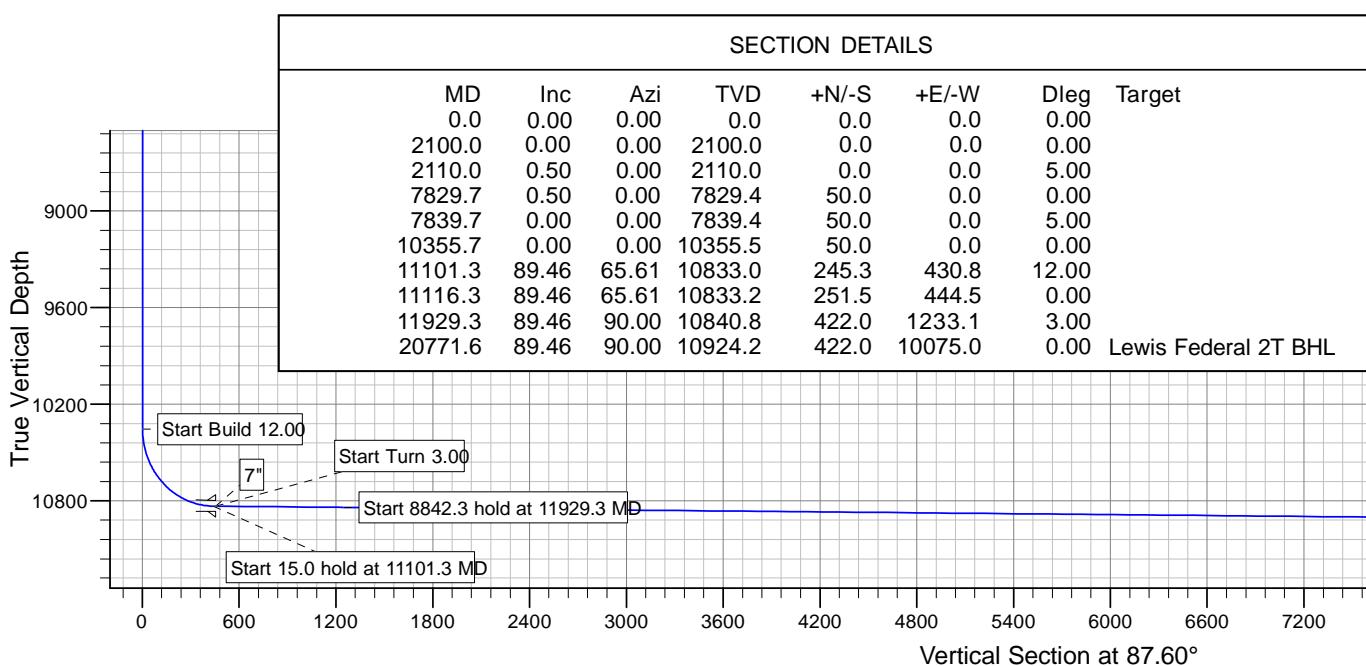
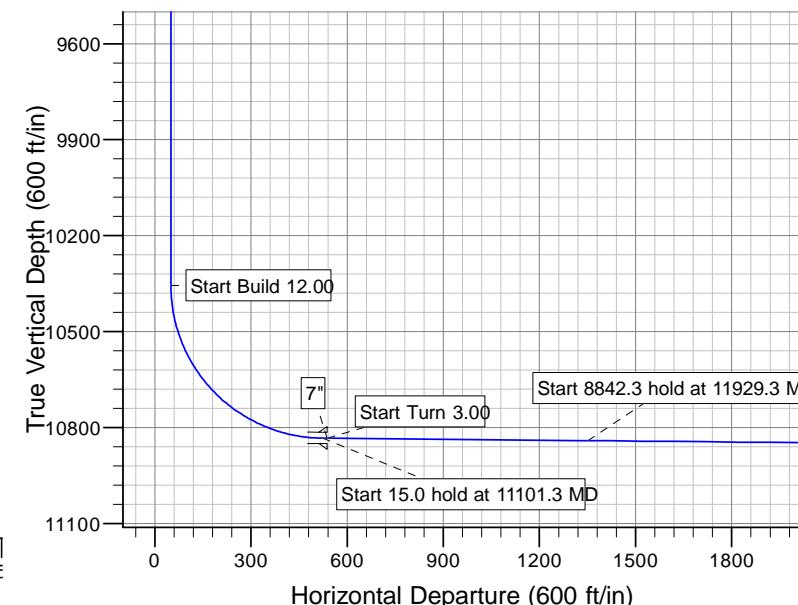
Azimuths to True North  
Magnetic North: 8.16°  
  
Magnetic Field  
Strength: 56474.1snT  
Dip Angle: 72.94°  
Date: 3/11/2014  
Model: IGRF200510



Project: Indian Hills  
Site: 153N-100W-31/32  
Well: Lewis Federal 5300 11-31 2T  
Wellbore: Lewis Federal 5300 11-31 2T  
Design: Plan #1



SITE DETAILS: 153N-100W-31/32	
Site Centre Latitude:	48° 1' 42.010 N
Longitude:	103° 36' 10.620 W
Positional Uncertainty:	0.0
Convergence:	-2.31
Local North:	True



# **Oasis**

**Indian Hills  
153N-100W-31/32  
Lewis Federal 5300 11-31 2T**

**Lewis Federal 5300 11-31 2T**

**Plan: Plan #1**

# **Standard Planning Report**

**24 March, 2014**

## Planning Report

<b>Database:</b> <b>Company:</b> <b>Project:</b> <b>Site:</b> <b>Well:</b> <b>Wellbore:</b> <b>Design:</b>	OpenWellsCompass - EDM Prod Oasis Indian Hills 153N-100W-31/32 Lewis Federal 5300 11-31 2T Lewis Federal 5300 11-31 2T Plan #1	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	Well Lewis Federal 5300 11-31 2T WELL @ 2134.0ft (Original Well Elev) WELL @ 2134.0ft (Original Well Elev) True Minimum Curvature							
<b>Project</b>	Indian Hills									
<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>	153N-100W-31/32									
<b>Site Position:</b>	<b>From:</b> Lat/Long	<b>Northing:</b> Easting:	<b>Latitude:</b> <b>Longitude:</b>							
<b>Position Uncertainty:</b>		0.0 ft Slot Radius:	13.200 in <b>Grid Convergence:</b>							
			48° 1' 42.010 N 103° 36' 10.620 W -2.31 °							
<b>Well</b>	Lewis Federal 5300 11-31 2T									
<b>Well Position</b>	+N/-S +E/-W	2,842.2 ft -63.2 ft	<b>Northing:</b> <b>Easting:</b>							
		0.0 ft	393,241.77 ft 1,209,520.20 ft							
<b>Position Uncertainty</b>			<b>Latitude:</b> <b>Longitude:</b> <b>Ground Level:</b>							
			48° 2' 10.060 N 103° 36' 11.550 W 2,112.0 ft							
<b>Wellbore</b>	Lewis Federal 5300 11-31 2T									
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b> (°)							
	IGRF200510	3/11/2014	8.16							
			<b>Dip Angle</b> (°)							
			72.94							
			<b>Field Strength</b> (nT)							
			56,474							
<b>Design</b>	Plan #1									
<b>Audit Notes:</b>										
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>							
<b>Vertical Section:</b>	<b>Depth From (TVD)</b> (ft)	<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)							
	0.0	0.0	<b>Direction</b> (°)							
			87.60							
<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (/100ft)	Build Rate (/100ft)	Turn Rate (/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
2,110.0	0.50	0.00	2,110.0	0.0	0.0	5.00	5.00	0.00	0.00	0.00
7,829.7	0.50	0.00	7,829.4	50.0	0.0	0.00	0.00	0.00	0.00	0.00
7,839.7	0.00	0.00	7,839.4	50.0	0.0	5.00	-5.00	0.00	180.00	
10,355.7	0.00	0.00	10,355.5	50.0	0.0	0.00	0.00	0.00	0.00	
11,101.3	89.46	65.61	10,833.0	245.3	430.8	12.00	12.00	0.00	65.61	
11,116.3	89.46	65.61	10,833.2	251.5	444.5	0.00	0.00	0.00	0.00	
11,929.3	89.46	90.00	10,840.8	422.0	1,233.1	3.00	0.00	3.00	90.00	
20,771.6	89.46	90.00	10,924.2	422.0	10,075.0	0.00	0.00	0.00	0.00	Lewis Federal 2T BHL

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<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	
1,984.0	0.00	0.00	1,984.0	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	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
<b>9 5/8"</b>										
2,110.0	0.50	0.00	2,110.0	0.0	0.0	0.0	5.00	5.00	0.00	
2,200.0	0.50	0.00	2,200.0	0.8	0.0	0.0	0.00	0.00	0.00	
2,300.0	0.50	0.00	2,300.0	1.7	0.0	0.1	0.00	0.00	0.00	
2,400.0	0.50	0.00	2,400.0	2.6	0.0	0.1	0.00	0.00	0.00	
2,500.0	0.50	0.00	2,500.0	3.4	0.0	0.1	0.00	0.00	0.00	
2,600.0	0.50	0.00	2,600.0	4.3	0.0	0.2	0.00	0.00	0.00	
2,700.0	0.50	0.00	2,700.0	5.2	0.0	0.2	0.00	0.00	0.00	
2,800.0	0.50	0.00	2,800.0	6.1	0.0	0.3	0.00	0.00	0.00	
2,900.0	0.50	0.00	2,900.0	6.9	0.0	0.3	0.00	0.00	0.00	
3,000.0	0.50	0.00	3,000.0	7.8	0.0	0.3	0.00	0.00	0.00	
3,100.0	0.50	0.00	3,100.0	8.7	0.0	0.4	0.00	0.00	0.00	
3,200.0	0.50	0.00	3,200.0	9.6	0.0	0.4	0.00	0.00	0.00	
3,300.0	0.50	0.00	3,300.0	10.4	0.0	0.4	0.00	0.00	0.00	
3,400.0	0.50	0.00	3,400.0	11.3	0.0	0.5	0.00	0.00	0.00	
3,500.0	0.50	0.00	3,499.9	12.2	0.0	0.5	0.00	0.00	0.00	
3,600.0	0.50	0.00	3,599.9	13.0	0.0	0.5	0.00	0.00	0.00	
3,700.0	0.50	0.00	3,699.9	13.9	0.0	0.6	0.00	0.00	0.00	
3,800.0	0.50	0.00	3,799.9	14.8	0.0	0.6	0.00	0.00	0.00	
3,900.0	0.50	0.00	3,899.9	15.7	0.0	0.7	0.00	0.00	0.00	
4,000.0	0.50	0.00	3,999.9	16.5	0.0	0.7	0.00	0.00	0.00	
4,100.0	0.50	0.00	4,099.9	17.4	0.0	0.7	0.00	0.00	0.00	
4,200.0	0.50	0.00	4,199.9	18.3	0.0	0.8	0.00	0.00	0.00	
4,300.0	0.50	0.00	4,299.9	19.2	0.0	0.8	0.00	0.00	0.00	
4,400.0	0.50	0.00	4,399.9	20.0	0.0	0.8	0.00	0.00	0.00	
4,500.0	0.50	0.00	4,499.9	20.9	0.0	0.9	0.00	0.00	0.00	
4,584.1	0.50	0.00	4,584.0	21.6	0.0	0.9	0.00	0.00	0.00	
<b>Greenhorn</b>										
4,600.0	0.50	0.00	4,599.9	21.8	0.0	0.9	0.00	0.00	0.00	
4,700.0	0.50	0.00	4,699.9	22.6	0.0	0.9	0.00	0.00	0.00	
4,800.0	0.50	0.00	4,799.9	23.5	0.0	1.0	0.00	0.00	0.00	

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<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)	
4,900.0	0.50	0.00	4,899.9	24.4	0.0	1.0	0.00	0.00	0.00	0.00
4,997.1	0.50	0.00	4,997.0	25.2	0.0	1.1	0.00	0.00	0.00	0.00
<b>Mowry</b>										
5,000.0	0.50	0.00	4,999.9	25.3	0.0	1.1	0.00	0.00	0.00	0.00
5,100.0	0.50	0.00	5,099.9	26.1	0.0	1.1	0.00	0.00	0.00	0.00
5,200.0	0.50	0.00	5,199.9	27.0	0.0	1.1	0.00	0.00	0.00	0.00
5,300.0	0.50	0.00	5,299.9	27.9	0.0	1.2	0.00	0.00	0.00	0.00
5,385.1	0.50	0.00	5,385.0	28.6	0.0	1.2	0.00	0.00	0.00	0.00
<b>Dakota</b>										
5,400.0	0.50	0.00	5,399.9	28.8	0.0	1.2	0.00	0.00	0.00	0.00
5,500.0	0.50	0.00	5,499.9	29.6	0.0	1.2	0.00	0.00	0.00	0.00
5,600.0	0.50	0.00	5,599.9	30.5	0.0	1.3	0.00	0.00	0.00	0.00
5,700.0	0.50	0.00	5,699.9	31.4	0.0	1.3	0.00	0.00	0.00	0.00
5,800.0	0.50	0.00	5,799.9	32.2	0.0	1.3	0.00	0.00	0.00	0.00
5,900.0	0.50	0.00	5,899.9	33.1	0.0	1.4	0.00	0.00	0.00	0.00
6,000.0	0.50	0.00	5,999.9	34.0	0.0	1.4	0.00	0.00	0.00	0.00
6,100.0	0.50	0.00	6,099.8	34.9	0.0	1.5	0.00	0.00	0.00	0.00
6,200.0	0.50	0.00	6,199.8	35.7	0.0	1.5	0.00	0.00	0.00	0.00
6,300.0	0.50	0.00	6,299.8	36.6	0.0	1.5	0.00	0.00	0.00	0.00
6,347.2	0.50	0.00	6,347.0	37.0	0.0	1.5	0.00	0.00	0.00	0.00
<b>Rierdon</b>										
6,400.0	0.50	0.00	6,399.8	37.5	0.0	1.6	0.00	0.00	0.00	0.00
6,500.0	0.50	0.00	6,499.8	38.4	0.0	1.6	0.00	0.00	0.00	0.00
6,600.0	0.50	0.00	6,599.8	39.2	0.0	1.6	0.00	0.00	0.00	0.00
6,700.0	0.50	0.00	6,699.8	40.1	0.0	1.7	0.00	0.00	0.00	0.00
6,800.0	0.50	0.00	6,799.8	41.0	0.0	1.7	0.00	0.00	0.00	0.00
6,877.2	0.50	0.00	6,877.0	41.6	0.0	1.7	0.00	0.00	0.00	0.00
<b>Dunham Salt</b>										
6,900.0	0.50	0.00	6,899.8	41.8	0.0	1.8	0.00	0.00	0.00	0.00
6,947.2	0.50	0.00	6,947.0	42.3	0.0	1.8	0.00	0.00	0.00	0.00
<b>Dunham Salt Base</b>										
7,000.0	0.50	0.00	6,999.8	42.7	0.0	1.8	0.00	0.00	0.00	0.00
7,100.0	0.50	0.00	7,099.8	43.6	0.0	1.8	0.00	0.00	0.00	0.00
7,200.0	0.50	0.00	7,199.8	44.5	0.0	1.9	0.00	0.00	0.00	0.00
7,249.2	0.50	0.00	7,249.0	44.9	0.0	1.9	0.00	0.00	0.00	0.00
<b>Pine Salt</b>										
7,300.0	0.50	0.00	7,299.8	45.3	0.0	1.9	0.00	0.00	0.00	0.00
7,314.2	0.50	0.00	7,314.0	45.5	0.0	1.9	0.00	0.00	0.00	0.00
<b>Pine Salt Base</b>										
7,380.2	0.50	0.00	7,380.0	46.0	0.0	1.9	0.00	0.00	0.00	0.00
<b>Opecche Salt</b>										
7,400.0	0.50	0.00	7,399.8	46.2	0.0	1.9	0.00	0.00	0.00	0.00
7,471.2	0.50	0.00	7,471.0	46.8	0.0	2.0	0.00	0.00	0.00	0.00
<b>Opecche Salt Base</b>										
7,500.0	0.50	0.00	7,499.8	47.1	0.0	2.0	0.00	0.00	0.00	0.00
7,600.0	0.50	0.00	7,599.8	48.0	0.0	2.0	0.00	0.00	0.00	0.00
7,693.2	0.50	0.00	7,693.0	48.8	0.0	2.0	0.00	0.00	0.00	0.00
<b>Amsden</b>										
7,700.0	0.50	0.00	7,699.8	48.8	0.0	2.0	0.00	0.00	0.00	0.00
7,800.0	0.50	0.00	7,799.8	49.7	0.0	2.1	0.00	0.00	0.00	0.00
7,829.7	0.50	0.00	7,829.4	50.0	0.0	2.1	0.00	0.00	0.00	0.00
7,839.7	0.00	0.00	7,839.4	50.0	0.0	2.1	5.00	-5.00	0.00	0.00
7,841.2	0.00	0.00	7,841.0	50.0	0.0	2.1	0.00	0.00	0.00	0.00
<b>Tyler</b>										

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<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)
7,900.0	0.00	0.00	7,899.8	50.0	0.0	2.1	0.00	0.00	0.00
8,000.0	0.00	0.00	7,999.8	50.0	0.0	2.1	0.00	0.00	0.00
8,065.2	0.00	0.00	8,065.0	50.0	0.0	2.1	0.00	0.00	0.00
<b>Otter/Base Minnelusa</b>									
8,100.0	0.00	0.00	8,099.8	50.0	0.0	2.1	0.00	0.00	0.00
8,200.0	0.00	0.00	8,199.8	50.0	0.0	2.1	0.00	0.00	0.00
8,300.0	0.00	0.00	8,299.8	50.0	0.0	2.1	0.00	0.00	0.00
8,400.0	0.00	0.00	8,399.8	50.0	0.0	2.1	0.00	0.00	0.00
8,408.2	0.00	0.00	8,408.0	50.0	0.0	2.1	0.00	0.00	0.00
<b>Kibbey Lime</b>									
8,500.0	0.00	0.00	8,499.8	50.0	0.0	2.1	0.00	0.00	0.00
8,561.2	0.00	0.00	8,561.0	50.0	0.0	2.1	0.00	0.00	0.00
<b>Charles Salt</b>									
8,600.0	0.00	0.00	8,599.8	50.0	0.0	2.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,699.8	50.0	0.0	2.1	0.00	0.00	0.00
8,800.0	0.00	0.00	8,799.8	50.0	0.0	2.1	0.00	0.00	0.00
8,900.0	0.00	0.00	8,899.8	50.0	0.0	2.1	0.00	0.00	0.00
9,000.0	0.00	0.00	8,999.8	50.0	0.0	2.1	0.00	0.00	0.00
9,100.0	0.00	0.00	9,099.8	50.0	0.0	2.1	0.00	0.00	0.00
9,200.0	0.00	0.00	9,199.8	50.0	0.0	2.1	0.00	0.00	0.00
9,230.2	0.00	0.00	9,230.0	50.0	0.0	2.1	0.00	0.00	0.00
<b>Base Last Salt</b>									
9,300.0	0.00	0.00	9,299.8	50.0	0.0	2.1	0.00	0.00	0.00
9,400.0	0.00	0.00	9,399.8	50.0	0.0	2.1	0.00	0.00	0.00
9,446.2	0.00	0.00	9,446.0	50.0	0.0	2.1	0.00	0.00	0.00
<b>Mission Canyon</b>									
9,500.0	0.00	0.00	9,499.8	50.0	0.0	2.1	0.00	0.00	0.00
9,600.0	0.00	0.00	9,599.8	50.0	0.0	2.1	0.00	0.00	0.00
9,700.0	0.00	0.00	9,699.8	50.0	0.0	2.1	0.00	0.00	0.00
9,800.0	0.00	0.00	9,799.8	50.0	0.0	2.1	0.00	0.00	0.00
9,900.0	0.00	0.00	9,899.8	50.0	0.0	2.1	0.00	0.00	0.00
9,987.2	0.00	0.00	9,987.0	50.0	0.0	2.1	0.00	0.00	0.00
<b>Lodgepole</b>									
10,000.0	0.00	0.00	9,999.8	50.0	0.0	2.1	0.00	0.00	0.00
10,100.0	0.00	0.00	10,099.8	50.0	0.0	2.1	0.00	0.00	0.00
10,200.0	0.00	0.00	10,199.8	50.0	0.0	2.1	0.00	0.00	0.00
10,300.0	0.00	0.00	10,299.8	50.0	0.0	2.1	0.00	0.00	0.00
10,355.7	0.00	0.00	10,355.5	50.0	0.0	2.1	0.00	0.00	0.00
10,375.0	2.31	65.61	10,374.8	50.2	0.4	2.5	12.00	12.00	0.00
10,400.0	5.31	65.61	10,399.7	50.8	1.9	4.0	12.00	12.00	0.00
10,425.0	8.31	65.61	10,424.5	52.1	4.6	6.7	12.00	12.00	0.00
10,450.0	11.31	65.61	10,449.2	53.8	8.4	10.7	12.00	12.00	0.00
10,475.0	14.31	65.61	10,473.5	56.1	13.5	15.8	12.00	12.00	0.00
10,500.0	17.31	65.61	10,497.6	58.9	19.7	22.1	12.00	12.00	0.00
10,525.0	20.31	65.61	10,521.3	62.3	27.0	29.6	12.00	12.00	0.00
10,550.0	23.31	65.61	10,544.5	66.1	35.5	38.2	12.00	12.00	0.00
10,575.0	26.31	65.61	10,567.2	70.4	45.0	48.0	12.00	12.00	0.00
10,600.0	29.31	65.61	10,589.3	75.2	55.7	58.8	12.00	12.00	0.00
10,625.0	32.31	65.61	10,610.7	80.5	67.3	70.6	12.00	12.00	0.00
10,650.0	35.31	65.61	10,631.5	86.3	80.0	83.5	12.00	12.00	0.00
10,675.0	38.31	65.61	10,651.5	92.5	93.6	97.4	12.00	12.00	0.00
10,700.0	41.31	65.61	10,670.7	99.1	108.2	112.3	12.00	12.00	0.00
10,725.0	44.31	65.61	10,689.1	106.1	123.7	128.0	12.00	12.00	0.00
10,750.0	47.31	65.61	10,706.5	113.5	140.0	144.6	12.00	12.00	0.00
10,764.3	49.02	65.61	10,716.0	117.9	149.7	154.5	12.00	12.00	0.00

## Planning Report

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<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<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>False Bakken</b>									
10,775.0	50.31	65.61	10,723.0	121.2	157.1	162.1	12.00	12.00	0.00
10,783.0	51.27	65.61	10,728.0	123.8	162.8	167.8	12.00	12.00	0.00
<b>Upper Bakken Shale</b>									
10,800.0	53.30	65.61	10,738.4	129.4	175.0	180.3	12.00	12.00	0.00
10,809.5	54.45	65.61	10,744.0	132.5	182.0	187.4	12.00	12.00	0.00
<b>Middle Bakken</b>									
10,825.0	56.30	65.61	10,752.8	137.8	193.6	199.2	12.00	12.00	0.00
10,850.0	59.30	65.61	10,766.1	146.5	212.9	218.8	12.00	12.00	0.00
10,875.0	62.30	65.61	10,778.3	155.5	232.8	239.1	12.00	12.00	0.00
10,878.7	62.74	65.61	10,780.0	156.9	235.7	242.1	12.00	12.00	0.00
<b>Lower Bakken Shale</b>									
10,899.2	65.20	65.61	10,789.0	164.5	252.5	259.2	12.00	12.00	0.00
<b>Pronghorn</b>									
10,900.0	65.30	65.61	10,789.4	164.8	253.2	259.9	12.00	12.00	0.00
10,925.0	68.30	65.61	10,799.2	174.3	274.1	281.2	12.00	12.00	0.00
10,950.0	71.30	65.61	10,807.8	184.0	295.5	302.9	12.00	12.00	0.00
10,956.9	72.14	65.61	10,810.0	186.7	301.5	309.0	12.00	12.00	0.00
<b>Threeforks</b>									
10,975.0	74.30	65.61	10,815.2	193.8	317.2	325.1	12.00	12.00	0.00
10,998.5	77.12	65.61	10,821.0	203.2	337.9	346.1	12.00	12.00	0.00
<b>Threeforks(Top of Target)</b>									
11,000.0	77.30	65.61	10,821.4	203.8	339.3	347.5	12.00	12.00	0.00
11,025.0	80.30	65.61	10,826.2	214.0	361.6	370.3	12.00	12.00	0.00
11,050.0	83.30	65.61	10,829.8	224.2	384.2	393.2	12.00	12.00	0.00
11,075.0	86.30	65.61	10,832.0	234.5	406.8	416.3	12.00	12.00	0.00
11,101.3	89.46	65.61	10,833.0	245.3	430.8	440.7	12.00	12.00	0.00
11,116.0	89.46	65.61	10,833.2	251.4	444.2	454.3	0.00	0.00	0.00
<b>7"</b>									
11,116.3	89.46	65.61	10,833.2	251.5	444.5	454.6	0.00	0.00	0.00
11,200.0	89.46	68.12	10,834.0	284.4	521.4	532.8	3.00	0.00	3.00
11,300.0	89.46	71.12	10,834.9	319.2	615.1	627.9	3.00	0.00	3.00
11,400.0	89.46	74.12	10,835.8	349.1	710.5	724.5	3.00	0.00	3.00
11,500.0	89.46	77.12	10,836.8	373.9	807.4	822.3	3.00	0.00	3.00
11,600.0	89.46	80.12	10,837.7	393.6	905.4	921.1	3.00	0.00	3.00
11,700.0	89.46	83.12	10,838.7	408.2	1,004.3	1,020.5	3.00	0.00	3.00
11,800.0	89.46	86.12	10,839.6	417.6	1,103.9	1,120.4	3.00	0.00	3.00
11,900.0	89.46	89.12	10,840.5	421.7	1,203.8	1,220.4	3.00	0.00	3.00
11,929.3	89.46	90.00	10,840.8	422.0	1,233.1	1,249.7	3.00	0.00	3.00
12,000.0	89.46	90.00	10,841.5	422.0	1,303.8	1,320.3	0.00	0.00	0.00
12,100.0	89.46	90.00	10,842.4	422.0	1,403.8	1,420.2	0.00	0.00	0.00
12,200.0	89.46	90.00	10,843.4	422.0	1,503.8	1,520.1	0.00	0.00	0.00
12,300.0	89.46	90.00	10,844.3	422.0	1,603.8	1,620.0	0.00	0.00	0.00
12,400.0	89.46	90.00	10,845.3	422.0	1,703.8	1,719.9	0.00	0.00	0.00
12,500.0	89.46	90.00	10,846.2	422.0	1,803.7	1,819.8	0.00	0.00	0.00
12,600.0	89.46	90.00	10,847.1	422.0	1,903.7	1,919.7	0.00	0.00	0.00
12,700.0	89.46	90.00	10,848.1	422.0	2,003.7	2,019.6	0.00	0.00	0.00
12,800.0	89.46	90.00	10,849.0	422.0	2,103.7	2,119.5	0.00	0.00	0.00
12,900.0	89.46	90.00	10,850.0	422.0	2,203.7	2,219.5	0.00	0.00	0.00
13,000.0	89.46	90.00	10,850.9	422.0	2,303.7	2,319.4	0.00	0.00	0.00
13,100.0	89.46	90.00	10,851.9	422.0	2,403.7	2,419.3	0.00	0.00	0.00
13,200.0	89.46	90.00	10,852.8	422.0	2,503.7	2,519.2	0.00	0.00	0.00
13,300.0	89.46	90.00	10,853.7	422.0	2,603.7	2,619.1	0.00	0.00	0.00
13,400.0	89.46	90.00	10,854.7	422.0	2,703.7	2,719.0	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<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)
13,500.0	89.46	90.00	10,855.6	422.0	2,803.7	2,818.9	0.00	0.00	0.00
13,600.0	89.46	90.00	10,856.6	422.0	2,903.7	2,918.8	0.00	0.00	0.00
13,700.0	89.46	90.00	10,857.5	422.0	3,003.7	3,018.7	0.00	0.00	0.00
13,800.0	89.46	90.00	10,858.5	422.0	3,103.7	3,118.6	0.00	0.00	0.00
13,900.0	89.46	90.00	10,859.4	422.0	3,203.7	3,218.5	0.00	0.00	0.00
14,000.0	89.46	90.00	10,860.3	422.0	3,303.7	3,318.4	0.00	0.00	0.00
14,100.0	89.46	90.00	10,861.3	422.0	3,403.7	3,418.4	0.00	0.00	0.00
14,200.0	89.46	90.00	10,862.2	422.0	3,503.7	3,518.3	0.00	0.00	0.00
14,300.0	89.46	90.00	10,863.2	422.0	3,603.7	3,618.2	0.00	0.00	0.00
14,400.0	89.46	90.00	10,864.1	422.0	3,703.7	3,718.1	0.00	0.00	0.00
14,500.0	89.46	90.00	10,865.1	422.0	3,803.7	3,818.0	0.00	0.00	0.00
14,600.0	89.46	90.00	10,866.0	422.0	3,903.7	3,917.9	0.00	0.00	0.00
14,700.0	89.46	90.00	10,866.9	422.0	4,003.6	4,017.8	0.00	0.00	0.00
14,800.0	89.46	90.00	10,867.9	422.0	4,103.6	4,117.7	0.00	0.00	0.00
14,900.0	89.46	90.00	10,868.8	422.0	4,203.6	4,217.6	0.00	0.00	0.00
15,000.0	89.46	90.00	10,869.8	422.0	4,303.6	4,317.5	0.00	0.00	0.00
15,100.0	89.46	90.00	10,870.7	422.0	4,403.6	4,417.4	0.00	0.00	0.00
15,200.0	89.46	90.00	10,871.7	422.0	4,503.6	4,517.3	0.00	0.00	0.00
15,300.0	89.46	90.00	10,872.6	422.0	4,603.6	4,617.2	0.00	0.00	0.00
15,400.0	89.46	90.00	10,873.5	422.0	4,703.6	4,717.2	0.00	0.00	0.00
15,500.0	89.46	90.00	10,874.5	422.0	4,803.6	4,817.1	0.00	0.00	0.00
15,600.0	89.46	90.00	10,875.4	422.0	4,903.6	4,917.0	0.00	0.00	0.00
15,700.0	89.46	90.00	10,876.4	422.0	5,003.6	5,016.9	0.00	0.00	0.00
15,800.0	89.46	90.00	10,877.3	422.0	5,103.6	5,116.8	0.00	0.00	0.00
15,900.0	89.46	90.00	10,878.2	422.0	5,203.6	5,216.7	0.00	0.00	0.00
16,000.0	89.46	90.00	10,879.2	422.0	5,303.6	5,316.6	0.00	0.00	0.00
16,100.0	89.46	90.00	10,880.1	422.0	5,403.6	5,416.5	0.00	0.00	0.00
16,200.0	89.46	90.00	10,881.1	422.0	5,503.6	5,516.4	0.00	0.00	0.00
16,300.0	89.46	90.00	10,882.0	422.0	5,603.6	5,616.3	0.00	0.00	0.00
16,400.0	89.46	90.00	10,883.0	422.0	5,703.6	5,716.2	0.00	0.00	0.00
16,500.0	89.46	90.00	10,883.9	422.0	5,803.6	5,816.1	0.00	0.00	0.00
16,600.0	89.46	90.00	10,884.8	422.0	5,903.6	5,916.1	0.00	0.00	0.00
16,700.0	89.46	90.00	10,885.8	422.0	6,003.6	6,016.0	0.00	0.00	0.00
16,800.0	89.46	90.00	10,886.7	422.0	6,103.6	6,115.9	0.00	0.00	0.00
16,900.0	89.46	90.00	10,887.7	422.0	6,203.6	6,215.8	0.00	0.00	0.00
17,000.0	89.46	90.00	10,888.6	422.0	6,303.5	6,315.7	0.00	0.00	0.00
17,100.0	89.46	90.00	10,889.6	422.0	6,403.5	6,415.6	0.00	0.00	0.00
17,200.0	89.46	90.00	10,890.5	422.0	6,503.5	6,515.5	0.00	0.00	0.00
17,300.0	89.46	90.00	10,891.4	422.0	6,603.5	6,615.4	0.00	0.00	0.00
17,400.0	89.46	90.00	10,892.4	422.0	6,703.5	6,715.3	0.00	0.00	0.00
17,500.0	89.46	90.00	10,893.3	422.0	6,803.5	6,815.2	0.00	0.00	0.00
17,600.0	89.46	90.00	10,894.3	422.0	6,903.5	6,915.1	0.00	0.00	0.00
17,700.0	89.46	90.00	10,895.2	422.0	7,003.5	7,015.0	0.00	0.00	0.00
17,800.0	89.46	90.00	10,896.2	422.0	7,103.5	7,114.9	0.00	0.00	0.00
17,900.0	89.46	90.00	10,897.1	422.0	7,203.5	7,214.9	0.00	0.00	0.00
18,000.0	89.46	90.00	10,898.0	422.0	7,303.5	7,314.8	0.00	0.00	0.00
18,100.0	89.46	90.00	10,899.0	422.0	7,403.5	7,414.7	0.00	0.00	0.00
18,200.0	89.46	90.00	10,899.9	422.0	7,503.5	7,514.6	0.00	0.00	0.00
18,300.0	89.46	90.00	10,900.9	422.0	7,603.5	7,614.5	0.00	0.00	0.00
18,400.0	89.46	90.00	10,901.8	422.0	7,703.5	7,714.4	0.00	0.00	0.00
18,500.0	89.46	90.00	10,902.8	422.0	7,803.5	7,814.3	0.00	0.00	0.00
18,600.0	89.46	90.00	10,903.7	422.0	7,903.5	7,914.2	0.00	0.00	0.00
18,700.0	89.46	90.00	10,904.6	422.0	8,003.5	8,014.1	0.00	0.00	0.00
18,800.0	89.46	90.00	10,905.6	422.0	8,103.5	8,114.0	0.00	0.00	0.00
18,900.0	89.46	90.00	10,906.5	422.0	8,203.5	8,213.9	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<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)
19,000.0	89.46	90.00	10,907.5	422.0	8,303.5	8,313.8	0.00	0.00	0.00
19,100.0	89.46	90.00	10,908.4	422.0	8,403.5	8,413.8	0.00	0.00	0.00
19,200.0	89.46	90.00	10,909.3	422.0	8,503.4	8,513.7	0.00	0.00	0.00
19,300.0	89.46	90.00	10,910.3	422.0	8,603.4	8,613.6	0.00	0.00	0.00
19,400.0	89.46	90.00	10,911.2	422.0	8,703.4	8,713.5	0.00	0.00	0.00
19,500.0	89.46	90.00	10,912.2	422.0	8,803.4	8,813.4	0.00	0.00	0.00
19,600.0	89.46	90.00	10,913.1	422.0	8,903.4	8,913.3	0.00	0.00	0.00
19,700.0	89.46	90.00	10,914.1	422.0	9,003.4	9,013.2	0.00	0.00	0.00
19,800.0	89.46	90.00	10,915.0	422.0	9,103.4	9,113.1	0.00	0.00	0.00
19,900.0	89.46	90.00	10,915.9	422.0	9,203.4	9,213.0	0.00	0.00	0.00
20,000.0	89.46	90.00	10,916.9	422.0	9,303.4	9,312.9	0.00	0.00	0.00
20,100.0	89.46	90.00	10,917.8	422.0	9,403.4	9,412.8	0.00	0.00	0.00
20,200.0	89.46	90.00	10,918.8	422.0	9,503.4	9,512.7	0.00	0.00	0.00
20,300.0	89.46	90.00	10,919.7	422.0	9,603.4	9,612.6	0.00	0.00	0.00
20,400.0	89.46	90.00	10,920.7	422.0	9,703.4	9,712.6	0.00	0.00	0.00
20,500.0	89.46	90.00	10,921.6	422.0	9,803.4	9,812.5	0.00	0.00	0.00
20,600.0	89.46	90.00	10,922.5	422.0	9,903.4	9,912.4	0.00	0.00	0.00
20,700.0	89.46	90.00	10,923.5	422.0	10,003.4	10,012.3	0.00	0.00	0.00
20,771.6	89.46	90.00	10,924.2	422.0	10,075.0	10,083.8	0.00	0.00	0.00

Lewis Federal 2T BHL

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/S (ft)	+E/W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Lewis Federal 2T BHL	0.00	0.00	10,924.5	422.0	10,075.0	393,257.49	1,219,604.03	48° 2' 14.198 N	103° 33' 43.292 W
- plan misses target center by 0.4ft at 20771.6ft MD (10924.2 TVD, 422.0 N, 10075.0 E)									
- Point									

Casing Points									
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (in)	Hole Diameter (in)			
2,100.0	2,100.0	9 5/8"			9.625	13.500			
11,116.0	10,833.2	7"			7.000	8.750			
20,804.6		4 1/2"			4.500	6.000			

## Planning Report

<b>Database:</b>	OpenWellsCompass - EDM Prod	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Company:</b>	Oasis	<b>TVD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Project:</b>	Indian Hills	<b>MD Reference:</b>	WELL @ 2134.0ft (Original Well Elev)
<b>Site:</b>	153N-100W-31/32	<b>North Reference:</b>	True
<b>Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Lewis Federal 5300 11-31 2T		
<b>Design:</b>	Plan #1		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,984.0	1,984.0	Pierre				
4,584.1	4,584.0	Greenhorn				
4,997.1	4,997.0	Mowry				
5,385.1	5,385.0	Dakota				
6,347.2	6,347.0	Rierdon				
6,877.2	6,877.0	Dunham Salt				
6,947.2	6,947.0	Dunham Salt Base				
7,249.2	7,249.0	Pine Salt				
7,314.2	7,314.0	Pine Salt Base				
7,380.2	7,380.0	Opeche Salt				
7,471.2	7,471.0	Opeche Salt Base				
7,693.2	7,693.0	Amsden				
7,841.2	7,841.0	Tyler				
8,065.2	8,065.0	Otter/Base Minnelusa				
8,408.2	8,408.0	Kibbey Lime				
8,561.2	8,561.0	Charles Salt				
9,230.2	9,230.0	Base Last Salt				
9,446.2	9,446.0	Mission Canyon				
9,987.2	9,987.0	Lodgepole				
10,764.3	10,716.0	False Bakken				
10,783.0	10,728.0	Upper Bakken Shale				
10,809.5	10,744.0	Middle Bakken				
10,878.7	10,780.0	Lower Bakken Shale				
10,899.2	10,789.0	Pronghorn				
10,956.9	10,810.0	Threeforks				
10,998.5	10,821.0	Threeforks(Top of Target)				

# **Oasis**

**Indian Hills  
153N-100W-31/32  
Lewis Federal 5300 11-31 2T**

**Lewis Federal 5300 11-31 2T  
Plan #1**

## **Anticollision Report**

**11 March, 2014**

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference	Plan #1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 10,000.0 usft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

Survey Tool Program	Date	3/11/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	20,804.2	Plan #1 (Lewis Federal 5300 11-31 2T)		MWD MWD - Standard

Site Name	Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
153N-100W-31/32	Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31	2,100.0	2,100.0	32.5	23.4	3.550	CC
	Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31	20,804.6	20,640.9	454.6	-124.0	0.786	Level 1, ES, SF
	Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-3	2,100.0	2,100.0	66.1	57.0	7.216	CC
	Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-3	20,804.6	20,757.0	449.5	-136.5	0.767	Level 1, ES, SF
	Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31	2,100.0	2,100.0	98.7	89.5	10.766	CC, ES
	Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31	20,804.6	20,812.9	943.3	355.0	1.604	SF

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31 3B - Plan #1											Offset Site Error:	0.0 usft	
Survey Program: 0-MWD											Offset Well Error:	0.0 usft	
Measured Depth (usft)	Vertical Depth (usft)	Reference Offset		Semi Major Axis			Distance					Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset +N/-S (usft)	Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-175.21	-32.4	-2.7	32.5				
100.0	100.0	100.0	100.0	0.1	0.1	-175.21	-32.4	-2.7	32.5	32.4	0.18	185.596	
200.0	200.0	200.0	200.0	0.3	0.3	-175.21	-32.4	-2.7	32.5	31.9	0.62	52.074	
300.0	300.0	300.0	300.0	0.5	0.5	-175.21	-32.4	-2.7	32.5	31.5	1.07	30.286	
400.0	400.0	400.0	400.0	0.8	0.8	-175.21	-32.4	-2.7	32.5	31.0	1.52	21.352	
500.0	500.0	500.0	500.0	1.0	1.0	-175.21	-32.4	-2.7	32.5	30.6	1.97	16.488	
600.0	600.0	600.0	600.0	1.2	1.2	-175.21	-32.4	-2.7	32.5	30.1	2.42	13.429	
700.0	700.0	700.0	700.0	1.4	1.4	-175.21	-32.4	-2.7	32.5	29.7	2.87	11.327	
800.0	800.0	800.0	800.0	1.7	1.7	-175.21	-32.4	-2.7	32.5	29.2	3.32	9.795	
900.0	900.0	900.0	900.0	1.9	1.9	-175.21	-32.4	-2.7	32.5	28.8	3.77	8.627	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-175.21	-32.4	-2.7	32.5	28.3	4.22	7.708	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	-175.21	-32.4	-2.7	32.5	27.9	4.67	6.967	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-175.21	-32.4	-2.7	32.5	27.4	5.12	6.355	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-175.21	-32.4	-2.7	32.5	27.0	5.57	5.842	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-175.21	-32.4	-2.7	32.5	26.5	6.02	5.406	
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.2	-175.21	-32.4	-2.7	32.5	26.1	6.47	5.030	
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-175.21	-32.4	-2.7	32.5	25.6	6.92	4.703	
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	-175.21	-32.4	-2.7	32.5	25.2	7.37	4.416	
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	-175.21	-32.4	-2.7	32.5	24.7	7.82	4.162	
1,900.0	1,900.0	1,900.0	1,900.0	4.1	4.1	-175.21	-32.4	-2.7	32.5	24.3	8.27	3.936	
2,000.0	2,000.0	2,000.0	2,000.0	4.4	4.4	-175.21	-32.4	-2.7	32.5	23.8	8.72	3.733	
2,100.0	2,100.0	2,100.0	2,100.0	4.6	4.6	-175.21	-32.4	-2.7	32.5	23.4	9.17	3.550 CC	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31 3B - Plan #1													Offset Site Error:	0.0 usft		
Survey Program: 0-MWD															Offset Well Error:	0.0 usft
References		Offset		Semi Major Axis			Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			Warning	
2,110.0	2,110.0	2,110.2	2,110.2	4.6	4.6	-175.27	-32.4	-2.7	32.5	23.3	9.21	3.534				
2,200.0	2,200.0	2,200.2	2,200.2	4.8	4.8	-176.27	-31.8	-2.1	32.7	23.1	9.61	3.407				
2,300.0	2,300.0	2,300.2	2,300.2	5.0	5.0	-177.37	-31.2	-1.5	33.0	22.9	10.05	3.279				
2,400.0	2,400.0	2,400.2	2,400.2	5.3	5.2	-178.45	-30.6	-0.9	33.2	22.7	10.49	3.163				
2,500.0	2,500.0	2,500.2	2,500.2	5.5	5.5	-179.52	-30.0	-0.3	33.4	22.5	10.94	3.057				
2,600.0	2,600.0	2,600.2	2,600.2	5.7	5.7	179.43	-29.4	0.3	33.7	22.3	11.38	2.960				
2,700.0	2,700.0	2,700.2	2,700.2	5.9	5.9	178.39	-28.8	1.0	34.0	22.1	11.83	2.872				
2,800.0	2,800.0	2,800.2	2,800.2	6.2	6.1	177.37	-28.1	1.6	34.2	22.0	12.27	2.790				
2,900.0	2,900.0	2,900.2	2,900.2	6.4	6.3	176.37	-27.5	2.2	34.5	21.8	12.72	2.715				
3,000.0	3,000.0	3,000.2	3,000.2	6.6	6.6	175.38	-26.9	2.8	34.8	21.7	13.16	2.646				
3,100.0	3,100.0	3,100.2	3,100.2	6.8	6.8	174.41	-26.3	3.4	35.1	21.5	13.61	2.582				
3,200.0	3,200.0	3,200.2	3,200.2	7.1	7.0	173.46	-25.7	4.0	35.5	21.4	14.05	2.523				
3,300.0	3,300.0	3,300.2	3,300.1	7.3	7.2	172.52	-25.0	4.7	35.8	21.3	14.50	2.468				
3,400.0	3,400.0	3,400.2	3,400.1	7.5	7.4	171.60	-24.4	5.3	36.1	21.2	14.94	2.417				
3,500.0	3,499.9	3,500.2	3,500.1	7.7	7.7	170.70	-23.8	5.9	36.5	21.1	15.39	2.369				
3,600.0	3,599.9	3,600.2	3,600.1	8.0	7.9	169.82	-23.2	6.5	36.8	21.0	15.84	2.325				
3,700.0	3,699.9	3,700.2	3,700.1	8.2	8.1	168.95	-22.6	7.1	37.2	20.9	16.29	2.284				
3,800.0	3,799.9	3,800.2	3,800.1	8.4	8.3	168.11	-22.0	7.7	37.6	20.8	16.73	2.245				
3,900.0	3,899.9	3,900.2	3,900.1	8.6	8.6	167.27	-21.3	8.4	37.9	20.8	17.18	2.209				
4,000.0	3,999.9	4,000.2	4,000.1	8.9	8.8	166.46	-20.7	9.0	38.3	20.7	17.63	2.175				
4,100.0	4,099.9	4,100.2	4,100.1	9.1	9.0	165.66	-20.1	9.6	38.7	20.7	18.07	2.143				
4,200.0	4,199.9	4,200.2	4,200.1	9.3	9.2	164.88	-19.5	10.2	39.1	20.6	18.52	2.113				
4,300.0	4,299.9	4,300.2	4,300.1	9.5	9.4	164.11	-18.9	10.8	39.5	20.6	18.97	2.085				
4,400.0	4,399.9	4,400.2	4,400.1	9.8	9.7	163.36	-18.3	11.4	40.0	20.5	19.42	2.058				
4,500.0	4,499.9	4,500.2	4,500.1	10.0	9.9	162.62	-17.6	12.1	40.4	20.5	19.86	2.033				
4,600.0	4,599.9	4,600.2	4,600.1	10.2	10.1	161.90	-17.0	12.7	40.8	20.5	20.31	2.010				
4,700.0	4,699.9	4,700.2	4,700.1	10.4	10.3	161.20	-16.4	13.3	41.3	20.5	20.76	1.987				
4,800.0	4,799.9	4,800.2	4,800.1	10.7	10.6	160.51	-15.8	13.9	41.7	20.5	21.21	1.966				
4,900.0	4,899.9	4,900.2	4,900.0	10.9	10.8	159.84	-15.2	14.5	42.2	20.5	21.66	1.946				
5,000.0	4,999.9	5,000.2	5,000.0	11.1	11.0	159.18	-14.6	15.1	42.6	20.5	22.10	1.928				
5,100.0	5,099.9	5,100.1	5,100.0	11.3	11.2	158.53	-13.9	15.8	43.1	20.5	22.55	1.910				
5,200.0	5,199.9	5,200.1	5,200.0	11.6	11.5	157.90	-13.3	16.4	43.5	20.5	23.00	1.893				
5,300.0	5,299.9	5,300.1	5,300.0	11.8	11.7	157.28	-12.7	17.0	44.0	20.6	23.45	1.877				
5,400.0	5,399.9	5,400.1	5,400.0	12.0	11.9	156.67	-12.1	17.6	44.5	20.6	23.90	1.862				
5,500.0	5,499.9	5,500.1	5,500.0	12.2	12.1	156.08	-11.5	18.2	45.0	20.6	24.34	1.847				
5,600.0	5,599.9	5,600.1	5,600.0	12.5	12.3	155.50	-10.9	18.8	45.4	20.7	24.79	1.833				
5,700.0	5,699.9	5,700.1	5,700.0	12.7	12.6	154.93	-10.2	19.5	45.9	20.7	25.24	1.820				
5,800.0	5,799.9	5,800.1	5,800.0	12.9	12.8	154.37	-9.6	20.1	46.4	20.7	25.69	1.808				
5,900.0	5,899.9	5,900.1	5,900.0	13.1	13.0	153.83	-9.0	20.7	46.9	20.8	26.14	1.796				
6,000.0	5,999.9	6,000.1	6,000.0	13.4	13.2	153.30	-8.4	21.3	47.4	20.9	26.58	1.784				
6,100.0	6,099.8	6,100.1	6,100.0	13.6	13.5	152.78	-7.8	21.9	47.9	20.9	27.03	1.774				
6,200.0	6,199.8	6,200.0	6,199.8	13.8	13.7	152.69	-7.4	22.3	48.6	21.1	27.47	1.768				
6,300.0	6,299.8	6,300.0	6,299.8	14.0	13.9	153.16	-7.4	22.3	49.3	21.4	27.91	1.768				
6,400.0	6,399.8	6,400.0	6,399.8	14.3	14.1	153.61	-7.4	22.3	50.1	21.8	28.36	1.768				
6,500.0	6,499.8	6,500.0	6,499.8	14.5	14.3	154.05	-7.4	22.3	50.9	22.1	28.81	1.767				
6,600.0	6,599.8	6,600.0	6,599.8	14.7	14.6	154.47	-7.4	22.3	51.7	22.4	29.25	1.767				
6,700.0	6,699.8	6,700.0	6,699.8	14.9	14.8	154.88	-7.4	22.3	52.5	22.8	29.70	1.767				
6,800.0	6,799.8	6,800.0	6,799.8	15.1	15.0	155.28	-7.4	22.3	53.3	23.1	30.15	1.767				
6,900.0	6,899.8	6,900.0	6,899.8	15.4	15.2	155.66	-7.4	22.3	54.1	23.5	30.59	1.767				
7,000.0	6,999.8	7,000.0	6,999.8	15.6	15.5	156.04	-7.4	22.3	54.9	23.8	31.04	1.768				
7,100.0	7,099.8	7,100.0	7,099.8	15.8	15.7	156.40	-7.4	22.3	55.7	24.2	31.49	1.768				
7,200.0	7,199.8	7,200.0	7,199.8	16.0	15.9	156.76	-7.4	22.3	56.5	24.5	31.93	1.768				
7,300.0	7,299.8	7,300.0	7,299.8	16.3	16.1	157.10	-7.4	22.3	57.3	24.9	32.38	1.769				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31 3B - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis				Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
7,400.0	7,399.8	7,400.0	7,399.8	16.5	16.3	157.44	-7.4	22.3	58.1	25.2	32.83	1.769		
7,500.0	7,499.8	7,499.9	7,499.8	16.7	16.6	157.76	-7.4	22.3	58.9	25.6	33.27	1.770		
7,600.0	7,599.8	7,599.9	7,599.8	16.9	16.8	158.08	-7.4	22.3	59.7	26.0	33.72	1.770		
7,700.0	7,699.8	7,699.9	7,699.8	17.2	17.0	158.39	-7.4	22.3	60.5	26.3	34.17	1.771		
7,800.0	7,799.8	7,799.9	7,799.8	17.4	17.2	158.69	-7.4	22.3	61.3	26.7	34.62	1.771		
7,829.7	7,829.4	7,829.6	7,829.4	17.5	17.3	158.78	-7.4	22.3	61.6	26.8	34.75	1.771		
7,839.7	7,839.4	7,839.6	7,839.4	17.5	17.3	158.79	-7.4	22.3	61.6	26.8	34.75	1.772		
7,900.0	7,899.8	7,899.9	7,899.8	17.6	17.4	158.79	-7.4	22.3	61.6	26.6	35.00	1.760		
8,000.0	7,999.8	7,999.9	7,999.8	17.8	17.7	158.79	-7.4	22.3	61.6	26.1	35.45	1.738		
8,100.0	8,099.8	8,099.9	8,099.8	18.1	17.9	158.79	-7.4	22.3	61.6	25.7	35.90	1.716		
8,200.0	8,199.8	8,199.9	8,199.8	18.3	18.1	158.79	-7.4	22.3	61.6	25.3	36.34	1.695		
8,300.0	8,299.8	8,299.9	8,299.8	18.5	18.3	158.79	-7.4	22.3	61.6	24.8	36.79	1.674		
8,400.0	8,399.8	8,399.9	8,399.8	18.7	18.6	158.79	-7.4	22.3	61.6	24.4	37.24	1.654		
8,500.0	8,499.8	8,499.9	8,499.8	19.0	18.8	158.79	-7.4	22.3	61.6	23.9	37.69	1.634		
8,600.0	8,599.8	8,599.9	8,599.8	19.2	19.0	158.79	-7.4	22.3	61.6	23.5	38.13	1.615		
8,700.0	8,699.8	8,699.9	8,699.8	19.4	19.2	158.79	-7.4	22.3	61.6	23.0	38.58	1.597		
8,800.0	8,799.8	8,799.9	8,799.8	19.6	19.5	158.79	-7.4	22.3	61.6	22.6	39.03	1.578		
8,900.0	8,899.8	8,899.9	8,899.8	19.8	19.7	158.79	-7.4	22.3	61.6	22.1	39.47	1.560		
9,000.0	8,999.8	8,999.9	8,999.8	20.1	19.9	158.79	-7.4	22.3	61.6	21.7	39.92	1.543		
9,100.0	9,099.8	9,099.9	9,099.8	20.3	20.1	158.79	-7.4	22.3	61.6	21.2	40.37	1.526		
9,200.0	9,199.8	9,199.9	9,199.8	20.5	20.3	158.79	-7.4	22.3	61.6	20.8	40.82	1.509		
9,300.0	9,299.8	9,299.9	9,299.8	20.7	20.6	158.79	-7.4	22.3	61.6	20.3	41.26	1.493	Level 3	
9,400.0	9,399.8	9,399.9	9,399.8	21.0	20.8	158.79	-7.4	22.3	61.6	19.9	41.71	1.477	Level 3	
9,500.0	9,499.8	9,499.9	9,499.8	21.2	21.0	158.79	-7.4	22.3	61.6	19.4	42.16	1.461	Level 3	
9,600.0	9,599.8	9,599.9	9,599.8	21.4	21.2	158.79	-7.4	22.3	61.6	19.0	42.61	1.446	Level 3	
9,700.0	9,699.8	9,699.9	9,699.8	21.6	21.5	158.79	-7.4	22.3	61.6	18.5	43.05	1.431	Level 3	
9,800.0	9,799.8	9,799.9	9,799.8	21.9	21.7	158.79	-7.4	22.3	61.6	18.1	43.50	1.416	Level 3	
9,900.0	9,899.8	9,899.9	9,899.8	22.1	21.9	158.79	-7.4	22.3	61.6	17.6	43.95	1.402	Level 3	
10,000.0	9,999.8	9,999.9	9,999.8	22.3	22.1	158.79	-7.4	22.3	61.6	17.2	44.40	1.387	Level 3	
10,100.0	10,099.8	10,099.9	10,099.8	22.5	22.4	158.79	-7.4	22.3	61.6	16.8	44.84	1.374	Level 3	
10,200.0	10,199.8	10,199.9	10,199.8	22.8	22.6	158.79	-7.4	22.3	61.6	16.3	45.29	1.360	Level 3	
10,259.7	10,259.5	10,259.7	10,259.5	22.9	22.7	158.79	-7.4	22.3	61.6	16.0	45.56	1.352	Level 3	
10,300.0	10,299.8	10,299.1	10,298.9	23.0	22.8	158.55	-7.4	22.6	61.7	16.0	45.74	1.349	Level 3	
10,355.7	10,355.6	10,356.1	10,351.2	23.1	22.9	154.68	-7.6	27.3	63.9	17.9	45.97	1.389	Level 3	
10,375.0	10,374.8	10,369.6	10,368.9	23.2	23.0	86.93	-7.7	30.2	65.3	19.3	46.10	1.418	Level 3	
10,400.0	10,399.7	10,392.6	10,391.5	23.2	23.0	84.42	-7.9	34.9	67.9	21.7	46.20	1.469	Level 3	
10,425.0	10,424.5	10,415.5	10,413.7	23.3	23.1	82.23	-8.1	40.6	71.0	24.7	46.30	1.533		
10,450.0	10,449.2	10,438.2	10,435.3	23.3	23.1	80.37	-8.3	47.4	74.6	28.2	46.39	1.608		
10,475.0	10,473.5	10,460.7	10,456.4	23.4	23.2	78.82	-8.6	55.1	78.8	32.3	46.48	1.695		
10,500.0	10,497.6	10,482.9	10,477.0	23.4	23.2	77.56	-8.9	63.6	83.4	36.8	46.56	1.791		
10,525.0	10,521.3	10,505.0	10,496.9	23.5	23.3	76.54	-9.2	73.1	88.4	41.8	46.64	1.896		
10,550.0	10,544.5	10,526.8	10,516.2	23.6	23.4	75.75	-9.5	83.3	93.8	47.1	46.71	2.009		
10,575.0	10,567.2	10,548.5	10,534.8	23.6	23.4	75.13	-9.9	94.3	99.7	52.9	46.78	2.130		
10,600.0	10,589.3	10,569.9	10,552.7	23.7	23.5	74.66	-10.3	106.0	105.8	58.9	46.86	2.258		
10,625.0	10,610.7	10,591.1	10,569.9	23.8	23.6	74.31	-10.7	118.4	112.3	65.3	46.93	2.392		
10,650.0	10,631.5	10,612.0	10,586.4	23.8	23.6	74.06	-11.2	131.4	119.1	72.1	47.01	2.533		
10,675.0	10,651.5	10,632.8	10,602.1	23.9	23.7	73.87	-11.7	144.9	126.2	79.1	47.09	2.679		
10,700.0	10,670.7	10,653.4	10,617.1	24.0	23.8	73.74	-12.2	159.0	133.5	86.3	47.19	2.829		
10,725.0	10,689.1	10,675.0	10,632.2	24.1	23.9	73.70	-12.7	174.5	141.2	93.9	47.30	2.984		
10,750.0	10,706.5	10,694.0	10,644.8	24.2	24.0	73.59	-13.2	188.6	149.0	101.6	47.42	3.143		
10,775.0	10,722.9	10,714.0	10,657.5	24.3	24.1	73.54	-13.7	204.1	157.2	109.6	47.56	3.305		
10,800.0	10,738.4	10,733.8	10,669.5	24.5	24.3	73.50	-14.3	219.9	165.5	117.8	47.71	3.469		
10,825.0	10,752.8	10,753.6	10,680.7	24.6	24.4	73.46	-14.8	236.1	174.1	126.2	47.89	3.635		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31 3B - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
10,850.0	10,766.1	10,775.0	10,692.1	24.8	24.5	73.52	-15.4	254.3	182.8	134.7	48.10	3.800		
10,875.0	10,778.3	10,792.6	10,700.9	24.9	24.7	73.37	-16.0	269.5	191.7	143.4	48.30	3.969		
10,900.0	10,789.4	10,811.9	10,709.9	25.1	24.8	73.32	-16.6	286.6	200.8	152.3	48.55	4.137		
10,925.0	10,799.2	10,831.1	10,718.1	25.3	25.0	73.25	-17.2	304.0	210.1	161.2	48.82	4.303		
10,950.0	10,807.8	10,850.0	10,725.5	25.5	25.2	73.16	-17.8	321.3	219.4	170.3	49.10	4.469		
10,975.0	10,815.2	10,869.4	10,732.4	25.8	25.3	73.10	-18.4	339.4	228.9	179.5	49.43	4.631		
11,000.0	10,821.3	10,888.5	10,738.4	26.0	25.5	73.00	-19.0	357.5	238.5	188.7	49.78	4.791		
11,025.0	10,826.2	10,907.5	10,743.7	26.2	25.7	72.90	-19.6	375.8	248.2	198.0	50.15	4.948		
11,050.0	10,829.8	10,925.0	10,747.9	26.5	25.9	72.70	-20.2	392.8	257.9	207.4	50.52	5.105		
11,075.0	10,832.0	10,945.5	10,752.1	26.8	26.2	72.67	-20.9	412.8	267.7	216.7	50.98	5.251		
11,101.3	10,833.0	10,965.6	10,755.3	27.1	26.4	72.55	-21.6	432.6	278.0	226.6	51.46	5.403		
11,116.3	10,833.1	10,977.0	10,756.8	27.3	26.5	73.17	-22.0	444.0	284.0	232.1	51.84	5.478		
11,200.0	10,833.9	11,044.8	10,760.1	28.4	27.4	75.60	-24.3	511.6	317.6	263.5	54.10	5.871		
11,300.0	10,834.9	11,149.0	10,761.1	29.9	29.0	77.43	-25.4	615.8	352.5	295.2	57.32	6.149		
11,400.0	10,835.8	11,244.5	10,761.9	31.6	30.6	78.55	-25.4	711.2	381.8	321.0	60.72	6.287		
11,500.0	10,836.8	11,341.3	10,762.7	33.5	32.4	79.36	-25.4	808.1	406.2	341.7	64.42	6.305		
11,600.0	10,837.7	11,439.3	10,763.6	35.5	34.4	79.92	-25.4	906.1	425.6	357.2	68.37	6.225		
11,700.0	10,838.6	11,538.3	10,764.4	37.6	36.5	80.29	-25.4	1,005.0	440.0	367.5	72.49	6.069		
11,800.0	10,839.6	11,637.8	10,765.3	39.7	38.8	80.50	-25.4	1,104.5	449.2	372.5	76.71	5.856		
11,900.0	10,840.5	11,737.7	10,766.2	42.0	41.1	80.57	-25.4	1,204.4	453.3	372.3	80.97	5.598		
11,929.3	10,840.8	11,767.0	10,766.4	42.6	41.8	80.56	-25.4	1,233.7	453.5	371.3	82.22	5.516		
12,000.0	10,841.5	11,837.7	10,767.1	44.3	43.5	80.56	-25.4	1,304.4	453.5	368.0	85.54	5.302		
12,100.0	10,842.4	11,937.7	10,767.9	46.6	46.0	80.55	-25.4	1,404.4	453.6	363.2	90.34	5.021		
12,200.0	10,843.4	12,037.7	10,768.8	49.0	48.5	80.54	-25.4	1,504.4	453.6	358.3	95.25	4.762		
12,300.0	10,844.3	12,137.7	10,769.7	51.5	51.0	80.53	-25.4	1,604.4	453.6	353.3	100.25	4.524		
12,400.0	10,845.2	12,237.7	10,770.6	54.0	53.6	80.52	-25.4	1,704.4	453.6	348.3	105.33	4.306		
12,500.0	10,846.2	12,337.7	10,771.4	56.5	56.3	80.51	-25.4	1,804.4	453.6	343.1	110.48	4.106		
12,600.0	10,847.1	12,437.7	10,772.3	59.1	58.9	80.50	-25.4	1,904.4	453.6	337.9	115.69	3.921		
12,700.0	10,848.1	12,537.7	10,773.2	61.7	61.6	80.50	-25.4	2,004.4	453.6	332.7	120.95	3.751		
12,800.0	10,849.0	12,637.7	10,774.0	64.4	64.3	80.49	-25.4	2,104.4	453.6	327.4	126.25	3.593		
12,900.0	10,850.0	12,737.7	10,774.9	67.1	67.0	80.48	-25.4	2,204.4	453.6	322.0	131.60	3.447		
13,000.0	10,850.9	12,837.7	10,775.8	69.7	69.8	80.47	-25.4	2,304.4	453.7	316.7	136.98	3.312		
13,100.0	10,851.8	12,937.7	10,776.7	72.5	72.5	80.46	-25.4	2,404.4	453.7	311.3	142.39	3.186		
13,200.0	10,852.8	13,037.7	10,777.5	75.2	75.3	80.45	-25.4	2,504.4	453.7	305.9	147.83	3.069		
13,300.0	10,853.7	13,137.7	10,778.4	77.9	78.1	80.44	-25.4	2,604.4	453.7	300.4	153.29	2.960		
13,400.0	10,854.7	13,237.7	10,779.3	80.7	80.9	80.44	-25.4	2,704.4	453.7	294.9	158.78	2.858		
13,500.0	10,855.6	13,337.7	10,780.2	83.4	83.7	80.43	-25.4	2,804.4	453.7	289.4	164.28	2.762		
13,600.0	10,856.5	13,437.7	10,781.0	86.2	86.5	80.42	-25.4	2,904.4	453.7	283.9	169.80	2.672		
13,700.0	10,857.5	13,537.7	10,781.9	89.0	89.3	80.41	-25.4	3,004.4	453.7	278.4	175.34	2.588		
13,800.0	10,858.4	13,637.7	10,782.8	91.8	92.1	80.40	-25.4	3,104.4	453.8	272.9	180.90	2.508		
13,900.0	10,859.4	13,737.7	10,783.6	94.6	94.9	80.39	-25.4	3,204.4	453.8	267.3	186.46	2.434		
14,000.0	10,860.3	13,837.7	10,784.5	97.4	97.8	80.38	-25.4	3,304.4	453.8	261.7	192.04	2.363		
14,100.0	10,861.3	13,937.7	10,785.4	100.2	100.6	80.37	-25.4	3,404.4	453.8	256.2	197.63	2.296		
14,200.0	10,862.2	14,037.7	10,786.3	103.0	103.5	80.37	-25.4	3,504.4	453.8	250.6	203.23	2.233		
14,300.0	10,863.1	14,137.7	10,787.1	105.9	106.3	80.36	-25.4	3,604.4	453.8	245.0	208.84	2.173		
14,400.0	10,864.1	14,237.7	10,788.0	108.7	109.2	80.35	-25.4	3,704.3	453.8	239.4	214.45	2.116		
14,500.0	10,865.0	14,337.7	10,788.9	111.5	112.0	80.34	-25.4	3,804.3	453.8	233.8	220.08	2.062		
14,600.0	10,866.0	14,437.7	10,789.7	114.4	114.9	80.33	-25.4	3,904.3	453.8	228.1	225.71	2.011		
14,700.0	10,866.9	14,537.7	10,790.6	117.2	117.7	80.32	-25.4	4,004.3	453.9	222.5	231.35	1.962		
14,800.0	10,867.9	14,637.7	10,791.5	120.1	120.6	80.31	-25.4	4,104.3	453.9	216.9	237.00	1.915		
14,900.0	10,868.8	14,737.7	10,792.4	122.9	123.5	80.30	-25.4	4,204.3	453.9	211.2	242.65	1.871		
15,000.0	10,869.7	14,837.7	10,793.2	125.8	126.4	80.30	-25.4	4,304.3	453.9	205.6	248.30	1.828		
15,100.0	10,870.7	14,937.7	10,794.1	128.7	129.2	80.29	-25.4	4,404.3	453.9	199.9	253.96	1.787		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31 3B - Plan #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference				Offset		Semi Major Axis				Distance			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (%)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,200.0	10,871.6	15,037.7	10,795.0	131.5	132.1	80.28	-25.4	4,504.3	453.9	194.3	259.63	1.748	
15,300.0	10,872.6	15,137.7	10,795.9	134.4	135.0	80.27	-25.4	4,604.3	453.9	188.6	265.30	1.711	
15,400.0	10,873.5	15,237.7	10,796.7	137.3	137.9	80.26	-25.4	4,704.3	453.9	183.0	270.97	1.675	
15,500.0	10,874.5	15,337.7	10,797.6	140.1	140.8	80.25	-25.4	4,804.3	454.0	177.3	276.65	1.641	
15,600.0	10,875.4	15,437.7	10,798.5	143.0	143.7	80.24	-25.4	4,904.3	454.0	171.6	282.33	1.608	
15,700.0	10,876.3	15,537.7	10,799.3	145.9	146.5	80.24	-25.4	5,004.3	454.0	166.0	288.01	1.576	
15,800.0	10,877.3	15,637.7	10,800.2	148.8	149.4	80.23	-25.4	5,104.3	454.0	160.3	293.70	1.546	
15,900.0	10,878.2	15,737.7	10,801.1	151.7	152.3	80.22	-25.4	5,204.3	454.0	154.6	299.39	1.516	
16,000.0	10,879.2	15,837.7	10,802.0	154.5	155.2	80.21	-25.4	5,304.3	454.0	148.9	305.09	1.488 Level 3	
16,100.0	10,880.1	15,937.7	10,802.8	157.4	158.1	80.20	-25.4	5,404.3	454.0	143.2	310.78	1.461 Level 3	
16,200.0	10,881.1	16,037.7	10,803.7	160.3	161.0	80.19	-25.4	5,504.3	454.0	137.6	316.48	1.435 Level 3	
16,300.0	10,882.0	16,137.7	10,804.6	163.2	163.9	80.18	-25.4	5,604.3	454.0	131.9	322.18	1.409 Level 3	
16,400.0	10,882.9	16,237.7	10,805.5	166.1	166.8	80.17	-25.4	5,704.3	454.1	126.2	327.88	1.385 Level 3	
16,500.0	10,883.9	16,337.7	10,806.3	169.0	169.7	80.17	-25.4	5,804.3	454.1	120.5	333.58	1.361 Level 3	
16,600.0	10,884.8	16,437.7	10,807.2	171.9	172.6	80.16	-25.4	5,904.3	454.1	114.8	339.29	1.338 Level 3	
16,700.0	10,885.8	16,537.7	10,808.1	174.8	175.5	80.15	-25.4	6,004.3	454.1	109.1	345.00	1.316 Level 3	
16,800.0	10,886.7	16,637.7	10,808.9	177.7	178.4	80.14	-25.4	6,104.3	454.1	103.4	350.71	1.295 Level 3	
16,900.0	10,887.7	16,737.7	10,809.8	180.6	181.3	80.13	-25.4	6,204.3	454.1	97.7	356.42	1.274 Level 3	
17,000.0	10,888.6	16,837.7	10,810.7	183.5	184.2	80.12	-25.4	6,304.2	454.1	92.0	362.13	1.254 Level 3	
17,100.0	10,889.5	16,937.7	10,811.6	186.4	187.1	80.11	-25.4	6,404.2	454.1	86.3	367.84	1.235 Level 2	
17,200.0	10,890.5	17,037.7	10,812.4	189.3	190.0	80.11	-25.4	6,504.2	454.2	80.6	373.56	1.216 Level 2	
17,300.0	10,891.4	17,137.7	10,813.3	192.2	192.9	80.10	-25.4	6,604.2	454.2	74.9	379.28	1.197 Level 2	
17,400.0	10,892.4	17,237.7	10,814.2	195.1	195.8	80.09	-25.4	6,704.2	454.2	69.2	384.99	1.180 Level 2	
17,500.0	10,893.3	17,337.7	10,815.1	198.0	198.7	80.08	-25.4	6,804.2	454.2	63.5	390.71	1.162 Level 2	
17,600.0	10,894.2	17,437.7	10,815.9	200.9	201.6	80.07	-25.4	6,904.2	454.2	57.8	396.43	1.146 Level 2	
17,700.0	10,895.2	17,537.7	10,816.8	203.8	204.6	80.06	-25.4	7,004.2	454.2	52.1	402.15	1.129 Level 2	
17,800.0	10,896.1	17,637.7	10,817.7	206.7	207.5	80.05	-25.4	7,104.2	454.2	46.4	407.87	1.114 Level 2	
17,900.0	10,897.1	17,737.7	10,818.5	209.6	210.4	80.04	-25.4	7,204.2	454.2	40.6	413.60	1.098 Level 2	
18,000.0	10,898.0	17,837.7	10,819.4	212.5	213.3	80.04	-25.4	7,304.2	454.3	34.9	419.32	1.083 Level 2	
18,100.0	10,899.0	17,937.7	10,820.3	215.4	216.2	80.03	-25.4	7,404.2	454.3	29.2	425.04	1.069 Level 2	
18,200.0	10,909.9	18,037.7	10,821.2	218.3	219.1	80.02	-25.4	7,504.2	454.3	23.5	430.77	1.055 Level 2	
18,300.0	10,909.8	18,137.7	10,822.0	221.2	222.0	80.01	-25.4	7,604.2	454.3	17.8	436.49	1.041 Level 2	
18,400.0	10,901.8	18,237.7	10,822.9	224.1	224.9	80.00	-25.4	7,704.2	454.3	12.1	442.22	1.027 Level 2	
18,500.0	10,902.7	18,337.7	10,823.8	227.0	227.8	79.99	-25.4	7,804.2	454.3	6.4	447.95	1.014 Level 2	
18,600.0	10,903.7	18,437.7	10,824.7	229.9	230.8	79.98	-25.4	7,904.2	454.3	0.7	453.67	1.001 Level 2	
18,700.0	10,904.6	18,537.7	10,825.5	232.8	233.7	79.98	-25.4	8,004.2	454.3	-5.1	459.40	0.989 Level 1	
18,800.0	10,905.6	18,637.7	10,826.4	235.7	236.6	79.97	-25.4	8,104.2	454.3	-10.8	465.13	0.977 Level 1	
18,900.0	10,906.5	18,737.7	10,827.3	238.6	239.5	79.96	-25.4	8,204.2	454.4	-16.5	470.86	0.965 Level 1	
19,000.0	10,907.4	18,837.7	10,828.1	241.6	242.4	79.95	-25.4	8,304.2	454.4	-22.2	476.59	0.953 Level 1	
19,100.0	10,908.4	18,937.7	10,829.0	244.5	245.3	79.94	-25.4	8,404.2	454.4	-27.9	482.32	0.942 Level 1	
19,200.0	10,909.3	19,037.7	10,829.9	247.4	248.2	79.93	-25.4	8,504.2	454.4	-33.6	488.05	0.931 Level 1	
19,300.0	10,910.3	19,137.7	10,830.8	250.3	251.2	79.92	-25.4	8,604.2	454.4	-39.4	493.78	0.920 Level 1	
19,400.0	10,911.2	19,237.7	10,831.6	253.2	254.1	79.91	-25.4	8,704.2	454.4	-45.1	499.51	0.910 Level 1	
19,500.0	10,912.2	19,337.7	10,832.5	256.1	257.0	79.91	-25.4	8,804.2	454.4	-50.8	505.24	0.899 Level 1	
19,600.0	10,913.1	19,437.7	10,833.4	259.0	259.9	79.90	-25.4	8,904.1	454.4	-56.5	510.97	0.889 Level 1	
19,700.0	10,914.0	19,537.7	10,834.3	261.9	262.8	79.89	-25.4	9,004.1	454.5	-62.2	516.70	0.880 Level 1	
19,800.0	10,915.0	19,637.7	10,835.1	264.9	265.7	79.88	-25.4	9,104.1	454.5	-68.0	522.43	0.870 Level 1	
19,900.0	10,915.9	19,737.7	10,836.0	267.8	268.7	79.87	-25.4	9,204.1	454.5	-73.7	528.17	0.860 Level 1	
20,000.0	10,916.9	19,837.7	10,836.9	270.7	271.6	79.86	-25.4	9,304.1	454.5	-79.4	533.90	0.851 Level 1	
20,100.0	10,917.8	19,937.7	10,837.7	273.6	274.5	79.85	-25.4	9,404.1	454.5	-85.1	539.63	0.842 Level 1	
20,200.0	10,918.8	20,037.7	10,838.6	276.5	277.4	79.85	-25.4	9,504.1	454.5	-90.8	545.36	0.833 Level 1	
20,300.0	10,919.7	20,137.7	10,839.5	279.4	280.3	79.84	-25.4	9,604.1	454.5	-96.6	551.10	0.825 Level 1	
20,400.0	10,920.6	20,237.7	10,840.4	282.3	283.2	79.83	-25.4	9,704.1	454.5	-102.3	556.83	0.816 Level 1	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 3B - Lewis Federal 5300 11-31 3B - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
20,500.0	10,921.6	20,337.7	10,841.2	285.3	286.2	79.82	-25.4	9,804.1	454.6	-108.0	562.56	0.808	Level 1	
20,600.0	10,922.5	20,437.7	10,842.1	288.2	289.1	79.81	-25.4	9,904.1	454.6	-113.7	568.30	0.800	Level 1	
20,700.0	10,923.5	20,537.7	10,843.0	291.1	292.0	79.80	-25.4	10,004.1	454.6	-119.4	574.03	0.792	Level 1	
20,761.5	10,924.0	20,599.2	10,843.5	292.3	293.8	79.80	-25.4	10,065.6	454.6	-122.4	576.96	0.788	Level 1	
20,804.6	10,924.4	20,640.9	10,843.9	293.1	294.6	79.79	-25.4	10,107.3	454.6	-124.0	578.56	0.786	Level 1, ES, SF	

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-31 4T2 - Plan #1												Offset Site Error:	0.0 usft		
Survey Program: 0-MWD		Distance												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			Warning
0.0	0.0	0.0	0.0	0.0	0.0	-174.69	-65.9	-6.1	66.1						
100.0	100.0	100.0	100.0	0.1	0.1	-174.69	-65.9	-6.1	66.1	66.0	0.18	377.290			
200.0	200.0	200.0	200.0	0.3	0.3	-174.69	-65.9	-6.1	66.1	65.5	0.62	105.859			
300.0	300.0	300.0	300.0	0.5	0.5	-174.69	-65.9	-6.1	66.1	65.1	1.07	61.566			
400.0	400.0	400.0	400.0	0.8	0.8	-174.69	-65.9	-6.1	66.1	64.6	1.52	43.405			
500.0	500.0	500.0	500.0	1.0	1.0	-174.69	-65.9	-6.1	66.1	64.2	1.97	33.518			
600.0	600.0	600.0	600.0	1.2	1.2	-174.69	-65.9	-6.1	66.1	63.7	2.42	27.299			
700.0	700.0	700.0	700.0	1.4	1.4	-174.69	-65.9	-6.1	66.1	63.3	2.87	23.027			
800.0	800.0	800.0	800.0	1.7	1.7	-174.69	-65.9	-6.1	66.1	62.8	3.32	19.911			
900.0	900.0	900.0	900.0	1.9	1.9	-174.69	-65.9	-6.1	66.1	62.4	3.77	17.538			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-174.69	-65.9	-6.1	66.1	61.9	4.22	15.670			
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	-174.69	-65.9	-6.1	66.1	61.5	4.67	14.162			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-174.69	-65.9	-6.1	66.1	61.0	5.12	12.919			
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-174.69	-65.9	-6.1	66.1	60.6	5.57	11.876			
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-174.69	-65.9	-6.1	66.1	60.1	6.02	10.989			
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.2	-174.69	-65.9	-6.1	66.1	59.7	6.47	10.225			
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-174.69	-65.9	-6.1	66.1	59.2	6.92	9.561			
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	-174.69	-65.9	-6.1	66.1	58.8	7.37	8.978			
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	-174.69	-65.9	-6.1	66.1	58.3	7.82	8.461			
1,900.0	1,900.0	1,900.0	1,900.0	4.1	4.1	-174.69	-65.9	-6.1	66.1	57.9	8.27	8.001			
2,000.0	2,000.0	2,000.0	2,000.0	4.4	4.4	-174.69	-65.9	-6.1	66.1	57.4	8.72	7.589			
2,100.0	2,100.0	2,100.0	2,100.0	4.6	4.6	-174.69	-65.9	-6.1	66.1	57.0	9.17	7.216 CC			
2,110.0	2,110.0	2,109.6	2,109.6	4.6	4.6	-174.72	-65.9	-6.1	66.2	57.0	9.21	7.192			
2,200.0	2,200.0	2,199.6	2,199.6	4.8	4.8	-175.30	-66.4	-5.5	67.5	57.9	9.57	7.054			
2,300.0	2,300.0	2,299.6	2,299.6	5.0	4.9	-175.91	-67.1	-4.9	68.9	59.0	9.97	6.912			
2,400.0	2,400.0	2,399.6	2,399.6	5.3	5.1	-176.50	-67.7	-4.3	70.4	60.0	10.38	6.779			
2,500.0	2,500.0	2,499.6	2,499.6	5.5	5.3	-177.06	-68.3	-3.7	71.8	61.0	10.80	6.655			
2,600.0	2,600.0	2,599.6	2,599.5	5.7	5.5	-177.60	-68.9	-3.1	73.3	62.1	11.21	6.539			
2,700.0	2,700.0	2,699.6	2,699.5	5.9	5.7	-178.12	-69.5	-2.4	74.8	63.1	11.63	6.430			
2,800.0	2,800.0	2,799.5	2,799.5	6.2	5.9	-178.62	-70.1	-1.8	76.2	64.2	12.05	6.328			
2,900.0	2,900.0	2,899.5	2,899.5	6.4	6.1	-179.11	-70.8	-1.2	77.7	65.2	12.47	6.233			
3,000.0	3,000.0	2,999.5	2,999.5	6.6	6.3	-179.57	-71.4	-0.6	79.2	66.3	12.89	6.143			
3,100.0	3,100.0	3,099.5	3,099.5	6.8	6.5	-179.99	-72.0	0.0	80.7	67.4	13.32	6.058			
3,200.0	3,200.0	3,199.5	3,199.4	7.1	6.7	-179.56	-72.6	0.6	82.2	68.4	13.74	5.979			
3,300.0	3,300.0	3,299.5	3,299.4	7.3	6.9	-179.14	-73.2	1.3	83.7	69.5	14.17	5.904			
3,400.0	3,400.0	3,399.5	3,399.4	7.5	7.1	-178.74	-73.8	1.9	85.2	70.6	14.60	5.833			
3,500.0	3,499.9	3,499.4	3,499.4	7.7	7.3	-178.35	-74.5	2.5	86.7	71.6	15.03	5.766			
3,600.0	3,599.9	3,599.4	3,599.4	8.0	7.5	-177.98	-75.1	3.1	88.2	72.7	15.46	5.702			
3,700.0	3,699.9	3,699.4	3,699.4	8.2	7.7	-177.62	-75.7	3.7	89.7	73.8	15.90	5.642			
3,800.0	3,799.9	3,799.4	3,799.3	8.4	7.9	-177.27	-76.3	4.3	91.2	74.9	16.33	5.585			
3,900.0	3,899.9	3,899.4	3,899.3	8.6	8.1	-176.94	-76.9	5.0	92.7	76.0	16.77	5.531			
4,000.0	3,999.9	3,999.4	3,999.3	8.9	8.4	-176.61	-77.6	5.6	94.3	77.1	17.20	5.480			
4,100.0	4,099.9	4,099.4	4,099.3	9.1	8.6	-176.29	-78.2	6.2	95.8	78.1	17.64	5.431			
4,200.0	4,199.9	4,199.4	4,199.3	9.3	8.8	-175.99	-78.8	6.8	97.3	79.2	18.07	5.384			
4,300.0	4,299.9	4,299.3	4,299.3	9.5	9.0	-175.69	-79.4	7.4	98.8	80.3	18.51	5.339			
4,400.0	4,399.9	4,399.3	4,399.2	9.8	9.2	-175.40	-80.0	8.0	100.4	81.4	18.95	5.297			
4,500.0	4,499.9	4,499.3	4,499.2	10.0	9.4	-175.13	-80.6	8.7	101.9	82.5	19.39	5.256			
4,600.0	4,599.9	4,599.3	4,599.2	10.2	9.6	-174.86	-81.3	9.3	103.4	83.6	19.83	5.217			
4,700.0	4,699.9	4,699.3	4,699.2	10.4	9.9	-174.59	-81.9	9.9	105.0	84.7	20.27	5.180			
4,800.0	4,799.9	4,799.3	4,799.2	10.7	10.1	-174.34	-82.5	10.5	106.5	85.8	20.71	5.145			
4,900.0	4,899.9	4,899.3	4,899.2	10.9	10.3	-174.09	-83.1	11.1	108.1	86.9	21.15	5.111			
5,000.0	4,999.9	4,999.3	4,999.1	11.1	10.5	-173.85	-83.7	11.7	109.6	88.0	21.59	5.078			
5,100.0	5,099.9	5,099.2	5,099.1	11.3	10.7	-173.62	-84.3	12.4	111.2	89.1	22.03	5.047			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-31 4T2 - Plan #1													Offset Site Error:	0.0 usft		
Survey Program: 0-MWD															Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Hightside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			Warning	
5,200.0	5,199.9	5,199.2	5,199.1	11.6	10.9	173.39	-85.0	13.0	112.7	90.2	22.47	5.016				
5,300.0	5,299.9	5,299.2	5,299.1	11.8	11.2	173.17	-85.6	13.6	114.3	91.4	22.91	4.987				
5,400.0	5,399.9	5,399.2	5,399.1	12.0	11.4	172.95	-86.2	14.2	115.8	92.5	23.35	4.960				
5,500.0	5,499.9	5,499.2	5,499.1	12.2	11.6	172.74	-86.8	14.8	117.4	93.6	23.80	4.933				
5,600.0	5,599.9	5,599.2	5,599.0	12.5	11.8	172.54	-87.4	15.4	118.9	94.7	24.24	4.907				
5,700.0	5,699.9	5,699.2	5,699.0	12.7	12.0	172.34	-88.0	16.1	120.5	95.8	24.68	4.882				
5,800.0	5,799.9	5,799.2	5,799.0	12.9	12.2	172.14	-88.7	16.7	122.0	96.9	25.12	4.858				
5,900.0	5,899.9	5,899.1	5,899.0	13.1	12.5	171.96	-89.3	17.3	123.6	98.0	25.57	4.835				
6,000.0	5,999.9	5,999.1	5,999.0	13.4	12.7	171.77	-89.9	17.9	125.2	99.2	26.01	4.812				
6,100.0	6,099.8	6,099.1	6,099.0	13.6	12.9	171.59	-90.5	18.5	126.7	100.3	26.45	4.791				
6,200.0	6,199.8	6,200.0	6,199.8	13.8	13.1	171.52	-90.9	18.9	128.0	101.1	26.89	4.759				
6,300.0	6,299.8	6,300.0	6,299.8	14.0	13.3	171.57	-90.9	18.9	128.9	101.5	27.32	4.716				
6,400.0	6,399.8	6,400.0	6,399.8	14.3	13.5	171.63	-90.9	18.9	129.7	102.0	27.75	4.675				
6,500.0	6,499.8	6,500.0	6,499.8	14.5	13.7	171.69	-90.9	18.9	130.6	102.4	28.18	4.634				
6,600.0	6,599.8	6,600.0	6,599.8	14.7	13.9	171.74	-90.9	18.9	131.5	102.8	28.61	4.595				
6,700.0	6,699.8	6,700.0	6,699.8	14.9	14.1	171.79	-90.9	18.9	132.3	103.3	29.04	4.557				
6,800.0	6,799.8	6,800.0	6,799.8	15.1	14.3	171.85	-90.9	18.9	133.2	103.7	29.47	4.520				
6,900.0	6,899.8	6,900.0	6,899.8	15.4	14.5	171.90	-90.9	18.9	134.0	104.1	29.90	4.483				
7,000.0	6,999.8	7,000.0	6,999.8	15.6	14.8	171.95	-90.9	18.9	134.9	104.6	30.33	4.448				
7,100.0	7,099.8	7,100.0	7,099.8	15.8	15.0	172.00	-90.9	18.9	135.8	105.0	30.76	4.414				
7,200.0	7,199.8	7,200.0	7,199.8	16.0	15.2	172.06	-90.9	18.9	136.6	105.4	31.19	4.380				
7,300.0	7,299.8	7,300.0	7,299.8	16.3	15.4	172.11	-90.9	18.9	137.5	105.9	31.63	4.348				
7,400.0	7,399.8	7,400.0	7,399.8	16.5	15.6	172.16	-90.9	18.9	138.4	106.3	32.06	4.316				
7,500.0	7,499.8	7,499.9	7,499.8	16.7	15.8	172.20	-90.9	18.9	139.2	106.7	32.49	4.285				
7,600.0	7,599.8	7,599.9	7,599.8	16.9	16.0	172.25	-90.9	18.9	140.1	107.2	32.93	4.255				
7,700.0	7,699.8	7,699.9	7,699.8	17.2	16.2	172.30	-90.9	18.9	141.0	107.6	33.36	4.225				
7,800.0	7,799.8	7,799.9	7,799.8	17.4	16.4	172.35	-90.9	18.9	141.8	108.0	33.80	4.196				
7,829.7	7,829.4	7,829.6	7,829.4	17.5	16.5	172.36	-90.9	18.9	142.1	108.2	33.93	4.188				
7,839.7	7,839.4	7,839.6	7,839.4	17.5	16.5	172.36	-90.9	18.9	142.1	108.2	33.94	4.187				
7,900.0	7,899.8	7,899.9	7,899.8	17.6	16.6	172.36	-90.9	18.9	142.1	107.9	34.19	4.157				
8,000.0	7,999.8	7,999.9	7,999.8	17.8	16.8	172.36	-90.9	18.9	142.1	107.5	34.62	4.105				
8,100.0	8,099.8	8,099.9	8,099.8	18.1	17.0	172.36	-90.9	18.9	142.1	107.1	35.06	4.054				
8,200.0	8,199.8	8,199.9	8,199.8	18.3	17.3	172.36	-90.9	18.9	142.1	106.6	35.49	4.004				
8,300.0	8,299.8	8,299.9	8,299.8	18.5	17.5	172.36	-90.9	18.9	142.1	106.2	35.93	3.956				
8,400.0	8,399.8	8,399.9	8,399.8	18.7	17.7	172.36	-90.9	18.9	142.1	105.8	36.37	3.908				
8,500.0	8,499.8	8,499.9	8,499.8	19.0	17.9	172.36	-90.9	18.9	142.1	105.3	36.80	3.862				
8,600.0	8,599.8	8,599.9	8,599.8	19.2	18.1	172.36	-90.9	18.9	142.1	104.9	37.24	3.817				
8,700.0	8,699.8	8,699.9	8,699.8	19.4	18.3	172.36	-90.9	18.9	142.1	104.4	37.68	3.772				
8,800.0	8,799.8	8,799.9	8,799.8	19.6	18.5	172.36	-90.9	18.9	142.1	104.0	38.11	3.729				
8,900.0	8,899.8	8,899.9	8,899.8	19.8	18.7	172.36	-90.9	18.9	142.1	103.6	38.55	3.687				
9,000.0	8,999.8	8,999.9	8,999.8	20.1	19.0	172.36	-90.9	18.9	142.1	103.1	38.99	3.645				
9,100.0	9,099.8	9,099.9	9,099.8	20.3	19.2	172.36	-90.9	18.9	142.1	102.7	39.43	3.605				
9,200.0	9,199.8	9,199.9	9,199.8	20.5	19.4	172.36	-90.9	18.9	142.1	102.3	39.87	3.565				
9,300.0	9,299.8	9,299.9	9,299.8	20.7	19.6	172.36	-90.9	18.9	142.1	101.8	40.31	3.526				
9,400.0	9,399.8	9,399.9	9,399.8	21.0	19.8	172.36	-90.9	18.9	142.1	101.4	40.74	3.488				
9,500.0	9,499.8	9,499.9	9,499.8	21.2	20.0	172.36	-90.9	18.9	142.1	100.9	41.18	3.451				
9,600.0	9,599.8	9,599.9	9,599.8	21.4	20.2	172.36	-90.9	18.9	142.1	100.5	41.62	3.414				
9,700.0	9,699.8	9,699.9	9,699.8	21.6	20.5	172.36	-90.9	18.9	142.1	100.1	42.06	3.379				
9,800.0	9,799.8	9,799.9	9,799.8	21.9	20.7	172.36	-90.9	18.9	142.1	99.6	42.50	3.344				
9,900.0	9,899.8	9,899.9	9,899.8	22.1	20.9	172.36	-90.9	18.9	142.1	99.2	42.94	3.309				
10,000.0	9,999.8	9,999.9	9,999.8	22.3	21.1	172.36	-90.9	18.9	142.1	98.7	43.38	3.276				
10,100.0	10,099.8	10,099.9	10,099.8	22.5	21.3	172.36	-90.9	18.9	142.1	98.3	43.82	3.243				
10,200.0	10,199.8	10,199.9	10,199.8	22.8	21.5	172.36	-90.9	18.9	142.1	97.9	44.27	3.211				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-31 4T2 - Plan #1													Offset Site Error:	0.0 usft		
Survey Program: 0-MWD															Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
10,300.0	10,299.8	10,299.9	10,299.8	23.0	21.8	172.36	-90.9	18.9	142.1	97.4	44.71	3.179				
10,355.7	10,355.5	10,355.7	10,355.5	23.1	21.9	172.36	-90.9	18.9	142.1	97.2	44.95	3.162				
10,375.0	10,374.8	10,374.9	10,374.8	23.2	21.9	106.89	-90.9	18.9	142.2	97.2	45.07	3.156				
10,400.0	10,399.7	10,399.9	10,399.7	23.2	22.0	107.45	-90.9	18.9	142.7	97.6	45.17	3.160				
10,425.0	10,424.5	10,424.7	10,424.6	23.3	22.0	108.06	-90.7	20.0	143.6	98.4	45.27	3.173				
10,450.0	10,449.2	10,449.7	10,449.4	23.3	22.1	108.60	-90.5	22.3	145.0	99.6	45.36	3.196				
10,475.0	10,473.5	10,474.7	10,474.2	23.4	22.1	109.05	-90.1	25.9	146.7	101.3	45.44	3.229				
10,500.0	10,497.6	10,499.8	10,498.8	23.4	22.2	109.41	-89.5	30.8	148.9	103.4	45.51	3.272				
10,525.0	10,521.3	10,525.0	10,523.2	23.5	22.3	109.67	-88.9	37.0	151.5	105.9	45.59	3.323				
10,550.0	10,544.5	10,550.2	10,547.2	23.6	22.3	109.85	-88.0	44.5	154.4	108.8	45.65	3.382				
10,575.0	10,567.2	10,575.4	10,570.8	23.6	22.4	109.94	-87.1	53.2	157.8	112.0	45.72	3.450				
10,600.0	10,589.3	10,600.7	10,594.0	23.7	22.5	109.94	-86.0	63.2	161.5	115.7	45.79	3.526				
10,625.0	10,610.7	10,625.9	10,616.6	23.8	22.5	109.85	-84.7	74.4	165.5	119.7	45.87	3.609				
10,650.0	10,631.5	10,651.2	10,638.6	23.8	22.6	109.67	-83.4	86.8	169.9	124.0	45.96	3.698				
10,675.0	10,651.5	10,676.5	10,660.0	23.9	22.7	109.42	-81.9	100.3	174.7	128.6	46.06	3.793				
10,700.0	10,670.7	10,701.8	10,680.5	24.0	22.8	109.09	-80.3	114.9	179.7	133.6	46.18	3.892				
10,725.0	10,689.1	10,727.1	10,700.3	24.1	22.8	108.70	-78.5	130.6	185.1	138.8	46.32	3.996				
10,750.0	10,706.5	10,752.4	10,719.2	24.2	22.9	108.24	-76.7	147.3	190.8	144.3	46.48	4.104				
10,775.0	10,722.9	10,777.7	10,737.2	24.3	23.1	107.71	-74.8	165.0	196.7	150.0	46.68	4.213				
10,800.0	10,738.4	10,803.0	10,754.2	24.5	23.2	107.14	-72.7	183.6	202.9	156.0	46.91	4.325				
10,825.0	10,752.8	10,828.3	10,770.2	24.6	23.3	106.51	-70.6	203.1	209.3	162.1	47.17	4.437				
10,850.0	10,766.1	10,853.6	10,785.1	24.8	23.5	105.84	-68.3	223.4	216.0	168.5	47.47	4.549				
10,875.0	10,778.3	10,878.9	10,799.0	24.9	23.6	105.14	-66.0	244.4	222.8	175.0	47.81	4.661				
10,900.0	10,789.4	10,904.2	10,811.7	25.1	23.8	104.39	-63.6	266.1	229.9	181.7	48.18	4.771				
10,925.0	10,799.2	10,929.5	10,823.2	25.3	24.0	103.62	-61.1	288.5	237.1	188.5	48.59	4.879				
10,950.0	10,807.8	10,954.8	10,833.5	25.5	24.2	102.82	-58.6	311.5	244.5	195.4	49.04	4.985				
10,975.0	10,815.2	10,980.2	10,842.6	25.8	24.5	101.99	-56.0	335.0	252.0	202.5	49.52	5.088				
11,000.0	10,821.3	11,005.5	10,850.4	26.0	24.7	101.15	-53.4	359.0	259.6	209.6	50.04	5.188				
11,025.0	10,826.2	11,031.0	10,857.0	26.2	25.0	100.30	-50.7	383.4	267.3	216.7	50.59	5.284				
11,050.0	10,829.8	11,056.4	10,862.2	26.5	25.3	99.43	-47.9	408.2	275.1	224.0	51.17	5.377				
11,075.0	10,832.0	11,082.0	10,866.2	26.8	25.6	98.55	-45.2	433.3	283.0	231.2	51.77	5.466				
11,101.3	10,833.0	11,108.9	10,868.8	27.1	26.0	97.63	-42.2	459.9	291.3	238.8	52.43	5.555				
11,116.3	10,833.1	11,124.3	10,869.7	27.3	26.2	97.64	-40.6	475.2	296.0	243.2	52.79	5.606				
11,200.0	10,833.9	11,200.0	10,870.6	28.4	27.2	97.01	-32.8	550.5	320.7	265.7	55.00	5.831				
11,300.0	10,834.9	11,279.6	10,871.4	29.9	28.5	96.41	-27.7	629.9	349.2	291.3	57.85	6.035				
11,400.0	10,835.8	11,362.8	10,872.2	31.6	30.0	95.89	-25.9	713.1	376.8	315.7	61.03	6.173				
11,500.0	10,836.8	11,456.8	10,873.1	33.5	31.8	95.44	-25.9	807.1	401.5	336.8	64.67	6.208				
11,600.0	10,837.7	11,554.8	10,874.0	35.5	33.8	95.11	-25.9	905.1	421.1	352.5	68.60	6.139				
11,700.0	10,838.6	11,653.7	10,874.9	37.6	35.9	94.88	-25.9	1,004.0	435.6	362.9	72.70	5.992				
11,800.0	10,839.6	11,753.3	10,875.9	39.7	38.2	94.73	-25.9	1,103.5	445.0	368.1	76.91	5.786				
11,900.0	10,840.5	11,853.2	10,876.9	42.0	40.5	94.65	-25.9	1,203.4	449.1	368.0	81.17	5.533				
11,929.3	10,840.8	11,882.5	10,877.1	42.6	41.2	94.64	-25.9	1,232.8	449.3	366.9	82.41	5.453				
12,000.0	10,841.5	11,953.2	10,877.8	44.3	43.0	94.64	-25.9	1,303.4	449.3	363.6	85.79	5.238				
12,100.0	10,842.4	12,053.2	10,878.8	46.6	45.5	94.64	-25.9	1,403.4	449.3	358.7	90.67	4.956				
12,200.0	10,843.4	12,153.2	10,879.7	49.0	48.0	94.65	-25.9	1,503.4	449.3	353.7	95.66	4.697				
12,300.0	10,844.3	12,253.2	10,880.7	51.5	50.6	94.65	-25.9	1,603.4	449.3	348.6	100.74	4.460				
12,400.0	10,845.2	12,353.2	10,881.7	54.0	53.2	94.65	-25.9	1,703.4	449.3	343.4	105.90	4.243				
12,500.0	10,846.2	12,453.2	10,882.6	56.5	55.8	94.65	-25.9	1,803.4	449.3	338.2	111.13	4.044				
12,600.0	10,847.1	12,553.2	10,883.6	59.1	58.5	94.65	-25.9	1,903.4	449.4	332.9	116.41	3.860				
12,700.0	10,848.1	12,653.2	10,884.5	61.7	61.2	94.66	-25.9	2,003.4	449.4	327.6	121.75	3.691				
12,800.0	10,849.0	12,753.2	10,885.5	64.4	63.9	94.66	-25.9	2,103.4	449.4	322.2	127.13	3.535				
12,900.0	10,850.0	12,853.2	10,886.5	67.1	66.6	94.66	-25.9	2,203.4	449.4	316.8	132.55	3.390				
13,000.0	10,850.9	12,953.2	10,887.4	69.7	69.4	94.66	-25.9	2,303.4	449.4	311.4	138.00	3.256				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-31 4T2 - Plan #1												Offset Site Error:	0.0 usft		
Survey Program: 0-MWD		Distance												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
13,100.0	10,851.8	13,053.2	10,888.4	72.5	72.2	94.67	-25.9	2,403.4	449.4	305.9	143.49	3.132			
13,200.0	10,852.8	13,153.2	10,889.3	75.2	74.9	94.67	-25.9	2,503.4	449.4	300.4	149.00	3.016			
13,300.0	10,853.7	13,253.2	10,890.3	77.9	77.7	94.67	-25.9	2,603.4	449.4	294.8	154.53	2.908			
13,400.0	10,854.7	13,353.2	10,891.3	80.7	80.5	94.67	-25.9	2,703.4	449.4	289.3	160.09	2.807			
13,500.0	10,855.6	13,453.2	10,892.2	83.4	83.3	94.67	-25.9	2,803.4	449.4	283.7	165.67	2.712			
13,600.0	10,856.5	13,553.2	10,893.2	86.2	86.1	94.68	-25.9	2,903.4	449.4	278.1	171.26	2.624			
13,700.0	10,857.5	13,653.2	10,894.1	89.0	89.0	94.68	-25.9	3,003.4	449.4	272.5	176.87	2.541			
13,800.0	10,858.4	13,753.2	10,895.1	91.8	91.8	94.68	-25.9	3,103.4	449.4	266.9	182.50	2.462			
13,900.0	10,859.4	13,853.2	10,896.1	94.6	94.6	94.68	-25.9	3,203.4	449.4	261.2	188.14	2.389			
14,000.0	10,860.3	13,953.2	10,897.0	97.4	97.5	94.69	-25.9	3,303.3	449.4	255.6	193.79	2.319			
14,100.0	10,861.3	14,053.2	10,898.0	100.2	100.3	94.69	-25.9	3,403.3	449.4	249.9	199.45	2.253			
14,200.0	10,862.2	14,153.2	10,898.9	103.0	103.2	94.69	-25.9	3,503.3	449.4	244.3	205.12	2.191			
14,300.0	10,863.1	14,253.2	10,899.9	105.9	106.0	94.69	-25.9	3,603.3	449.4	238.6	210.80	2.132			
14,400.0	10,864.1	14,353.2	10,900.9	108.7	108.9	94.69	-25.9	3,703.3	449.4	232.9	216.49	2.076			
14,500.0	10,865.0	14,453.2	10,901.8	111.5	111.7	94.70	-25.9	3,803.3	449.4	227.2	222.18	2.023			
14,600.0	10,866.0	14,553.2	10,902.8	114.4	114.6	94.70	-25.9	3,903.3	449.4	221.5	227.89	1.972			
14,700.0	10,866.9	14,653.2	10,903.7	117.2	117.5	94.70	-25.9	4,003.3	449.4	215.8	233.60	1.924			
14,800.0	10,867.9	14,753.2	10,904.7	120.1	120.3	94.70	-25.9	4,103.3	449.4	210.1	239.32	1.878			
14,900.0	10,868.8	14,853.2	10,905.7	122.9	123.2	94.71	-25.9	4,203.3	449.4	204.3	245.04	1.834			
15,000.0	10,869.7	14,953.2	10,906.6	125.8	126.1	94.71	-25.9	4,303.3	449.4	198.6	250.77	1.792			
15,100.0	10,870.7	15,053.2	10,907.6	128.7	129.0	94.71	-25.9	4,403.3	449.4	192.9	256.50	1.752			
15,200.0	10,871.6	15,153.2	10,908.5	131.5	131.9	94.71	-25.9	4,503.3	449.4	187.1	262.24	1.714			
15,300.0	10,872.6	15,253.2	10,909.5	134.4	134.7	94.71	-25.9	4,603.3	449.4	181.4	267.98	1.677			
15,400.0	10,873.5	15,353.2	10,910.5	137.3	137.6	94.72	-25.9	4,703.3	449.4	175.7	273.73	1.642			
15,500.0	10,874.5	15,453.2	10,911.4	140.1	140.5	94.72	-25.9	4,803.3	449.4	169.9	279.48	1.608			
15,600.0	10,875.4	15,553.2	10,912.4	143.0	143.4	94.72	-25.9	4,903.3	449.4	164.2	285.23	1.576			
15,700.0	10,876.3	15,653.2	10,913.3	145.9	146.3	94.72	-25.9	5,003.3	449.4	158.4	290.99	1.544			
15,800.0	10,877.3	15,753.2	10,914.3	148.8	149.2	94.73	-25.9	5,103.3	449.4	152.6	296.75	1.514			
15,900.0	10,878.2	15,853.2	10,915.3	151.7	152.1	94.73	-25.9	5,203.3	449.4	146.9	302.51	1.486 Level 3			
16,000.0	10,879.2	15,953.2	10,916.2	154.5	155.0	94.73	-25.9	5,303.3	449.4	141.1	308.28	1.458 Level 3			
16,100.0	10,880.1	16,053.2	10,917.2	157.4	157.9	94.73	-25.9	5,403.3	449.4	135.4	314.05	1.431 Level 3			
16,200.0	10,881.1	16,153.2	10,918.1	160.3	160.8	94.73	-25.9	5,503.2	449.4	129.6	319.82	1.405 Level 3			
16,300.0	10,882.0	16,253.2	10,919.1	163.2	163.7	94.74	-25.9	5,603.2	449.4	123.8	325.60	1.380 Level 3			
16,400.0	10,882.9	16,353.2	10,920.1	166.1	166.6	94.74	-25.9	5,703.2	449.4	118.0	331.37	1.356 Level 3			
16,500.0	10,883.9	16,453.2	10,921.0	169.0	169.5	94.74	-25.9	5,803.2	449.4	112.3	337.15	1.333 Level 3			
16,600.0	10,884.8	16,553.2	10,922.0	171.9	172.4	94.74	-25.9	5,903.2	449.4	106.5	342.93	1.310 Level 3			
16,700.0	10,885.8	16,653.2	10,922.9	174.8	175.3	94.74	-25.9	6,003.2	449.4	100.7	348.71	1.289 Level 3			
16,800.0	10,886.7	16,753.2	10,923.9	177.7	178.2	94.75	-25.9	6,103.2	449.4	94.9	354.50	1.268 Level 3			
16,900.0	10,887.7	16,853.2	10,924.9	180.6	181.1	94.75	-25.9	6,203.2	449.4	89.1	360.29	1.247 Level 2			
17,000.0	10,888.6	16,953.2	10,925.8	183.5	184.0	94.75	-25.9	6,303.2	449.4	83.3	366.07	1.228 Level 2			
17,100.0	10,889.5	17,053.2	10,926.8	186.4	186.9	94.75	-25.9	6,403.2	449.4	77.6	371.86	1.209 Level 2			
17,200.0	10,890.5	17,153.2	10,927.7	189.3	189.8	94.76	-25.9	6,503.2	449.4	71.8	377.65	1.190 Level 2			
17,300.0	10,891.4	17,253.2	10,928.7	192.2	192.7	94.76	-25.9	6,603.2	449.4	66.0	383.45	1.172 Level 2			
17,400.0	10,892.4	17,353.2	10,929.7	195.1	195.6	94.76	-25.9	6,703.2	449.4	60.2	389.24	1.155 Level 2			
17,500.0	10,893.3	17,453.2	10,930.6	198.0	198.5	94.76	-25.9	6,803.2	449.4	54.4	395.04	1.138 Level 2			
17,600.0	10,894.2	17,553.2	10,931.6	200.9	201.4	94.76	-25.9	6,903.2	449.4	48.6	400.83	1.121 Level 2			
17,700.0	10,895.2	17,653.2	10,932.5	203.8	204.3	94.77	-25.9	7,003.2	449.4	42.8	406.63	1.105 Level 2			
17,800.0	10,896.1	17,753.2	10,933.5	206.7	207.3	94.77	-25.9	7,103.2	449.4	37.0	412.43	1.090 Level 2			
17,900.0	10,897.1	17,853.2	10,934.5	209.6	210.2	94.77	-25.9	7,203.2	449.4	31.2	418.23	1.075 Level 2			
18,000.0	10,898.0	17,953.2	10,935.4	212.5	213.1	94.77	-25.9	7,303.2	449.4	25.4	424.03	1.060 Level 2			
18,100.0	10,899.0	18,053.2	10,936.4	215.4	216.0	94.78	-25.9	7,403.2	449.4	19.6	429.83	1.046 Level 2			
18,200.0	10,899.9	18,153.2	10,937.3	218.3	218.9	94.78	-25.9	7,503.2	449.4	13.8	435.63	1.032 Level 2			
18,300.0	10,900.8	18,253.2	10,938.3	221.2	221.8	94.78	-25.9	7,603.2	449.4	8.0	441.44	1.018 Level 2			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 4T2 - Lewis Federal 5300 11-31 4T2 - Plan #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,400.0	10,901.8	18,353.2	10,939.3	224.1	224.7	94.78	-25.9	7,703.1	449.4	2.2	447.24	1.005	Level 2
18,500.0	10,902.7	18,453.2	10,940.2	227.0	227.6	94.78	-25.9	7,803.1	449.4	-3.6	453.05	0.992	Level 1
18,600.0	10,903.7	18,553.2	10,941.2	229.9	230.6	94.79	-25.9	7,903.1	449.4	-9.4	458.86	0.979	Level 1
18,700.0	10,904.6	18,653.2	10,942.1	232.8	233.5	94.79	-25.9	8,003.1	449.4	-15.2	464.66	0.967	Level 1
18,800.0	10,905.6	18,753.2	10,943.1	235.7	236.4	94.79	-25.9	8,103.1	449.4	-21.0	470.47	0.955	Level 1
18,900.0	10,906.5	18,853.2	10,944.1	238.6	239.3	94.79	-25.9	8,203.1	449.4	-26.8	476.28	0.944	Level 1
19,000.0	10,907.4	18,953.2	10,945.0	241.6	242.2	94.80	-25.9	8,303.1	449.4	-32.6	482.09	0.932	Level 1
19,100.0	10,908.4	19,053.2	10,946.0	244.5	245.1	94.80	-25.9	8,403.1	449.4	-38.5	487.90	0.921	Level 1
19,200.0	10,909.3	19,153.2	10,946.9	247.4	248.0	94.80	-25.9	8,503.1	449.4	-44.3	493.71	0.910	Level 1
19,300.0	10,910.3	19,253.2	10,947.9	250.3	251.0	94.80	-25.9	8,603.1	449.4	-50.1	499.52	0.900	Level 1
19,400.0	10,911.2	19,353.2	10,948.9	253.2	253.9	94.80	-25.9	8,703.1	449.5	-55.9	505.33	0.889	Level 1
19,500.0	10,912.2	19,453.2	10,949.8	256.1	256.8	94.81	-25.9	8,803.1	449.5	-61.7	511.15	0.879	Level 1
19,600.0	10,913.1	19,553.2	10,950.8	259.0	259.7	94.81	-25.9	8,903.1	449.5	-67.5	516.96	0.869	Level 1
19,700.0	10,914.0	19,653.2	10,951.7	261.9	262.6	94.81	-25.9	9,003.1	449.5	-73.3	522.77	0.860	Level 1
19,800.0	10,915.0	19,753.2	10,952.7	264.9	265.5	94.81	-25.9	9,103.1	449.5	-79.1	528.59	0.850	Level 1
19,900.0	10,915.9	19,853.2	10,953.7	267.8	268.5	94.82	-25.9	9,203.1	449.5	-84.9	534.40	0.841	Level 1
20,000.0	10,916.9	19,953.2	10,954.6	270.7	271.4	94.82	-25.9	9,303.1	449.5	-90.8	540.22	0.832	Level 1
20,100.0	10,917.8	20,053.2	10,955.6	273.6	274.3	94.82	-25.9	9,403.1	449.5	-96.6	546.03	0.823	Level 1
20,200.0	10,918.8	20,153.2	10,956.5	276.5	277.2	94.82	-25.9	9,503.1	449.5	-102.4	551.85	0.814	Level 1
20,300.0	10,919.7	20,253.2	10,957.5	279.4	280.1	94.82	-25.9	9,603.1	449.5	-108.2	557.67	0.806	Level 1
20,400.0	10,920.6	20,353.2	10,958.5	282.3	283.1	94.83	-25.9	9,703.1	449.5	-114.0	563.48	0.798	Level 1
20,500.0	10,921.6	20,453.2	10,959.4	285.3	286.0	94.83	-25.9	9,803.0	449.5	-119.8	569.30	0.790	Level 1
20,600.0	10,922.5	20,553.2	10,960.4	288.2	288.9	94.83	-25.9	9,903.0	449.5	-125.6	575.12	0.782	Level 1
20,700.0	10,923.5	20,653.2	10,961.3	291.1	291.8	94.83	-25.9	10,003.0	449.5	-131.5	580.94	0.774	Level 1
20,763.5	10,924.1	20,716.6	10,961.9	292.3	293.7	94.84	-25.9	10,066.5	449.5	-134.5	584.00	0.770	Level 1
20,804.6	10,924.4	20,757.0	10,962.3	293.1	294.9	94.84	-25.9	10,106.9	449.5	-136.5	585.97	0.767	Level 1, ES, SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31 5T - Plan #1												Offset Site Error:	0.0 usft		
Survey Program: 0-MWD		Distance												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			Warning
0.0	0.0	0.0	0.0	0.0	0.0	-174.86	-98.3	-8.8	98.7						
100.0	100.0	100.0	100.0	0.1	0.1	-174.86	-98.3	-8.8	98.7	98.5	0.18	562.881			
200.0	200.0	200.0	200.0	0.3	0.3	-174.86	-98.3	-8.8	98.7	98.1	0.62	157.931			
300.0	300.0	300.0	300.0	0.5	0.5	-174.86	-98.3	-8.8	98.7	97.6	1.07	91.851			
400.0	400.0	400.0	400.0	0.8	0.8	-174.86	-98.3	-8.8	98.7	97.2	1.52	64.756			
500.0	500.0	500.0	500.0	1.0	1.0	-174.86	-98.3	-8.8	98.7	96.7	1.97	50.005			
600.0	600.0	600.0	600.0	1.2	1.2	-174.86	-98.3	-8.8	98.7	96.3	2.42	40.728			
700.0	700.0	700.0	700.0	1.4	1.4	-174.86	-98.3	-8.8	98.7	95.8	2.87	34.354			
800.0	800.0	800.0	800.0	1.7	1.7	-174.86	-98.3	-8.8	98.7	95.4	3.32	29.706			
900.0	900.0	900.0	900.0	1.9	1.9	-174.86	-98.3	-8.8	98.7	94.9	3.77	26.165			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-174.86	-98.3	-8.8	98.7	94.5	4.22	23.378			
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	-174.86	-98.3	-8.8	98.7	94.0	4.67	21.128			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-174.86	-98.3	-8.8	98.7	93.6	5.12	19.273			
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-174.86	-98.3	-8.8	98.7	93.1	5.57	17.718			
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-174.86	-98.3	-8.8	98.7	92.7	6.02	16.395			
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.2	-174.86	-98.3	-8.8	98.7	92.2	6.47	15.255			
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-174.86	-98.3	-8.8	98.7	91.8	6.92	14.264			
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	-174.86	-98.3	-8.8	98.7	91.3	7.37	13.394			
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	-174.86	-98.3	-8.8	98.7	90.9	7.82	12.624			
1,900.0	1,900.0	1,900.0	1,900.0	4.1	4.1	-174.86	-98.3	-8.8	98.7	90.4	8.27	11.937			
2,000.0	2,000.0	2,000.0	2,000.0	4.4	4.4	-174.86	-98.3	-8.8	98.7	90.0	8.72	11.322			
2,100.0	2,100.0	2,100.0	2,100.0	4.6	4.6	-174.86	-98.3	-8.8	98.7	89.5	9.17	10.766 CC, ES			
2,110.0	2,110.0	2,109.2	2,109.2	4.6	4.6	-174.87	-98.3	-8.8	98.8	89.6	9.21	10.728			
2,200.0	2,200.0	2,199.1	2,199.1	4.8	4.8	-174.95	-99.1	-8.8	100.3	90.8	9.56	10.495			
2,300.0	2,300.0	2,299.1	2,299.1	5.0	4.9	-175.03	-100.0	-8.8	102.1	92.1	9.96	10.251			
2,400.0	2,400.0	2,399.1	2,399.1	5.3	5.1	-175.12	-100.9	-8.8	103.8	93.5	10.36	10.022			
2,500.0	2,500.0	2,499.1	2,499.1	5.5	5.3	-175.20	-101.7	-8.8	105.5	94.8	10.76	9.807			
2,600.0	2,600.0	2,599.1	2,599.0	5.7	5.5	-175.28	-102.6	-8.8	107.3	96.1	11.17	9.604			
2,700.0	2,700.0	2,699.1	2,699.0	5.9	5.7	-175.35	-103.5	-8.8	109.0	97.4	11.58	9.414			
2,800.0	2,800.0	2,799.0	2,799.0	6.2	5.8	-175.42	-104.3	-8.8	110.8	98.8	12.00	9.234			
2,900.0	2,900.0	2,899.0	2,899.0	6.4	6.0	-175.50	-105.2	-8.8	112.5	100.1	12.41	9.064			
3,000.0	3,000.0	2,999.0	2,999.0	6.6	6.2	-175.56	-106.1	-8.8	114.2	101.4	12.83	8.904			
3,100.0	3,100.0	3,099.0	3,099.0	6.8	6.4	-175.63	-107.0	-8.8	116.0	102.7	13.25	8.753			
3,200.0	3,200.0	3,199.0	3,198.9	7.1	6.6	-175.70	-107.8	-8.8	117.7	104.1	13.67	8.610			
3,300.0	3,300.0	3,299.0	3,298.9	7.3	6.8	-175.76	-108.7	-8.8	119.5	105.4	14.10	8.474			
3,400.0	3,400.0	3,398.9	3,398.9	7.5	7.0	-175.82	-109.6	-8.8	121.2	106.7	14.52	8.346			
3,500.0	3,499.9	3,498.9	3,498.9	7.7	7.2	-175.88	-110.5	-8.8	122.9	108.0	14.95	8.224			
3,600.0	3,599.9	3,598.9	3,598.9	8.0	7.4	-175.94	-111.3	-8.8	124.7	109.3	15.38	8.108			
3,700.0	3,699.9	3,698.9	3,698.8	8.2	7.6	-175.99	-112.2	-8.8	126.4	110.6	15.81	7.998			
3,800.0	3,799.9	3,798.9	3,798.8	8.4	7.8	-176.05	-113.1	-8.8	128.2	111.9	16.24	7.893			
3,900.0	3,899.9	3,898.9	3,898.8	8.6	8.0	-176.10	-113.9	-8.8	129.9	113.2	16.67	7.793			
4,000.0	3,999.9	3,998.9	3,998.8	8.9	8.3	-176.15	-114.8	-8.8	131.7	114.5	17.10	7.698			
4,100.0	4,099.9	4,098.8	4,098.8	9.1	8.5	-176.20	-115.7	-8.8	133.4	115.9	17.54	7.607			
4,200.0	4,199.9	4,198.8	4,198.7	9.3	8.7	-176.25	-116.6	-8.8	135.1	117.2	17.97	7.520			
4,300.0	4,299.9	4,298.8	4,298.7	9.5	8.9	-176.30	-117.4	-8.8	136.9	118.5	18.41	7.437			
4,400.0	4,399.9	4,398.8	4,398.7	9.8	9.1	-176.35	-118.3	-8.8	138.6	119.8	18.84	7.357			
4,500.0	4,499.9	4,498.8	4,498.7	10.0	9.3	-176.39	-119.2	-8.8	140.4	121.1	19.28	7.281			
4,600.0	4,599.9	4,598.8	4,598.7	10.2	9.5	-176.44	-120.0	-8.8	142.1	122.4	19.71	7.208			
4,700.0	4,699.9	4,698.7	4,698.6	10.4	9.7	-176.48	-120.9	-8.8	143.8	123.7	20.15	7.138			
4,800.0	4,799.9	4,798.7	4,798.6	10.7	10.0	-176.52	-121.8	-8.8	145.6	125.0	20.59	7.071			
4,900.0	4,899.9	4,898.7	4,898.6	10.9	10.2	-176.56	-122.7	-8.8	147.3	126.3	21.03	7.006			
5,000.0	4,999.9	4,998.7	4,998.6	11.1	10.4	-176.60	-123.5	-8.8	149.1	127.6	21.47	6.944			
5,100.0	5,099.9	5,098.7	5,098.6	11.3	10.6	-176.64	-124.4	-8.8	150.8	128.9	21.91	6.884			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31 5T - Plan #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Reference Offset		Semi Major Axis			Distance					Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,200.0	5,199.9	5,198.7	5,198.6	11.6	10.8	-176.68	-125.3	-8.8	152.6	130.2	22.35	6.827	
5,300.0	5,299.9	5,298.7	5,298.5	11.8	11.0	-176.72	-126.2	-8.8	154.3	131.5	22.79	6.771	
5,400.0	5,399.9	5,398.6	5,398.5	12.0	11.2	-176.75	-127.0	-8.8	156.0	132.8	23.23	6.718	
5,500.0	5,499.9	5,498.6	5,498.5	12.2	11.5	-176.79	-127.9	-8.8	157.8	134.1	23.67	6.666	
5,600.0	5,599.9	5,598.6	5,598.5	12.5	11.7	-176.82	-128.8	-8.8	159.5	135.4	24.11	6.616	
5,700.0	5,699.9	5,698.6	5,698.5	12.7	11.9	-176.86	-129.6	-8.8	161.3	136.7	24.55	6.568	
5,800.0	5,799.9	5,798.6	5,798.4	12.9	12.1	-176.89	-130.5	-8.8	163.0	138.0	24.99	6.522	
5,900.0	5,899.9	5,898.6	5,898.4	13.1	12.3	-176.93	-131.4	-8.8	164.8	139.3	25.44	6.477	
6,000.0	5,999.9	5,998.5	5,998.4	13.4	12.6	-176.96	-132.3	-8.8	166.5	140.6	25.88	6.434	
6,100.0	6,099.8	6,098.5	6,098.4	13.6	12.8	-176.99	-133.1	-8.8	168.2	141.9	26.32	6.392	
6,200.0	6,199.8	6,198.5	6,198.4	13.8	13.0	-177.02	-134.0	-8.8	170.0	143.2	26.76	6.351	
6,300.0	6,299.8	6,298.5	6,298.3	14.0	13.2	-177.05	-134.9	-8.8	171.7	144.5	27.21	6.312	
6,400.0	6,399.8	6,398.5	6,398.3	14.3	13.4	-177.08	-135.8	-8.8	173.5	145.8	27.65	6.273	
6,500.0	6,499.8	6,498.5	6,498.3	14.5	13.7	-177.11	-136.6	-8.8	175.2	147.1	28.09	6.236	
6,600.0	6,599.8	6,598.5	6,598.3	14.7	13.9	-177.14	-137.5	-8.8	177.0	148.4	28.54	6.200	
6,700.0	6,699.8	6,698.4	6,698.3	14.9	14.1	-177.17	-138.4	-8.8	178.7	149.7	28.98	6.166	
6,800.0	6,799.8	6,798.4	6,798.2	15.1	14.3	-177.19	-139.2	-8.8	180.4	151.0	29.43	6.132	
6,900.0	6,899.8	6,898.4	6,898.2	15.4	14.5	-177.22	-140.1	-8.8	182.2	152.3	29.87	6.099	
7,000.0	6,999.8	6,998.4	6,998.2	15.6	14.8	-177.25	-141.0	-8.8	183.9	153.6	30.32	6.067	
7,100.0	7,099.8	7,098.4	7,098.2	15.8	15.0	-177.27	-141.9	-8.8	185.7	154.9	30.76	6.036	
7,200.0	7,199.8	7,198.4	7,198.2	16.0	15.2	-177.30	-142.7	-8.8	187.4	156.2	31.21	6.006	
7,300.0	7,299.8	7,298.4	7,298.2	16.3	15.4	-177.32	-143.6	-8.8	189.2	157.5	31.65	5.976	
7,400.0	7,399.8	7,398.3	7,398.1	16.5	15.6	-177.35	-144.5	-8.8	190.9	158.8	32.10	5.948	
7,500.0	7,499.8	7,498.3	7,498.1	16.7	15.9	-177.37	-145.4	-8.8	192.6	160.1	32.54	5.920	
7,600.0	7,599.8	7,598.3	7,598.1	16.9	16.1	-177.39	-146.2	-8.8	194.4	161.4	32.99	5.893	
7,700.0	7,699.8	7,698.3	7,698.1	17.2	16.3	-177.42	-147.1	-8.8	196.1	162.7	33.43	5.867	
7,800.0	7,799.8	7,798.3	7,798.1	17.4	16.5	-177.44	-148.0	-8.8	197.9	164.0	33.88	5.841	
7,829.7	7,829.4	7,827.9	7,827.7	17.5	16.6	-177.45	-148.2	-8.8	198.4	164.4	34.01	5.833	
7,839.7	7,839.4	7,839.7	7,839.4	17.5	16.6	-177.45	-148.3	-8.8	198.5	164.4	34.08	5.824	
7,900.0	7,899.8	7,900.0	7,899.8	17.6	16.7	-177.45	-148.3	-8.8	198.5	164.2	34.32	5.783	
8,000.0	7,999.8	8,000.0	7,999.8	17.8	16.9	-177.45	-148.3	-8.8	198.5	163.7	34.74	5.714	
8,100.0	8,099.8	8,100.0	8,099.8	18.1	17.1	-177.45	-148.3	-8.8	198.5	163.3	35.15	5.647	
8,200.0	8,199.8	8,200.0	8,199.8	18.3	17.3	-177.45	-148.3	-8.8	198.5	162.9	35.57	5.580	
8,300.0	8,299.8	8,300.0	8,299.8	18.5	17.5	-177.45	-148.3	-8.8	198.5	162.5	35.99	5.516	
8,400.0	8,399.8	8,400.0	8,399.8	18.7	17.7	-177.45	-148.3	-8.8	198.5	162.1	36.40	5.452	
8,500.0	8,499.8	8,500.0	8,499.8	19.0	17.9	-177.45	-148.3	-8.8	198.5	161.7	36.82	5.390	
8,600.0	8,599.8	8,600.0	8,599.8	19.2	18.1	-177.45	-148.3	-8.8	198.5	161.2	37.24	5.329	
8,700.0	8,699.8	8,700.0	8,699.8	19.4	18.3	-177.45	-148.3	-8.8	198.5	160.8	37.66	5.270	
8,800.0	8,799.8	8,800.0	8,799.8	19.6	18.5	-177.45	-148.3	-8.8	198.5	160.4	38.08	5.212	
8,900.0	8,899.8	8,900.0	8,899.8	19.8	18.7	-177.45	-148.3	-8.8	198.5	160.0	38.51	5.155	
9,000.0	8,999.8	9,000.0	8,999.8	20.1	18.9	-177.45	-148.3	-8.8	198.5	159.6	38.93	5.099	
9,100.0	9,099.8	9,100.0	9,099.8	20.3	19.1	-177.45	-148.3	-8.8	198.5	159.1	39.35	5.044	
9,200.0	9,199.8	9,200.0	9,199.8	20.5	19.3	-177.45	-148.3	-8.8	198.5	158.7	39.77	4.990	
9,300.0	9,299.8	9,300.0	9,299.8	20.7	19.5	-177.45	-148.3	-8.8	198.5	158.3	40.20	4.938	
9,400.0	9,399.8	9,400.0	9,399.8	21.0	19.7	-177.45	-148.3	-8.8	198.5	157.9	40.62	4.886	
9,500.0	9,499.8	9,500.0	9,499.8	21.2	19.9	-177.45	-148.3	-8.8	198.5	157.4	41.05	4.835	
9,600.0	9,599.8	9,600.0	9,599.8	21.4	20.1	-177.45	-148.3	-8.8	198.5	157.0	41.47	4.786	
9,700.0	9,699.8	9,700.0	9,699.8	21.6	20.3	-177.45	-148.3	-8.8	198.5	156.6	41.90	4.737	
9,800.0	9,799.8	9,800.0	9,799.8	21.9	20.5	-177.45	-148.3	-8.8	198.5	156.2	42.33	4.689	
9,900.0	9,899.8	9,900.0	9,899.8	22.1	20.7	-177.45	-148.3	-8.8	198.5	155.7	42.75	4.642	
10,000.0	9,999.8	10,000.0	9,999.8	22.3	20.9	-177.45	-148.3	-8.8	198.5	155.3	43.18	4.596	
10,100.0	10,099.8	10,100.0	10,099.8	22.5	21.1	-177.45	-148.3	-8.8	198.5	154.9	43.61	4.551	
10,200.0	10,199.8	10,200.0	10,199.8	22.8	21.3	-177.45	-148.3	-8.8	198.5	154.4	44.04	4.507	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31 5T - Plan #1												Offset Site Error:	0.0 usft		
Survey Program: 0-MWD		Distance												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
10,300.0	10,299.8	10,300.0	10,299.8	23.0	21.5	-177.45	-148.3	-8.8	198.5	154.0	44.47	4.464			
10,337.1	10,336.9	10,337.1	10,336.9	23.1	21.6	-177.45	-148.3	-8.8	198.5	153.9	44.63	4.448			
10,355.7	10,355.5	10,355.7	10,355.5	23.1	21.6	-177.45	-148.3	-8.8	198.5	153.8	44.71	4.440			
10,375.0	10,374.8	10,372.4	10,372.2	23.2	21.7	116.92	-148.4	-8.6	198.8	154.0	44.78	4.439			
10,400.0	10,399.7	10,394.0	10,393.8	23.2	21.7	116.82	-148.9	-7.4	200.1	155.2	44.86	4.460			
10,425.0	10,424.5	10,415.5	10,415.2	23.3	21.7	116.64	-149.8	-5.4	202.4	157.4	44.93	4.504			
10,450.0	10,449.2	10,436.9	10,436.3	23.3	21.8	116.37	-151.1	-2.6	205.7	160.7	44.99	4.571			
10,475.0	10,473.5	10,458.2	10,457.2	23.4	21.8	116.04	-152.8	1.1	209.9	164.9	45.05	4.661			
10,500.0	10,497.6	10,479.2	10,477.6	23.4	21.9	115.62	-154.9	5.6	215.2	170.1	45.09	4.772			
10,525.0	10,521.3	10,500.0	10,497.6	23.5	21.9	115.12	-157.2	10.9	221.4	176.2	45.13	4.904			
10,550.0	10,544.5	10,520.5	10,517.0	23.6	22.0	114.55	-159.9	16.8	228.5	183.3	45.18	5.057			
10,575.0	10,567.2	10,540.6	10,535.8	23.6	22.0	113.90	-162.9	23.4	236.4	191.2	45.22	5.228			
10,600.0	10,589.3	10,560.5	10,554.1	23.7	22.1	113.17	-166.2	30.5	245.3	200.0	45.28	5.417			
10,625.0	10,610.7	10,580.0	10,571.6	23.8	22.1	112.36	-169.7	38.2	254.9	209.6	45.34	5.622			
10,650.0	10,631.5	10,600.0	10,589.3	23.8	22.2	111.50	-173.6	46.8	265.3	219.9	45.42	5.842			
10,675.0	10,651.5	10,617.9	10,604.7	23.9	22.2	110.51	-177.3	55.1	276.5	231.0	45.51	6.075			
10,700.0	10,670.7	10,636.3	10,620.2	24.0	22.3	109.47	-181.4	64.1	288.4	242.8	45.63	6.320			
10,725.0	10,689.1	10,654.3	10,635.0	24.1	22.3	108.34	-185.7	73.4	300.9	255.2	45.77	6.575			
10,750.0	10,706.5	10,671.9	10,649.1	24.2	22.4	107.14	-190.0	83.0	314.1	268.2	45.94	6.838			
10,775.0	10,722.9	10,689.1	10,662.4	24.3	22.4	105.85	-194.5	92.9	327.9	281.7	46.13	7.108			
10,800.0	10,738.4	10,705.9	10,675.1	24.5	22.5	104.48	-199.1	102.9	342.2	295.8	46.34	7.383			
10,825.0	10,752.8	10,722.4	10,687.2	24.6	22.6	103.03	-203.7	113.1	357.0	310.4	46.58	7.663			
10,850.0	10,766.1	10,738.4	10,698.5	24.8	22.6	101.50	-208.4	123.5	372.2	325.4	46.85	7.946			
10,875.0	10,778.3	10,754.2	10,709.3	24.9	22.7	99.90	-213.2	133.9	387.9	340.8	47.13	8.231			
10,900.0	10,789.4	10,769.6	10,719.5	25.1	22.8	98.23	-218.0	144.5	404.0	356.6	47.43	8.519			
10,925.0	10,799.2	10,784.6	10,729.0	25.3	22.9	96.48	-222.8	155.1	420.4	372.7	47.73	8.808			
10,950.0	10,807.8	10,800.0	10,738.4	25.5	23.0	94.71	-227.8	166.1	437.2	389.1	48.04	9.100			
10,975.0	10,815.2	10,813.9	10,746.5	25.8	23.0	92.81	-232.5	176.4	454.2	405.9	48.35	9.394			
11,000.0	10,821.3	10,828.1	10,754.5	26.0	23.1	90.90	-237.3	187.1	471.5	422.8	48.65	9.691			
11,025.0	10,826.2	10,842.1	10,762.0	26.2	23.2	88.94	-242.2	197.8	488.9	440.0	48.94	9.990			
11,050.0	10,829.8	10,855.8	10,769.0	26.5	23.3	86.96	-247.1	208.5	506.6	457.4	49.21	10.294			
11,075.0	10,832.0	10,869.3	10,775.6	26.8	23.4	84.95	-252.0	219.3	524.4	474.9	49.47	10.601			
11,101.3	10,833.0	10,883.3	10,782.1	27.1	23.5	82.82	-257.1	230.6	543.2	493.5	49.71	10.929			
11,116.3	10,833.1	10,891.3	10,785.6	27.3	23.6	83.44	-260.1	237.1	554.1	504.1	49.95	11.091			
11,200.0	10,833.9	10,939.4	10,804.3	28.4	24.0	86.62	-278.4	277.5	614.1	562.7	51.46	11.935			
11,300.0	10,834.9	11,004.9	10,822.4	29.9	24.7	89.07	-304.4	334.7	683.9	630.4	53.46	12.793			
11,400.0	10,835.8	11,077.6	10,832.2	31.6	25.6	90.10	-334.2	400.3	750.5	694.7	55.75	13.462			
11,500.0	10,836.8	11,184.3	10,833.8	33.5	27.2	90.13	-377.2	497.9	812.4	753.8	58.67	13.848			
11,600.0	10,837.7	11,336.3	10,835.2	35.5	29.8	90.10	-429.5	640.6	864.7	802.0	62.70	13.792			
11,700.0	10,838.6	11,507.0	10,836.8	37.6	33.1	90.07	-474.5	805.2	904.9	837.1	67.79	13.348			
11,800.0	10,839.6	11,692.8	10,838.6	39.7	37.1	90.04	-506.5	988.1	931.3	857.4	73.95	12.594			
11,900.0	10,840.5	11,887.9	10,840.4	42.0	41.6	90.01	-520.8	1,182.5	942.8	862.0	80.86	11.660			
11,929.3	10,840.8	11,938.5	10,840.9	42.6	42.8	90.01	-521.3	1,233.1	943.3	860.5	82.78	11.395			
12,000.0	10,841.5	12,009.2	10,841.6	44.3	44.5	90.01	-521.3	1,303.8	943.3	857.1	86.19	10.944			
12,100.0	10,842.4	12,109.2	10,842.5	46.6	46.9	90.01	-521.3	1,403.8	943.3	852.2	91.11	10.353			
12,200.0	10,843.4	12,209.2	10,843.4	49.0	49.4	90.01	-521.3	1,503.8	943.3	847.2	96.14	9.812			
12,300.0	10,844.3	12,309.2	10,844.4	51.5	51.9	90.01	-521.3	1,603.8	943.3	842.0	101.25	9.316			
12,400.0	10,845.2	12,409.2	10,845.3	54.0	54.5	90.01	-521.3	1,703.8	943.3	836.8	106.44	8.862			
12,500.0	10,846.2	12,509.2	10,846.3	56.5	57.1	90.01	-521.3	1,803.8	943.3	831.6	111.70	8.445			
12,600.0	10,847.1	12,609.2	10,847.2	59.1	59.8	90.01	-521.3	1,903.8	943.3	826.3	117.02	8.061			
12,700.0	10,848.1	12,709.2	10,848.2	61.7	62.4	90.01	-521.3	2,003.8	943.3	820.9	122.38	7.708			
12,800.0	10,849.0	12,809.2	10,849.1	64.4	65.1	90.01	-521.3	2,103.8	943.3	815.5	127.79	7.382			
12,900.0	10,850.0	12,909.2	10,850.0	67.1	67.8	90.01	-521.3	2,203.7	943.3	810.1	133.23	7.080			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31 5T - Plan #1												Offset Site Error:	0.0 usft		
Survey Program: 0-MWD		Distance												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
13,000.0	10,850.9	13,009.2	10,851.0	69.7	70.5	90.01	-521.3	2,303.7	943.3	804.6	138.71	6.800			
13,100.0	10,851.8	13,109.2	10,851.9	72.5	73.3	90.01	-521.3	2,403.7	943.3	799.1	144.22	6.540			
13,200.0	10,852.8	13,209.2	10,852.9	75.2	76.0	90.01	-521.3	2,503.7	943.3	793.5	149.76	6.299			
13,300.0	10,853.7	13,309.2	10,853.8	77.9	78.8	90.01	-521.3	2,603.7	943.3	788.0	155.32	6.073			
13,400.0	10,854.7	13,409.2	10,854.8	80.7	81.6	90.01	-521.3	2,703.7	943.3	782.4	160.90	5.863			
13,500.0	10,855.6	13,509.2	10,855.7	83.4	84.4	90.01	-521.3	2,803.7	943.3	776.8	166.50	5.665			
13,600.0	10,856.5	13,609.2	10,856.6	86.2	87.2	90.01	-521.3	2,903.7	943.3	771.2	172.12	5.481			
13,700.0	10,857.5	13,709.2	10,857.6	89.0	90.0	90.01	-521.3	3,003.7	943.3	765.5	177.75	5.307			
13,800.0	10,858.4	13,809.2	10,858.5	91.8	92.8	90.01	-521.3	3,103.7	943.3	759.9	183.40	5.143			
13,900.0	10,859.4	13,909.2	10,859.5	94.6	95.6	90.01	-521.3	3,203.7	943.3	754.2	189.06	4.989			
14,000.0	10,860.3	14,009.2	10,860.4	97.4	98.4	90.01	-521.3	3,303.7	943.3	748.6	194.73	4.844			
14,100.0	10,861.3	14,109.2	10,861.3	100.2	101.3	90.01	-521.3	3,403.7	943.3	742.9	200.41	4.707			
14,200.0	10,862.2	14,209.2	10,862.3	103.0	104.1	90.01	-521.3	3,503.7	943.3	737.2	206.10	4.577			
14,300.0	10,863.1	14,309.2	10,863.2	105.9	107.0	90.01	-521.3	3,603.7	943.3	731.5	211.80	4.454			
14,400.0	10,864.1	14,409.2	10,864.2	108.7	109.8	90.01	-521.3	3,703.7	943.3	725.8	217.51	4.337			
14,500.0	10,865.0	14,509.2	10,865.1	111.5	112.7	90.01	-521.3	3,803.7	943.3	720.1	223.23	4.226			
14,600.0	10,866.0	14,609.2	10,866.1	114.4	115.5	90.01	-521.3	3,903.7	943.3	714.3	228.96	4.120			
14,700.0	10,866.9	14,709.2	10,867.0	117.2	118.4	90.01	-521.3	4,003.7	943.3	708.6	234.69	4.019			
14,800.0	10,867.9	14,809.2	10,867.9	120.1	121.2	90.01	-521.3	4,103.7	943.3	702.9	240.43	3.923			
14,900.0	10,868.8	14,909.2	10,868.9	122.9	124.1	90.01	-521.3	4,203.7	943.3	697.1	246.17	3.832			
15,000.0	10,869.7	15,009.2	10,869.8	125.8	127.0	90.01	-521.3	4,303.7	943.3	691.4	251.92	3.744			
15,100.0	10,870.7	15,109.2	10,870.8	128.7	129.8	90.01	-521.3	4,403.7	943.3	685.6	257.67	3.661			
15,200.0	10,871.6	15,209.2	10,871.7	131.5	132.7	90.01	-521.3	4,503.6	943.3	679.9	263.43	3.581			
15,300.0	10,872.6	15,309.2	10,872.7	134.4	135.6	90.01	-521.3	4,603.6	943.3	674.1	269.19	3.504			
15,400.0	10,873.5	15,409.2	10,873.6	137.3	138.5	90.01	-521.3	4,703.6	943.3	668.3	274.96	3.431			
15,500.0	10,874.5	15,509.2	10,874.5	140.1	141.4	90.01	-521.3	4,803.6	943.3	662.6	280.73	3.360			
15,600.0	10,875.4	15,609.2	10,875.5	143.0	144.2	90.01	-521.3	4,903.6	943.3	656.8	286.50	3.292			
15,700.0	10,876.3	15,709.2	10,876.4	145.9	147.1	90.01	-521.3	5,003.6	943.3	651.0	292.28	3.227			
15,800.0	10,877.3	15,809.2	10,877.4	148.8	150.0	90.01	-521.3	5,103.6	943.3	645.2	298.06	3.165			
15,900.0	10,878.2	15,909.2	10,878.3	151.7	152.9	90.01	-521.3	5,203.6	943.3	639.4	303.84	3.105			
16,000.0	10,879.2	16,009.2	10,879.3	154.5	155.8	90.01	-521.3	5,303.6	943.3	633.7	309.63	3.047			
16,100.0	10,880.1	16,109.2	10,880.2	157.4	158.7	90.01	-521.3	5,403.6	943.3	627.9	315.42	2.991			
16,200.0	10,881.1	16,209.2	10,881.1	160.3	161.6	90.01	-521.3	5,503.6	943.3	622.1	321.21	2.937			
16,300.0	10,882.0	16,309.2	10,882.1	163.2	164.5	90.01	-521.3	5,603.6	943.3	616.3	327.00	2.885			
16,400.0	10,882.9	16,409.2	10,883.0	166.1	167.4	90.01	-521.3	5,703.6	943.3	610.5	332.80	2.834			
16,500.0	10,883.9	16,509.2	10,884.0	169.0	170.3	90.01	-521.3	5,803.6	943.3	604.7	338.60	2.786			
16,600.0	10,884.8	16,609.2	10,884.9	171.9	173.2	90.01	-521.3	5,903.6	943.3	598.9	344.40	2.739			
16,700.0	10,885.8	16,709.2	10,885.9	174.8	176.0	90.01	-521.3	6,003.6	943.3	593.1	350.20	2.694			
16,800.0	10,886.7	16,809.2	10,886.8	177.7	178.9	90.01	-521.3	6,103.6	943.3	587.3	356.00	2.650			
16,900.0	10,887.7	16,909.2	10,887.7	180.6	181.8	90.01	-521.3	6,203.6	943.3	581.5	361.81	2.607			
17,000.0	10,888.6	17,009.2	10,888.7	183.5	184.7	90.01	-521.3	6,303.6	943.3	575.7	367.62	2.566			
17,100.0	10,889.5	17,109.2	10,889.6	186.4	187.7	90.01	-521.3	6,403.6	943.3	569.9	373.43	2.526			
17,200.0	10,890.5	17,209.2	10,890.6	189.3	190.6	90.01	-521.3	6,503.6	943.3	564.1	379.24	2.487			
17,300.0	10,891.4	17,309.2	10,891.5	192.2	193.5	90.01	-521.3	6,603.6	943.3	558.2	385.05	2.450			
17,400.0	10,892.4	17,409.2	10,892.4	195.1	196.4	90.01	-521.3	6,703.5	943.3	552.4	390.86	2.413			
17,500.0	10,893.3	17,509.2	10,893.4	198.0	199.3	90.01	-521.3	6,803.5	943.3	546.6	396.68	2.378			
17,600.0	10,894.2	17,609.2	10,894.3	200.9	202.2	90.01	-521.3	6,903.5	943.3	540.8	402.50	2.344			
17,700.0	10,895.2	17,709.2	10,895.3	203.8	205.1	90.01	-521.3	7,003.5	943.3	535.0	408.31	2.310			
17,800.0	10,896.1	17,809.2	10,896.2	206.7	208.0	90.01	-521.3	7,103.5	943.3	529.2	414.13	2.278			
17,900.0	10,897.1	17,909.2	10,897.2	209.6	210.9	90.01	-521.3	7,203.5	943.3	523.3	419.95	2.246			
18,000.0	10,898.0	18,009.2	10,898.1	212.5	213.8	90.01	-521.3	7,303.5	943.3	517.5	425.77	2.215			
18,100.0	10,899.0	18,109.2	10,899.0	215.4	216.7	90.01	-521.3	7,403.5	943.3	511.7	431.59	2.186			
18,200.0	10,899.9	18,209.2	10,900.0	218.3	219.6	90.01	-521.3	7,503.5	943.3	505.9	437.42	2.157			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Oasis Petroleum

## Anticollision Report

<b>Company:</b>	Oasis	<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>Project:</b>	Indian Hills	<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Reference Site:</b>	153N-100W-31/32	<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T	<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 11-31 5T - Lewis Federal 5300 11-31 5T - Plan #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis				Distance					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,300.0	10,900.8	18,309.2	10,900.9	221.2	222.5	90.01	-521.3	7,603.5	943.3	500.1	443.24	2.128	
18,400.0	10,901.8	18,409.2	10,901.9	224.1	225.4	90.01	-521.3	7,703.5	943.3	494.2	449.06	2.101	
18,500.0	10,902.7	18,509.2	10,902.8	227.0	228.4	90.01	-521.3	7,803.5	943.3	488.4	454.89	2.074	
18,600.0	10,903.7	18,609.2	10,903.8	229.9	231.3	90.01	-521.3	7,903.5	943.3	482.6	460.72	2.047	
18,700.0	10,904.6	18,709.2	10,904.7	232.8	234.2	90.01	-521.3	8,003.5	943.3	476.7	466.54	2.022	
18,800.0	10,905.6	18,809.2	10,905.6	235.7	237.1	90.01	-521.3	8,103.5	943.3	470.9	472.37	1.997	
18,900.0	10,906.5	18,909.2	10,906.6	238.6	240.0	90.01	-521.3	8,203.5	943.3	465.1	478.20	1.973	
19,000.0	10,907.4	19,009.2	10,907.5	241.6	242.9	90.01	-521.3	8,303.5	943.3	459.3	484.03	1.949	
19,100.0	10,908.4	19,109.2	10,908.5	244.5	245.8	90.01	-521.3	8,403.5	943.3	453.4	489.86	1.926	
19,200.0	10,909.3	19,209.2	10,909.4	247.4	248.7	90.01	-521.3	8,503.5	943.3	447.6	495.69	1.903	
19,300.0	10,910.3	19,309.2	10,910.4	250.3	251.7	90.01	-521.3	8,603.5	943.3	441.8	501.52	1.881	
19,400.0	10,911.2	19,409.2	10,911.3	253.2	254.6	90.01	-521.3	8,703.5	943.3	435.9	507.35	1.859	
19,500.0	10,912.2	19,509.2	10,912.2	256.1	257.5	90.01	-521.3	8,803.5	943.3	430.1	513.19	1.838	
19,600.0	10,913.1	19,609.2	10,913.2	259.0	260.4	90.01	-521.3	8,903.5	943.3	424.3	519.02	1.817	
19,700.0	10,914.0	19,709.2	10,914.1	261.9	263.3	90.01	-521.3	9,003.4	943.3	418.4	524.85	1.797	
19,800.0	10,915.0	19,809.2	10,915.1	264.9	266.2	90.01	-521.3	9,103.4	943.3	412.6	530.69	1.777	
19,900.0	10,915.9	19,909.2	10,916.0	267.8	269.2	90.01	-521.3	9,203.4	943.3	406.8	536.52	1.758	
20,000.0	10,916.9	20,009.2	10,917.0	270.7	272.1	90.01	-521.3	9,303.4	943.3	400.9	542.36	1.739	
20,100.0	10,917.8	20,109.2	10,917.9	273.6	275.0	90.01	-521.3	9,403.4	943.3	395.1	548.19	1.721	
20,200.0	10,918.8	20,209.2	10,918.8	276.5	277.9	90.01	-521.3	9,503.4	943.3	389.3	554.03	1.703	
20,300.0	10,919.7	20,309.2	10,919.8	279.4	280.8	90.01	-521.3	9,603.4	943.3	383.4	559.87	1.685	
20,400.0	10,920.6	20,409.2	10,920.7	282.3	283.7	90.01	-521.3	9,703.4	943.3	377.6	565.71	1.667	
20,500.0	10,921.6	20,509.2	10,921.7	285.3	286.7	90.01	-521.3	9,803.4	943.3	371.7	571.54	1.650	
20,600.0	10,922.5	20,609.2	10,922.6	288.2	289.6	90.01	-521.3	9,903.4	943.3	365.9	577.38	1.634	
20,700.0	10,923.5	20,709.2	10,923.6	291.1	292.5	90.01	-521.3	10,003.4	943.3	360.1	583.22	1.617	
20,763.9	10,924.1	20,773.0	10,924.2	292.3	294.4	90.01	-521.3	10,067.3	943.3	357.0	586.32	1.609	
20,804.6	10,924.4	20,812.9	10,924.5	293.1	295.5	90.01	-521.3	10,107.2	943.3	355.0	588.26	1.604 SF	

# Oasis Petroleum

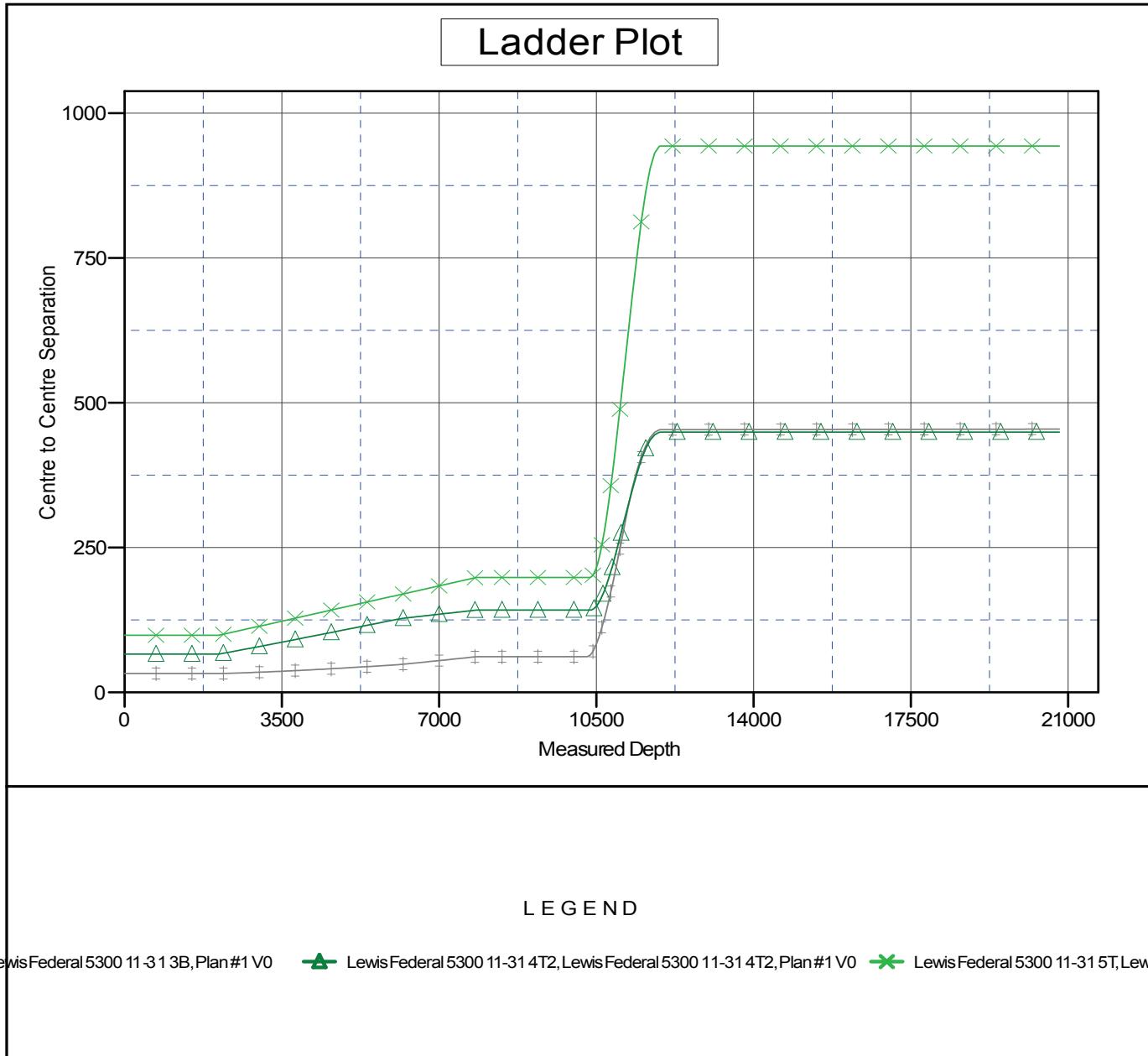
## Anticollision Report

<b>Company:</b>	Oasis
<b>Project:</b>	Indian Hills
<b>Reference Site:</b>	153N-100W-31/32
<b>Site Error:</b>	0.0 usft
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T
<b>Well Error:</b>	0.0 usft
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T
<b>Reference Design:</b>	Plan #1

<b>Local Co-ordinate Reference:</b>	Well Lewis Federal 5300 11-31 2T
<b>TVD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>MD Reference:</b>	WELL @ 2134.0usft (Original Well Elev)
<b>North Reference:</b>	True
<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Output errors are at</b>	2.00 sigma
<b>Database:</b>	OpenWellsCompass - EDM Prod
<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 2134.0usft (Original Well Ele  
Offset Depths are relative to Offset Datum  
Central Meridian is 100° 30' 0.000 W

Coordinates are relative to: Lewis Federal 5300 11-31 2T  
Coordinate System is US State Plane 1983, North Dakota Northern Zone  
Grid Convergence at Surface is: -2.31°



# Oasis Petroleum

## Anticollision Report

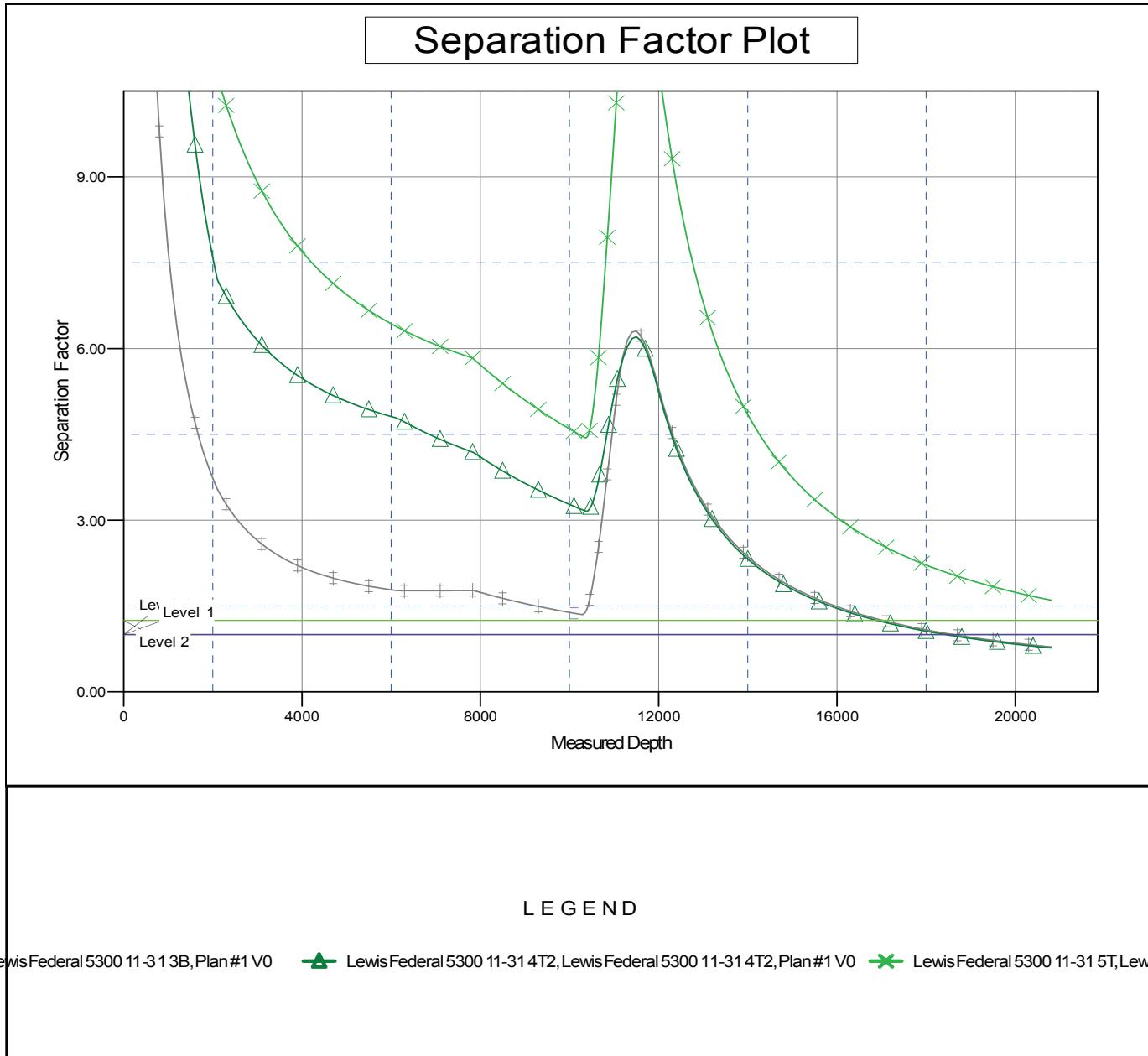
<b>Company:</b>	Oasis
<b>Project:</b>	Indian Hills
<b>Reference Site:</b>	153N-100W-31/32
<b>Site Error:</b>	0.0 usft
<b>Reference Well:</b>	Lewis Federal 5300 11-31 2T
<b>Well Error:</b>	0.0 usft
<b>Reference Wellbore</b>	Lewis Federal 5300 11-31 2T
<b>Reference Design:</b>	Plan #1

<b>Local Co-ordinate Reference:</b>
<b>TVD Reference:</b>
<b>MD Reference:</b>
<b>North Reference:</b>
<b>Survey Calculation Method:</b>
<b>Output errors are at</b>
<b>Database:</b>
<b>Offset TVD Reference:</b>

Well Lewis Federal 5300 11-31 2T
WELL @ 2134.0usft (Original Well Elev)
WELL @ 2134.0usft (Original Well Elev)
True
Minimum Curvature
2.00 sigma
OpenWellsCompass - EDM Prod
Offset Datum

Reference Depths are relative to WELL @ 2134.0usft (Original Well Ele  
Offset Depths are relative to Offset Datum  
Central Meridian is 100° 30' 0.000 W

Coordinates are relative to: Lewis Federal 5300 11-31 2T  
Coordinate System is US State Plane 1983, North Dakota Northern Zone  
Grid Convergence at Surface is: -2.31°





### **STATEMENT**

This statement is being sent in order to comply with NDAC 43-02-03-16 (Application for permit to drill and recomplete) which states (in part that) "confirmation that a legal street address has been requested for the well site, and well facility if separate from the well site, and the proposed road access to the nearest existing public road". On the date noted below a legal street address was requested from the appropriate county office.

McKenzie County

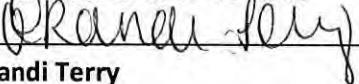
Aaron Chisolm – McKenzie County Dept.

Lewis Federal 5300 11-31 2T

Lewis Federal 5300 11-31 3B

Lewis Federal 5300 11-31 4T2

Lewis Federal 5300 11-31 5T

  
**Brandi Terry**

Regulatory Specialist

Oasis Petroleum North America, LLC

Hello Dave,

Below is the comments from construction regarding the wells on fill as requested. Page 4 of the plats shows the production layout. We only have pumping units planned for onsite with production going to an offsite CTB. Please let me know if you need further information on the CTB.

Once permits have been received, I will work with Cody Vanderbusch to get approval on the offsite pit. He has requested well file numbers be issued prior to submitting a sundry. With the sundry, we will include a landowner agreement and plat showing the offsite cutting pit. If for any reason the pit is not approved, we will haul cuttings to an appropriate disposal or work with the NDIC for another solution.

Sincerely,

**Victoria Siemieniewski**  
Regulatory Specialist  
Direct: 281-404-9652



**From:** Damon Jorgensen  
**Sent:** Monday, November 24, 2014 4:44 PM  
**To:** Victoria Siemieniewski  
**Cc:** James Demorrett; Kristy Aasheim; [Josh.Schmierer@interstateeng.com](mailto:Josh.Schmierer@interstateeng.com); Thomas Osen; Karyme Martin  
**Subject:** RE: Lewis Federal 5300 11-31 2T, 3B, 4T2, 5T Well Pad

Victoria,

Regarding the question of geotech: While there are places in the Indian Hills field where glacial till overburden is present, this area is comprised primarily of bedrock clays, sandy clays and layers of sandstone. During construction this material is placed, compacted in lifts, and tested to ensure proper compaction has been achieved. Any material (coal, topsoil, large rocks/sandstone, etc) encountered during construction is removed and kept out of the compacted fill sections of the pad. Having successfully constructed numerous pads with extensive fill sections in this area, some with fills over 45', we feel confident in our supervision and seasoned contractors that the additional time and expense associated with formal geotechnical review of each pad is not warranted at this time.

Josh, Remove the pit and have the plats updated. produce an offsite pit plat. I'm assuming you have already gotten with facilities and have the production facility info Victoria needs (see comments below)....?

If there is anything else, please let me know.

Thanks

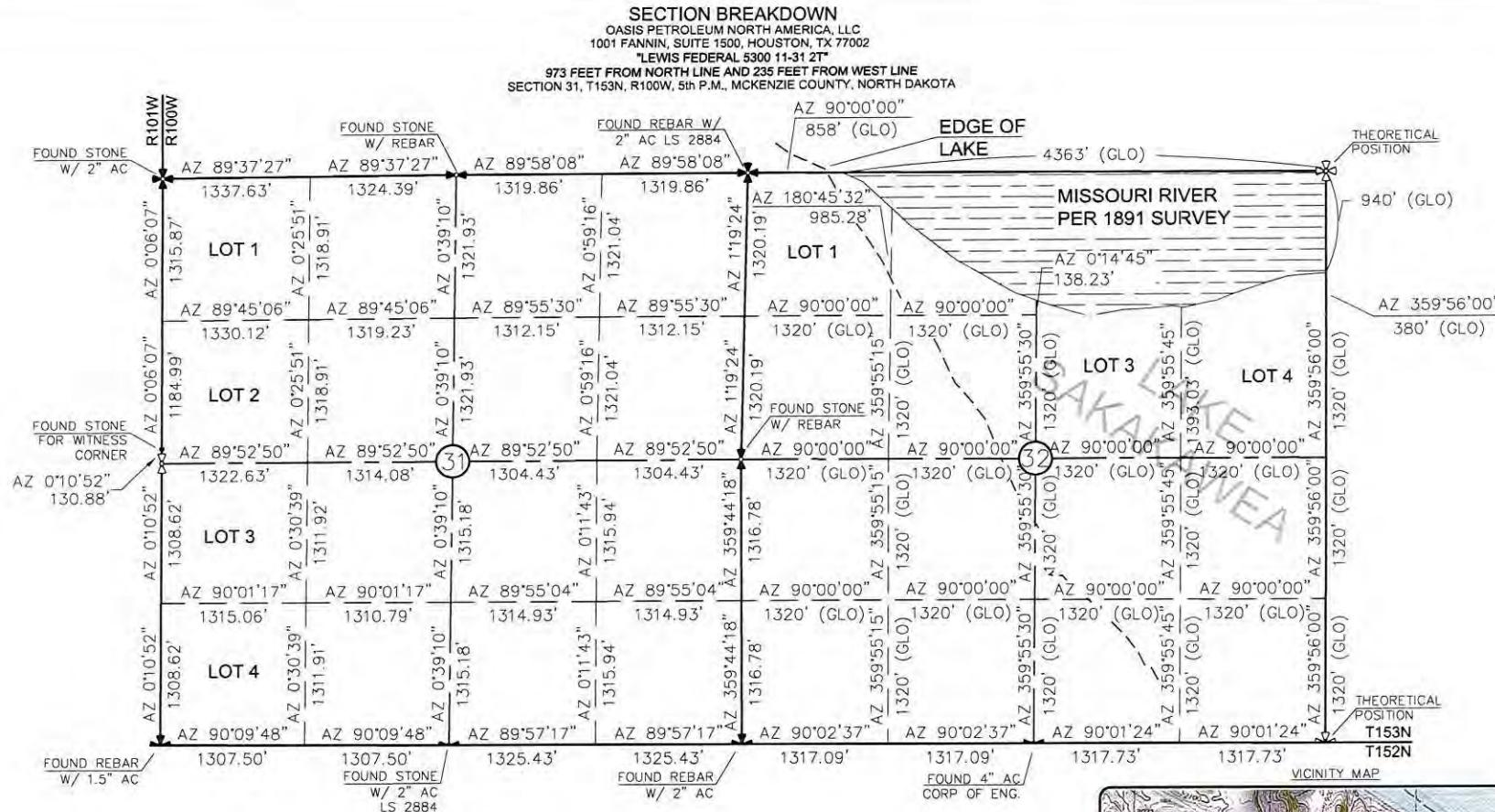


Damon Jorgensen  
Construction Superintendent  
701.577.1687 Office  
701.400.1353 Mobile

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Section Breakdown No.	Date	By	Description
OASIS PETROLEUM NORTH AMERICA, LLC SECTION BREAKDOWN SECTIONS 31 & 32, T153N R100W MCKENZIE COUNTY, NORTH DAKOTA			
Project No.: S153-01-0001	Date:		
Drawn By: B.L.H.	Checked By: D.D.K.	Approved By: D.D.K.	

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- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

0 1000  
1" = 1000'



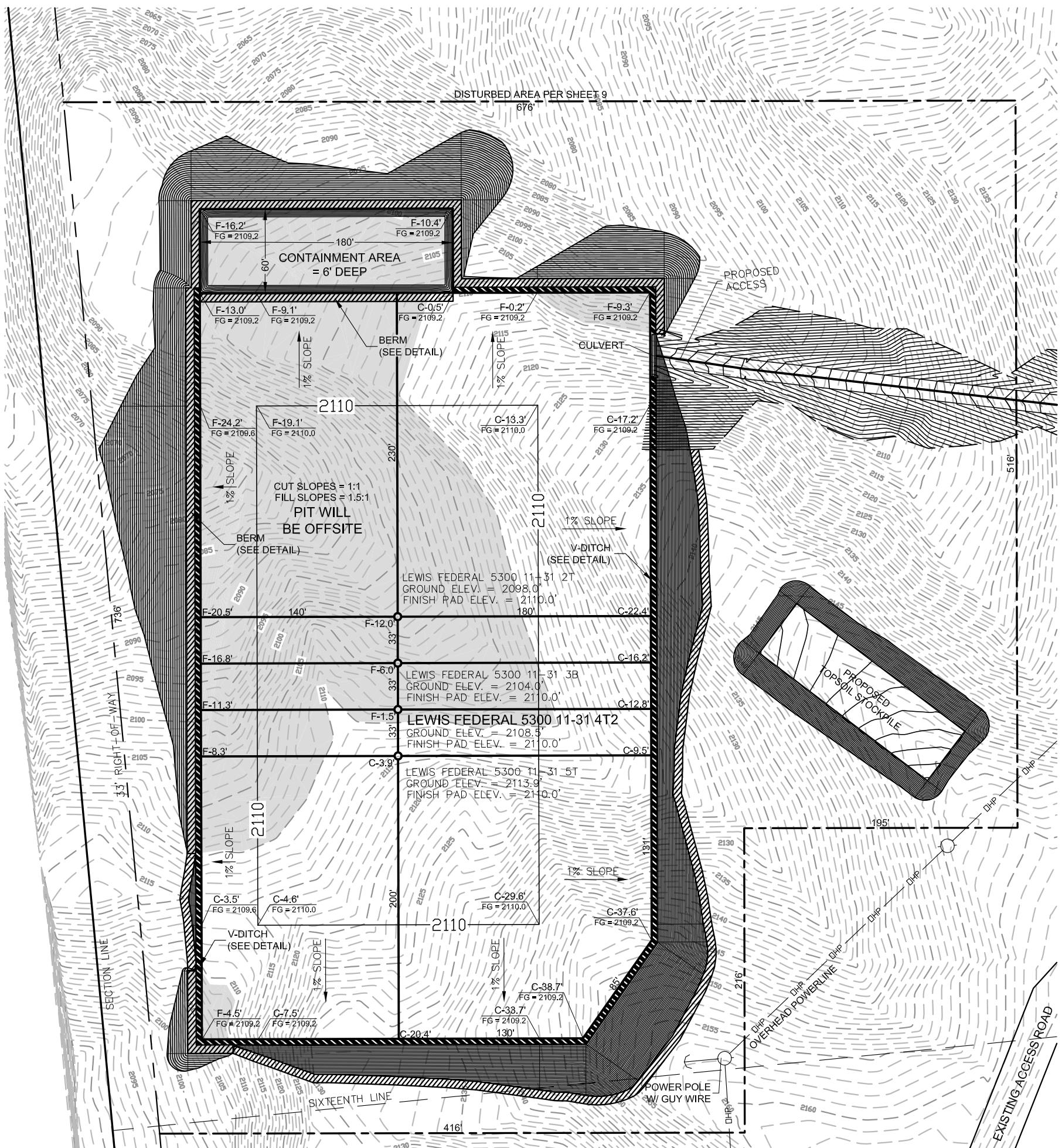
ALL AZIMUTHS ARE BASED ON G.P.S. OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1897. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA. THE MAPPING ANGLE FOR THIS AREA IS APPROXIMATELY 0°03'.



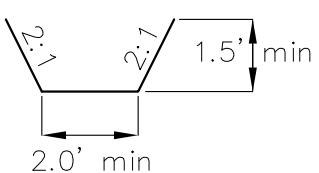
LS 2884

LS 2884

**PAD LAYOUT**  
**OASIS PETROLEUM NORTH AMERICA, LLC**  
**1001 FANNIN, SUITE 1500, HOUSTON, TX 77002**  
**"LEWIS FEDERAL 5300 11-31 4T2"**  
**1038 FEET FROM NORTH LINE AND 230 FEET FROM WEST LINE**  
**SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA**



**V-DITCH DETAIL**



— BERM  
 — DITCH  
 Proposed Contours  
 Original Contours

NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

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

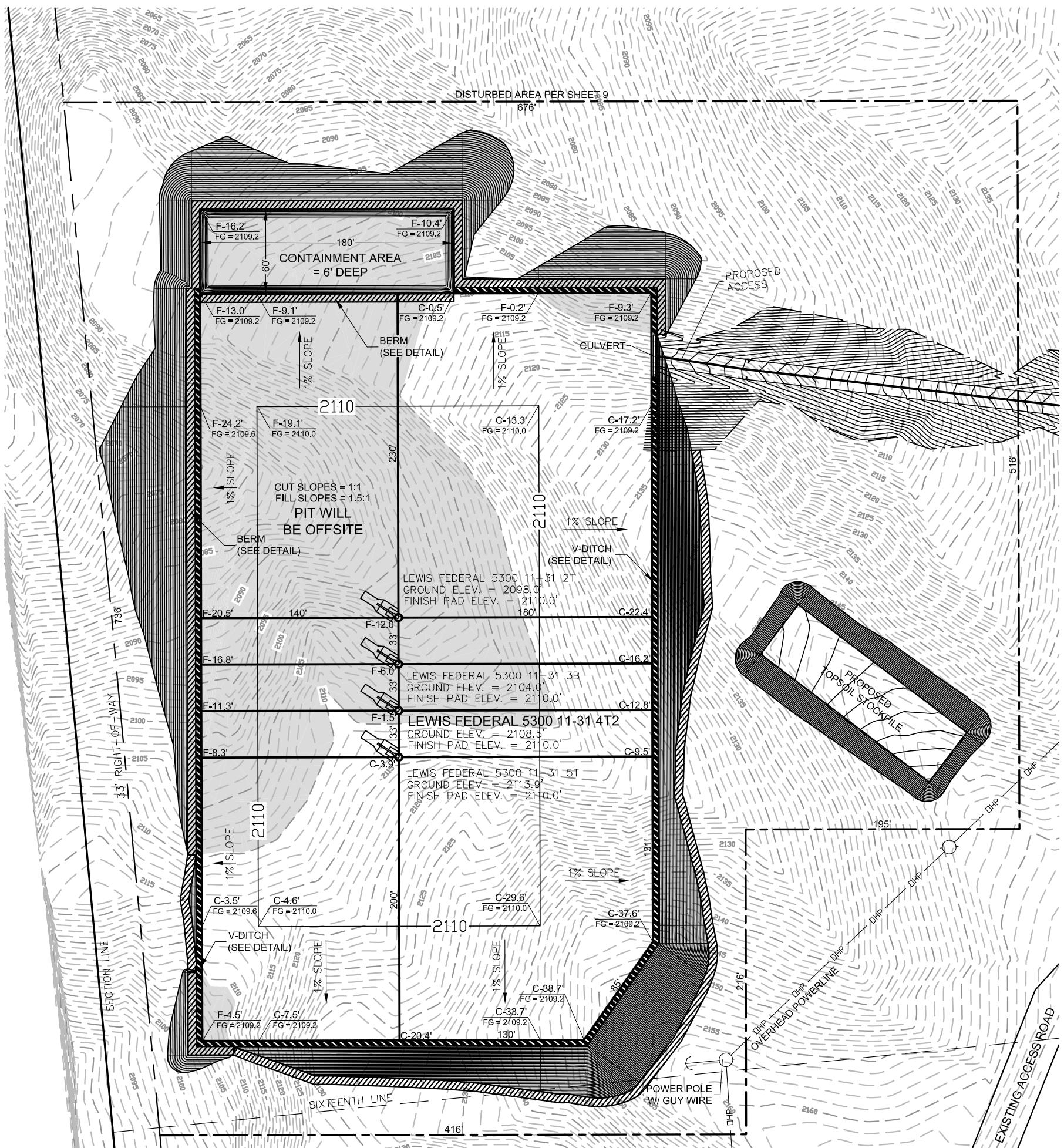
(c) 2014, INTERSTATE ENGINEERING, INC.



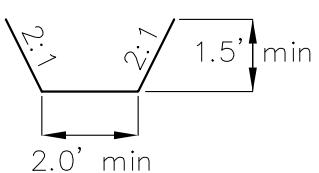
0  
1" = 80'

Revision No.	Date	By	Description
REV 1	12/3/14	BHH	REMOVED PIT FROM PAD

**PRODUCTION LAYOUT**  
OASIS PETROLEUM NORTH AMERICA, LLC  
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002  
"LEWIS FEDERAL 5300 11-31 4T2"  
1038 FEET FROM NORTH LINE AND 230 FEET FROM WEST LINE  
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



**V-DITCH DETAIL**



— BERM  
 — DITCH  
 Proposed Contours  
 Original Contours

NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

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

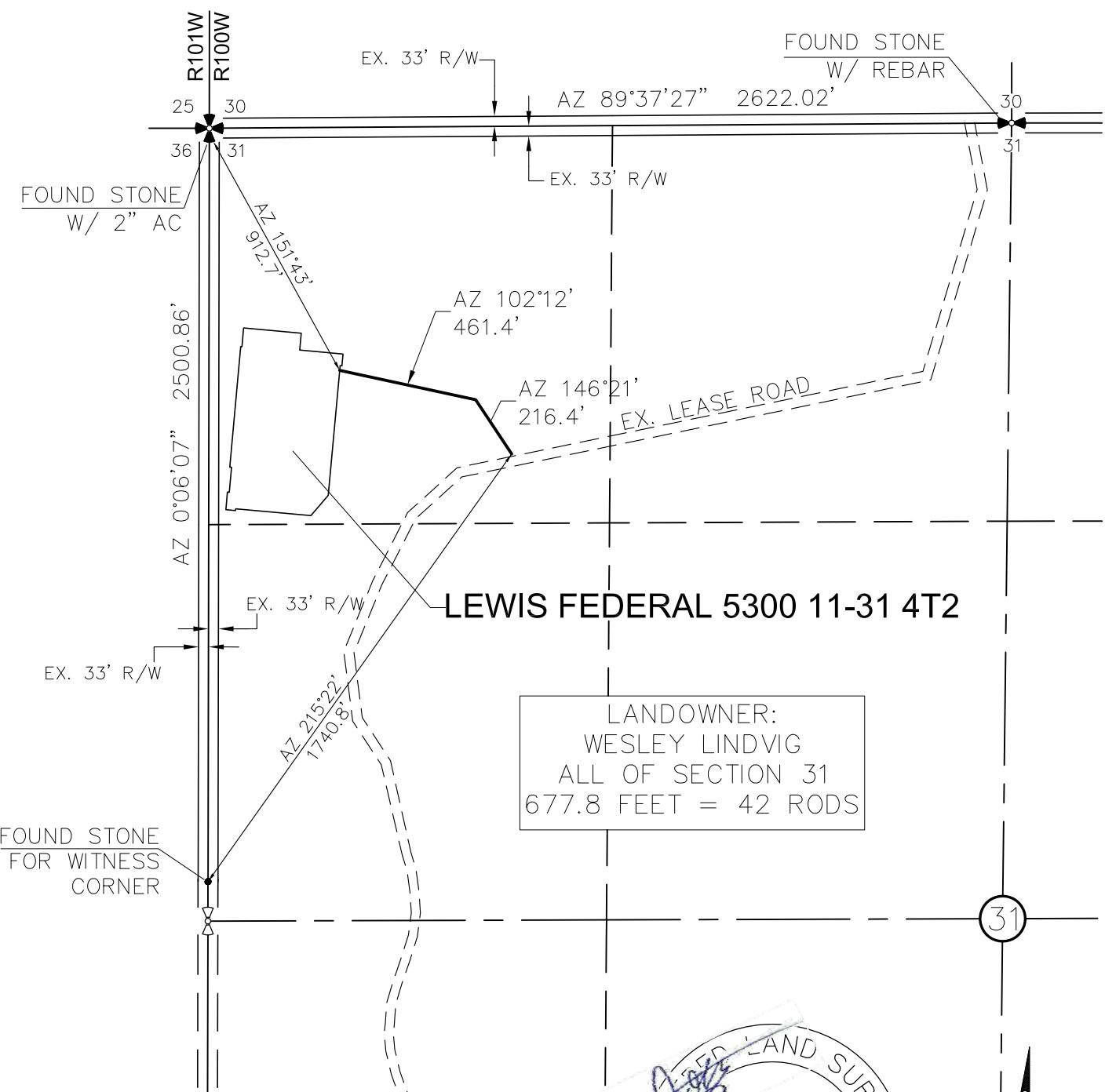
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0 80  
1" = 80'

Revision No.	Date	By	Description
REV 1	12/3/14	BHH	REMOVED PIT FROM PAD

**ACCESS APPROACH**  
 OASIS PETROLEUM NORTH AMERICA, LLC  
 1001 FANNIN, SUITE 1500, HOUSTON, TX 77002  
 "LEWIS FEDERAL 5300 11-31 4T2"  
 1038 FEET FROM NORTH LINE AND 230 FEET FROM WEST LINE  
 SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

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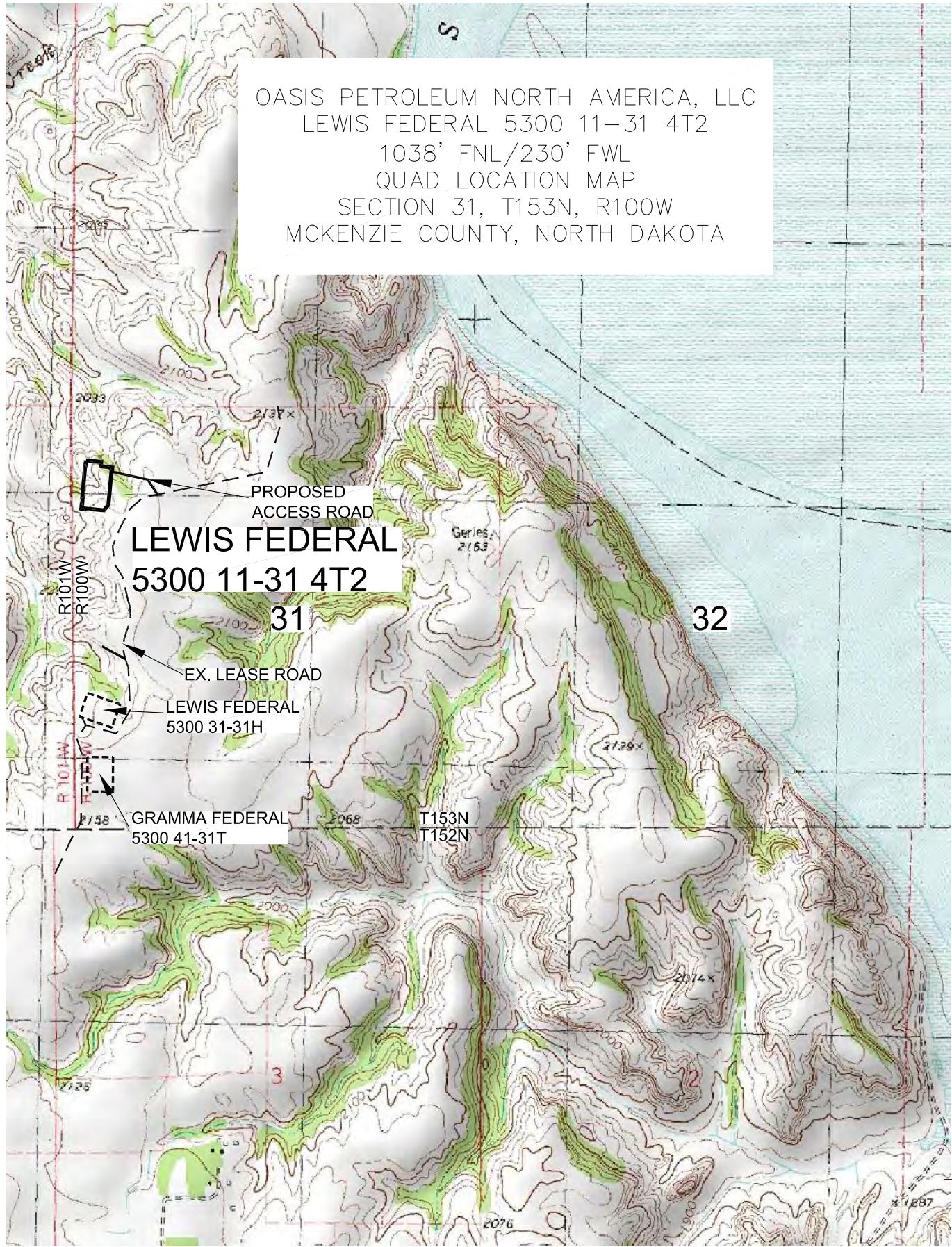


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Interstate Engineering, Inc.  
 P.O. Box 648  
 Sidney, Montana 59270  
 Ph (406) 433-5617  
 Fax (406) 433-5618  
[www.Interstateeng.com](http://www.Interstateeng.com)  
 Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC  
 ACCESS APPROACH  
 SECTION 31, T153N, R100W  
 MCKENZIE COUNTY, NORTH DAKOTA  
 Drawn By: B.H.H. Project No.: S13-09-378.03  
 Checked By: D.D.K. Date: JAN, 2014

Revision No.	Date	By	Description
REV 1	12/3/14	B.H.H.	REMOVED PIT FROM PAD



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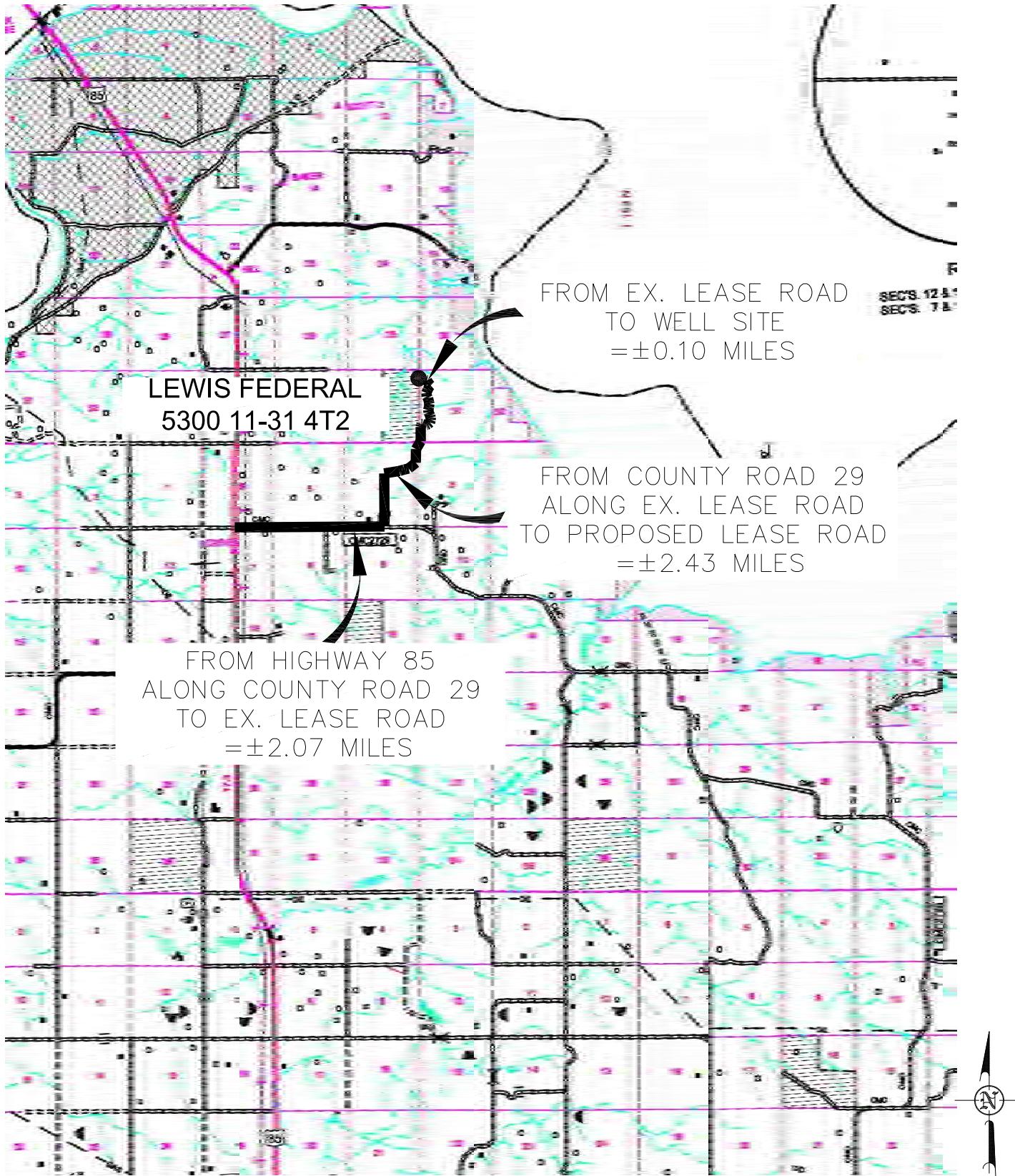
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OASIS PETROLEUM NORTH AMERICA, LLC  
QUAD LOCATION MAP  
SECTION 31, T153N, R100W  
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	B.H.H.	Project No.:	S13-09-378.03
Checked By:	D.D.K.	Date:	JAN, 2014

Revision No.	Date	By	Description
REV 1	12/3/14	BHH	REMOVED PIT FROM PAD

**COUNTY ROAD MAP**  
 OASIS PETROLEUM NORTH AMERICA, LLC  
 1001 FANNIN, SUITE 1500, HOUSTON, TX 77002  
 "LEWIS FEDERAL 5300 11-31 4T2"  
 1038 FEET FROM NORTH LINE AND 230 FEET FROM WEST LINE  
 SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

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OASIS PETROLEUM NORTH AMERICA, LLC  
 COUNTY ROAD MAP  
 SECTION 31, T153N, R100W  
**MCKENZIE COUNTY, NORTH DAKOTA**

Drawn By: B.H.H. Project No.: S13-09-378.03  
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Revision No.	Date	By	Description
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