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)

TH

Received
NOV 12 2019
ND Oil & Gas Division

Well File No.
28194

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL.

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
LEWIS FEDERAL 5300 21-31 5B	LOT2	153	100	0	McKenzie

Operator	Telephone Number	Field
Oasis Petroleum North America LLC	(281) 404-9573	BAKER

Address	City	State	Zip Code
1001 Fannin, Suite 1500	Houston	TX	77002

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
Oasis Petroleum Marketing LLC	(281) 404-9627	100%	August 12, 2019

Principal Place of Business	City	State	Zip Code
1001 Fannin, Suite 1500	Houston	TX	77002

Field Address	City	State	Zip Code

Names of Transporter	Telephone Number	% Transported	Date Effective
Hiland Crude, LLC	(918) 588-5000	95%	August 12, 2019

Address	City	State	Zip Code
8811 South Yale Avenue, Suite 200	Tulsa	OK	74137

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
		August 12, 2019

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
		August 12, 2019

Other Transporters Transporting From This Lease	% Transported	Date Effective
Power Energy Logistics, LLC	5%	August 12, 2019

Other Transporters Transporting From This Lease	% Transported	Date Effective
		August 12, 2019

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 $VPCR_4$ requirement. ☒ 13.7 $VPCR_4$ 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: November 5, 2019

Signature	Printed Name	Title
	Claudia Arguelles	Contracts Administrator

Above Signature Witnessed By:

Signature	Printed Name	Witness Title
	Kenzie Buchanan	Scheduler

FOR STATE USE ONLY

Date Approved	NDIC CTB No.
NOV 15 2019	28190
By	Melissa Heg
Title	Oil & Gas Production Analyst

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
SEP 17 2019
ND OIL & GAS DIVISION

Well File No.
28194

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

Designate Type of Completion
☑ Oil Well ☐ EOR Well ☐ Recompletion ☐ Deepened Well ☐ Added Horizontal Leg ☐ Extended Horizontal Leg
☐ Gas Well ☐ SWD Well ☐ Water Supply Well ☐ Other:

Well Name and Number		Spacing Unit Description
Lewis Federal 5300 21-31 5B		**Sec. 31/32 T153N R100W**
Operator: **Oasis Petroleum North America**	Telephone Number: **(281) 404-9500**	Field: **Baker**
Address: **1001 Fannin, Suite 1500**		Pool: **Bakken**
City: **Houston** / State: **TX**	Zip Code: **77002**	Permit Type: ☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
2552 F N L 259 F WL	**LOT 3**	**31**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
January 30, 2019	**May 3, 2019**	**Nabors B21**	**2157**	**2132**

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)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	13 3/8	0	3310	17 1/2	54.5			2295	0
Vertical Hole	Intermediate	9 5/8	0	6121	13 1/2	36			1170	7370
Vertical Hole	Intermediate	7	0	11130	8 3/4	32			750	
Lateral1	Liner	4 1/2	10220	20850	6	13.5			520	

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft) Top	Bottom	Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	~~20860~~	Perforations	11180	~~20791~~	10270		07/16/2019			
	15739			15739						
ST1	20860		15556	20791						

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)	Name of Zone (If Different from Pool Name)
Lateral 1- 11180' to 20791'	

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
August 12, 2019	**flowing**		**producing**

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
08/24/2019	**24**	**18 /64**		**864**	**703**	**1077**	**°**	**Sold**

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
	2600		**864**	**703**	**1077**	**813**

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota		
Kibbey Lime	8441	8436
First Charles Salt	8589	8584
UB		
Base Last Salt	9265	9258
Ratcliffe		
Mission Canyon	9473	9466
Lodgepole	10039	10032
False Bakken	10940	10750
Scallion		
Upper Bakken	10963	10759
Middle Bakken	11020	10774
Target		

PLUG BACK INFORMATION

Well Bore	Type of Plug	Top (Ft)	Bottom (Ft)	Sacks Cement

CORES CUT

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

Drill Stem Test

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Well Specific Stimulations

Date Stimulated 07/16/2019	Stimulated Formation Bakken	Top (Ft) 11180	Bottom (Ft) 20791	Stimulation Stages 35	Volume 323544	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 5990853	Maximum Treatment Pressure (PSI) 8995	Maximum Treatment Rate (BBLS/Min) 52.0		

Details
100 Mesh: 3556863
40/70 White: 1495810
40/70 CRC: 938180

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

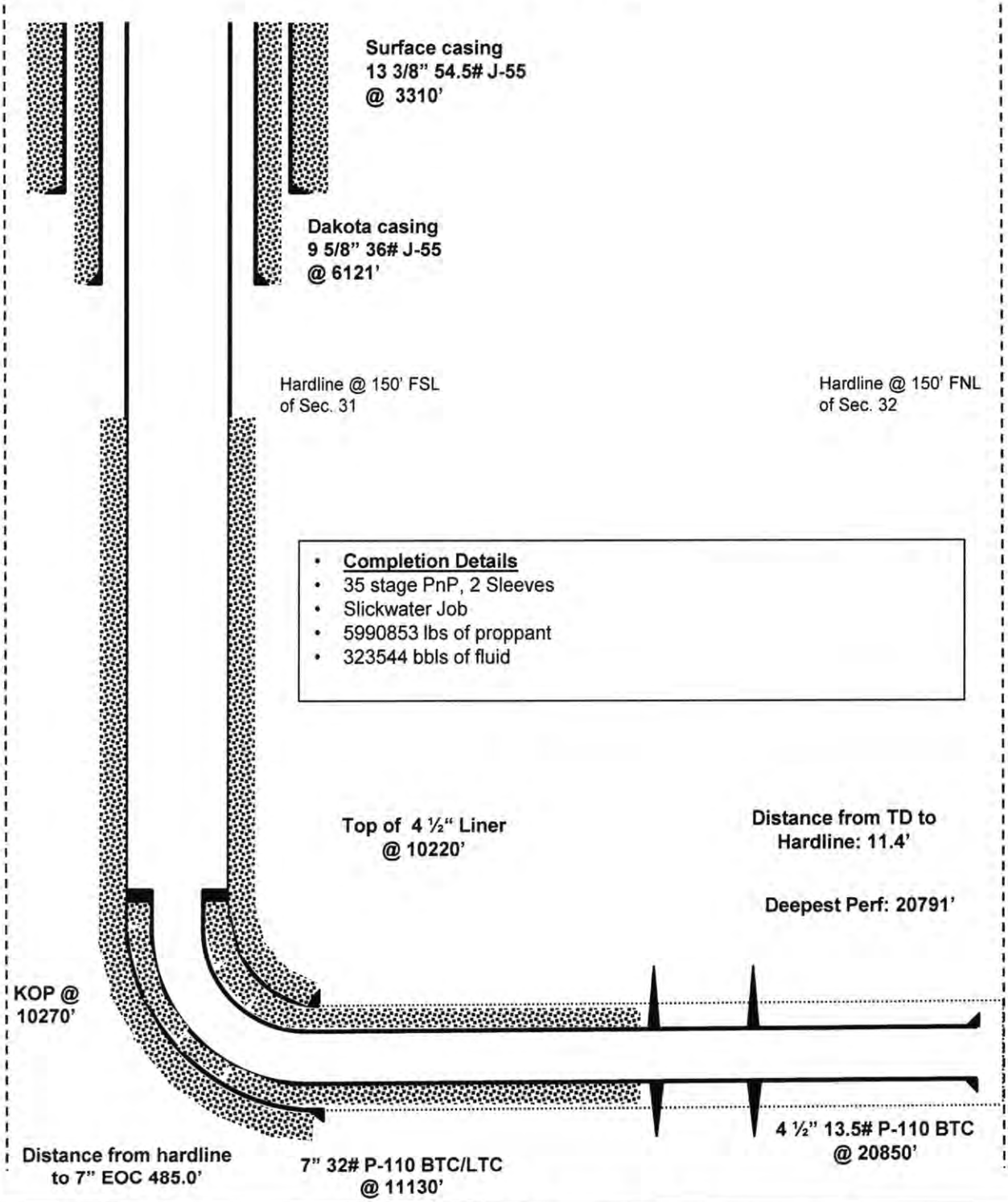
This supplemental report provides frac data.

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

ELEVATION: 2132' GL

Lewis Federal 5300 21-31 5B
Wellbore Schematic

FORMATION: Bakken



OASIS PETROLEUM NA LLC

Lewis Federal 5300 21-31 5B
Wellbore: T153N-R100W Sec. 31 & 32
SHL: 2552' FNL & 259' FWL T153N-R100W Sec. 31

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)

RECEIVED
AUG 27 2019
ND OIL & GAS DIVISION

Well File No.
28194

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

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed: **August 12, 2019**	☐ Redrilling or Repair	☐ Shooting
☐ 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	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☑ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	**Change well status to CONFIDENTIAL**

Well Name and Number					
Lewis Federal 5300 21-31 5B					
Footages		Qtr-Qtr	Section	Township	Range
2552 F **N** L	**259** F **W** L	**LOT2**	**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

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

Date of First Production August 12, 2019.

off confidential 2/12/20

Company		Telephone Number
Oasis Petroleum North America LLC		**713-770- 6570**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Jasmine Crawford	Printed Name: **Jasmine Crawford**	
Title: **Regulatory Specialist**	Date: **August 19, 2019**	
Email Address: **jcrawford@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 8/27/19	
By: Nathaniel Erbele	
Title: Petroleum Resource Specialist	

Industrial Commission of North Dakota
Oil and Gas Division
Verbal Approval To Purchase and Transport Oil

Well or Facility No **28194**

Tight Hole **No**

OPERATOR

Operator	Representative	Rep Phone
OASIS PETROLEUM NORTH AMERICA LL	**Mike Haase**	**(701) 570-6752**

WELL INFORMATION

Well Name: **LEWIS FEDERAL 5300 21-31 5B**

Inspector: **Richard Dunn**

Well Location	QQ	Sec	Twp		Rng		County
	LOT2	**31**	**153**	**N**	**100**	**W**	**MCKENZIE**

Field: **BAKER**

Footages: **2552** Feet From the **N** Line; **259** Feet From the **W** Line

Pool: **BAKKEN**

Date of First Production Through Permanent Wellhead **8/12/2019** **This Is The First Sales**

PURCHASER / TRANSPORTER

Purchaser	Transporter
OASIS PETROLEUM MARKETING LLC	**HILAND CRUDE, LLC**

TANK BATTERY

Single Well Tank Battery Number : 128194-01

SALES INFORMATION **This Is The First Sales**

ESTIMATED BARRELS TO BE SOLD		ACTUAL BARRELS SOLD		DATE
15000	BBLS	**1379**	BBLS	**8/12/2019**
	BBLS		BBLS	
	BBLS		BBLS	
	BBLS		BBLS	
	BBLS		BBLS	
	BBLS		BBLS	
	BBLS		BBLS	
	BBLS		BBLS	
	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.

Start Date	**8/12/2019**
Date Approved	**8/22/2019**
Approved By	**Richard Dunn**

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)

5

Received
JUN 19 2019
ND Oil & Gas Division

Well File No. 28194

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

Designate Type of Completion
☑ Oil Well ☐ EOR Well ☐ Recompletion ☐ Deepened Well ☐ Added Horizontal Leg ☐ Extended Horizontal Leg
☐ Gas Well ☐ SWD Well ☐ Water Supply Well ☐ Other:

Well Name and Number		Spacing Unit Description
Lewis Federal 5300 21-31 5B		Sec. 31/32 T153N R100W
Operator: Oasis Petroleum North America	Telephone Number: (281) 404-9500	Field: Baker
Address: 1001 Fannin, Suite 1500		Pool: Bakken
City: Houston / State: TX	Zip Code: 77002	Permit Type: ☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
2552 F N L 259 F WL	LOT3 (lot 2)	31	153 N	100 W	McKenzie

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
January 30, ~~2018~~ 2019	May 3, 2019	Nabors B21	2157	2132

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)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	13 3/8	0	3310	17 1/2	54.5			2295	0
Vertical Hole	Intermediate	9 5/8	0	6121	13 1/2	36			1170	
Vertical Hole	Intermediate	7	0	11130	8 3/4	32			750	
Lateral1	Liner	4 1/2	10220	20850	6	13.5			520	

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft) Top	Bottom	Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	20860	Perforations			10270					

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)				Name of Zone (If Different from Pool Name)	
Lateral 1-					
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 /64	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

Formation	MD (Ft)	TVD (Ft)
Dakota		
Kibbey Lime	**8441**	**8436**
First Charles Salt	**8589**	**8584**
UB		
Base Last Salt	**9265**	**9258**
Ratcliffe		
Mission Canyon	**9473**	**9466**
Lodgepole	**10039**	**10032**
False Bakken	**10940**	**10750**
Scallion		
Upper Bakken	**10963**	**10759**
Middle Bakken	**11020**	**10774**
Target		

PLUG BACK INFORMATION

Well Bore	Type of Plug	Top (Ft)	Bottom (Ft)	Sacks Cement

CORES CUT

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

Drill Stem Test

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (ºF)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (ºF)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (ºF)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (ºF)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (ºF)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)

Drill Pipe Recovery

Sample Chamber Recovery

Well Specific Stimulations

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

Type Treatment **Sand Frac**	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**	Date **06/18/2019**
Signature	Printed Name **Jennifer Swenson**	Title **Regulatory Specialist**

Oasis Petroleum North America LLC

Lewis Federal 5300 21-31 5B

2,552' FNL & 259' FWL
Lot 2 Section 31, T153N, R100W
Baker Field / Middle Bakken
McKenzie County, North Dakota

BOTTOM HOLE LOCATION:
111.70 S & 10,097.57' E of surface location or approx.
2,616.3' FNL & 169' FEL, NE SE Sec. 32, T153N, R100W

Prepared for:
John O'Donnell
Oasis Petroleum North America LLC
1001 Fannin Suite 1500
Houston, TX 77002

Prepared by:
Dillon Johnson, Michelle Baker, Adam Collar
PO Box 80507; Billings, MT 59108
(406) 259-4124
geology@sunburstconsulting.com
www.sunburstconsulting.com

Oasis Petroleum North America, LLC.
Lewis Federal 5300 21-31 5B
Well Evaluation

Figure 1. Nabors drilling rig #B21 at the Oasis Petroleum NA, LLC. Lewis Federal 5300 21-31 5B; May 2019, McKenzie County, North Dakota (All photos by Dillon Johnson unless noted otherwise).

Introduction

The Oasis Petroleum NA, LLC. Lewis Federal 5300 21-31 5B is located in Baker Field of the Williston Basin [Lot 2 Section 31, T153N, R101W]. The subject well lies approximately 8 miles south of the town of Williston, in McKenzie County, North Dakota **(Figure 1)**. The Lewis Federal 5300 21-31 5B is the first of two wells to be drilled on the Lewis Federal 5300 21-31 pad. 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 13 3/8" surface casing for the subject well was preset at a depth of 3,325' prior to Nabors B21 arrival. Nabors B21 reentered the subject well on April 16, 2019. 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 6,097'. The 9 5/8" casing was then set to set to a depth of 6,077'. The remainder of the vertical hole was completed with two 8.75" assemblies. The first vertical assembly drilled to a depth of 8,485' before being replace due to low ROP, the second vertical assembly drilled to a depth of 10,270' (KOP). While drilling in the Mission Canyon, at a depth of 9,821' the driller noticed that the mud volume was increasing. A flow test indicated that the well was taking on water. A cement bond log will be run at a later date, but as of this report, it is assumed that the cement job on the 9 5/8" casing string was poor and lead to water from the Inyan Kara flowing into the wellbore. To resolve the water flow for the time being, the drilling choke was engaged to increase pressure on the back side of the drill pipe and hold back the water flow. From 9,821'-10,270' ~350 psi casing back pressure was maintained to reduce the water influx.

The curve assembly consisted of a Reed TKC56 PDC bit (#4), attached to a 2.38° NOV mud motor and Scientific Drilling MWD tools drilled to a depth of 11,148' (casing point). At a depth of 11,325' while attempting to slowly reduce flow with the drilling choke, the choke was accidently closed completely resulting in a dramatic increase in pressure. Shortly after this incident fluid losses we observed at a substantial rate. It is assumed that with the increase in pressure the Mission Canyon began to absorb fluid. From this depth to casing point there was a substantial amount of LCM pumped down hole. To keep the LCM in the drilling fluid the shaker screens were removed and not used until cement operations for the 7" casing began. The curve was successfully landed at 11,148' MD and 10,786' TVD, approximately 12' below the Upper Bakken Shale on April 25, 2019. Seven inch diameter 32# P-110 intermediate casing was set to 11,130' MD at landing.

The lateral was completed using two 6" assemblies. The first lateral assembly drilled to a depth of 15,739' before a trip was required due to an MWD failure. Prior to the MWD failure the decision was made to sidetrack due to the potential proximity to the Upper Bakken Shale (please see details below in the Geosteering portion of this report). The sidetrack was kicked off on the first attempt, at a depth of 15,620'. While replacing the faulty MWD tool, the bit and mud motor were also replaced. The second lateral assembly drilled the remainder of the lateral. The Lewis Federal 5300 21-31 5B reached a total depth of 20,860' on May 3, 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, Lewis Federal 5300 11-31 4BR*, the *Oasis Petroleum North America, LLC, Lewis Federal 5300 31-31H*, and the *Oasis Petroleum North America, LLC, Lewis Federal 5300 11-31 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 8,300' 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 9,473' MD, 9,466' 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. The limestone has an earthy, rarely crystalline texture. Also noted in in several samples were trace fossil fragments. The limestone is argillaceous in part throughout this interval. In certain areas possible intercrystalline porosity 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 ~360u with several connection gasses exceeding 1000u. It should be noted that prior to the drilling choke being used to hold ~350psi casing back pressure, gas show was much higher (~510u background gas) than those observed with the casing back pressure (135u background gas).

Figure 2. Limestone from the Mission Canyon.

The **Bakken Formation**

The Upper Bakken Shale Member [Mississippian] was recorded at 10,963' MD, 10,759' TVD (-8,602' 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 580u was observed, as well as several gas shows exceeding 800u. 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 11,020' MD, 10,774' TVD (-8,617' MSL). Samples in the Middle Bakken are predominantly a light brown, light brown gray, light to medium gray, silty sandstone. The silty sandstone is fine to very fine grained, and 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 ~700 to 3500 units while several shows exceeded 4500u.

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

Geosteering

Structure maps provided by Oasis Petroleum projected the structure would have an overall down dip averaging -0.50º. Below are the two nearest offset wells to the Lewis Federal 5300 21-31 5B. The Lewis Federal 5300 11-21 4BR (**Figure 4**), drilling west to east, ~0.30 miles north of the subject well, and the Lewis Federal 5300 31-31H (**Figure 5**), drilling west to east, ~0.20 miles south of the subject well. Although the nearby offsets all had an overall dip rate of -0.50º, the structure near a vertical section of 4,700' varied considerably. The Lewis Federal 5300 31-31H has a very consistent downward dip rate of approximately -0.50 throughout the course of the lateral. While the Lewis Federal 5300 11-21 4BR has a constant downward dip rate until ~4,700' vertical section, where the structure abruptly dips down at a steep >2º for several hundred feet before flattening, reversing to a steep >1.5º up dip for several hundred feet, then returning to dip rate more similar to that of regional structure. In total the synclinal structure observed on the Lewis Federal 5300 11-21 4BR lasted for ~1,950'. The steering team recognized that if the structure on the subject well was to be irregular, and similar to the Lewis Federal 5300 11-21 4BR, that this irregular structure would be observed from 4,000'-7,000' vertical section.

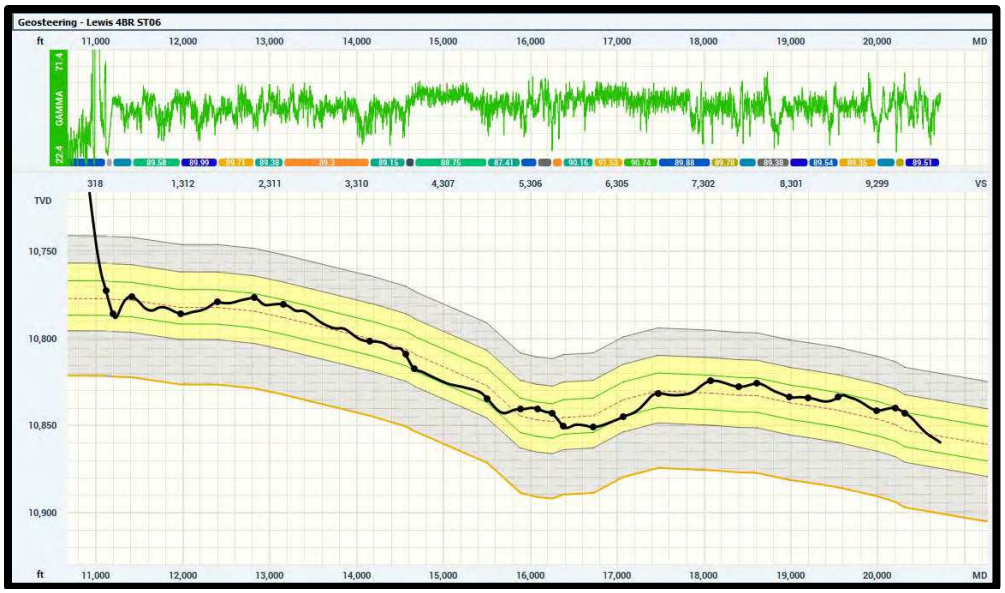


Figure 4. Cross-sectional profile of the Lewis Federal 5300 11-31 4BR displaying stratigraphic position and gamma values.

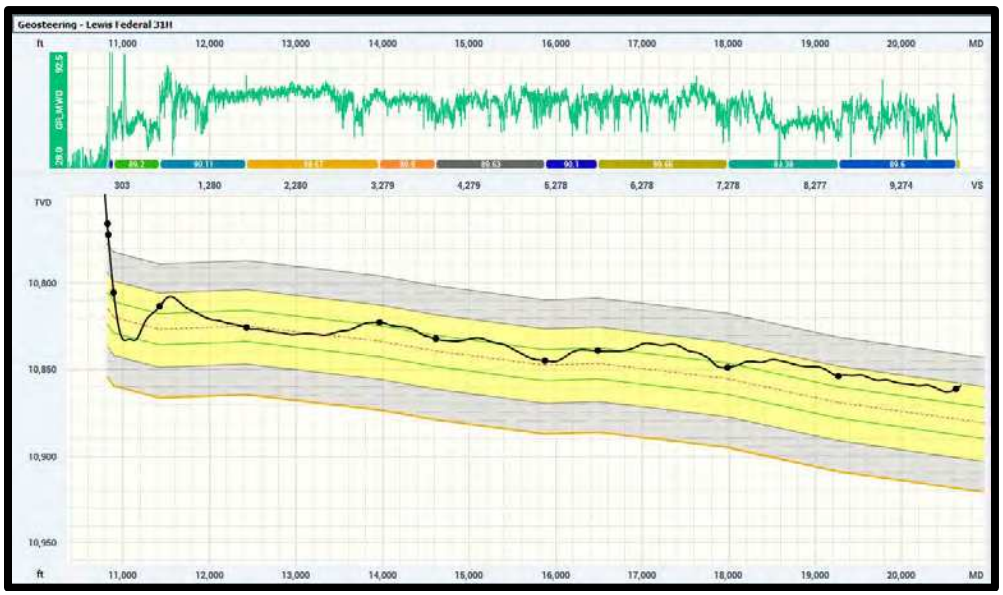


Figure 5. Cross-sectional profile of the Lewis Federal 5300 31-31H displaying stratigraphic position and gamma values.

The 18’ target interval for the subject well is 9’ below the Upper Bakken Shale and 9’ above the Lower Bakken Shale. Prior to drilling out of the 7” casing it was determined that the C marker near the center of target and the featureless D marker in the lower portion of the Middle Bakken were to be the primary steering guides throughout the course of the lateral (**Figure 6**). For the first ~3,200’ of the lateral the structure observed was similar to regional structure, with dip rates of -0.15º to -0.85º being calculated. As the wellbore ascended above the target interval at ~18,300’ it became apparent that the structure was dipping down at a steep >1º rate. While drilling ahead the possibility of the structure dipping down at >2º was anticipated. As the MWD data collected from the survey at 15,651’ was analyzed it was realized that the structure had begun to dip down at a very steep >2º angle. At this time the steering teams profile placed the wellbore at the top of the target interval. Unfortunately, simultaneously as the structure began to dip down at a steep angle, the assembly also began to build a considerable amount of inclination (continuous

inclination of 91.5º). At a measured depth of 15,739' a stop card was pulled to assess the wellbores position within the Middle Bakken. At the time of the stop card there were no drilling parameters that would indicate an Upper Bakken Shale strike, and a bottoms up sample did not display any shale. When the data was assessed it was determined that the structure could possibly be dipping down at -2.35º, and that the wellbore could be as close as 1' from the Upper Bakken Shale. To avoid a potential shale strike Oasis Petroleum decided that the safest course of action would be to pull back to a depth of 15,620' and begin a sidetrack. As the sidetrack was being troughed the MWD tool failed and a trip was required. After the required trip the wellbore was successfully sidetracked on the first attempt. After the sidetrack the structure continued to dip down at a steep -1.4º to 2.3º until a MD of 16,125'. From a MD of 16,125'- 16,960' the structure appeared to be relatively flat before turning up-dip for ~500'. In total the irregular synclinal structure was observed for ~3,150' MD of drilling. This structure should be anticipated if more wells are to be drilled within the DSU in the future. Aside from a brief 340' when the wellbore ascended above the target interval, the wellbore drilled within the target interval from the sidetrack point to 20,860' TD. Over the course of the lateral, gamma markers throughout the target interval were relatively inconsistent and difficult to interpret. Two of the more dependable steering guides were a cool marker above the target interval, and a relatively warm marker near the top of the target zone. Although the cool was semi-consistent, due to the close proximity to the Upper Bakken Shale, it was not used as a primary steering guide. The warm marker ~4' from the top of the target interval was a good reference for the wellbore's position within the member but was not consistently observed while drilling in the upper portion of the target interval. Regardless of position in zone the assembly regularly built inclination on rotation. There did not appear to be any noticeable hard streaks or intervals that were more or less favorable in relation to ROP.

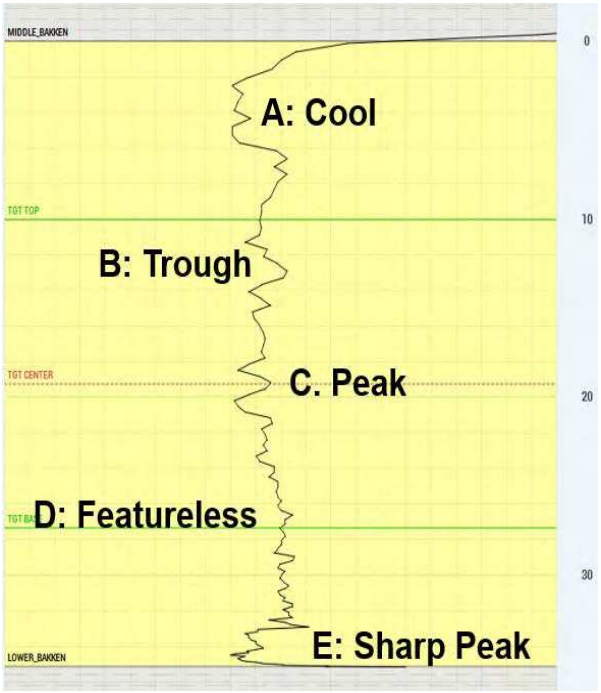


Figure 6. Target definition for the Oasis Petroleum, Lewis Federal 5300 21-31 5B.

The Lewis Federal 5300 21-31 5B had an estimated overall formation dip of approximately -0.54º. 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, the target interval was determined to maintain adequate distance from the shale and used as preferred drilling areas.

The lateral was drilled in less than 5 days from casing exit to total depth, with two lateral assemblies. A total depth of 20,860' MD was achieved at 05:20 hours on May 3, 2019. The wellbore was completed 95% within target, opening 9,730' (measurement taken from uncased lateral portion) of potentially productive reservoir rock.

Hydrocarbon Shows

Gas was continuously recorded from 8,300' 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 1860 units were noted, against a 10.10 to 10.95 pound per gallon (PPG) diesel-invert, mud weight. Due to water influx from the Inyan Kara, casing back pressure was utilized from 9,821' to

11,148'. This increase pressure simulates a higher mud weight and reduced hydrocarbon shows. Background concentrations in the lateral ranged from 700 to 3500 units, against a 9.4-9.45 PPG saltwater gel drilling fluid **(Figure 7)**. Chromatography of gas revealed typical concentrations of methane, ethane and propane characteristic of the Middle Bakken **(Figure 8)**. 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.*

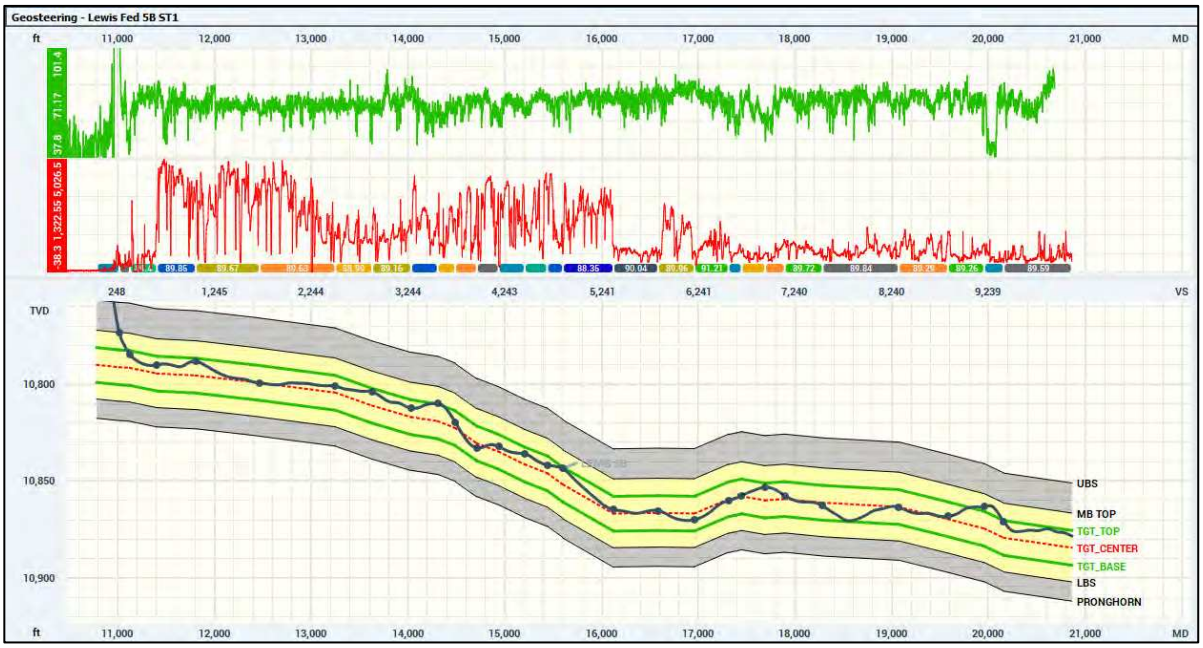


Figure 7. Cross-sectional profile of the Lewis Federal 5300 21-31 5B displaying stratigraphic position, total gas and gamma values.

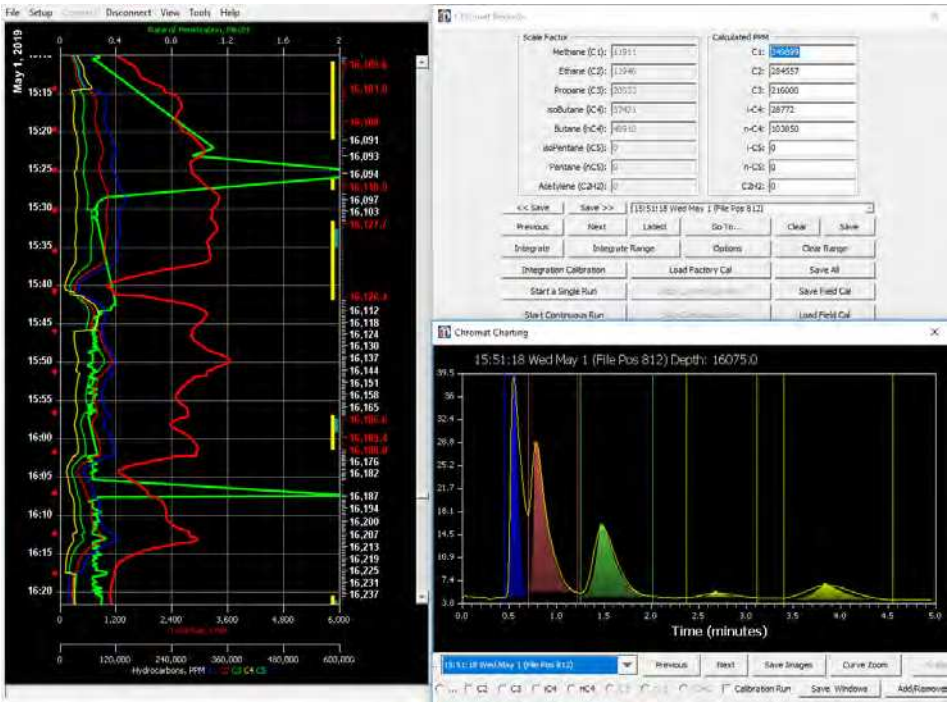


Figure 8. Screen shot of gas chromatography portraying total gas values and C_1-C_4 values, shown in parts per million.

Summary

The *Lewis Federal 5300 21-31 5B* is a well in Oasis Petroleum's horizontal Middle Bakken Member development program, in the Indian Hill prospect of McKenzie County, North Dakota. The project was drilled from surface casing to total depth in 17 days. Due to the wellbore proximity to the Upper Bakken Shale a sidetrack was utilized at a depth of 15,620'. A total depth of 20,860' MD was achieved at 05:20 hours on May 3, 2019. The well-site team worked together to maintain the wellbore in the desired target interval for 95% within target, opening 9,730' of potentially productive reservoir rock.

Samples in the Middle Bakken Member are predominantly silty sandstone. These samples are light brown, light brown gray, light to medium gray 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 shale strikes

The *Oasis Petroleum North America, LLC, Lewis Federal 5300 21-31 5B* awaits completion operations to determine its ultimate production potential and commercial value.

Respectfully,
Dillon Johnson
Lead Geologist & Geosteerer
Sunburst Consulting, Inc.
May 3, 2019

SUNBURST CONSULTING
A GEOLOGY SERVICE

WELL DATA SUMMARY

OPERATOR:	**Oasis Petroleum North America LLC**
ADDRESS:	1001 Fannin Suite 1500 Houston, TX 77002
WELL NAME:	**Lewis Federal 5300 21-31 5B**
API #:	33-053-05849
WELL FILE #:	28194
SURFACE LOCATION:	2,552' FNL & 259' FWL Lot 2 Section 31, T153N, R100W
FIELD/ OBJECTIVE:	Baker Field / Middle Bakken
COUNTY, STATE:	McKenzie County, North Dakota
RESERVATION:	N/A
BASIN:	Williston Basin
WELL TYPE:	Horizontal Development
ELEVATION:	GL: 2,132' KB: 2,157'
SPUD DATE:	January 30, 2019
RE-ENTRY DATES:	**Vertical:** April 16, 2018
BOTTOM HOLE LOCATION:	111.70 S & 10,097.57' E of surface location or approx. 2,616.3' FNL & 169' FEL, NE SE Sec. 32, T153N, R100W
CLOSURE COORDINATES:	Closure Azimuth: 90.63° Closure Distance: 10,098.18'
TOTAL DEPTH / DATE:	20,860' on May 03, 2019 95% within target interval
TOTAL DRILLING DAYS:	17 days
PUMP INFO:	Stroke length - 12" Liner Inner Diameter - 5.0"
COMPANY MEN:	Ian Anderson, Doug Rakstad, Mike Crow, Mike Ziegler

SUNBURST CONSULTING
A GEOLOGY SERVICE

COMPANY GEOLOGIST: John O'Donnell

WELLSITE GEOLOGISTS: Dillon Johnson, Michelle Baker, Adam Collar

ROCK SAMPLING: 30' from 8,300' - 11,148'
50' from 11,148' -20,860 (TD)

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, Rudy Salivar, Jason Strandalien, Willem Zylstra

MWD: Scientific Drilling
Steve Gray, John Parisee

CASING: Surface: 13 3/8" 54# J-55 set to 3,325'
Isolation: 9 5/8" 36# J-55 set to 6,077'
Intermediate: 7" 29# & 32# HCP-110 set to 11,130'

KEY OFFSET WELLS:

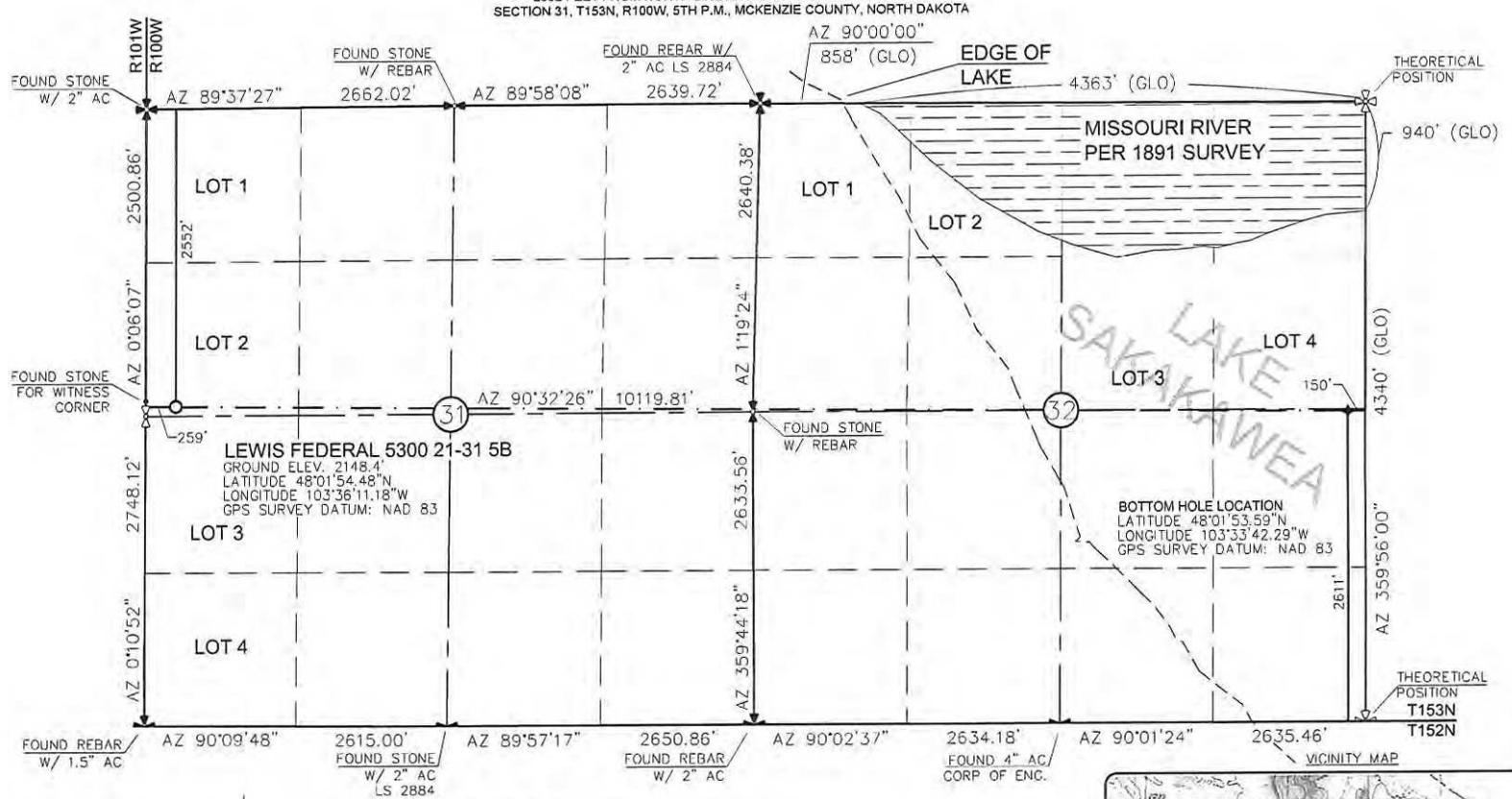
Oasis Petroleum North America, LLC
Lewis Federal 5300 11-31 4BR
Lot 1 Section 31, T153N, R100W
McKenzie County, ND
NDIC: 30197
KB: 2,135'

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

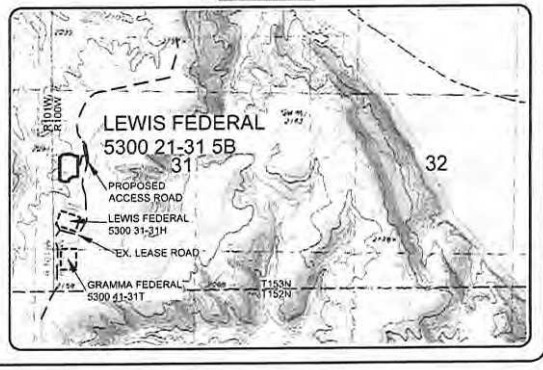
Oasis Petroleum North America, LLC
Lewis Federal 5300 11-31 3B
Lot 1 Section 31, T153N, R100W
McKenzie County, ND
NDIC: 30197
KB: 2,135'

WELL LOCATION

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
LEWIS FEDERAL 5300 21-31 5B
2552 FEET FROM NORTH LINE AND 259 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP



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1" = 1000'

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- MONUMENT – NOT RECOVERED

STAKED ON 1/9/14
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 ERIC BAYES 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

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 3-27-18
NORTH DAKOTA

Revision No.	By	Date	Description

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION
SECTION 31, T153N, R100W, 5TH P.M.,
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.H.S. | Project No.: 511-09-184
Checked By: D.D.K. | Date: MARCH 2018

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
Other offices in Minnesota, North Dakota and South Dakota

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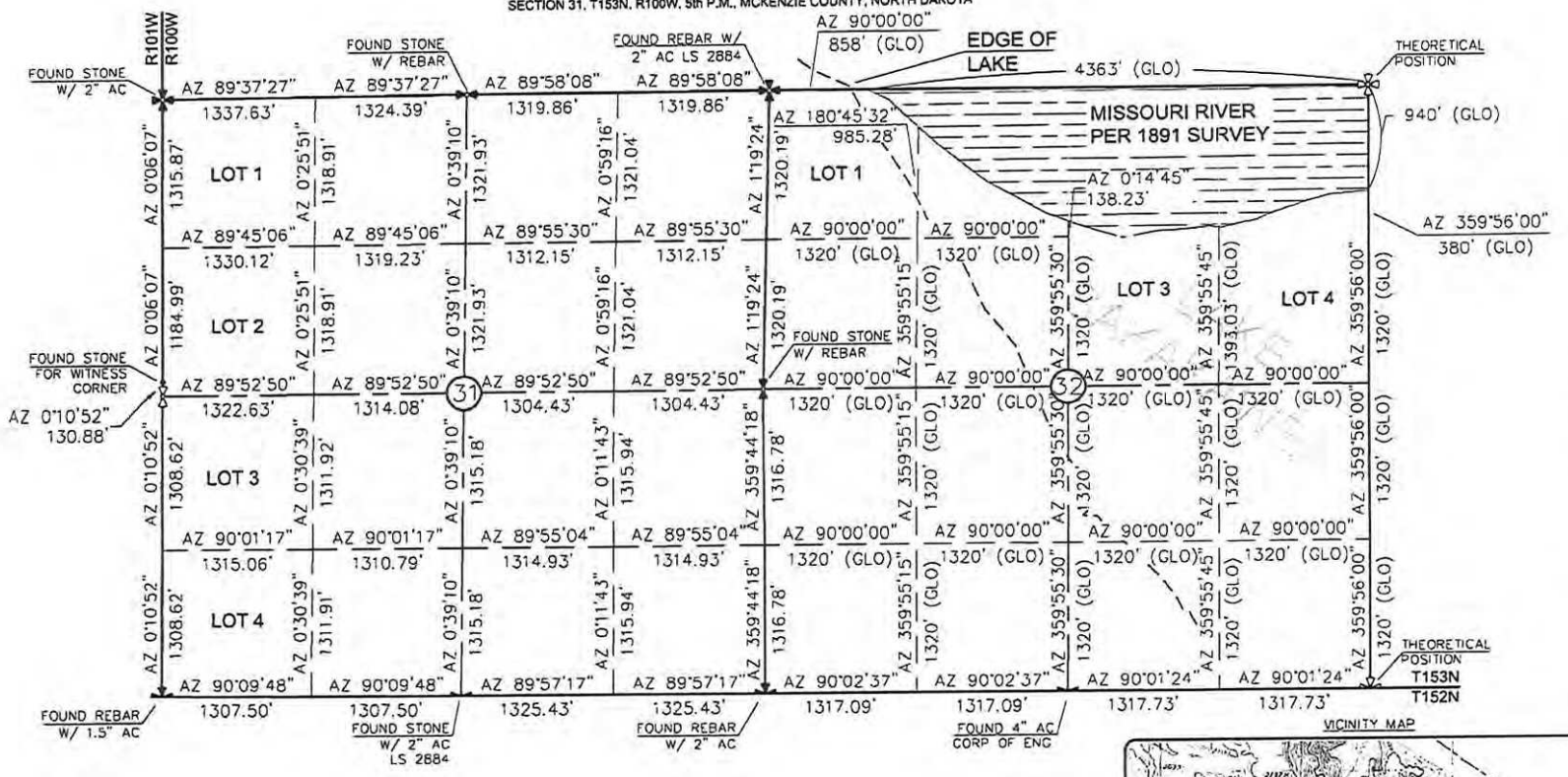
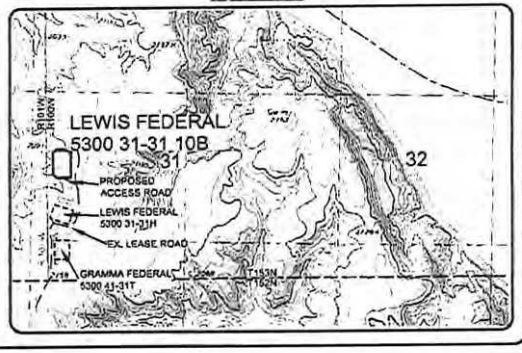
SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP



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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'.

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DARYL D. KASEMAN
LS-3880
DATE: 1/20/14
NORTH DAKOTA

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- ⊗ - MONUMENT - NOT RECOVERED

0 1000
1" = 1000'

Revision No.	Date	By	Description
REV 1	1/15/14	AB	ADDED "PROPOSED ACCESS ROAD" TO MAP

OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 31 & 32, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Drawn By: BAH | Project No.: 513-09-175.05
Checked By: DDK | Date: JAN 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
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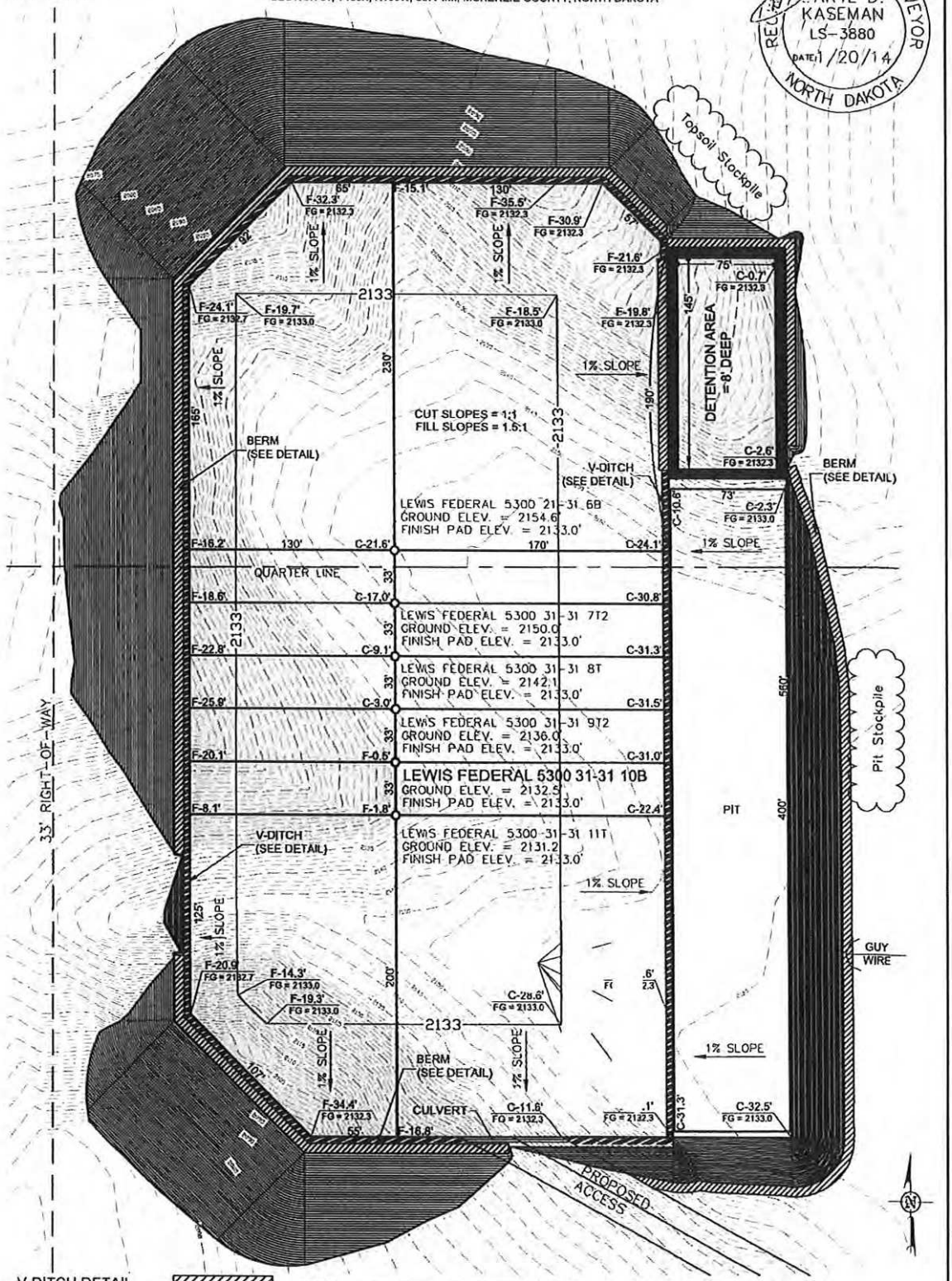
SHEET NO. 2/8

PAD LAYOUT

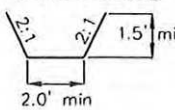
NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 1/20/14
NORTH DAKOTA



V-DITCH DETAIL



BERM — Proposed Contours
DITCH - - - - - Original Contours

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

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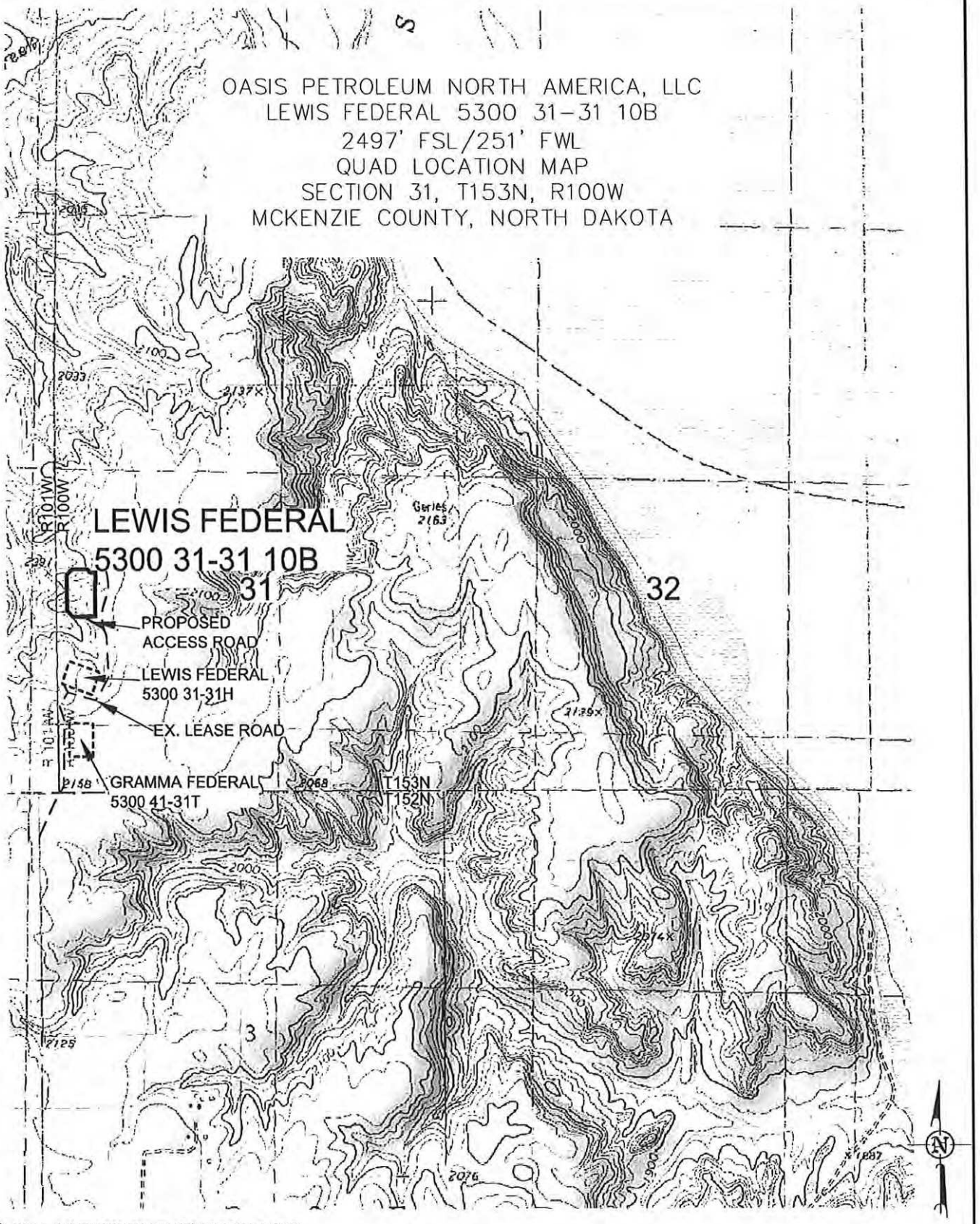
One office in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: 513-09-378.05
Checked By: D.D.K. | Date: JAN 2014

Revision No.	Date	By	Description
REV 1	1/15/14	AS	ADDED "FEDERAL" TO NAME



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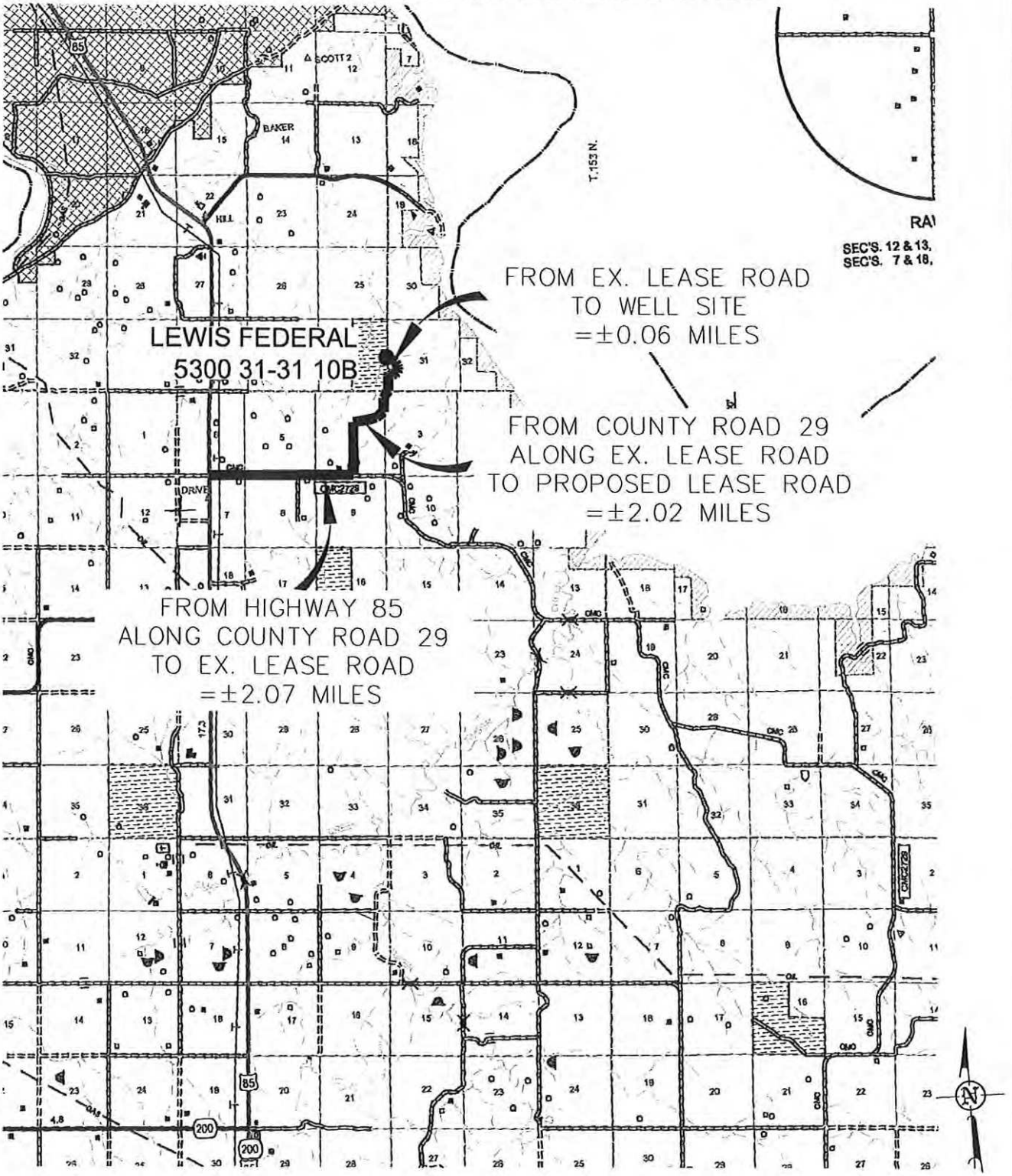
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



SCALE: 1" = 2 MILE

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Other offices in Minnesota, North Dakota and South Dakota

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

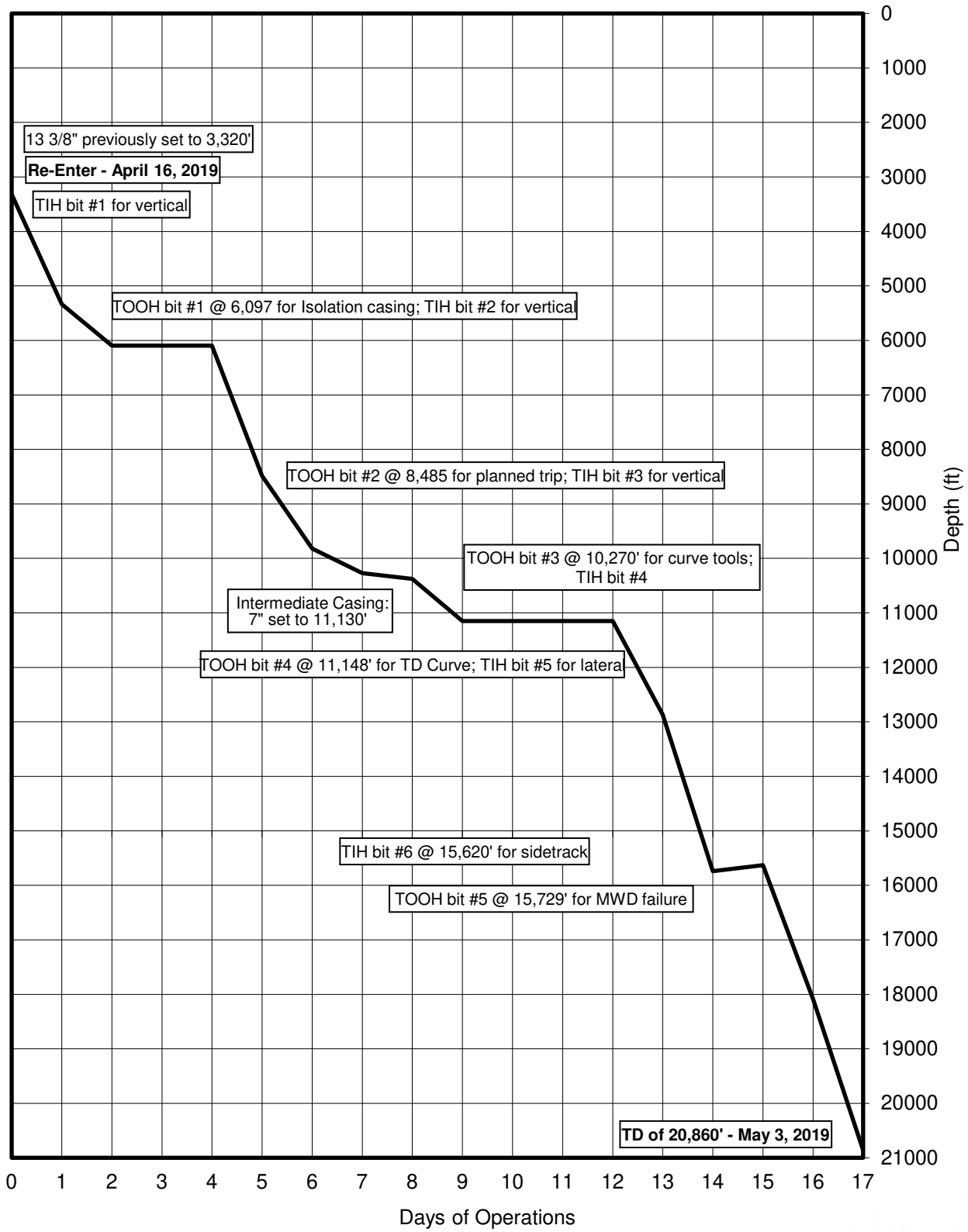
Drawn By: B.H.H. | Project No.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

TIME VS. DEPTH

Oasis Petroleum North America LLC

Lewis Federal 5300 21-31 5B



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A GEOLOGY SERVICE

MORNING REPORT SUMMARY

Rig Contractor:				Nabors B21					Tool Pushers:					Todd Miller, Matthew Piehl	
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	4/16	3,320'	0'	-	-	-	-	-	-	-	-	-	-	Skid rig to Lewis Federal 5300 21-31; nipple up BOPs; test BOPs; install/remove wear bushing; circulate through drilling choke; service rig; cut drilling line 10 wraps.	-
1	4/17	5,337'	2,017'	1	23	45	-	109	4200	78	78	78	785	Prep floor for BHA; install trip nipple; P/U BHA; TIH; displace to oil base; drill cement: 3,300'-3,335', float @ 3,275', shoe @ 3,320'; F.I T.; drill F/3,335'-3,462'; service rig; drill F/3,462'-5,337'.	Mowry
2	4/18	6,097'	760'	1	23	45	15	119	2950	85	85	85	742	Circulate and condition bottoms up; pump LCm; drill F/5,337'-5,679'; service rig; drill F/5,679'-6,097'; back ream to 5,300'; reaming/washing to bottom; circulate and condtion bottoms up; back reaming; service rig.	Swift
3	4/19	6,097'	0'	-	-	-	-	-	-	-	-	-	-	TOOH; L/D BHA; install/remove wear bushing; pre job safety meeting; R/U casing crew; run casing; service rig; run casing; circulate and condition bottoms up; R/D casing crew; pre job safety meeting with cement crew; R/U cementers; primary cement job.	Swift
4	4/20	6,097'	0'	2	-	-	-	-	-	-	-	-	-	Circulate cement displace; pump cement; pre job safety with cement crew; circulate cement displace; R/D cementers; L/D landing joint; remove bell ext.; casing elevators; install 5" elevators; install pack off; test pack off; install wear bushing; function blinds, HCR; wait on wire line crew; remove night cap; waiting on cement; pre job safety meeting with wireline crew; cased hole logs; R/D wireline; P/U BHA; TIH; tool orientation; TOOH; serivce rig.	Swift
5	4/21	8,485'	2,388'	3	33	45	13	144	4700	72	72	72	628	P/U BHA, TIH; drill cement 5,999'-6,112', float @ 6,030', shoe @ 6,077'; circulate and condition; FIT @ 6,112' 476 psi =13.0 ppg; drill F/ 6,112'-7,018'; service rig; drill F/ 7,018'-8,485'; PJSA tripping/pump slug; TOOH.	Kibbey
6	4/22	9,821'	1,336'	3	35	45	30	124	2700	62	62	62	541	TOOH; L/D BHA; P/U BHA; Function blinds; TIH; drill F/8,485'-9,245'; service rig; drill F/9,245'-9,821'; circulate and condition pull 4 stands.	Mission Canyon
7	4/23	10,270'	449'	3	40	55	-	114	3800	85	85	0	494	Circulate and condition bottoms up; TIH; hold casing pressure; drill F/9,821'-10,270'; build volume/weight; serivce rig; circulate and condition; flow check; change rotating head; TOOH.	Lodgepole
8	4/24	10,376'	106'	4	-	-	20	245	3300	84	0	84	489	TOOH; L/D BHA; functon blinds/HCR; P/U BHA; function blinds/HCR; TIH; trouble shoot MWD tool; TIH; ream/wash through salts; TIH; drill F/10,270'-10,325'; circulate and condition mud; mix LCM; service rig; drill F/10,325'-10,376'.	Lodgepole
9	4/25	11,148'	772'	4	25	20	45	268	3450	0	92	92	535	Drill F/10,376'-10,834'; service rig; drill F/10,834'-11,148'; circulate and condition, flow check; short trip to KOP.	Middle Bakken
10	4/26	11,148'	0'	4	-	-	-	-	-	-	-	-	-	Change rotating head, monitor well 265 psi on casing; TIH holding 250 psi on casing; C&C holding 250 psi on casing; monitor well wieght up mud in pits; C&C holding 100 psi on casing; TOOH 40/min holding 40 psi on casing; C&C pump dry job; TOOH 40/min holding 40 psi on casing; C&C circulate out dry job and spot LCM; C&C SPOT LCM across Mission Canyon; back reaming dry; TOOH to casing shoe; C&C build volume wieght up mud to 11.2 ppg.	Middle Bakken

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MORNING REPORT SUMMARY

Rig Contractor:			Nabors B21						Tool Pushers:					Todd Miller, Matthew Piehl	
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
11	4/27	11,148'	0'	4	-	-	-	-	-	-	-	-	-	C&C build volume wieght, circulate 11.2 to surface; remove rotating head, flow check; TOOH 200'/min; PJSA on laying down BHA; lay down BHA; remove wear bushing; PJSA w/ casing crew; rig up to run casing; run casing, circulate as needed; fill and circulate mud cap out at 9 5/8".	Middle Bakken
12	4/28	11,148'	0'	5	-	-	-	-	-	-	-	-	-	Circulate casing, holding 140 psi; pickup landing joint; circulate casing; laydown CRT; rig up cementers; pump cement; attempt to pump up backside to 50 psi; cement and displace; rig down cement crew; laydown BHA; clean rig floor, change elevators; pick up BHA; pick up drill pipe; orientate and test tool; slip and cut; rig service; TIH picking up pipe.	Middle Bakken
13	4/29	12,865'	1,717'	5	25	50	40	259	3600	0	0	105	305	Pressure test casing shoe to 2500 psi; load and strap pipe; pick up 4" drill pipe; drill out of cement, tag float at 11,048' and shoe at 11,130'; circulate bottoms up; rotate to 11,163'; FIT at 11,163' holding 1961 psi with EMW of 13 ppg; down time, repairing electrical on rig; rig service; rotary drilling, sliding as needed, from 11,283'- 12,865'; rig service.	Middle Bakken
14	4/30	15,739'	2,874'	5	25	45	45	267	3600	54	0	54	314	Rotary drilling, sliding as needed, from 12,865'-14,584'; rig service; rotary drilling, sliding as needed, from 14,584'-15,739; stop card, circulate and wait on orders; build oil base mud in premix; trough in preperation for sidetrack; rig service.	Middle Bakken
15	5/1	15,629'	-110'	6	-	-	40	267	3400	54	0	54	314	Trough for sidetrack; trouble shoot MWD tool; TOOH for MWD failure; lay down BHA; pick up BHA; TIH; rig service; circulate and condition; trough; time drill from 15,620'-15,629'.	Middle Bakken
16	5/2	18,090'	2,461'	6	25	45	30	267	3400	54	0	54	314	Time drill from 15,629'-15,635'; rotary drilling from 15,635'-16,409'; rig service; rotary drilling from 16,409'-18,090'; rig service.	Middle Bakken
17	5/3	20,860'	2,770'	6	25	45	30	267	3400	54	0	54	314	Rotary drilling from 18,090'-19783'; rig service; rotary drilling from 19783'-20,860', reach TD of 20,860' at 05:20 hours CDT on 5/3/19; circulate.	Middle Bakken

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DAILY MUD SUMMARY

Chemical Company: Reliable Drilling Fluids							Mud Engineer: P. Waltner					Diesel invert in vertical/curve; Salt water in lateral									
Date 2019	Mud Depth	Mud WT (ppg)	VIS (sec/qt)	PV (cP)	YP (lbs/ 100 ft^2)	Gels (lbs/ 100 ft^2)	600/ 300	Oil/ H_20 (ratio)	Oil/ H_20 (%)	Cake (API/ HTHP)	Solids (%)	Cor. Solids (%)	Alk	pH	Excess Lime (lb/bbl)	Cl^- (mg/L)	LGS/ HGS (%)	Salinity (ppm)	Electrical Stability	Mud loss (bbls)	Mud Gain (bbls)
04/16	3,725'	11.5	51	5	9	12/6/5	39/24	77/23	60/18	0/3	22	20.11	1.6	-	2.07	34k	9.11/11	235021	443	-	-
04/17	5,150'	12.15	53	15	9	12/6/5	39/24	76/24	57/18	0/3	25	23.23	1.5	-	1.94	32k	10.85	224153	489	-	-
04/18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/20	6,200'	11.3	41	16	12	16/8/7	44/28	72/28	60/23	0/3	17	14.94	1.5	-	1.94	37k	2.74/12.2	207564	441	-	-
04/21	8,485'	10.2	38	14	7	-/4/3	35/21	82/18	70.515.5	0/3	14	12.08	1.4	-	1.81	34k	3.72/8.36	262959	505	-	-
04/22	9,800'	10.1	40	13	8	-/5/4	34/21	78/22	67/19	0/3	14	11.85	1.3	-	1.68	38k	4.71/7.14	245710	385	-	-
04/23	10,270'	10.95	44	20	9	-/6/5	49/29	77/23	64/19	0/3	17	14.72	1.4	-	1.81	40k	4.58/10.14	255452	475	-	-
04/24	10,500'	10.95	40	16	9	-/5/4	41/25	80/20	66/16	0/3	18	16	1.3	-	1.68	39k	6.59/9.41	264830	465	-	-
04/25	11,148'	10.95	40	16	9	-/5/4	41/25	80/20	66/16	0/3	18	16	1.3	-	1.68	39k	6.59/9.41	264830	465	-	-
04/26	11,148'	10.95	40	15	9	5/9/-	39/24	77.3/22.7	68/20	-/3	10.2	68/20	1.7	-	2.20	29k	3.6/6.7	225629	540	-	-
04/27	11,148'	Change mud from diesel invert to salt water																		-	-
04/28	11,175'	9.4	28	8	2	1/1/1	5/3	-	1/90	-	-	0.59	-	8.5	-	172k	0.59/0	-	-	-	-
04/29	12,865'	9.4	28	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/30	15,739'	9.45	28	8	2	1/1/1	5/3	-	-/91	-	-	0.39	-	8.5	-	174k	0.39/0	-	-	-	-
05/01	15,629'	9.45	28	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
05/02	19,050'	9.45	28	8	2	1/1/1	5/3	-	-/91	-	-	0.19	-	8.5	-	178k	0.1//0	-	-	-	-
05/03	20,860'	9.45	28	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-

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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	Lobe	Stage	Bend	Rev/Gal	
1	12 1/4	PDC	Ulterra	SPL616	3,322'	6,097'	2,775'	21.5	21.5	Vertical	Stickman	7/8	4.0	2.0°	0.16	TD Isolation Portion
2	8 3/4	PDC	Smith	XS616	6,097'	8,485'	2,388'	17.1	38.6	Vertical	NOV	7/8	5.7	1.50°	0.23	Planned Bit Trip
3	8 3/4	PDC	Smith	XS616	8,485'	10,270'	1,785'	21.3	59.9	Vertical	NOV	7/8	5.7	1.50°	0.23	TD Vertical
4	8 3/4	PDC	Reed	TKC56	10,270'	11,148'	878'	14.97	74.87	Curve	NOV	4/5	7.0	2.38°	0.5	TD curve
5	6	PDC	Reed	TKC53	11,148'	15,729'	4,581'	31.5	106.37	Lateral	Discovery	7/8	10.6	1.50°	0.85	MWD Failure
6	6	PDC	HDBS	GTD54HE	15,620'	20,860'	5,240'	51	157.37	Lateral ST1	Discovery	7/8	10.6	1.50°	0.85	TD lateral

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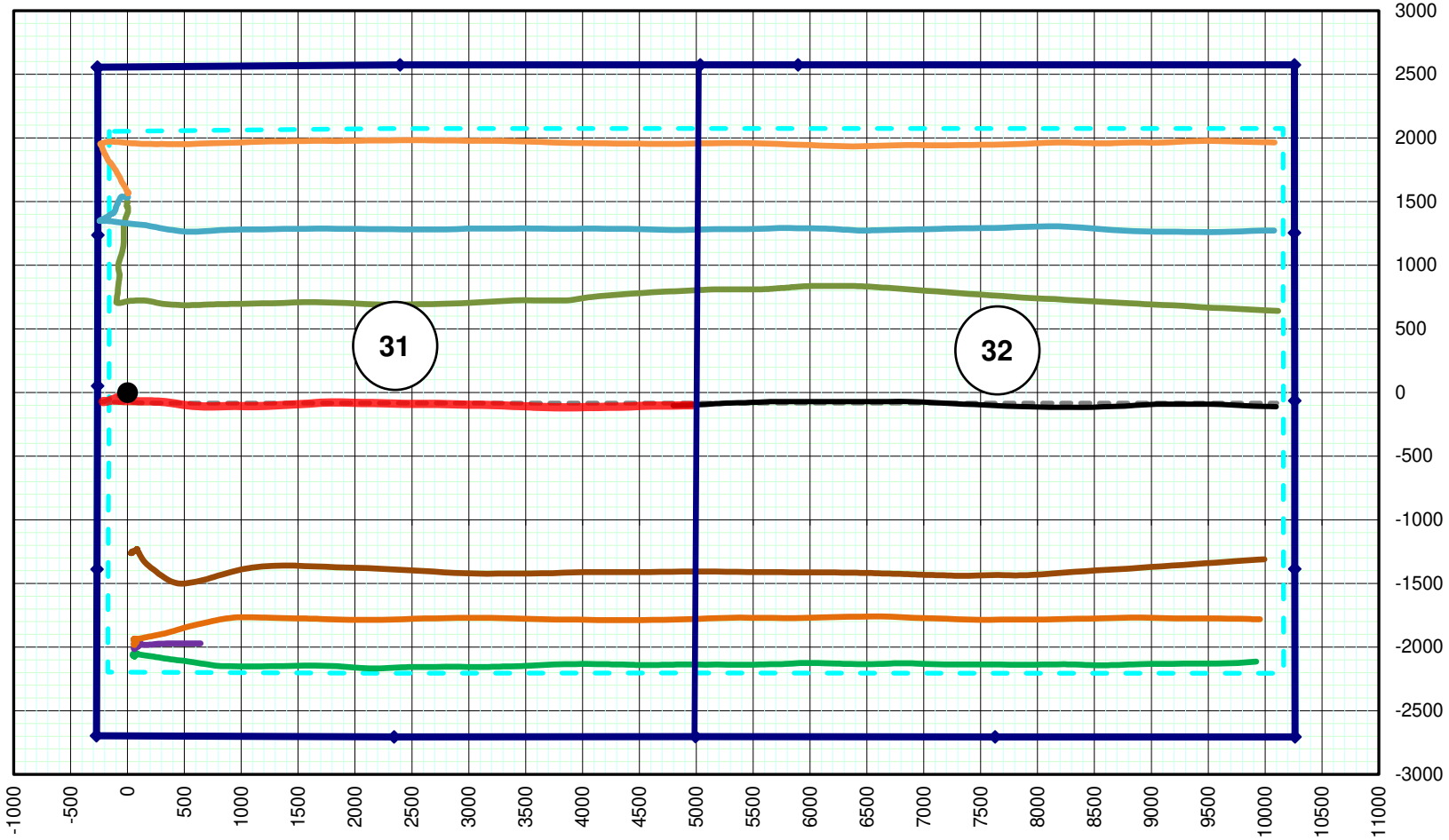
Note: 1,280 acre laydown spacing unit with 500' N/S & 100' E/W setbacks

PLAN VIEW

Oasis Petroleum North America, LLC
Lewis Federal 5300 21-31 5B
2,552' FNL & 259' FWL
Lot 2 Sec. 31, T153N, R100W

N
W E
S

Bottom Hole Location
111.70' S & 10,097.57' E
of surface location or
2,616.3' FSL & 169' FEL
NE SE Sec. 32, T153N, R100W



Surface	Section Line	Hardline
Proposed lateral:	Lewis Federal 5300 21-31 5B Sidetrack 1	**Lewis Federal 5300 21-31 5B**
GRAMMA FEDERAL 5300 41-31 12B	GRAMMA FEDERAL 5300 41-31T	GRAMMA FEDERAL 5300 41-31 13T
LEWIS FEDERAL 5300 31-31H	Lewis Federal 5300 11-31 4BR	Lewis Federal 5300 11-31 3B
Lewis Federal 5300 11-31 2B	Drilling Corridor	

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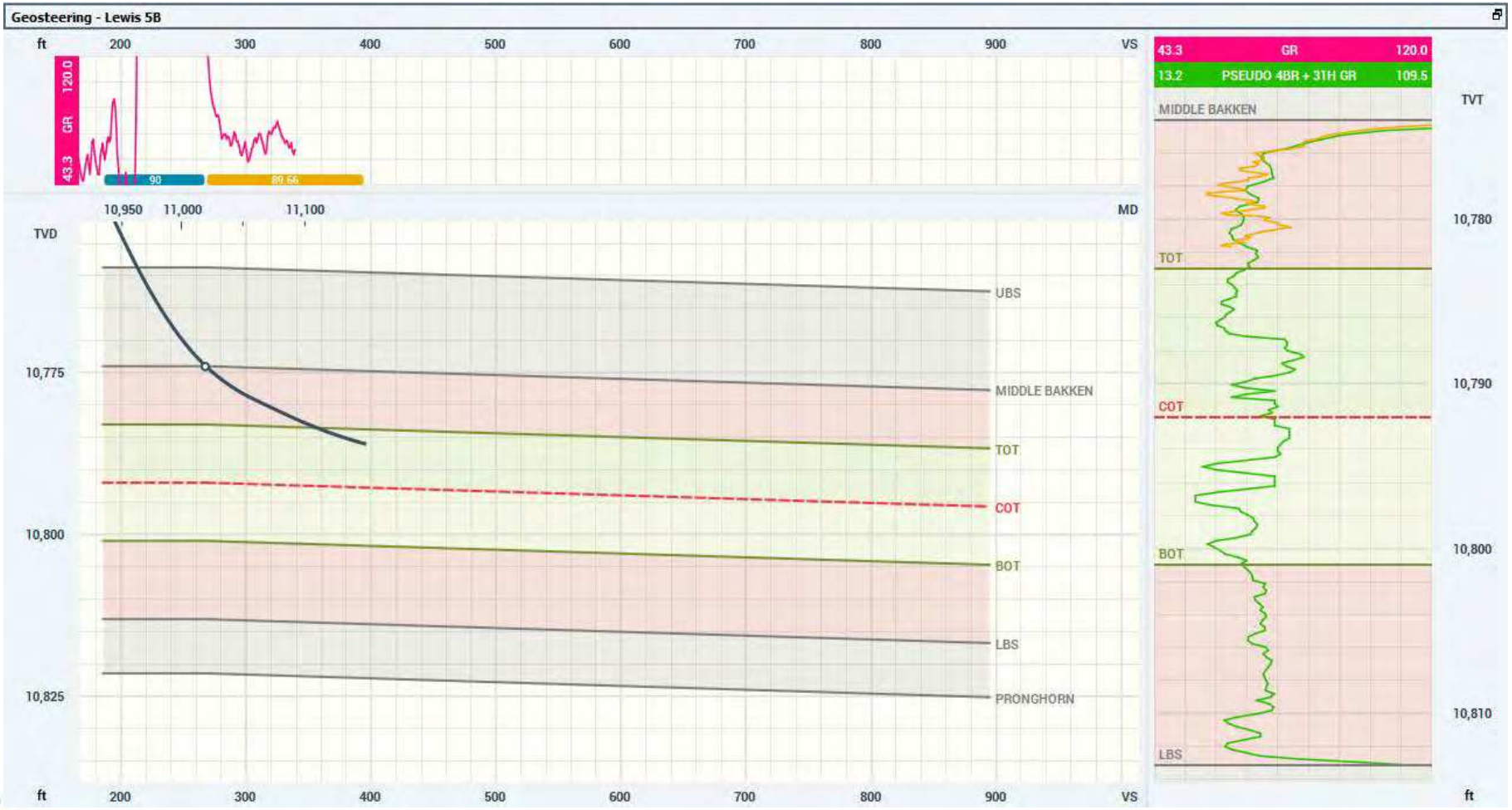
Curve Landing Profile



LANDING PROJECTION

Formation/ Zone:	Proposed Landing Target From:			
	Lewis Federal 5300 11-31 4BR	Lewis Federal 5300 31-31H	Lewis Federal 5300 11-31 3B	Average of Offset Wells
Kibbey "Lime"	10,795'	10,777'	10,803'	10,792'
Charles Salt	10,799'	10,775'	10,801'	10,792'
Base Last Salt	10,791'	10,778'	10,794'	10,788'
Mission Canyon	10,793'	10,778'	10,797'	10,789'
Lodgepole	10,789'	10,781'	10,791'	10,787'
Lodgepole A	10,788'	10,781'	10,785'	10,785'
Lodgepole B	10,793'	10,776'	10,779'	10,783'
Lodgepole C	10,760'	10,784'	10,757'	10,767'
Lodgepole D	10,787'	10,797'	10,792'	10,792'
Lodgepole E	10,793'	10,789'	10,785'	10,789'
Lodgepole F	10,793'	10,793'	10,789'	10,792'
False Bakken	10,794'	10,797'	10,792'	10,794'
Upper Bakken Shale	10,793'	10,792'	10,790'	10,792'
Middle Bakken	10,792'	10,792'	10,792'	10,792'

Current Landing Target (18' below the base of the UBS): **10,791'**

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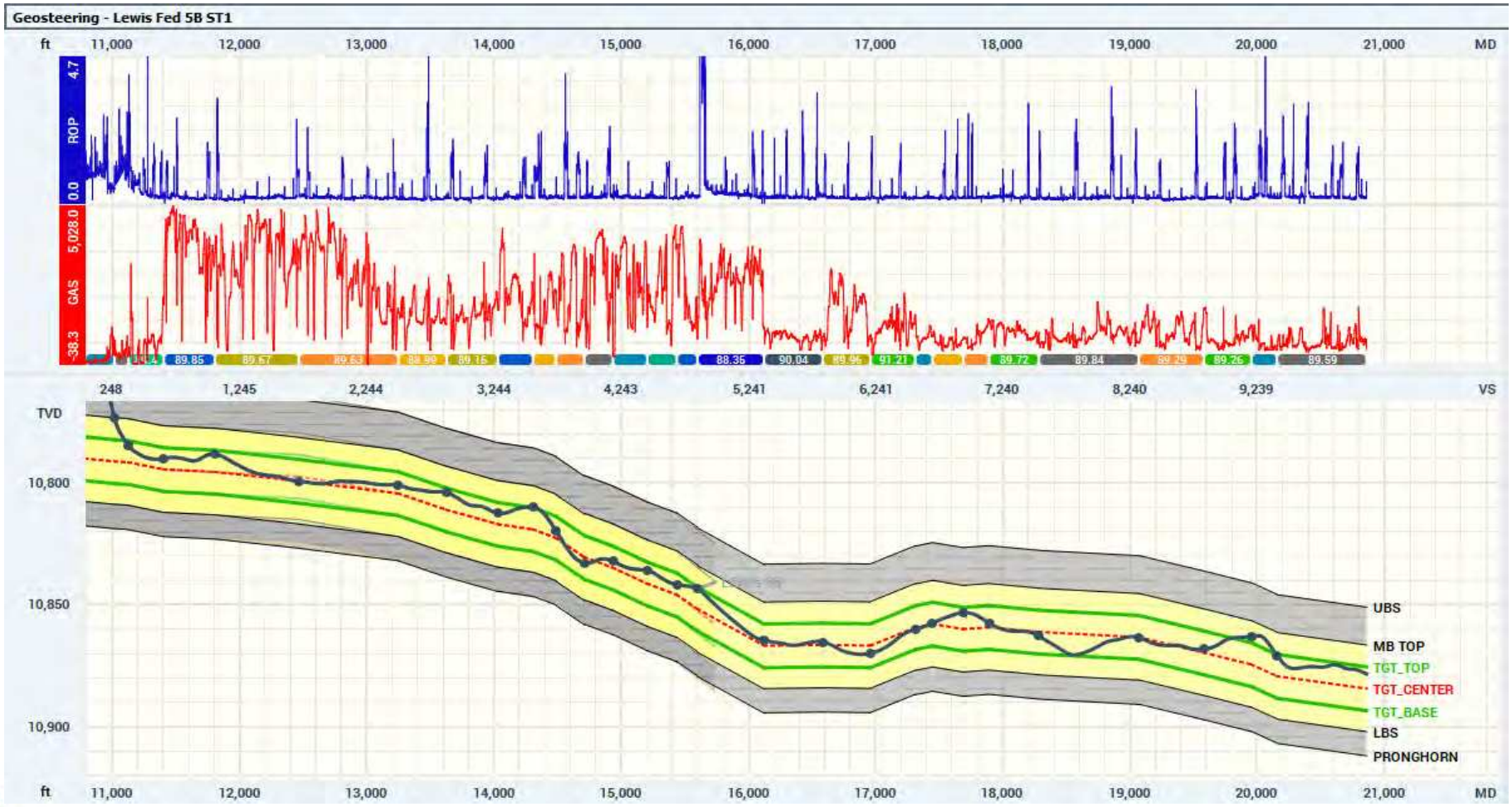
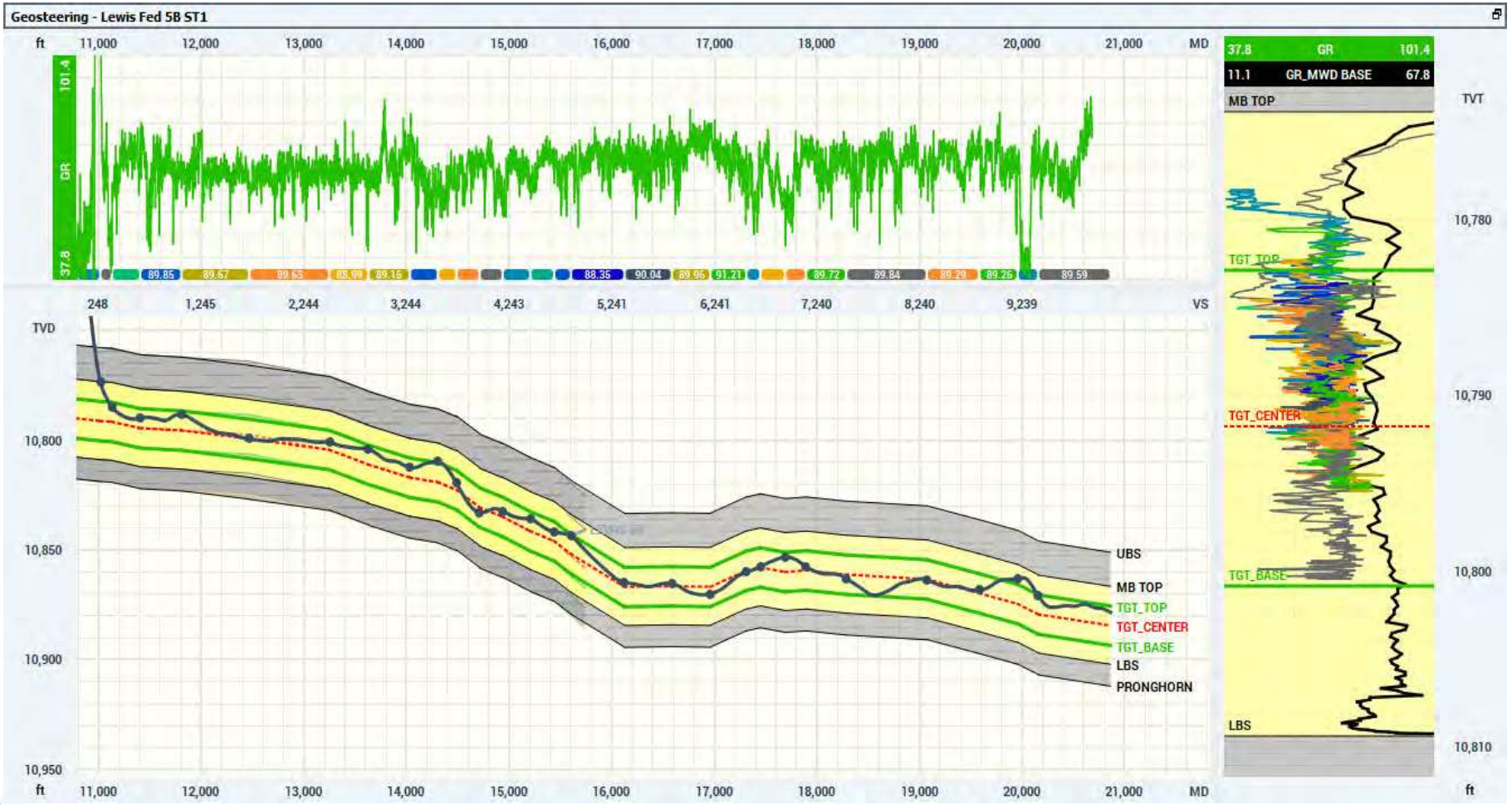
Summary Data Profile



Geosteering Profile



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Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	100.26' S & 4,981.28' E of surface location or 2,621.68' FSL & 5.95' FEL NE SE Sec. 31, T153N, R100W

SUNBURST CONSULTING
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Kick-off:	4/23/2019
Finish:	4/30/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132
KB:	2,157

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
Tie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	12.00	0.00	0.00	12.00	0.00	0.00	0.00	0.00
2	147.00	0.90	25.50	146.99	0.96	0.46	0.45	0.67
3	235.00	1.10	67.00	234.98	1.91	1.53	1.52	0.83
4	323.00	1.30	38.60	322.96	3.02	2.93	2.91	0.70
5	405.00	1.10	34.50	404.95	4.40	3.96	3.92	0.27
6	496.00	1.20	114.30	495.93	4.72	5.32	5.28	1.62
7	585.00	1.10	206.20	584.92	3.57	5.79	5.76	1.86
8	675.00	0.90	205.30	674.91	2.16	5.11	5.09	0.22
9	770.00	0.80	119.60	769.90	1.16	5.37	5.36	1.22
10	860.00	1.10	127.40	859.89	0.32	6.60	6.60	0.36
11	946.00	0.80	139.50	945.88	-0.63	7.65	7.65	0.42
12	1034.00	0.80	200.50	1033.87	-1.68	7.83	7.84	0.92
13	1120.00	0.80	201.60	1119.86	-2.80	7.40	7.42	0.02
14	1210.00	0.90	182.00	1209.85	-4.09	7.14	7.18	0.34
15	1298.00	0.90	176.20	1297.84	-5.47	7.16	7.21	0.10
16	1387.00	1.00	201.10	1386.83	-6.89	6.93	6.99	0.47
17	1475.00	0.90	218.40	1474.82	-8.15	6.23	6.29	0.34
18	1565.00	1.00	221.10	1564.80	-9.29	5.27	5.35	0.12
19	1651.00	1.10	240.00	1650.79	-10.27	4.06	4.15	0.42
20	1740.00	0.90	262.00	1739.78	-10.80	2.63	2.72	0.48
21	1829.00	0.90	279.30	1828.76	-10.78	1.25	1.34	0.30
22	1915.00	0.80	281.20	1914.76	-10.56	-0.01	0.08	0.12
23	2003.00	0.90	286.60	2002.75	-10.24	-1.27	-1.19	0.15
24	2093.00	1.00	289.30	2092.73	-9.78	-2.69	-2.61	0.12
25	2183.00	1.60	304.90	2182.71	-8.80	-4.46	-4.39	0.77
26	2272.00	1.60	312.30	2271.68	-7.25	-6.40	-6.34	0.23
27	2361.00	1.70	343.10	2360.64	-5.15	-7.70	-7.66	0.99
28	2448.00	1.60	344.00	2447.60	-2.75	-8.41	-8.39	0.12
29	2532.00	1.70	352.30	2531.57	-0.39	-8.90	-8.90	0.31
30	2622.00	2.20	354.10	2621.52	2.65	-9.26	-9.28	0.56
31	2710.00	0.70	352.20	2709.49	4.87	-9.51	-9.55	1.71
32	2798.00	0.90	354.30	2797.48	6.09	-9.65	-9.70	0.23
33	2883.00	1.10	359.20	2882.46	7.57	-9.73	-9.79	0.26
34	2969.00	0.90	14.90	2968.45	9.04	-9.56	-9.64	0.39
35	3054.00	1.10	56.00	3053.44	10.15	-8.72	-8.80	0.85

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Finish:	4/30/2019

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Scientific Drilling
RPM Consulting

GL:	2,132
KB:	2,157

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
36	3142.00	0.90	100.40	3141.43	10.49	-7.34	-7.42	0.88
37	3227.00	1.10	111.10	3226.41	10.08	-5.92	-6.00	0.32
38	3270.00	1.20	120.00	3269.41	9.71	-5.14	-5.22	0.48
39	3406.00	2.14	291.40	3405.38	9.92	-6.27	-6.36	2.45
40	3500.00	1.14	278.27	3499.34	10.69	-8.83	-8.92	1.13
41	3594.00	1.14	259.70	3593.32	10.66	-10.68	-10.77	0.39
42	3688.00	1.15	267.43	3687.31	10.45	-12.54	-12.63	0.16
43	3783.00	1.12	269.62	3782.29	10.40	-14.42	-14.51	0.06
44	3878.00	1.24	278.56	3877.27	10.55	-16.37	-16.45	0.23
45	3972.00	1.14	272.56	3971.25	10.74	-18.31	-18.39	0.17
46	4066.00	1.23	286.12	4065.23	11.07	-20.21	-20.30	0.31
47	4160.00	1.45	237.65	4159.20	10.71	-22.18	-22.27	1.19
48	4253.00	1.54	234.08	4252.17	9.35	-24.19	-24.27	0.14
49	4346.00	1.50	238.76	4345.14	7.98	-26.24	-26.31	0.14
50	4440.00	1.85	247.62	4439.10	6.77	-28.70	-28.75	0.46
51	4533.00	1.33	236.79	4532.06	5.60	-30.99	-31.03	0.64
52	4626.00	1.86	232.60	4625.03	4.10	-33.09	-33.12	0.58
53	4720.00	1.74	234.00	4718.98	2.33	-35.46	-35.48	0.14
54	4814.00	0.83	229.01	4812.96	1.04	-37.13	-37.13	0.97
55	4908.00	1.13	238.72	4906.94	0.12	-38.43	-38.43	0.36
56	5001.00	0.67	246.39	4999.93	-0.58	-39.71	-39.71	0.51
57	5094.00	0.78	201.75	5092.92	-1.38	-40.45	-40.43	0.60
58	5188.00	0.60	202.80	5186.92	-2.43	-40.88	-40.85	0.19
59	5281.00	0.44	166.03	5279.91	-3.23	-40.98	-40.95	0.39
60	5374.00	0.49	132.59	5372.91	-3.84	-40.60	-40.57	0.29
61	5468.00	0.33	139.96	5466.91	-4.32	-40.13	-40.09	0.18
62	5561.00	0.69	147.45	5559.90	-5.00	-39.65	-39.61	0.39
63	5654.00	0.53	157.58	5652.90	-5.87	-39.19	-39.14	0.21
64	5747.00	0.47	182.10	5745.90	-6.65	-39.04	-38.98	0.24
65	5841.00	0.48	126.38	5839.89	-7.27	-38.74	-38.68	0.47
66	5934.00	0.90	154.05	5932.89	-8.15	-38.10	-38.04	0.56
67	6027.00	0.91	165.74	6025.87	-9.53	-37.60	-37.52	0.20
68	6041.00	1.15	158.41	6039.87	-9.76	-37.52	-37.44	1.95
69	6122.00	0.65	164.92	6120.86	-10.96	-37.10	-37.01	0.63
70	6215.00	1.14	206.82	6213.85	-12.30	-37.38	-37.28	0.85
71	6309.00	1.99	242.97	6307.82	-13.87	-39.26	-39.14	1.34

SUNBURST CONSULTING
A GEOLOGY SERVICE

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	100.26' S & 4,981.28' E of surface location or 2,621.68' FSL & 5.95' FEL NE SE Sec. 31, T153N, R100W

SUNBURST CONSULTING
A GEOLOGY SERVICE

Kick-off:	4/23/2019
Finish:	4/30/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132
KB:	2,157

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
72	6402.00	3.53	241.10	6400.71	-15.99	-43.21	-43.07	1.66
73	6495.00	4.26	243.30	6493.49	-18.93	-48.80	-48.64	0.80
74	6589.00	4.10	245.60	6587.24	-21.89	-54.98	-54.80	0.25
75	6682.00	3.40	238.80	6680.04	-24.69	-60.36	-60.16	0.89
76	6776.00	3.94	242.84	6773.85	-27.61	-65.62	-65.39	0.64
77	6869.00	4.19	244.98	6866.62	-30.50	-71.54	-71.29	0.31
78	6962.00	3.76	249.09	6959.39	-33.03	-77.47	-77.20	0.55
79	7056.00	4.24	251.11	7053.16	-35.25	-83.64	-83.34	0.53
80	7151.00	4.31	245.54	7147.90	-37.87	-90.21	-89.90	0.44
81	7244.00	4.36	250.49	7240.63	-40.49	-96.72	-96.39	0.41
82	7338.00	4.26	247.10	7334.37	-43.05	-103.31	-102.95	0.29
83	7431.00	4.30	248.43	7427.11	-45.67	-109.73	-109.35	0.12
84	7525.00	4.26	252.77	7520.85	-48.00	-116.34	-115.94	0.35
85	7618.00	3.78	249.47	7613.62	-50.10	-122.51	-122.10	0.57
86	7711.00	3.92	252.34	7706.41	-52.14	-128.41	-127.98	0.26
87	7805.00	3.65	248.74	7800.20	-54.20	-134.26	-133.81	0.38
88	7898.00	3.81	249.61	7893.00	-56.35	-139.92	-139.45	0.18
89	7992.00	3.02	245.54	7986.84	-58.46	-145.10	-144.61	0.88
90	8085.00	2.93	250.97	8079.71	-60.25	-149.58	-149.08	0.32
91	8178.00	2.66	255.59	8172.60	-61.56	-153.91	-153.40	0.38
92	8272.00	2.15	249.53	8266.52	-62.72	-157.68	-157.16	0.61
93	8367.00	2.06	246.46	8361.45	-64.03	-160.91	-160.38	0.15
94	8460.00	2.27	256.65	8454.39	-65.12	-164.24	-163.70	0.47
95	8554.00	2.88	255.35	8548.29	-66.15	-168.33	-167.78	0.65
96	8649.00	2.95	267.18	8643.17	-66.87	-173.08	-172.53	0.64
97	8742.00	3.01	266.68	8736.05	-67.13	-177.91	-177.35	0.07
98	8836.00	2.67	266.99	8829.93	-67.39	-182.56	-182.00	0.36
99	8931.00	2.99	265.06	8924.81	-67.72	-187.24	-186.68	0.35
100	9025.00	2.75	263.25	9018.70	-68.19	-191.92	-191.36	0.27
101	9118.00	2.60	273.82	9111.59	-68.32	-196.24	-195.67	0.55
102	9211.00	2.62	268.50	9204.50	-68.23	-200.47	-199.90	0.26
103	9305.00	2.14	275.87	9298.42	-68.11	-204.36	-203.80	0.60
104	9398.00	2.35	277.86	9391.35	-67.67	-207.98	-207.42	0.24
105	9491.00	2.18	268.41	9484.27	-67.46	-211.64	-211.08	0.44
106	9584.00	0.24	201.18	9577.25	-67.69	-213.48	-212.91	2.26
107	9678.00	0.39	195.61	9671.25	-68.18	-213.63	-213.07	0.16

SUNBURST CONSULTING
A GEOLOGY SERVICE

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	100.26' S & 4,981.28' E of surface location or 2,621.68' FSL & 5.95' FEL NE SE Sec. 31, T153N, R100W

SUNBURST CONSULTING
A GEOLOGY SERVICE

Kick-off:	4/23/2019
Finish:	4/30/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132
KB:	2,157

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
108	9771.00	0.87	181.12	9764.24	-69.19	-213.73	-213.16	0.54
109	9865.00	0.59	202.65	9858.24	-70.35	-213.93	-213.35	0.41
110	9958.00	0.47	214.24	9951.23	-71.11	-214.33	-213.74	0.17
111	10051.00	0.57	189.63	10044.23	-71.88	-214.62	-214.03	0.26
112	10145.00	0.37	215.65	10138.22	-72.59	-214.88	-214.28	0.31
113	10240.00	0.60	201.51	10233.22	-73.30	-215.24	-214.63	0.27
114	10271.00	1.40	95.21	10264.22	-73.48	-214.92	-214.31	5.39
115	10303.00	6.22	87.18	10296.14	-73.44	-212.80	-212.19	15.12
116	10335.00	10.84	86.96	10327.78	-73.19	-208.06	-207.45	14.44
117	10366.00	15.28	82.82	10357.97	-72.52	-201.09	-200.49	14.63
118	10397.00	19.55	77.34	10387.54	-70.88	-191.98	-191.39	14.74
119	10429.00	24.11	79.18	10417.24	-68.47	-180.33	-179.76	14.41
120	10460.00	28.91	81.25	10444.97	-66.14	-166.69	-166.14	15.77
121	10492.00	30.78	84.64	10472.73	-64.20	-150.89	-150.36	7.87
122	10523.00	34.51	86.28	10498.83	-62.89	-134.23	-133.71	12.37
123	10554.00	39.09	89.65	10523.65	-62.26	-115.68	-115.16	16.14
124	10585.00	40.05	94.71	10547.55	-63.02	-95.96	-95.44	10.85
125	10616.00	41.49	93.44	10571.03	-64.46	-75.77	-75.24	5.36
126	10647.00	46.08	92.42	10593.40	-65.54	-54.35	-53.81	14.98
127	10679.00	48.75	92.07	10615.05	-66.47	-30.81	-30.27	8.38
128	10710.00	50.11	91.44	10635.21	-67.19	-7.28	-6.72	4.65
129	10742.00	52.67	90.75	10655.18	-67.66	17.72	18.28	8.18
130	10773.00	54.90	89.82	10673.49	-67.78	42.73	43.29	7.59
131	10804.00	59.62	90.27	10690.26	-67.81	68.80	69.35	15.27
132	10836.00	63.37	91.38	10705.52	-68.22	96.91	97.47	12.11
133	10867.00	64.04	91.23	10719.26	-68.85	124.70	125.26	2.20
134	10899.00	64.21	91.13	10733.22	-69.44	153.48	154.05	0.60
135	10930.00	66.04	90.30	10746.26	-69.79	181.60	182.17	6.38
136	10962.00	69.39	90.45	10758.39	-69.98	211.21	211.77	10.48
137	10993.00	74.53	91.75	10767.99	-70.56	240.67	241.24	17.05
138	11025.00	80.61	92.74	10774.88	-71.78	271.88	272.46	19.24
139	11056.00	84.63	93.83	10778.86	-73.54	302.56	303.16	13.43
140	11087.00	84.88	94.06	10781.69	-75.67	333.36	333.97	1.09
141	11179.00	88.12	99.28	10787.31	-86.34	424.52	425.22	6.67
142	11240.00	88.56	97.21	10789.08	-95.08	484.86	485.63	3.47
143	11332.00	89.87	93.83	10790.34	-103.93	576.41	577.25	3.94

SUNBURST CONSULTING
A GEOLOGY SERVICE

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	100.26' S & 4,981.28' E of surface location or 2,621.68' FSL & 5.95' FEL NE SE Sec. 31, T153N, R100W

SUNBURST CONSULTING
A GEOLOGY SERVICE

Kick-off:	4/23/2019
Finish:	4/30/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132
KB:	2,157

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
144	11424.00	90.64	91.46	10789.93	-108.17	668.31	669.17	2.71
145	11516.00	89.56	89.78	10789.77	-109.17	760.30	761.17	2.17
146	11609.00	89.10	88.02	10790.86	-107.38	853.27	854.12	1.96
147	11701.00	92.08	89.94	10789.91	-105.74	945.24	946.07	3.85
148	11793.00	89.93	90.54	10788.30	-106.13	1037.21	1038.05	2.43
149	11885.00	88.26	89.49	10789.75	-106.15	1129.20	1130.03	2.14
150	11981.00	88.36	88.08	10792.58	-104.12	1225.13	1225.95	1.47
151	12075.00	88.66	87.94	10795.02	-100.86	1319.04	1319.83	0.35
152	12170.00	89.46	87.10	10796.58	-96.75	1413.94	1414.69	1.22
153	12264.00	89.77	87.42	10797.22	-92.25	1507.83	1508.54	0.47
154	12359.00	88.97	86.06	10798.26	-86.85	1602.67	1603.33	1.66
155	12451.00	89.70	86.67	10799.33	-81.02	1694.48	1695.08	1.03
156	12543.00	89.56	89.91	10799.92	-78.27	1786.42	1787.00	3.52
157	12635.00	89.87	90.46	10800.38	-78.57	1878.42	1879.00	0.69
158	12726.00	90.80	91.39	10799.85	-80.04	1969.40	1969.99	1.45
159	12818.00	89.77	90.99	10799.39	-81.95	2061.38	2061.98	1.20
160	12913.00	89.97	90.39	10799.61	-83.09	2156.37	2156.98	0.67
161	13008.00	89.46	91.88	10800.08	-84.98	2251.35	2251.97	1.66
162	13102.00	89.73	91.64	10800.74	-87.86	2345.30	2345.95	0.38
163	13197.00	90.20	89.97	10800.80	-89.20	2440.29	2440.94	1.83
164	13291.00	88.83	90.75	10801.60	-89.79	2534.28	2534.93	1.68
165	13386.00	89.70	89.26	10802.81	-89.80	2629.27	2629.92	1.82
166	13480.00	89.50	90.55	10803.47	-89.64	2723.27	2723.91	1.39
167	13574.00	90.30	90.81	10803.63	-90.76	2817.26	2817.91	0.89
168	13669.00	88.22	91.39	10804.86	-92.58	2912.23	2912.89	2.27
169	13763.00	87.99	91.40	10807.97	-94.87	3006.15	3006.83	0.24
170	13858.00	90.17	91.00	10809.50	-96.86	3101.11	3101.80	2.33
171	13952.00	88.22	91.56	10810.82	-98.96	3195.07	3195.78	2.16
172	14046.00	89.70	91.20	10812.52	-101.22	3289.03	3289.75	1.62
173	14141.00	91.50	91.85	10811.53	-103.75	3383.98	3384.72	2.01
174	14235.00	90.17	92.73	10810.16	-107.50	3477.90	3478.66	1.70
175	14299.00	90.43	92.00	10809.82	-110.14	3541.84	3542.62	1.21
176	14330.00	88.49	92.57	10810.11	-111.38	3572.81	3573.61	6.52
177	14424.00	85.91	90.40	10814.71	-113.81	3666.65	3667.46	3.58
178	14518.00	84.97	91.49	10822.18	-115.36	3760.34	3761.16	1.53
179	14613.00	86.33	89.40	10829.39	-116.09	3855.06	3855.88	2.62

SUNBURST CONSULTING
A GEOLOGY SERVICE

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	100.26' S & 4,981.28' E of surface location or 2,621.68' FSL & 5.95' FEL NE SE Sec. 31, T153N, R100W

SUNBURST CONSULTING
A GEOLOGY SERVICE

Kick-off:	4/23/2019
Finish:	4/30/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132
KB:	2,157

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
180	14708.00	89.53	89.47	10832.82	-115.16	3949.98	3950.79	3.37
181	14803.00	91.50	89.42	10831.96	-114.24	4044.97	4045.77	2.07
182	14897.00	89.03	88.95	10831.53	-112.90	4138.95	4139.73	2.67
183	14991.00	88.43	89.76	10833.61	-111.84	4232.92	4233.69	1.07
184	15085.00	89.53	88.51	10835.29	-110.42	4326.89	4327.65	1.77
185	15180.00	89.90	88.76	10835.76	-108.16	4421.86	4422.60	0.47
186	15274.00	87.86	86.93	10837.60	-104.63	4515.77	4516.47	2.92
187	15368.00	88.56	89.61	10840.53	-101.79	4609.67	4610.35	2.95
188	15462.00	89.67	90.47	10841.98	-101.86	4703.66	4704.33	1.49
189	15556.00	89.40	89.66	10842.75	-101.96	4797.65	4798.33	0.91
190	15651.00	90.87	89.40	10842.52	-101.18	4892.65	4893.31	1.57
PTB	15739.00	91.50	89.40	10840.70	-100.26	4980.62	4981.28	0.72

SUNBURST CONSULTING
A GEOLOGY SERVICE

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B Sidetrack 1
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	111.70' S & 10,097.57' E of surface location or 2,616.3' FSL & 169' FEL NE SE Sec. 32, T153N, R100W

SUNBURST CONSULTING
A GEOLOGY SERVICE

Kick-off:	4/30/2019
Finish:	5/3/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132'
KB:	2,157'

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
Tie	15556.00	89.40	89.66	10842.75	-101.96	4797.65	4798.33	0.00
1	15651.00	87.15	88.47	10845.61	-100.41	4892.59	4893.25	2.68
2	15682.00	86.92	87.85	10847.21	-99.42	4923.53	4924.18	2.13
3	15714.00	87.25	87.17	10848.84	-98.03	4955.46	4956.09	2.36
4	15745.00	87.12	87.06	10850.36	-96.47	4986.38	4987.00	0.55
5	15777.00	87.45	87.65	10851.88	-95.00	5018.31	5018.92	2.11
6	15839.00	87.42	87.63	10854.65	-92.44	5080.20	5080.78	0.06
7	15934.00	87.62	86.74	10858.76	-87.78	5174.99	5175.54	0.96
8	15966.00	87.65	86.95	10860.08	-86.02	5206.92	5207.45	0.66
9	15997.00	87.55	87.50	10861.38	-84.52	5237.85	5238.37	1.80
10	16029.00	87.99	87.50	10862.63	-83.13	5269.80	5270.30	1.38
11	16061.00	88.53	89.42	10863.60	-82.27	5301.77	5302.27	6.23
12	16124.00	89.43	88.58	10864.72	-81.17	5364.75	5365.23	1.95
13	16187.00	89.60	88.49	10865.25	-79.56	5427.73	5428.20	0.31
14	16218.00	89.56	87.67	10865.48	-78.52	5458.71	5459.17	2.65
15	16312.00	89.30	88.14	10866.42	-75.09	5552.64	5553.07	0.57
16	16407.00	90.77	88.15	10866.36	-72.01	5647.59	5647.99	1.55
17	16501.00	90.54	89.52	10865.28	-70.10	5741.56	5741.94	1.48
18	16595.00	89.26	91.27	10865.45	-70.75	5835.55	5835.93	2.31
19	16690.00	88.19	90.10	10867.56	-71.88	5930.52	5930.91	1.67
20	16784.00	89.26	89.59	10869.65	-71.63	6024.49	6024.88	1.26
21	16879.00	89.87	89.89	10870.38	-71.20	6119.49	6119.87	0.72
22	16974.00	90.80	90.43	10869.82	-71.46	6214.48	6214.86	1.13
23	17069.00	91.64	89.43	10867.80	-71.35	6309.46	6309.83	1.37
24	17163.00	92.61	90.32	10864.31	-71.14	6403.39	6403.76	1.40
25	17257.00	91.24	90.19	10861.15	-71.56	6497.34	6497.71	1.46
26	17352.00	90.80	89.43	10859.46	-71.24	6592.32	6592.68	0.92
27	17447.00	91.44	89.30	10857.61	-70.19	6687.30	6687.65	0.69
28	17542.00	91.14	90.07	10855.47	-69.67	6782.27	6782.61	0.87
29	17636.00	90.94	91.58	10853.76	-71.02	6876.24	6876.59	1.62
30	17730.00	89.56	92.19	10853.35	-74.12	6970.19	6970.56	1.61
31	17825.00	88.06	93.15	10855.32	-78.54	7065.06	7065.47	1.87
32	17920.00	88.36	92.08	10858.29	-82.87	7159.91	7160.35	1.17
33	18014.00	89.16	92.50	10860.33	-86.63	7253.82	7254.28	0.96
34	18108.00	90.17	92.02	10860.87	-90.33	7347.74	7348.23	1.19
35	18203.00	89.43	92.47	10861.21	-94.05	7442.67	7443.19	0.91
36	18298.00	88.06	92.78	10863.29	-98.40	7537.54	7538.09	1.48

SUNBURST CONSULTING
A GEOLOGY SERVICE

Operator:	Oasis Petroleum North America, LLC
Well:	Lewis Federal 5300 21-31 5B Sidetrack 1
Surface Coordinates:	2,552' FNL & 259' FWL
Surface Location:	Lot 2 Sec. 31, T153N, R100W
County, State:	McKenzie County, ND
Bottom Hole Location:	111.70' S & 10,097.57' E of surface location or 2,616.3' FSL & 169' FEL NE SE Sec. 32, T153N, R100W

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Kick-off:	4/30/2019
Finish:	5/3/2019

Directional Supervision:
Scientific Drilling
RPM Consulting

GL:	2,132'
KB:	2,157'

Minimum Curvature Method (SPE-3362)
[North and East are positive and South and West are negative]

Vertical Section Azimuth: 90.47

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
37	18392.00	88.29	92.81	10866.28	-102.99	7631.38	7631.97	0.25
38	18487.00	88.03	92.01	10869.33	-106.98	7726.25	7726.86	0.89
39	18581.00	90.54	91.50	10870.50	-109.86	7820.19	7820.83	2.72
40	18675.00	91.27	91.41	10869.02	-112.24	7914.14	7914.80	0.78
41	18770.00	91.81	91.41	10866.47	-114.58	8009.08	8009.75	0.57
42	18865.00	90.37	90.27	10864.66	-115.97	8104.05	8104.73	1.93
43	18960.00	90.97	89.98	10863.55	-116.18	8199.04	8199.72	0.70
44	19054.00	89.20	90.14	10863.41	-116.28	8293.04	8293.71	1.89
45	19149.00	88.66	89.95	10865.18	-116.35	8388.02	8388.69	0.60
46	19243.00	89.60	88.24	10866.61	-114.87	8481.99	8482.65	2.08
47	19338.00	90.33	88.29	10866.67	-111.99	8576.95	8577.58	0.77
48	19433.00	88.86	88.46	10867.34	-109.30	8671.91	8672.51	1.56
49	19528.00	89.93	87.49	10868.34	-105.94	8766.84	8767.41	1.52
50	19622.00	90.64	86.37	10867.88	-100.91	8860.70	8861.23	1.41
51	19717.00	92.08	87.20	10865.62	-95.58	8955.52	8956.01	1.75
52	19811.00	90.37	88.81	10863.61	-92.31	9049.44	9049.89	2.50
53	19906.00	90.00	89.70	10863.30	-91.07	9144.43	9144.87	1.01
54	20001.00	90.67	90.04	10862.75	-90.86	9239.43	9239.86	0.79
55	20032.00	88.63	89.83	10862.94	-90.82	9270.42	9270.86	6.62
56	20063.00	86.62	90.06	10864.22	-90.79	9301.39	9301.83	6.53
57	20095.00	85.81	90.16	10866.33	-90.86	9333.32	9333.76	2.55
58	20126.00	85.71	89.71	10868.63	-90.82	9364.24	9364.67	1.48
59	20189.00	86.21	89.87	10873.07	-90.59	9427.08	9427.51	0.83
60	20283.00	90.03	90.96	10876.15	-91.27	9521.01	9521.44	4.23
61	20378.00	90.57	92.25	10875.65	-93.93	9615.97	9616.42	1.47
62	20472.00	89.56	91.98	10875.54	-97.40	9709.90	9710.38	1.11
63	20566.00	91.07	93.53	10875.03	-101.92	9803.79	9804.29	2.30
64	20661.00	88.49	91.93	10875.39	-106.44	9898.67	9899.21	3.20
65	20755.00	90.17	90.83	10876.49	-108.71	9992.63	9993.19	2.14
66	20794.00	88.70	91.82	10876.88	-109.61	10031.62	10032.18	4.54
PTB	20860.00	88.70	91.82	10878.37	-111.70	10097.57	10098.14	0.00

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FORMATION TOPS & STRUCTURAL RELATIONSHIPS

	Subject Well:								Offset Wells:		
Operator:	**Oasis Petroleum North America LLC**										
Well Name:	**Lewis Federal 5300 21-31 5B**										
Location:	2,552' FNL & 259' FWL										
	Lot 2 Section 31, T153N, R100W										
Elevation:	GL: 2,132'	Sub: 25'	KB: 2,157'						**Dip To Lewis Federal 5300 11-31 4BR**	**Dip To Lewis Federal 5300 31-31H**	**Dip To Lewis Federal 5300 11-31 3B**
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.**			
Kibbey "Lime"	8,432'	-6,275'	8,441'	8,436'	-6,279'	148'	2,356'	-4'	1'	10'	-5'
Charles Salt	8,577'	-6,420'	8,589'	8,584'	-6,427'	674'	2,208'	-7'	-2'	13'	-3'
Base Last Salt	9,260'	-7,103'	9,265'	9,258'	-7,101'	208'	1,534'	2'	6'	9'	5'
Mission Canyon	9,464'	-7,307'	9,473'	9,466'	-7,309'	566'	1,326'	-2'	4'	10'	2'
Lodgepole	10,034'	-7,877'	10,039'	10,032'	-7,875'	69'	760'	2'	7'	6'	8'
Lodgepole A	10,104'	-7,947'	10,108'	10,101'	-7,944'	81'	691'	3'	9'	7'	13'
Lodgepole B	10,189'	-8,032'	10,189'	10,182'	-8,025'	44'	610'	7'	4'	12'	20'
Lodgepole C	10,231'	-8,074'	10,233'	10,226'	-8,069'	200'	566'	5'	37'	3'	41'
Lodgepole D	10,429'	-8,272'	10,438'	10,426'	-8,269'	146'	366'	3'	9'	-10'	6'
Lodgepole E	10,546'	-8,389'	10,618'	10,572'	-8,415'	93'	220'	-26'	4'	-2'	14'
Lodgepole F	10,663'	-8,506'	10,758'	10,665'	-8,508'	85'	127'	-2'	4'	-6'	9'
False Bakken	10,748'	-8,591'	10,940'	10,750'	-8,593'	9'	42'	-2'	3'	-9'	7'
Upper Bakken Shale	10,758'	-8,601'	10,963'	10,759'	-8,602'	15'	33'	-1'	4'	-5'	8'
Middle Bakken	10,773'	-8,616'	11,020'	10,774'	-8,617'	9'	18'	-1'	5'	-4'	6'
Target Top	10,782'	-8,625'	11,101'	10,783'	-8,626'	9'	9'	-1'	5'	-4'	6'

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CONTROL DATA

Operator:	Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC			
Well Name:	Lewis Federal 5300 11-31 4BR				Lewis Federal 5300 31-31H				Lewis Federal 5300 11-31 3B			
Location:	Lot 1 Section 31, T153N, R100W McKenzie County, ND 0.3 miles N of subject well				Lot 6 Sec. 30, T153N, R100W McKenzie County, ND 0.15 miles S of subject well				Lot 1 Section 31, T153N, R100W McKenzie County, ND 0.3 miles N of subject well			
Elevation:	KB: 2,135'		NDIC: 30197		KB: 2,185'		NDIC: 20314		KB: 2,135'		NDIC: 30197	
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**
Kibbey "Lime"	8,415'	-6,280'	145'	2,359'	8,474'	-6,289'	151'	2,341'	8,409'	-6,274'	150'	2,367'
Charles Salt	8,560'	-6,425'	682'	2,215'	8,625'	-6,440'	671'	2,191'	8,559'	-6,424'	682'	2,217'
Base Last Salt	9,242'	-7,107'	207'	1,533'	9,295'	-7,110'	208'	1,520'	9,241'	-7,106'	205'	1,536'
Mission Canyon	9,448'	-7,313'	569'	1,327'	9,504'	-7,319'	563'	1,312'	9,446'	-7,311'	572'	1,331'
Lodgepole	10,017'	-7,882'	71'	757'	10,066'	-7,881'	69'	749'	10,018'	-7,883'	74'	759'
Lodgepole A	10,088'	-7,953'	75'	687'	10,136'	-7,951'	86'	680'	10,092'	-7,957'	88'	684'
Lodgepole B	10,164'	-8,029'	78'	611'	10,222'	-8,037'	36'	594'	10,180'	-8,045'	65'	597'
Lodgepole C	10,241'	-8,106'	172'	534'	10,257'	-8,072'	187'	558'	10,245'	-8,110'	165'	531'
Lodgepole D	10,413'	-8,278'	141'	361'	10,444'	-8,259'	154'	371'	10,410'	-8,275'	153'	366'
Lodgepole E	10,554'	-8,419'	93'	221'	10,598'	-8,413'	89'	217'	10,564'	-8,429'	88'	213'
Lodgepole F	10,647'	-8,512'	84'	128'	10,687'	-8,502'	81'	128'	10,652'	-8,517'	83'	124'
False Bakken	10,731'	-8,596'	11'	44'	10,769'	-8,584'	13'	47'	10,735'	-8,600'	10'	42'
Upper Bakken Shale	10,741'	-8,606'	16'	34'	10,782'	-8,597'	16'	33'	10,745'	-8,610'	13'	31'
Middle Bakken	10,757'	-8,622'	9'	18'	10,798'	-8,613'	9'	18'	10,758'	-8,623'	9'	18'
Target Top	10,766'	-8,631'	9'	9'	10,807'	-8,622'	9'	9'	10,767'	-8,632'	9'	9'
Target Landing	10,775'	-8,640'	9'	0'	10,815'	-8,630'	9'	0'	10,777'	-8,642'	9'	0'
Target Base	10,784'	-8,649'	12'	-9'	10,825'	-8,640'	9'	-9'	10,786'	-8,651'	11'	-9'
Lower Bakken Shale	10,796'	-8,661'		-21'	10,833'	-8,648'		-18'	10,797'	-8,662'		-20'

Projected depth

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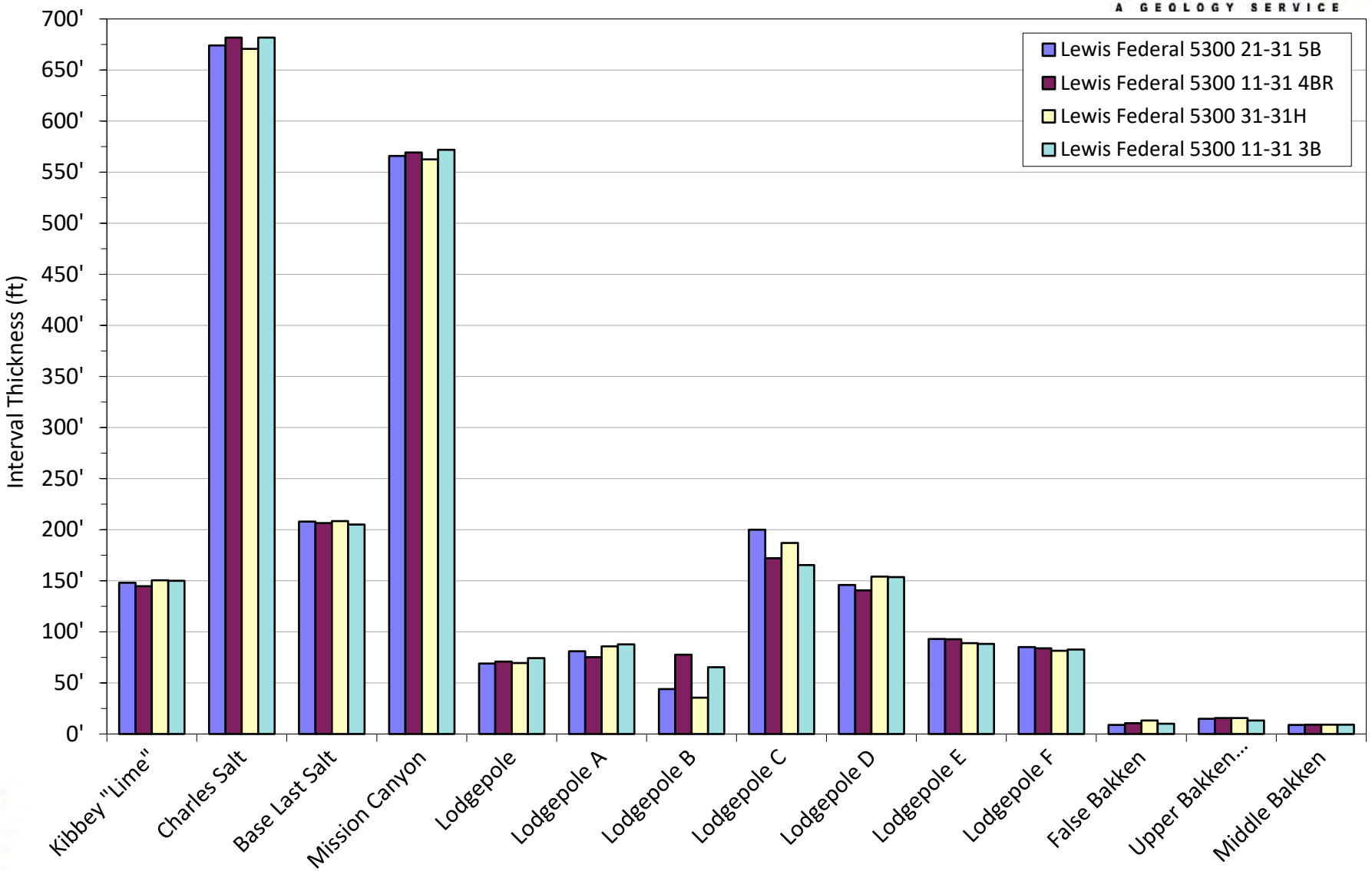
INTERVAL THICKNESS

Oasis Petroleum North America LLC - Lewis Federal 5300 21-31 5B



LITHOLOGY

Oasis Petroleum North America, LLC
Lewis Federal 5300 21-31 5B

Sunburst geologists caught 30' sample intervals from 8,300'-11,148' and 50' sample intervals through the lateral to TD at 20,860'. Additional spot samples were caught through the vertical, curve, and lateral as needed. Samples were examined wet and dry under a binocular microscope. Sample fluorescent cuts are masked by invert mud through 11,148', at which time the drilling fluid was displaced to Salt Water. Quantifiers in order of increasing abundance are trace, rare, occasional, common and abundant. One set of sample cuttings were packaged and mailed to the North Dakota Geological Survey Core Library, per state requirement.

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

Drilling in the Otter Formation [Mississippian Big Snowy Group]

8,300-8,330 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

8,330-8,360 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

8,360-8,390 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

8,390-8,420 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] ***8,441' MD / 8,436' TVD (-6,279')***

8,420-8,450 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

8,450-8,480 No Sample

8,480-4,510 SILTSTONE: dark orange, red brown, firm, occasional soft, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; occasional SILTY SANDSTONE: light gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain; trace ANHYDRITE: milky white, cream, microcrystalline, soft, amorphous, no visible porosity

8,510-8,540 SILTSTONE: dark orange, dark red, red brown, firm, trace soft, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; rare SILTY SANDSTONE: light gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

8,540-8,570 SILTSTONE: dark orange, red brown, firm, sub blocky, calcareous cement, well cemented, no visible porosity, no visible oil stain; trace SILTY SANDSTONE: light-medium gray, trace off white, very fine-fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented, no visible porosity, no visible oil stain

Charles Formation [Mississippian Madison Group] ***8,590' MD / 8,584' TVD (-6,427')***

8,570-8,600 No Sample

8,600-8,630 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; trace LIMESTONE: mudstone, cream, common light-medium gray, rare tan, microcrystalline, firm, earthy texture, no visible porosity, no visible oil stain

8,630-8,660 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; trace ANHYDRITE: milky white, cream, microcrystalline, soft, amorphous, no visible porosity

8,660-8,690 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,690-8,720 LIMESTONE: mudstone, cream, common light gray, rare tan, microcrystalline, firm, common friable, earthy texture, no visible porosity, no visible oil stain; rare ANHYDRITE: milky white, microcrystalline, soft, amorphous, no visible porosity

8,720-8,750 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,750-8,780 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,780-8,910 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity; trace LIMESTONE: mudstone, light gray, cream, microcrystalline, firm, earthy texture, no visible porosity, no visible oil stain

8,810-8,840 ARGILLACEOUS-DOLOMITIC LIMESTONE: mudstone, tan, medium-light gray, light brown gray, trace dark gray, cream, microcrystalline, firm, trace friable, dense, earthy texture, rare crystalline texture, no visible porosity

8,840-8,870 LIMESTONE: mudstone, light-medium gray, cream, microcrystalline, firm, earthy texture, no visible porosity, no visible oil stain

8,870-8,900 DOLOMITIC LIMESTONE: mudstone, tan, light gray, rare cream, microcrystalline, firm, common friable, earthy-crystalline texture, no visible porosity; rare ANHYDRITE: milky white, cream, microcrystalline, soft, amorphous, no visible porosity

8,900-8,930 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,930-8,960 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

8,960-8,990 LIMESTONE: mudstone, cream, light-medium gray, trace light brown gray, microcrystalline, firm, rare friable, earthy texture, no visible porosity, no visible oil stain

8,990-9,020 DOLOMITE: mudstone, tan, light brown gray, microcrystalline, firm-hard, dense-banded, crystalline-sucrosic texture, argillaceous in part, no visible porosity; rare ANHYDRITE: milky white, cream, microcrystalline, soft, amorphous, no visible porosity

9,020-9,050 ANHYDRITE: milky white, cream, rare light gray, microcrystalline, soft, amorphous, no visible porosity; occasional LIMESTONE: mudstone, cream, tan, light gray, earthy texture, friable, common firm, no visible porosity

9,050-9,080 SALT: translucent, common milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

9,080-9,110 LIMESTONE: mudstone, tan, cream, light-medium gray, microcrystalline, firm-hard, dense-banded, crystalline-sucrosic texture, argillaceous in part, no visible porosity; occasional ANHYDRITE: off white, tan, microcrystalline, firm-soft, massive, amorphous, no visible porosity

9,110-9,140 LIMESTONE: mudstone, tan, cream, light-medium gray, microcrystalline, firm-hard, dense-banded, crystalline-sucrosic texture, argillaceous in part, no visible porosity; occasional ANHYDRITE: off white, tan, microcrystalline, firm-soft, massive, amorphous, no visible porosity

9,140-9,170 LIMESTONE: mudstone, tan, cream, light-medium gray, microcrystalline, firm-hard, dense-banded, crystalline-sucrosic texture, argillaceous in part, no visible porosity; occasional ANHYDRITE: off white, tan, microcrystalline, firm-soft, massive, amorphous, no visible porosity

9,170-9,200 LIMESTONE: mudstone, tan, cream, light-medium gray, microcrystalline, firm-hard, dense-banded, crystalline-sucrosic texture, argillaceous in part, no visible porosity; occasional ANHYDRITE: off white, tan, microcrystalline, firm-soft, massive, amorphous, no visible porosity

9,200-9,230 SALT: translucent, rare milky white, firm, hard, crystalline, massive, anhedral, no visible porosity

9,230-9,260 LIMESTONE: mudstone, light-medium gray, tan-cream, microcrystalline, firm-friable, dense, earthy texture, common crystalline texture, argillaceous in part, no visible porosity, no visible oil stain; rare ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

Base of Last Salt [Charles Formation] ***9,265' MD / 9,258' TVD (-7,101')***

9,260-9,290 LIMESTONE: mudstone, light-medium gray, tan-cream, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; rare ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,290-9,320 LIMESTONE: mudstone, light-medium gray, tan-cream, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; rare ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,320-9,350 LIMESTONE: mudstone, light-medium gray, tan-cream, occasional off white, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; rare ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,350-9,380 LIMESTONE: mudstone, light-medium gray, tan-cream, occasional off white, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; rare ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,380-9,410 LIMESTONE: mudstone, light-medium gray, tan-cream, occasional off white, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; rare ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,410-9,440 LIMESTONE: mudstone, light-medium gray, common tan-cream, rare off white, microcrystalline, firm, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; trace ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,440-9,470 LIMESTONE: mudstone, light-medium gray, common tan-cream, rare off white, microcrystalline, firm, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; trace ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

Mission Canyon Formation [Mississippian Madison Group] ***9,473' MD / 9,466' TVD (-7,309')***

9,470-9,500 LIMESTONE: mudstone, light-medium gray, common tan-cream, rare off white, microcrystalline, firm, dense, earthy texture, no visible porosity, no visible oil stain; trace ANHYDRITE: off white, tan, microcrystalline, soft, massive, amorphous, no visible porosity

9,500-9,530 LIMESTONE: mudstone, light gray, occasional tan-cream, rare off white, microcrystalline, firm, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,530-9,560 LIMESTONE: mudstone, light gray, occasional tan-cream, rare off white, microcrystalline, firm, dense, earthy texture, no visible porosity, no visible oil stain

9,560-9,590 LIMESTONE: mudstone, light gray, occasional off white, occasional tan, rare gray-brown, microcrystalline, firm, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,590-9,620 LIMESTONE: mudstone, light gray, occasional off white, occasional tan, rare gray-brown, microcrystalline, firm, earthy texture, no visible porosity, no visible oil stain

9,620-9,650 ARGILLACEOUS LIMESTONE: mudstone, light gray, occasional off white, occasional tan, rare gray-brown, microcrystalline, firm, dense, earthy texture, no visible porosity, no visible oil stain

9,650-9,680 LIMESTONE: mudstone, light gray, common off white, occasional tan, rare gray-brown, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,680-9,710 ARGILLACEOUS LIMESTONE: mudstone, light gray, common off white, occasional tan, rare gray-brown, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,710-9,740 ARGILLACEOUS LIMESTONE: mudstone, light gray, common off white, occasional tan, rare gray-brown, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,740-9,770 LIMESTONE: mudstone, light gray, common off white, occasional tan, occasional gray-brown, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,770-9,800 LIMESTONE: mudstone, light gray, common off white, occasional tan, occasional gray-brown, microcrystalline, firm-friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,800-9,830 LIMESTONE: mudstone, tan, cream, light gray, microcrystalline, firm, rare friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,830-9,860 LIMESTONE: mudstone, tan, cream, light gray, microcrystalline, firm, rare friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,860-9,890 LIMESTONE: mudstone, tan, cream, light-medium gray, trace dark gray, microcrystalline, firm, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain; occasional ARGILLACEOUS LIMESTONE: mudstone, rare wackestone, medium-light gray, light brown, microcrystalline, firm, dense, earthy texture, no visible porosity, no visible oil stain

9,890-9,920 LIMESTONE: mudstone, tan, cream, light-medium gray, trace dark gray, microcrystalline, firm, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,920-9,950 LIMESTONE: mudstone, light gray, cream, rare tan, trace medium-dark gray, microcrystalline, firm, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,950-9,980 LIMESTONE: mudstone, light-medium gray, occasional tan, rare dark gray, microcrystalline, firm, occasional friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

9,980-10,010 LIMESTONE: mudstone, light-medium gray, occasional tan, rare dark gray, microcrystalline, firm, occasional friable, dense, earthy texture, argillaceous in part, no visible porosity, no visible oil stain

Lodgepole Formation [Mississippian Madison Group] 10,039' MD / 10,032' TVD (-7,875')

10,010-10,040 ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone; light-medium gray, light brown, rare cream, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,040-10,070 ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone; medium-dark gray, light gray brown, rare light gray, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,070-10,100 ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone; medium-dark gray, light gray brown, rare light gray, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,100-10,130 ARGILLACEOUS LIMESTONE: mudstone, common wackestone; dark gray, occasional medium-light gray, rare cream, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,130-10,160 ARGILLACEOUS LIMESTONE: mudstone, common wackestone; dark gray, occasional medium-light gray, rare cream, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,160-10,190 ARGILLACEOUS LIMESTONE: mudstone, light gray, cream, medium-dark gray, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,190-10,220 ARGILLACEOUS LIMESTONE: mudstone, light gray, cream, medium-dark gray, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,220-10,250 ARGILLACEOUS LIMESTONE: mudstone, medium-dark gray, cream, rare light brown, trace tan, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

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

10,250-10,280 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, cream, rare dark gray, rare light brown, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,280-10,310 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, cream, rare dark gray, rare light brown, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,310-10,340 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, cream-tan, rare dark gray, rare light brown, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,340-10,370 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone, dark gray, common light brown gray, occasional light-medium gray, rare tan, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,370-10,400 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone, dark gray, common light brown gray, occasional light-medium gray, rare tan, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,400-10,430 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone, dark gray, medium-light gray, rare cream, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,430-10,460 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, occasional wackestone, dark gray, medium-light gray, rare cream, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,460-10,490 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, rare wackestone, light gray, medium gray, light brown gray, light brown, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,490-10,520 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, rare wackestone, light gray, medium gray, light brown gray, light brown, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,520-10,550 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, rare wackestone, medium gray, light brown gray, cream, rare tan, trace light gray, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,550-10,580 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, rare wackestone, medium gray, light brown gray, cream, rare tan, trace light gray, microcrystalline, firm, trace hard, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,580-10,610 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, common wackestone, light brown gray, medium-dark gray, rare light gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,610-10,640 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, common wackestone, light brown gray, medium-dark gray, rare light gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,640-10,670 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, common wackestone, light brown gray, medium-dark gray, rare light gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,670-10,700 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, tan, light gray, medium-dark gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,700-10,730 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, tan, light gray, medium-dark gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,730-10,760 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,760-10,790 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,790-10,820 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,820-10,850 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,850-10,880 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,880-10,910 Sample slightly contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,910-10,940 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

False Bakken [Lodgepole Formation] ***10,940' MD / 10,750' TVD (-8,593')***

Upper Bakken Shale Member [Mississippian-Bakken Formation] ***10,963' MD / 10,759' TVD (-8,602')***

10,940-10,970 Sample heavily contaminated with LCM; ARGILLACEOUS LIMESTONE: mudstone, light brown gray, light-medium gray, firm, microcrystalline, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,970-11,000 Sample slightly contaminated with LCM; 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] ***11,020' MD / 10,774' TVD (-8,617')***

11,000-11,030 Sample slightly contaminated with LCM; SILTY SANDSTONE: light-medium gray, light gray-brown, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain; rare SHALE: black, hard, brittle, blocky, carbonaceous, petroliferous, pyritic, no visible porosity, possible fracture porosity, dark brown even oil stain

11,030-11,060 Sample slightly contaminated with LCM; SILTY SANDSTONE: light-medium gray, light gray-brown, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11,060-11,090 Sample slightly contaminated with LCM; SILTY SANDSTONE: light-medium gray, light gray-brown, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11,090-11,120 Sample slightly contaminated with LCM; SILTY SANDSTONE: light-medium gray, light gray-brown, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11,120-11,148 Sample slightly contaminated with LCM; SILTY SANDSTONE: light-medium gray, light gray-brown, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light brown spotty oil stain

11,148-11,200 SILTY SANDSTONE: tan, light brown gray, rare light brown, trace medium-light gray, firm, fine grained, sub-rounded, occasional sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

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

11,250-11,300SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,300-11,350 SILTY SANDSTONE: gray brown-medium brown, trace light 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,350-11,400 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,400-11,450 SILTY SANDSTONE: medium brown-gray brown, trace medium 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-medium brown spotty oil stain; moderately pale yellow diffuse cut fluorescence

11,450-11,500 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,500-11,550 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,550-11,600 SILTY SANDSTONE: gray brown-medium brown, trace light 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,600-11,650 SILTY SANDSTONE: medium brown-gray brown, trace medium 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-medium brown spotty oil stain; moderately pale yellow diffuse cut fluorescence

11,650-11,700 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,700-11,750 SILTY SANDSTONE: medium brown-gray brown, trace medium 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-medium brown spotty oil stain; moderately pale yellow diffuse cut fluorescence

11,750-11,800 SILTY SANDSTONE: gray brown-medium brown, trace light 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,800-11,850 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,850-11,900 SILTY SANDSTONE: medium brown-gray brown, trace medium 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-medium brown spotty oil stain; moderately pale yellow diffuse cut fluorescence

11,900-11,950 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

11,950-12,000 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,000-12,050 SILTY SANDSTONE: gray brown-medium brown, trace light 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,050-12,100 SILTY SANDSTONE: medium brown-gray brown, trace medium 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-medium brown spotty oil stain; moderately pale yellow diffuse cut fluorescence

12,100-12,150 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,150-12,200 SILTY SANDSTONE: gray brown-medium brown, trace light 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,200-12,250 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,250-12,300 SILTY SANDSTONE: light-medium brown, off white-gray, trace medium 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

12,300-12,350 SILTY SANDSTONE: light brown gray-light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,350-12,400 SILTY SANDSTONE: light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,400-12,450 SILTY SANDSTONE: light-medium brown, off white-gray, trace medium 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

12,450-12,500 SILTY SANDSTONE: light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,500-12,550 SILTY SANDSTONE: light-medium brown, off white-gray, trace medium 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

12,550-12,600 SILTY SANDSTONE: light-medium brown, off white-gray, trace medium 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

12,600-12,650 SILTY SANDSTONE: light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,650-12,700 SILTY SANDSTONE: light-medium brown, off white-gray, trace medium 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

12,700-12,750 SILTY SANDSTONE: light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,750-12,800 SILTY SANDSTONE: light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,800-12,850 SILTY SANDSTONE: light brown, trace medium-light gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

12,850-12,900 SILTY SANDSTONE: light brown gray, occasional light brown, rare light brown, trace medium-light gray, firm, 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

12,900-12,950 SILTY SANDSTONE: light brown gray, occasional light brown, rare light brown, trace medium-light gray, firm, 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

12,950-13,000 SILTY SANDSTONE: light brown gray, occasional light brown, rare light brown, trace medium-light gray, firm, 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

13,000-13,050 SILTY SANDSTONE: tan, light brown gray, rare medium-light gray, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,050-13,100 SILTY SANDSTONE: tan, light brown gray, rare medium-light gray, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,100-13,150 SILTY SANDSTONE: tan, light brown gray, rare medium-light gray, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,150-13,200 SILTY SANDSTONE: light gray, common light brown, rare medium-dark gray, trace tan, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,200-13,250 SILTY SANDSTONE: light gray, common light brown, rare medium-dark gray, trace tan, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,250-13,300 SILTY SANDSTONE: light gray, common light brown, rare medium-dark gray, trace tan, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,300-13,350 SILTY SANDSTONE: light brown, occasional light brown gray, rare light-medium gray, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

13,350-13,400 SILTY SANDSTONE: light brown, occasional light brown gray, rare light-medium gray, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

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

13,450-13,500 SILTY SANDSTONE: light brown gray, light brown, tan, medium-light gray, rare of white, 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; moderate pale yellow diffuse cut fluorescence

13,500-13,550 SILTY SANDSTONE: light brown gray, light brown, tan, medium-light gray, rare of white, 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; moderate pale yellow diffuse cut fluorescence

13,550-13,600 SILTY SANDSTONE: light brown gray, light brown, tan, medium-light gray, rare of white, 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; moderate pale yellow diffuse cut fluorescence

13,600-13,650 SILTY SANDSTONE: off white, light gray, occasional light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,650-13,700 SILTY SANDSTONE: off white, light gray, occasional light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,700-13,750 SILTY SANDSTONE: off white, light gray, occasional light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,750-13,800 SILTY SANDSTONE: light brown, light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,800-13,850 SILTY SANDSTONE: light brown, light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,850-13,900 SILTY SANDSTONE: light brown, light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,900-13,950 SILTY SANDSTONE: light brown, light brown gray, 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-moderate pale yellow diffuse cut fluorescence

13,950-14,000 SILTY SANDSTONE: light brown, tan, rare light gray, trace off white, 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-moderate pale yellow diffuse cut fluorescence

14,000-14,050 SILTY SANDSTONE: light brown, tan, rare light gray, trace off white, 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-moderate pale yellow diffuse cut fluorescence

14,050-14,100 SILTY SANDSTONE: light brown, tan, rare light gray, trace off white, 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-moderate pale yellow diffuse cut fluorescence

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

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

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

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

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

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

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

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

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

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

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

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

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

14,750-14,800 SILTY SANDSTONE: light-medium brown, rare medium gray, trace dark gray, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

14,800-14,850 SILTY SANDSTONE: tan, light brown, rare light brown gray, trace light gray, firm, fine grained, sub-rounded, trace sub angular, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated

pyrite, rare nodular pyrite, trace intergranular porosity, trace light-medium brown spotty oil stain; slow-moderate pale yellow diffuse cut fluorescence

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

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

14,950-15,000 SILTY SANDSTONE: tan, light gray brown, rare light gray-off white, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

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

15,050-15,100 SILTY SANDSTONE: tan, light gray brown, rare light gray-off white, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

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

15,150-15,200 SILTY SANDSTONE: tan, light gray brown, rare light gray-off white, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,200-15,250 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,250-15,300 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,300-15,350 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,350-15,400 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,450-15,500 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,500-15,550 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,550-15,600 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,600-15,650 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,650-15,700 SILTY SANDSTONE: light gray, tan-off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

15,700-15,739 SILTY SANDSTONE: light gray-tan, off white, rare light brown, trace medium gray, firm, 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-medium brown spotty oil stain; slow pale yellow diffuse cut fluorescence

Due to proximity to the UBS at 15,739' MD, a sidetrack was kicked off at 15,620' MD

15,620-15,650 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, light brown gray, medium-light gray, rare off white, trace dark gray, firm, fine grained, sub-rounded, rare sub angular, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

15,650-15,700 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, light brown gray, medium-light gray, rare off white, trace dark gray, firm, fine grained, sub-rounded, rare sub angular, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

15,700-15,750 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, light brown, rare medium-light 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; contaminated cut fluorescence

15,750-15,800 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, light brown, rare medium-light 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; contaminated cut fluorescence

15,800-15,850 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, light brown, rare medium-light 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; contaminated cut fluorescence

15,850-15,900 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, light brown gray, occasional off white, rare light brown, 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; contaminated cut fluorescence

15,900-15,950 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, light brown gray, occasional off white, rare light brown, 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; contaminated cut fluorescence

15,950-16,000 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, light brown gray, occasional off white, rare light brown, 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; contaminated cut fluorescence

16,000-16,050 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, medium-light gray, rare dark gray, firm, fine grained, sub-rounded, trace sub-angular, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

16,050-16,100 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, medium-light gray, rare dark gray, firm, fine grained, sub-rounded, trace sub-angular, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

16,100-16,150 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, medium-light gray, rare dark gray, firm, fine grained, sub-rounded, trace sub-angular, moderately poorly sorted, calcareous cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

16,150-16,200 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown 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; contaminated cut fluorescence

16,200-16,250 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown 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; contaminated cut fluorescence

16,250-16,300 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, medium-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,300-16,350 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, medium-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,350-16,400 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, medium-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,400-16,450 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-gray brown, medium-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,450-16,500 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-gray brown, medium-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,500-16,550 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,550-16,600 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-gray brown, medium-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,600-16,650 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,650-16,700 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-tan, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,700-16,750 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-tan, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,750-16,800 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,800-16,850 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-tan, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,850-16,900 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,900-16,950 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

16,950-17,000 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

17,000-17,050 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

17,050-17,100 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, off white-light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

17,100-17,150 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-light brown, light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

17,150-17,200 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown, light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

17,200-17,250 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-light brown, light gray, rare dark gray, trace off white, firm, 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; contaminated cut fluorescence

17,250-17,300 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-light brown, off white-light gray, rare dark gray, firm, 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; contaminated cut fluorescence

17,300-17,350 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-light brown, off white-light gray, rare dark gray, firm, 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; contaminated cut fluorescence

17,350-17,400 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-light brown, off white-light gray, rare dark gray, firm, 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; contaminated cut fluorescence

17,400-17,450 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray brown-light brown, off white-light gray, rare dark gray, firm, 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; contaminated cut fluorescence

17,450-17,500 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray brown, off white-light gray, rare dark gray, firm, 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; contaminated cut fluorescence

17,500-17,550 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray brown, off white-light gray, rare dark gray, firm, 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; contaminated cut fluorescence

17,550-17,600 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,600-17,650 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,650-17,700 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,700-17,750 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,750-17,800 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,800-17,850 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,850-17,900 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

17,900-17,950 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, firm, 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; contaminated cut fluorescence

17,950-18,000 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, firm, 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; contaminated cut fluorescence

18,000-18,050 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, firm, 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; contaminated cut fluorescence

18,050-18,100 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, occasional medium-light gray, rare light brown gray, trace dark gray, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

18,100-18,150 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, occasional medium-light gray, rare light brown gray, trace dark gray, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace 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 lubricant; SILTY SANDSTONE: light brown, occasional medium-light gray, rare light brown gray, trace dark gray, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace 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 lubricant; SILTY SANDSTONE: medium-light gray, occasional dark gray, rare light brown gray, trace off white, firm, fine grained, sub-rounded, moderately poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

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

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

18,350-18,400 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

18,400-18,450 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

18,450-18,500 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

18,500-18,550 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown gray, occasional medium-light gray, rare light brown, trace cream, firm, fine grained, sub-rounded, moderately poorly 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 lubricant; SILTY SANDSTONE: light brown gray, occasional medium-light gray, rare light brown, trace cream, firm, fine grained, sub-rounded, moderately poorly 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 lubricant; SILTY SANDSTONE: light brown gray, occasional medium-light gray, rare light brown, trace cream, firm, fine grained, sub-rounded, moderately poorly 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 lubricant; SILTY SANDSTONE: off white, light-medium gray, trace light brown gray, firm, 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; contaminated cut fluorescence

18,700-18,750 Sample moderately contaminated with lubricant; SILTY SANDSTONE: off white, light-medium gray, trace light brown gray, firm, 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; contaminated cut fluorescence

18,750-18,800 Sample moderately contaminated with lubricant; SILTY SANDSTONE: off white, light-medium gray, trace light brown gray, firm, 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; contaminated cut fluorescence

18,800-18,850 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

18,850-18,900 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

18,900-18,950 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

18,950-19,000 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,000-19,050 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,050-19,100 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, common light brown gray, rare light gray, 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; contaminated cut fluorescence

19,100-19,150 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, common light brown gray, rare light gray, 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; contaminated cut fluorescence

19,150-19,200 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown, common light brown gray, rare light gray, 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; contaminated cut fluorescence

19,200-19,250 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, occasional dark gray, rare light brown gray, firm, fine grained, sub-rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

19,250-19,300 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, occasional dark gray, rare light brown gray, firm, fine grained, sub-rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

19,300-19,350 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, occasional dark gray, rare light brown gray, firm, fine grained, sub-rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

19,350-19,400 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium-light gray, occasional dark gray, rare light brown gray, firm, fine grained, sub-rounded, moderately-poorly sorted, calcareous cement, moderately cemented, trace disseminated pyrite, trace nodular pyrite, trace intergranular porosity, trace light brown spotty oil stain; contaminated cut fluorescence

19,400-19,450 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,450-19,500 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,500-19,550 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,550-19,600 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,600-19,650 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

19,650-19,700 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

19,700-19,750 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium gray-brown gray, rare light brown, trace off white, 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; contaminated cut fluorescence

19,750-19,800 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium gray-brown gray, rare light brown, trace off white, 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; contaminated cut fluorescence

19,800-19,850 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

19,850-19,900 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium gray-brown gray, rare light brown, trace off white, 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; contaminated cut fluorescence

19,900-19,950 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium gray-brown gray, rare light brown, trace off white, 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; contaminated cut fluorescence

19,950-20,000 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

20,000-20,050 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray-off white, rare light brown, 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; contaminated cut fluorescence

20,050-20,100 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray-off white, rare light brown, 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; contaminated cut fluorescence

20,100-20,150 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

20,150-20,200 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

20,200-20,250 Sample moderately contaminated with lubricant; SILTY SANDSTONE: medium gray-brown gray, rare light brown, trace off white, 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; contaminated cut fluorescence

20,250-20,300 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light-medium gray, light brown gray, rare light brown, 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; contaminated cut fluorescence

20,300-20,350 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

20,350-20,400 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

20,400-20,450 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray-off white brown, rare tan-light brown, trace medium gray, firm, 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; contaminated cut fluorescence

20,450-20,500 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray-gray brown, occasional off white, trace medium gray, firm, 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; contaminated cut fluorescence

20,500-20,550 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

20,550-20,600 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray-gray brown, occasional off white, trace medium gray, firm, 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; contaminated cut fluorescence

20,600-20,650 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light brown-brown gray, occasional off white-light gray, trace medium gray, firm, 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; contaminated cut fluorescence

20,650-20,700 Sample moderately contaminated with lubricant; SILTY SANDSTONE: light gray-off white brown, rare tan-light brown, trace medium gray, firm, 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; contaminated cut fluorescence

20,700-20,750 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray-gray brown, occasional off white, trace medium gray, firm, 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; contaminated cut fluorescence

20,750-20,800 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray-gray brown, occasional off white, trace medium gray, firm, 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; contaminated cut fluorescence

20,800-20,860 Sample moderately contaminated with lubricant; SILTY SANDSTONE: gray-gray brown, occasional off white, trace medium gray, firm, 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; contaminated cut fluorescence

Directional Survey Certification

Operator: Oasis Petroleum North America LLC **Well Name:** Lewis Federal 5300 21-31 5B

API#: 33-053-05849 **Mesa West Job #:** S19052

Well Surface Hole Location (SHL): SESW Sec 31 T153N R100W

Latitude: 48° 01' 54.48" N **Longitude:** 103° 36' 11.18" W **Datum:** NAD83

Field: Baker **County:** McKenzie **State:** North Dakota

Rig Contractor & Rig #: Nabors B21

GL Elevation: 2132 **RKB Height:** 2157

Tie-in Surveys Provided By Mesa West Directional

MWD Report Date: 02/02/2019 *(mm/dd/yyyy)* **MWD Run Dates:** 1/30/2019-2/2/2019 *(mm/dd/yyyy)*

MWD Surveyed from: 147.0 **ft.** **to** 3270.0 **ft. MD**

Survey Type: D&I MWD **Sensor to Bit Offset:** 37.0

MWD Surveyor Name: James Duncan

"The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Mesa West Directional. I am authorized and qualified to review the data, calculations and this report and that the report represents a true and correct Directional Survey of this well based on the original data corrected to True North and obtained at the well site. Wellbore coordinates are calculated using the minimum curvature method."

John Woloshyn, Operations Manager		14/02/2019
Mesa West Representative Name, Title	**Signature**	**Date Signed** *(dd/mm/yyyy)*

Oasis Petroleum
Baker, McKenzie, North Dakota (NAD 83)
SESW Sec 31 T153N R100W
Lewis Federal 5300 21-31 5B
S19052

Mesa West Survey Certification Report

14 February 2019

Mesa West Directional
1 (701) 609 0520
www.MesaWestDirectional.com

Operator	Oasis Petroleum	**Local co-ord ref**	Well Centered
Field	Baker, McKenzie, North Dakota (NAD 83)	**TVD Reference**	RKB
Facility	SESW Sec 31 T153N R100W	**North Reference**	TRUE
Well	Lewis Federal 5300 21-31 5B	**Survey Calc Method**	Minimum Curvature
Wellbore	Lewis Federal 5300 21-31 5B		

Field	Baker, McKenzie, North Dakota (NAD 83)		
CRS	NAD83 / North Dakota North (Usft)		
Apply Scale Factor	NO	**Scale Factor**	1.000
System Datum	MSL	**Depth Datum->MSL**	2157.00 UsFt
Map Northing	391661.91 foot	**Map Easting**	1209477.20 foot
Latitude	48° 01' 54.48" N	**Longitude**	103° 36' 11.18" W
Grid Convergence	-2.309		

Facility	SESW Sec 31 T153N R100W		
Map Northing	391661.91 foot	**Map Easting**	1209477.20 foot
Latitude	48° 01' 54.48" N	**Longitude**	103° 36' 11.18" W
Vertical Uncertainty	0.00 UsFt	**Horizontal Uncertainty**	0.00 UsFt
Grid Convergence	-2.309		

Well	Lewis Federal 5300 21-31 5B		
Local North	0.00 UsFt	**Local East**	0.00 UsFt
Map Northing	391661.91 foot	**Map Easting**	1209477.20 foot
Latitude	48° 01' 54.48" N	**Longitude**	103° 36' 11.18" W
Depth Datum	RKB	**Datum Elevation**	2157.00 UsFt
GL Elevation	2132.00 UsFt		
Grid Convergence	-2.309		

Well bore	Lewis Federal 5300 21-31 5B		
Magnetic Model	User defined	**Date**	2/2/2019
Total Field (nT)	0.5581	**Dip Angle (°)**	72.75
Declination (°)	7.86		
VS Origin	Well	**VS Azimuth**	332.08
VS Orgin NS	0.00 UsFt	**VS Origin EW**	0.00 UsFt

Survey Report

MD UsFt	Inc °	Azi °	TVD UsFt	TVD SS UsFt	NS UsFt	EW UsFt	VS UsFt	DLS (°/100 UsFt)	BR (°/100 UsFt)	TR (°/100 UsFt)
0.00	0.00	0.00	0.00	-2157.00	0.00	0.00	0.00	0.00	0.00	0.00
12.00	0.00	0.00	12.00	-2145.00	0.00	0.00	0.00	0.00	0.00	0.00
147.00	0.90	25.50	146.99	-2010.01	0.96	0.46	0.63	0.67	0.67	18.89
235.00	1.10	67.00	234.98	-1922.02	1.91	1.53	0.97	0.83	0.23	47.16
323.00	1.30	38.60	322.96	-1834.04	3.02	2.93	1.30	0.70	0.23	-32.27
405.00	1.10	34.50	404.95	-1752.05	4.40	3.96	2.03	0.27	-0.24	-5.00
496.00	1.20	114.30	495.93	-1661.07	4.72	5.32	1.68	1.62	0.11	87.69
585.00	1.10	206.20	584.92	-1572.08	3.57	5.79	0.45	1.86	-0.11	103.26
675.00	0.90	205.30	674.91	-1482.09	2.16	5.11	-0.48	0.22	-0.22	-1.00
770.00	0.80	119.60	769.90	-1387.10	1.16	5.37	-1.49	1.22	-0.11	-90.21
860.00	1.10	127.40	859.89	-1297.11	0.32	6.60	-2.81	0.36	0.33	8.67
946.00	0.80	139.50	945.88	-1211.12	-0.63	7.65	-4.14	0.42	-0.35	14.07
1034.00	0.80	200.50	1033.87	-1123.13	-1.68	7.83	-5.15	0.92	0.00	69.32
1120.00	0.80	201.60	1119.86	-1037.14	-2.80	7.40	-5.94	0.02	0.00	1.28
1210.00	0.90	182.00	1209.85	-947.15	-4.09	7.14	-6.96	0.34	0.11	-21.78
1298.00	0.90	176.20	1297.84	-859.16	-5.47	7.16	-8.19	0.10	0.00	-6.59
1387.00	1.00	201.10	1386.83	-770.17	-6.89	6.93	-9.33	0.47	0.11	27.98
1475.00	0.90	218.40	1474.82	-682.18	-8.15	6.23	-10.12	0.34	-0.11	19.66
1565.00	1.00	221.10	1564.80	-592.20	-9.29	5.27	-10.68	0.12	0.11	3.00
1651.00	1.10	240.00	1650.79	-506.21	-10.27	4.06	-10.98	0.42	0.12	21.98
1740.00	0.90	262.00	1739.78	-417.22	-10.80	2.63	-10.77	0.48	-0.22	24.72
1829.00	0.90	279.30	1828.76	-328.24	-10.78	1.25	-10.11	0.30	0.00	19.44
1915.00	0.80	281.20	1914.76	-242.24	-10.56	-0.01	-9.32	0.12	-0.12	2.21
2003.00	0.90	286.60	2002.75	-154.25	-10.24	-1.27	-8.45	0.15	0.11	6.14
2093.00	1.00	289.30	2092.73	-64.27	-9.78	-2.69	-7.38	0.12	0.11	3.00
2183.00	1.60	304.90	2182.71	25.71	-8.80	-4.46	-5.69	0.77	0.67	17.33
2272.00	1.60	312.30	2271.68	114.68	-7.25	-6.40	-3.41	0.23	0.00	8.31
2361.00	1.70	343.10	2360.64	203.64	-5.15	-7.70	-0.95	0.99	0.11	34.61
2448.00	1.60	344.00	2447.60	290.60	-2.75	-8.41	1.51	0.12	-0.11	1.03
2532.00	1.70	352.30	2531.57	374.57	-0.39	-8.90	3.83	0.31	0.12	9.88
2622.00	2.20	354.10	2621.52	464.52	2.65	-9.26	6.68	0.56	0.56	2.00
2710.00	0.70	352.20	2709.49	552.49	4.87	-9.51	8.75	1.71	-1.70	-2.16
2798.00	0.90	354.30	2797.48	640.48	6.09	-9.65	9.90	0.23	0.23	2.39
2883.00	1.10	359.20	2882.46	725.46	7.57	-9.73	11.24	0.26	0.24	5.76
2969.00	0.90	14.90	2968.45	811.45	9.04	-9.56	12.47	0.39	-0.23	18.26
3054.00	1.10	56.00	3053.44	896.44	10.15	-8.72	13.05	0.85	0.24	48.35
3142.00	0.90	100.40	3141.43	984.43	10.49	-7.34	12.71	0.88	-0.23	50.45
3227.00	1.10	111.10	3226.41	1069.41	10.08	-5.92	11.68	0.32	0.24	12.59
3270.00	1.20	120.00	3269.41	1112.41	9.71	-5.14	10.98	0.48	0.23	20.70

Scientific Drilling

Survey Certification

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

Operator	Oasis Petroleum
Well Name & No.	Lewis Federal 5300 21-31 5B
API #	33-053-05849
County & State	McKenzie County, ND
SDI Job #	OP.017958
Rig	Nabors B21
Survey Date	30-Apr-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 3270 feet to a measured depth of 15739 feet is true and correct as determined from all available records.

Seth Burstad

Signature

30-Apr-2019

Date

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

Project: McKenzie County, ND
Site: Lewis Federal
Well: Lewis Federal 5300 21-31 5B
Wellbore: OH
Design: OH

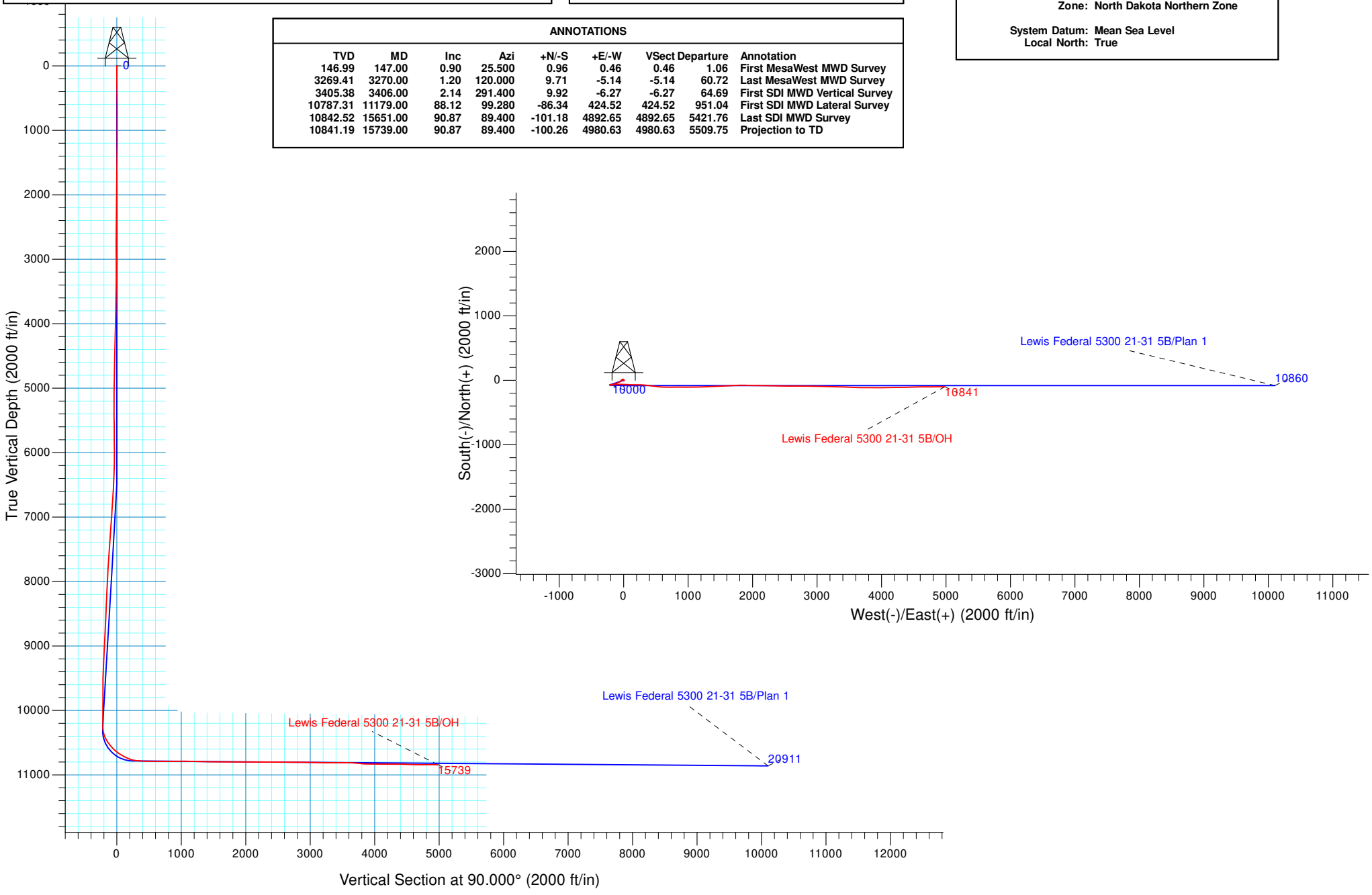
WELL DETAILS: Lewis Federal 5300 21-31 5B			
GL 2132' & KB 25' @ 2157.00ft	2132.00		
Northing	Easting	Latitude	Longitude
391661.89	1209477.20	48° 1' 54.480 N	103° 36' 11.180 W

Design: OH (Lewis Federal 5300 21-31 5B/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

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
146.99	147.00	0.90	25.500	0.96	0.46	0.46	1.06	First MesaWest MWD Survey
3269.41	3270.00	1.20	120.000	9.71	-5.14	-5.14	60.72	Last MesaWest MWD Survey
3405.38	3406.00	2.14	291.400	9.92	-6.27	-6.27	64.69	First SDI MWD Vertical Survey
10787.31	11179.00	88.12	99.280	-86.34	424.52	424.52	951.04	First SDI MWD Lateral Survey
10842.52	15651.00	90.87	89.400	-101.18	4892.65	4892.65	5421.76	Last SDI MWD Survey
10841.19	15739.00	90.87	89.400	-100.26	4980.63	4980.63	5509.75	Projection to TD



Oasis Petroleum

McKenzie County, ND
Lewis Federal
Lewis Federal 5300 21-31 5B

OH

Design: OH

Standard Survey Report

30 April, 2019

Scientific Drilling

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Project McKenzie County, ND

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site Lewis Federal, Site Center: Lewis Federal 5300 11-31 2B

Site Position:		**Northing:**	393,162.02 usft	**Latitude:**	48° 2' 9.300 N
From:	Lat/Long	**Easting:**	1,209,545.85 usft	**Longitude:**	103° 36' 11.060 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.31 °

Well Lewis Federal 5300 21-31 5B, 2552' FNL 259' FWL Sec 31 T153N R100W

Well Position	**+N/-S**	0.00 ft	**Northing:**	391,661.89 usft	**Latitude:**	48° 1' 54.480 N
	+E/-W	0.00 ft	**Easting:**	1,209,477.20 usft	**Longitude:**	103° 36' 11.180 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	2,132.00 ft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/30/2019	7.87	72.68	55,759

Design OH

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	90.000

Survey Program **Date** 4/30/2019

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
12.00	3,270.00	Survey #1 - Surface (OH)	OWSG MWD	OWSG MWD - Standard
3,406.00	11,087.00	Survey #2 - Vertical/Curve (OH)	MWD+HDGM	OWSG MWD + HDGM
11,179.00	15,739.00	Survey #3 - Lateral (OH)	MWD+HDGM	OWSG MWD + HDGM

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)
3,270.00	1.20	120.000	3,269.41	9.71	-5.14	-5.14	0.48	0.23	20.70
Last MesaWest MWD Survey									
3,406.00	2.14	291.400	3,405.38	9.92	-6.27	-6.27	2.45	0.69	126.03
First SDI MWD Vertical Survey									
3,500.00	1.14	278.270	3,499.34	10.69	-8.83	-8.83	1.13	-1.06	-13.97
3,594.00	1.14	259.700	3,593.32	10.66	-10.68	-10.68	0.39	0.00	-19.76
3,688.00	1.15	267.430	3,687.31	10.45	-12.54	-12.54	0.16	0.01	8.22
3,783.00	1.12	269.620	3,782.29	10.40	-14.42	-14.42	0.06	-0.03	2.31

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	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)
3,878.00	1.24	278.560	3,877.27	10.55	-16.37	-16.37	0.23	0.13	9.41
3,972.00	1.14	272.560	3,971.25	10.74	-18.31	-18.31	0.17	-0.11	-6.38
4,066.00	1.23	286.120	4,065.23	11.07	-20.21	-20.21	0.31	0.10	14.43
4,160.00	1.45	237.650	4,159.20	10.71	-22.18	-22.18	1.19	0.23	-51.56
4,253.00	1.54	234.080	4,252.17	9.35	-24.19	-24.19	0.14	0.10	-3.84
4,346.00	1.50	238.760	4,345.14	7.98	-26.24	-26.24	0.14	-0.04	5.03
4,440.00	1.85	247.620	4,439.10	6.77	-28.70	-28.70	0.46	0.37	9.43
4,533.00	1.33	236.790	4,532.06	5.60	-30.99	-30.99	0.64	-0.56	-11.65
4,626.00	1.86	232.600	4,625.03	4.10	-33.09	-33.09	0.58	0.57	-4.51
4,720.00	1.74	234.000	4,718.98	2.33	-35.46	-35.46	0.14	-0.13	1.49
4,814.00	0.83	229.010	4,812.96	1.04	-37.13	-37.13	0.97	-0.97	-5.31
4,908.00	1.13	238.720	4,906.94	0.12	-38.43	-38.43	0.36	0.32	10.33
5,001.00	0.67	246.390	4,999.93	-0.58	-39.71	-39.71	0.51	-0.49	8.25
5,094.00	0.78	201.750	5,092.92	-1.38	-40.45	-40.45	0.60	0.12	-48.00
5,188.00	0.60	202.800	5,186.92	-2.43	-40.88	-40.88	0.19	-0.19	1.12
5,281.00	0.44	166.030	5,279.91	-3.23	-40.98	-40.98	0.39	-0.17	-39.54
5,374.00	0.49	132.590	5,372.91	-3.84	-40.60	-40.60	0.29	0.05	-35.96
5,468.00	0.33	139.960	5,466.91	-4.32	-40.13	-40.13	0.18	-0.17	7.84
5,561.00	0.69	147.450	5,559.90	-5.00	-39.65	-39.65	0.39	0.39	8.05
5,654.00	0.53	157.580	5,652.90	-5.87	-39.19	-39.19	0.21	-0.17	10.89
5,747.00	0.47	182.100	5,745.90	-6.65	-39.04	-39.04	0.24	-0.06	26.37
5,841.00	0.48	126.380	5,839.89	-7.27	-38.74	-38.74	0.47	0.01	-59.28
5,934.00	0.90	154.050	5,932.89	-8.15	-38.10	-38.10	0.56	0.45	29.75
6,027.00	0.91	165.740	6,025.87	-9.53	-37.60	-37.60	0.20	0.01	12.57
6,041.00	1.15	158.410	6,039.87	-9.76	-37.52	-37.52	1.95	1.71	-52.36
6,122.00	0.65	164.920	6,120.86	-10.96	-37.10	-37.10	0.63	-0.62	8.04
6,215.00	1.14	206.820	6,213.85	-12.30	-37.38	-37.38	0.85	0.53	45.05
6,309.00	1.99	242.970	6,307.82	-13.87	-39.26	-39.26	1.34	0.90	38.46
6,402.00	3.53	241.100	6,400.71	-15.99	-43.21	-43.21	1.66	1.66	-2.01
6,495.00	4.26	243.300	6,493.49	-18.93	-48.80	-48.80	0.80	0.78	2.37
6,589.00	4.10	245.600	6,587.24	-21.89	-54.98	-54.98	0.25	-0.17	2.45
6,682.00	3.40	238.800	6,680.04	-24.69	-60.36	-60.36	0.89	-0.75	-7.31
6,776.00	3.94	242.840	6,773.85	-27.61	-65.62	-65.62	0.64	0.57	4.30
6,869.00	4.19	244.980	6,866.62	-30.50	-71.54	-71.54	0.31	0.27	2.30
6,962.00	3.76	249.090	6,959.39	-33.03	-77.47	-77.47	0.55	-0.46	4.42
7,056.00	4.24	251.110	7,053.16	-35.25	-83.64	-83.64	0.53	0.51	2.15
7,151.00	4.31	245.540	7,147.90	-37.87	-90.21	-90.21	0.44	0.07	-5.86
7,244.00	4.36	250.490	7,240.63	-40.49	-96.72	-96.72	0.41	0.05	5.32
7,338.00	4.26	247.100	7,334.37	-43.05	-103.31	-103.31	0.29	-0.11	-3.61
7,431.00	4.30	248.430	7,427.11	-45.67	-109.73	-109.73	0.12	0.04	1.43
7,525.00	4.26	252.770	7,520.85	-48.00	-116.34	-116.34	0.35	-0.04	4.62
7,618.00	3.78	249.470	7,613.62	-50.10	-122.51	-122.51	0.57	-0.52	-3.55
7,711.00	3.92	252.340	7,706.41	-52.14	-128.41	-128.41	0.26	0.15	3.09

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	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)
7,805.00	3.65	248.740	7,800.20	-54.20	-134.26	-134.26	0.38	-0.29	-3.83
7,898.00	3.81	249.610	7,893.00	-56.35	-139.92	-139.92	0.18	0.17	0.94
7,992.00	3.02	245.540	7,986.84	-58.46	-145.10	-145.10	0.88	-0.84	-4.33
8,085.00	2.93	250.970	8,079.71	-60.25	-149.58	-149.58	0.32	-0.10	5.84
8,178.00	2.66	255.590	8,172.60	-61.56	-153.91	-153.91	0.38	-0.29	4.97
8,272.00	2.15	249.530	8,266.52	-62.72	-157.68	-157.68	0.61	-0.54	-6.45
8,367.00	2.06	246.460	8,361.45	-64.03	-160.91	-160.91	0.15	-0.09	-3.23
8,460.00	2.27	256.650	8,454.39	-65.12	-164.24	-164.24	0.47	0.23	10.96
8,554.00	2.88	255.350	8,548.29	-66.15	-168.33	-168.33	0.65	0.65	-1.38
8,649.00	2.95	267.180	8,643.17	-66.87	-173.08	-173.08	0.64	0.07	12.45
8,742.00	3.01	266.680	8,736.05	-67.13	-177.91	-177.91	0.07	0.06	-0.54
8,836.00	2.67	266.990	8,829.93	-67.39	-182.56	-182.56	0.36	-0.36	0.33
8,931.00	2.99	265.060	8,924.81	-67.72	-187.24	-187.24	0.35	0.34	-2.03
9,025.00	2.75	263.250	9,018.70	-68.19	-191.92	-191.92	0.27	-0.26	-1.93
9,118.00	2.60	273.820	9,111.60	-68.32	-196.24	-196.24	0.55	-0.16	11.37
9,211.00	2.62	268.500	9,204.50	-68.23	-200.47	-200.47	0.26	0.02	-5.72
9,305.00	2.14	275.870	9,298.42	-68.11	-204.36	-204.36	0.60	-0.51	7.84
9,398.00	2.35	277.860	9,391.35	-67.67	-207.98	-207.98	0.24	0.23	2.14
9,491.00	2.18	268.410	9,484.27	-67.46	-211.64	-211.64	0.44	-0.18	-10.16
9,584.00	0.24	201.180	9,577.25	-67.69	-213.48	-213.48	2.26	-2.09	-72.29
9,678.00	0.39	195.610	9,671.25	-68.18	-213.63	-213.63	0.16	0.16	-5.93
9,771.00	0.87	181.120	9,764.24	-69.19	-213.73	-213.73	0.54	0.52	-15.58
9,865.00	0.59	202.650	9,858.24	-70.35	-213.93	-213.93	0.41	-0.30	22.90
9,958.00	0.47	214.240	9,951.23	-71.11	-214.33	-214.33	0.17	-0.13	12.46
10,051.00	0.57	189.630	10,044.23	-71.88	-214.62	-214.62	0.26	0.11	-26.46
10,145.00	0.37	215.650	10,138.22	-72.59	-214.88	-214.88	0.31	-0.21	27.68
10,240.00	0.60	201.510	10,233.22	-73.30	-215.24	-215.24	0.27	0.24	-14.88
10,271.00	1.40	95.210	10,264.22	-73.48	-214.92	-214.92	5.39	2.58	-342.90
10,303.00	6.22	87.180	10,296.14	-73.44	-212.80	-212.80	15.12	15.06	-25.09
10,335.00	10.84	86.960	10,327.78	-73.19	-208.06	-208.06	14.44	14.44	-0.69
10,366.00	15.28	82.820	10,357.97	-72.52	-201.09	-201.09	14.63	14.32	-13.35
10,397.00	19.55	77.340	10,387.54	-70.88	-191.98	-191.98	14.74	13.77	-17.68
10,429.00	24.11	79.180	10,417.24	-68.47	-180.33	-180.33	14.41	14.25	5.75
10,460.00	28.91	81.250	10,444.97	-66.14	-166.69	-166.69	15.77	15.48	6.68
10,492.00	30.78	84.640	10,472.73	-64.20	-150.89	-150.89	7.87	5.84	10.59
10,523.00	34.51	86.280	10,498.83	-62.89	-134.23	-134.23	12.37	12.03	5.29
10,554.00	39.09	89.650	10,523.65	-62.26	-115.68	-115.68	16.14	14.77	10.87
10,585.00	40.05	94.710	10,547.55	-63.02	-95.96	-95.96	10.85	3.10	16.32
10,616.00	41.49	93.440	10,571.03	-64.46	-75.77	-75.77	5.36	4.65	-4.10
10,647.00	46.08	92.420	10,593.40	-65.54	-54.35	-54.35	14.98	14.81	-3.29
10,679.00	48.75	92.070	10,615.05	-66.47	-30.81	-30.81	8.38	8.34	-1.09
10,710.00	50.11	91.440	10,635.21	-67.19	-7.28	-7.28	4.65	4.39	-2.03
10,742.00	52.67	90.750	10,655.18	-67.66	17.72	17.72	8.18	8.00	-2.16

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	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)
10,773.00	54.90	89.820	10,673.49	-67.78	42.73	42.73	7.59	7.19	-3.00
10,804.00	59.62	90.270	10,690.26	-67.81	68.80	68.80	15.27	15.23	1.45
10,836.00	63.37	91.380	10,705.52	-68.22	96.91	96.91	12.11	11.72	3.47
10,867.00	64.04	91.230	10,719.26	-68.85	124.70	124.70	2.20	2.16	-0.48
10,899.00	64.21	91.130	10,733.22	-69.44	153.48	153.48	0.60	0.53	-0.31
10,930.00	66.04	90.300	10,746.26	-69.79	181.60	181.60	6.38	5.90	-2.68
10,962.00	69.39	90.450	10,758.40	-69.98	211.21	211.21	10.48	10.47	0.47
10,993.00	74.53	91.750	10,767.99	-70.56	240.67	240.67	17.05	16.58	4.19
11,025.00	80.61	92.740	10,774.88	-71.78	271.88	271.88	19.24	19.00	3.09
11,056.00	84.63	93.830	10,778.86	-73.54	302.56	302.56	13.43	12.97	3.52
11,087.00	84.88	94.060	10,781.69	-75.67	333.36	333.36	1.09	0.81	0.74
11,179.00	88.12	99.280	10,787.31	-86.34	424.52	424.52	6.67	3.52	5.67
First SDI MWD Lateral Survey									
11,240.00	88.56	97.210	10,789.08	-95.08	484.86	484.86	3.47	0.72	-3.39
11,332.00	89.87	93.830	10,790.34	-103.93	576.41	576.41	3.94	1.42	-3.67
11,424.00	90.64	91.460	10,789.93	-108.17	668.31	668.31	2.71	0.84	-2.58
11,516.00	89.56	89.780	10,789.77	-109.17	760.30	760.30	2.17	-1.17	-1.83
11,609.00	89.10	88.020	10,790.86	-107.38	853.27	853.27	1.96	-0.49	-1.89
11,701.00	92.08	89.940	10,789.91	-105.74	945.24	945.24	3.85	3.24	2.09
11,793.00	89.93	90.540	10,788.30	-106.13	1,037.21	1,037.21	2.43	-2.34	0.65
11,885.00	88.26	89.490	10,789.75	-106.15	1,129.20	1,129.20	2.14	-1.82	-1.14
11,981.00	88.36	88.080	10,792.58	-104.12	1,225.13	1,225.13	1.47	0.10	-1.47
12,075.00	88.66	87.940	10,795.03	-100.86	1,319.04	1,319.04	0.35	0.32	-0.15
12,170.00	89.46	87.100	10,796.58	-96.75	1,413.94	1,413.94	1.22	0.84	-0.88
12,264.00	89.77	87.420	10,797.22	-92.25	1,507.83	1,507.83	0.47	0.33	0.34
12,359.00	88.97	86.060	10,798.26	-86.85	1,602.67	1,602.67	1.66	-0.84	-1.43
12,451.00	89.70	86.670	10,799.33	-81.02	1,694.48	1,694.48	1.03	0.79	0.66
12,543.00	89.56	89.910	10,799.92	-78.27	1,786.42	1,786.42	3.52	-0.15	3.52
12,635.00	89.87	90.460	10,800.38	-78.57	1,878.42	1,878.42	0.69	0.34	0.60
12,726.00	90.80	91.390	10,799.85	-80.04	1,969.40	1,969.40	1.45	1.02	1.02
12,818.00	89.77	90.990	10,799.39	-81.95	2,061.38	2,061.38	1.20	-1.12	-0.43
12,913.00	89.97	90.390	10,799.61	-83.09	2,156.37	2,156.37	0.67	0.21	-0.63
13,008.00	89.46	91.880	10,800.08	-84.98	2,251.35	2,251.35	1.66	-0.54	1.57
13,102.00	89.73	91.640	10,800.74	-87.86	2,345.30	2,345.30	0.38	0.29	-0.26
13,197.00	90.20	89.970	10,800.80	-89.20	2,440.29	2,440.29	1.83	0.49	-1.76
13,291.00	88.83	90.750	10,801.60	-89.79	2,534.28	2,534.28	1.68	-1.46	0.83
13,386.00	89.70	89.260	10,802.81	-89.80	2,629.27	2,629.27	1.82	0.92	-1.57
13,480.00	89.50	90.550	10,803.47	-89.64	2,723.27	2,723.27	1.39	-0.21	1.37
13,574.00	90.30	90.810	10,803.64	-90.76	2,817.26	2,817.26	0.89	0.85	0.28
13,669.00	88.22	91.390	10,804.86	-92.58	2,912.23	2,912.23	2.27	-2.19	0.61
13,763.00	87.99	91.400	10,807.97	-94.87	3,006.15	3,006.15	0.24	-0.24	0.01
13,858.00	90.17	91.000	10,809.50	-96.86	3,101.11	3,101.11	2.33	2.29	-0.42
13,952.00	88.22	91.560	10,810.82	-98.96	3,195.07	3,195.07	2.16	-2.07	0.60
14,046.00	89.70	91.200	10,812.52	-101.22	3,289.03	3,289.03	1.62	1.57	-0.38

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	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)
14,141.00	91.50	91.850	10,811.53	-103.75	3,383.98	3,383.98	2.01	1.89	0.68
14,235.00	90.17	92.730	10,810.16	-107.50	3,477.90	3,477.90	1.70	-1.41	0.94
14,299.00	90.43	92.000	10,809.82	-110.14	3,541.84	3,541.84	1.21	0.41	-1.14
14,330.00	88.49	92.570	10,810.11	-111.38	3,572.81	3,572.81	6.52	-6.26	1.84
14,424.00	85.91	90.400	10,814.71	-113.81	3,666.65	3,666.65	3.58	-2.74	-2.31
14,518.00	84.97	91.490	10,822.18	-115.36	3,760.34	3,760.34	1.53	-1.00	1.16
14,613.00	86.33	89.400	10,829.39	-116.09	3,855.06	3,855.06	2.62	1.43	-2.20
14,708.00	89.53	89.470	10,832.82	-115.16	3,949.98	3,949.98	3.37	3.37	0.07
14,803.00	91.50	89.420	10,831.96	-114.24	4,044.97	4,044.97	2.07	2.07	-0.05
14,897.00	89.03	88.950	10,831.53	-112.90	4,138.95	4,138.95	2.67	-2.63	-0.50
14,991.00	88.43	89.760	10,833.61	-111.84	4,232.92	4,232.92	1.07	-0.64	0.86
15,085.00	89.53	88.510	10,835.29	-110.42	4,326.89	4,326.89	1.77	1.17	-1.33
15,180.00	89.90	88.760	10,835.76	-108.16	4,421.86	4,421.86	0.47	0.39	0.26
15,274.00	87.86	86.930	10,837.60	-104.63	4,515.77	4,515.77	2.92	-2.17	-1.95
15,368.00	88.56	89.610	10,840.53	-101.79	4,609.67	4,609.67	2.95	0.74	2.85
15,462.00	89.67	90.470	10,841.98	-101.86	4,703.66	4,703.66	1.49	1.18	0.91
15,556.00	89.40	89.660	10,842.75	-101.96	4,797.65	4,797.65	0.91	-0.29	-0.86
15,651.00	90.87	89.400	10,842.52	-101.18	4,892.65	4,892.65	1.57	1.55	-0.27
Last SDI MWD Survey									
15,739.00	90.87	89.400	10,841.19	-100.26	4,980.63	4,980.63	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
147.00	146.99	0.96	0.46	First MesaWest MWD Survey
3,270.00	3,269.41	9.71	-5.14	Last MesaWest MWD Survey
3,406.00	3,405.38	9.92	-6.27	First SDI MWD Vertical Survey
11,179.00	10,787.31	-86.34	424.52	First SDI MWD Lateral Survey
15,651.00	10,842.52	-101.18	4,892.65	Last SDI MWD Survey
15,739.00	10,841.19	-100.26	4,980.63	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

Scientific Drilling

Survey Certification

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

Operator	Oasis Petroleum
Well Name & No.	Lewis Federal 5300 21-31 5B ST 1
API #	33-053-05849
County & State	McKenzie County, ND
SDI Job #	OP.017958
Rig	Nabors B21
Survey Date	04-Mar-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 15556 feet to a measured depth of 20860 feet is true and correct as determined from all available records.

Seth Burstad

Signature

30-Apr-2019

Date

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

Project: McKenzie County, ND
Site: Lewis Federal
Well: Lewis Federal 5300 21-31 5B
Wellbore: ST 1
Design: ST 1

Scientific Drilling

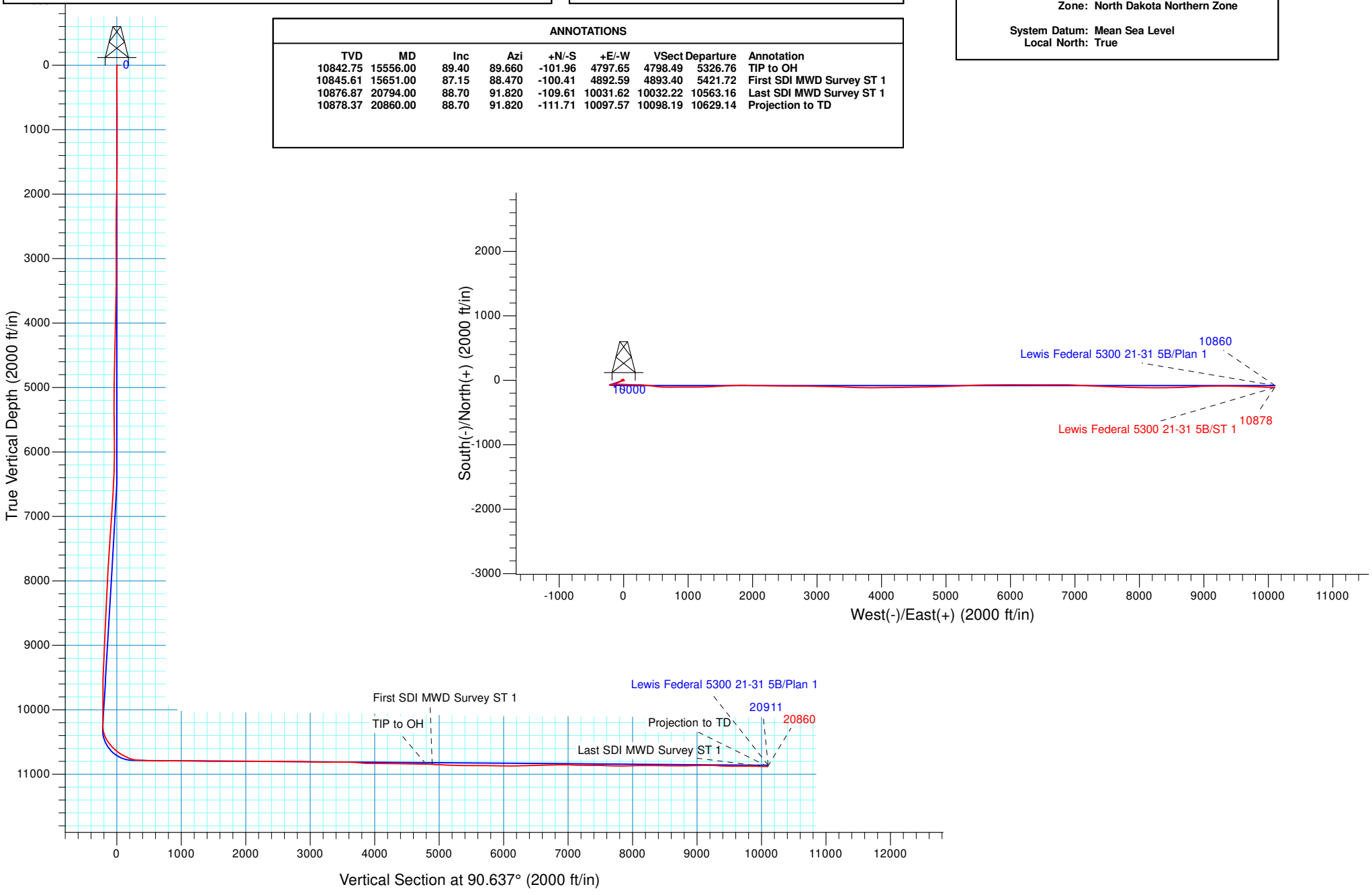
WELL DETAILS: Lewis Federal 5300 21-31 5B			
GL 2132' & KB 25' @ 2157.00ft	2132.00		
Northing	Easting	Latitude	Longitude
391661.89	1209477.20	48° 1' 54.480 N	103° 36' 11.180 W

Design: ST 1 (Lewis Federal 5300 21-31 5B/ST 1)
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

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
10842.75	15556.00	89.40	89.660	-101.96	4797.65	4798.49	5326.76	TIP to OH
10845.61	15651.00	87.15	88.470	-100.41	4892.59	4893.40	5421.72	First SDI MWD Survey ST 1
10876.87	20794.00	88.70	91.820	-109.61	10031.62	10032.22	10563.16	Last SDI MWD Survey ST 1
10878.37	20860.00	88.70	91.820	-111.71	10097.57	10098.19	10629.14	Projection to TD



Oasis Petroleum

McKenzie County, ND
Lewis Federal
Lewis Federal 5300 21-31 5B

ST 1

Design: ST 1

Standard Survey Report

07 May, 2019

Scientific Drilling

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	ST 1	**Survey Calculation Method:**	Minimum Curvature
Design:	ST 1	**Database:**	Casper District

Project McKenzie County, ND

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site Lewis Federal, Site Center: Lewis Federal 5300 11-31 2B

Site Position:		**Northing:**	393,162.02 usft	**Latitude:**	48° 2' 9.300 N
From:	Lat/Long	**Easting:**	1,209,545.85 usft	**Longitude:**	103° 36' 11.060 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.31 °

Well Lewis Federal 5300 21-31 5B, 2552' FNL 259' FWL Sec 31 T153N R100W

Well Position	**+N/-S**	0.00 ft	**Northing:**	391,661.89 usft	**Latitude:**	48° 1' 54.480 N
	+E/-W	0.00 ft	**Easting:**	1,209,477.20 usft	**Longitude:**	103° 36' 11.180 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	2,132.00 ft

Wellbore ST 1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/2/2019	7.85	72.67	55,735

Design ST 1

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	15,556.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	90.637

Survey Program **Date** 5/6/2019

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
12.00	3,270.00	Survey #1 - Surface (OH)	OWSG MWD	OWSG MWD - Standard
3,406.00	11,087.00	Survey #2 - Vertical/Curve (OH)	MWD+HDGM	OWSG MWD + HDGM
11,179.00	15,556.00	Survey #3 - Lateral (OH)	MWD+HDGM	OWSG MWD + HDGM
15,651.00	20,860.00	Survey #1 - Lateral (ST 1)	MWD+HDGM	OWSG MWD + HDGM

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)
15,556.00	89.40	89.660	10,842.75	-101.96	4,797.65	4,798.49	0.91	-0.29	-0.86
TIP to OH									
15,651.00	87.15	88.470	10,845.61	-100.41	4,892.59	4,893.40	2.68	-2.37	-1.25
First SDI MWD Survey ST 1									
15,682.00	86.92	87.850	10,847.21	-99.42	4,923.53	4,924.33	2.13	-0.74	-2.00
15,714.00	87.25	87.170	10,848.84	-98.03	4,955.46	4,956.24	2.36	1.03	-2.13
15,745.00	87.12	87.060	10,850.36	-96.47	4,986.38	4,987.15	0.55	-0.42	-0.35

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	ST 1	**Survey Calculation Method:**	Minimum Curvature
Design:	ST 1	**Database:**	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)
15,777.00	87.45	87.650	10,851.88	-95.00	5,018.31	5,019.06	2.11	1.03	1.84
15,839.00	87.42	87.630	10,854.65	-92.45	5,080.20	5,080.91	0.06	-0.05	-0.03
15,934.00	87.62	86.740	10,858.76	-87.79	5,174.99	5,175.65	0.96	0.21	-0.94
15,966.00	87.65	86.950	10,860.08	-86.03	5,206.92	5,207.55	0.66	0.09	0.66
15,997.00	87.55	87.500	10,861.38	-84.53	5,237.85	5,238.47	1.80	-0.32	1.77
16,029.00	87.99	87.500	10,862.63	-83.13	5,269.80	5,270.40	1.38	1.38	0.00
16,061.00	88.53	89.420	10,863.60	-82.27	5,301.77	5,302.36	6.23	1.69	6.00
16,124.00	89.43	88.580	10,864.72	-81.17	5,364.75	5,365.32	1.95	1.43	-1.33
16,187.00	89.60	88.490	10,865.25	-79.56	5,427.73	5,428.28	0.31	0.27	-0.14
16,218.00	89.56	87.670	10,865.48	-78.52	5,458.71	5,459.24	2.65	-0.13	-2.65
16,312.00	89.30	88.140	10,866.41	-75.09	5,552.64	5,553.13	0.57	-0.28	0.50
16,407.00	90.77	88.150	10,866.36	-72.01	5,647.59	5,648.04	1.55	1.55	0.01
16,501.00	90.54	89.520	10,865.28	-70.10	5,741.56	5,741.98	1.48	-0.24	1.46
16,595.00	89.26	91.270	10,865.45	-70.75	5,835.55	5,835.98	2.31	-1.36	1.86
16,690.00	88.19	90.100	10,867.56	-71.89	5,930.52	5,930.95	1.67	-1.13	-1.23
16,784.00	89.26	89.590	10,869.65	-71.63	6,024.49	6,024.92	1.26	1.14	-0.54
16,879.00	89.87	89.890	10,870.37	-71.20	6,119.49	6,119.90	0.72	0.64	0.32
16,974.00	90.80	90.430	10,869.82	-71.47	6,214.49	6,214.90	1.13	0.98	0.57
17,069.00	91.64	89.430	10,867.79	-71.35	6,309.46	6,309.87	1.37	0.88	-1.05
17,163.00	92.61	90.320	10,864.31	-71.14	6,403.40	6,403.79	1.40	1.03	0.95
17,257.00	91.24	90.190	10,861.15	-71.56	6,497.34	6,497.73	1.46	-1.46	-0.14
17,352.00	90.80	89.430	10,859.46	-71.25	6,592.32	6,592.71	0.92	-0.46	-0.80
17,447.00	91.44	89.300	10,857.60	-70.20	6,687.30	6,687.67	0.69	0.67	-0.14
17,542.00	91.14	90.070	10,855.46	-69.67	6,782.27	6,782.63	0.87	-0.32	0.81
17,636.00	90.94	91.580	10,853.76	-71.03	6,876.24	6,876.61	1.62	-0.21	1.61
17,730.00	89.56	92.190	10,853.35	-74.12	6,970.19	6,970.58	1.61	-1.47	0.65
17,825.00	88.06	93.150	10,855.32	-78.54	7,065.06	7,065.50	1.87	-1.58	1.01
17,920.00	88.36	92.080	10,858.29	-82.87	7,159.92	7,160.39	1.17	0.32	-1.13
18,014.00	89.16	92.500	10,860.32	-86.63	7,253.82	7,254.33	0.96	0.85	0.45
18,108.00	90.17	92.020	10,860.87	-90.34	7,347.74	7,348.29	1.19	1.07	-0.51
18,203.00	89.43	92.470	10,861.20	-94.06	7,442.67	7,443.25	0.91	-0.78	0.47
18,298.00	88.06	92.780	10,863.28	-98.41	7,537.54	7,538.17	1.48	-1.44	0.33
18,392.00	88.29	92.810	10,866.28	-102.99	7,631.38	7,632.06	0.25	0.24	0.03
18,487.00	88.03	92.010	10,869.33	-106.98	7,726.25	7,726.96	0.89	-0.27	-0.84
18,581.00	90.54	91.500	10,870.50	-109.86	7,820.19	7,820.93	2.72	2.67	-0.54
18,675.00	91.27	91.410	10,869.02	-112.25	7,914.15	7,914.91	0.78	0.78	-0.10
18,770.00	91.81	91.410	10,866.46	-114.58	8,009.08	8,009.86	0.57	0.57	0.00
18,865.00	90.37	90.270	10,864.66	-115.98	8,104.05	8,104.84	1.93	-1.52	-1.20
18,960.00	90.97	89.980	10,863.55	-116.18	8,199.04	8,199.83	0.70	0.63	-0.31
19,054.00	89.20	90.140	10,863.41	-116.28	8,293.04	8,293.82	1.89	-1.88	0.17
19,149.00	88.66	89.950	10,865.18	-116.36	8,388.02	8,388.80	0.60	-0.57	-0.20
19,243.00	89.60	88.240	10,866.61	-114.87	8,482.00	8,482.75	2.08	1.00	-1.82
19,338.00	90.33	88.290	10,866.67	-111.99	8,576.95	8,577.67	0.77	0.77	0.05

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Project:	McKenzie County, ND	**TVD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Site:	Lewis Federal	**MD Reference:**	GL 2132' & KB 25' @ 2157.00ft
Well:	Lewis Federal 5300 21-31 5B	**North Reference:**	True
Wellbore:	ST 1	**Survey Calculation Method:**	Minimum Curvature
Design:	ST 1	**Database:**	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)
19,433.00	88.86	88.460	10,867.34	-109.30	8,671.91	8,672.59	1.56	-1.55	0.18
19,528.00	89.93	87.490	10,868.34	-105.94	8,766.84	8,767.48	1.52	1.13	-1.02
19,622.00	90.64	86.370	10,867.87	-100.91	8,860.70	8,861.28	1.41	0.76	-1.19
19,717.00	92.08	87.200	10,865.62	-95.58	8,955.52	8,956.03	1.75	1.52	0.87
19,811.00	90.37	88.810	10,863.61	-92.31	9,049.44	9,049.91	2.50	-1.82	1.71
19,906.00	90.00	89.700	10,863.30	-91.08	9,144.43	9,144.88	1.01	-0.39	0.94
20,001.00	90.67	90.040	10,862.75	-90.86	9,239.43	9,239.87	0.79	0.71	0.36
20,032.00	88.63	89.830	10,862.94	-90.83	9,270.42	9,270.86	6.62	-6.58	-0.68
20,063.00	86.62	90.060	10,864.22	-90.80	9,301.40	9,301.83	6.53	-6.48	0.74
20,095.00	85.81	90.160	10,866.33	-90.86	9,333.33	9,333.76	2.55	-2.53	0.31
20,126.00	85.71	89.710	10,868.62	-90.82	9,364.24	9,364.67	1.48	-0.32	-1.45
20,189.00	86.21	89.870	10,873.06	-90.59	9,427.08	9,427.51	0.83	0.79	0.25
20,283.00	90.03	90.960	10,876.15	-91.27	9,521.01	9,521.44	4.23	4.06	1.16
20,378.00	90.57	92.250	10,875.65	-93.93	9,615.97	9,616.42	1.47	0.57	1.36
20,472.00	89.56	91.980	10,875.54	-97.40	9,709.91	9,710.39	1.11	-1.07	-0.29
20,566.00	91.07	93.530	10,875.03	-101.92	9,803.79	9,804.32	2.30	1.61	1.65
20,661.00	88.49	91.930	10,875.39	-106.45	9,898.67	9,899.24	3.20	-2.72	-1.68
20,755.00	90.17	90.830	10,876.49	-108.71	9,992.63	9,993.22	2.14	1.79	-1.17
20,794.00	88.70	91.820	10,876.87	-109.61	10,031.62	10,032.22	4.54	-3.77	2.54
Last SDI MWD Survey ST 1									
20,860.00	88.70	91.820	10,878.37	-111.71	10,097.57	10,098.19	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
15,556.00	10,842.75	-101.96	4,797.65	TIP to OH
15,651.00	10,845.61	-100.41	4,892.59	First SDI MWD Survey ST 1
20,794.00	10,876.87	-109.61	10,031.62	Last SDI MWD Survey ST 1
20,860.00	10,878.37	-111.71	10,097.57	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

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 21 2019
ND Oil & Gas Division

Well File No.
28194

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

☑ Notice of Intent	Approximate Start Date: **January 23, 2019**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed:	☐ Redrilling or Repair	☐ Shooting
☐ 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:	☑ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other	

Well Name and Number					
Lewis Federal 5300 21-31 5B					
Footages		Qtr-Qtr	Section	Township	Range
2552 F N L	**259 F W L**	**LOT 3**	**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 Petroleum respectfully requests to amend the surface casing depth to 3300' MD (previously (2157') 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. A DV tool will not be used.

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

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9436**
Address		
1001 Fannin St, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Jennifer Swenson	
Title	Date	
Regulatory Specialist	**January 21, 2019**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☑ Approved
Date: 1-21-2019	
By: D Burns	
Title: DAVID BURNS Engineering Technician	

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Lewis Federal 5300 21-31 5B	**RIG**	0
WELL TYPE	Middle Bakken		
LOCATION	T153N R100W S31 SWNW Surface Location (survey plat): 2552' FNL	259' FWL	
EST. T.D.	20,911'	**FINISH PAD ELEV:**	2,132' **Sub Height:** 25'
TOTAL LATERAL:	9,850'	**KB ELEV:**	2,157'

MARKER		TVD	Subsea TVD
Pierre	NDIC MAP	2,007	150'
Greenhorn		4,615	-2,458'
Mowry (Dakota Group)		5,029	-2,872'
Inyan Kara (Dakota Group)		5,451	-3,294'
Swift (Base Dakota Group)		5,874	-3,717'
Rierdon		6,390	-4,233'
Dunham Salt		6,917	-4,760'
Dunham Salt Base		6,974	-4,817'
Pine Salt		7,281	-5,124'
Pine Salt Base		7,342	-5,185'
Opeche Salt		7,460	-5,303'
Opeche Salt Base		7,486	-5,329'
Amsden		7,682	-5,525'
Tyler		7,870	-5,713'
Otter/Base Minnelusa		8,088	-5,931'
Kibbey Lime		8,435	-6,278'
Charles Salt		8,581	-6,424'
Base Last Salt		9,252	-7,095'
Mission Canyon		9,466	-7,309'
Lodgepole		10,025	-7,868'
False Bakken		10,739	-8,582'
Upper Bakken Shale		10,749	-8,592'
Middle Bakken		10,765	-8,608'
Target Top		10,775	-8,618'
Target Landing		10,784	-8,627'
Target Base		10,793	-8,636'
Lower Bakken		10,803	-8,646'
-		-	-
-		-	-
-		-	-
-		-	-
-		-	-
-		-	-
-		-	-
Est. Average Dip Rate:	89.58		
Max. Anticipated BHP:	4,706'		

LOGS:

	Type	Interval
OH Logs:	Triple Combo	KOP to Kibbey (or min run of 1800' whichever is greater)
	GR/Resistivity	Bottom of surface casing
	GR	To surface
	CND	Through Dakota Group (Inyan Kara Sands)
CBL/GR:		Above top of cement/GR to base of casing
MWD GR:		KOP to lateral TD

DEVIATION:

Surf:	3 deg. max., 1 deg / 100'; srvy every 500'
Prod:	5 deg. max., 1 deg / 100'; srvy every 100'

DST'S:

CORES:

Core Planned?	NO
Core Type:	-
Formations/Depths:	

MUDLOGGING:

Company:	TBD
Starting Depth:	Begin 200' above Kibbey
Sample Protocol:	30' samples in curve, 50' samples in lateral

BOP:

11" 5000 psi blind, pipe & annular

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	3,300'	FW/Gel Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	3,300'	11,061'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,061' -	20,911'	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"	3,300'	To Surface	12 hours	150' into Pierre
Intermediate: (Dakota)	9-5/8"	40#	12-1/4"	5,974'	To Surface	24 hours	Set Casing across Dakota
Intermediate:	7"	32#	8-3/4"	11,061'	4829	24 hours	200' above Mowry
Production Liner:	4.5"	13.5#	6"	20,911'	10236		50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	3,300'	3,300'	2552 FNL	259 FWL	**Sec 31 T153N R100W**	-
KOP:	10,286'	10,279'	2625 FNL	40 FWL	**Sec 31 T153N R100W**	-
EOC:	11,061'	10,784'	2611 FSL	513 FWL	**Sec 31 T153N R100W**	90.0
Casing Point:	11,061'	10,784'	2611 FSL	513 FWL	**Sec 31 T153N R100W**	90.0
TD:	20,911'	10,860'	2611 FSL	150 FEL	**Sec 32 T153N R100W**	90.0

Survey Company:

Build Rate: 12 deg /100'

Comments:

Request waiver of open hole logs. Justification well: Lewis Federal 5300 31-31H (33053034330000) ~0.22 miles S of SHL

The above open hole logs will be run if Oasis does not submit and receive an approved logging waiver from the NDIC.

Currently planned for 50 stages. No frac string planned. 4-1/2" cemented liner completed using plug & perf method

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)

OASIS PETROLEUM	**Geology:**	LRH 4/3/2018	**Engineering:**	TR 4/16/18
	Revision:		**Revision:**	
	Revision 2:		**Revision 2:**	

Oasis Petroleum
Well Summary
Lewis Federal 5300 21-31 5B
Section 31 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
13-3/8"	0' - 3300'	54.5	J-55	STC	12.615"	12.459"

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 3300'	13-3/8", 54.5#, J-55, LTC, 8rd	1130 / 0.73	2730 / 1.22	514 / 2.01

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 9 ppg fluid on backside (3300' setting depth).

b) Burst pressure based on 13 ppg fluid with no fluid on backside (3300' setting depth).

c) Based on string weight in 9 ppg fluid at 3300' TVD plus 100k# overpull. (Buoyed weight equals 155k 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: **1166 sks** (602 bbls), 11.5 lb/gal, 2.97 cu. Ft./sk Varicem Cement with 0.125 il/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 21-31 5B
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' - 5974'	40	J-55	LTC	8.921"	8.765"

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 5974'	9-5/8", 36#, J-55, LTC, 8rd	3530 / 4.00	7870 / 3.08	1260 / 4.18

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (5974' 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 5974' TVD plus 100k# overpull. (Buoyed weight equals 201k 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: **541 sks** (280 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 21-31 5B
Section 31 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift**
7"	0' - 11061'	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 / 2.10*	12460 / 1.28	897 / 2.24
5000' - 11061'	6061'	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 10784' 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: **568 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 21-31 5B
Section 31 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**
4-1/2"	10236' - 20911'	13.5	P-110	GB CD BTC	3.920"	3.795"

Interval	**Length**	**Description**	**Collapse**	**Burst**	**Tension**
		4-1/2", 13.5 lb, P-110, GB CD BTC	(psi) a	(psi) b	(1000 lbs) c
10236' - 20911'	10675		10670 / 1.98	12410 / 1.28	443 / 1.98

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10860' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10860' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 123k lbs.) plus 100k lbs overpull.

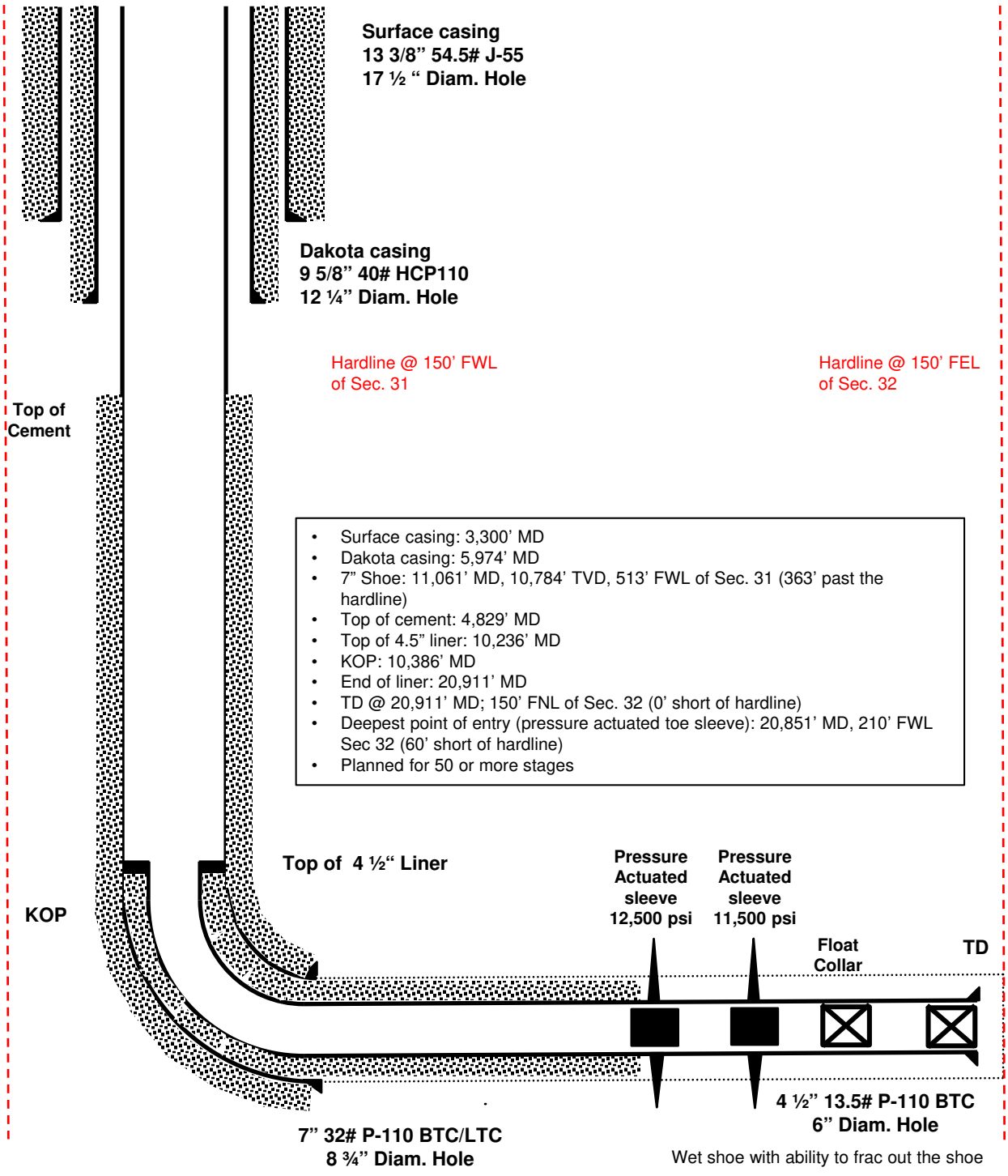
Cement volumes are estimates based on 4-1/2" casing hung from 7" casing, and into 6" OH. 20% excess.
Mix and pump the cement slurry. Follow cement with liner dart and then saltwater displacement

Pre-flush (Spacer):	**20 bbls**	Viscous spacer
Cement Slurry:	**727 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 10236ft @ 0.011bbl/ft 4.5" casing: 10236ft to 20858ft; 0.0149bbl/ft

ELEVATION: 2,132' SL

Lewis Federal 5300 21-31 5B
Proposed Wellbore Schematic

FORMATION: Bakken



- Surface casing: 3,300' MD
- Dakota casing: 5,974' MD
- 7" Shoe: 11,061' MD, 10,784' TVD, 513' FWL of Sec. 31 (363' past the hardline)
- Top of cement: 4,829' MD
- Top of 4.5" liner: 10,236' MD
- KOP: 10,386' MD
- End of liner: 20,911' MD
- TD @ 20,911' MD; 150' FNL of Sec. 32 (0' short of hardline)
- Deepest point of entry (pressure actuated toe sleeve): 20,851' MD, 210' FWL Sec 32 (60' short of hardline)
- Planned for 50 or more stages

OASIS PETROLEUM NA LLC

Lewis Federal 5300 21-31 5B
Wellbore: T153N-R100W Sec. 31 & 32
SHL: 2552' FNL & 259' FWL T153N-R100W Sec. 31

Williams County, North Dakota
Updated: 4-12-2018 TR

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 - 4 2019
ND OIL & GAS DIVISION

Well File No.
28194

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

- [x] 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
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [ ] Change Production Method
- [ ] Reclamation
- [x] Other **Waiver from tubing/packer requirement**

Well Name and Number					
Lewis Federal 5300 21-31 5B					
Footages	Qtr-Qtr	Section	Township	Range	
~~2497~~ 2552 F ~~S~~ N L / ~~251~~ 259 F W L	LOT ~~3~~ 2	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 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 ise 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 montioring equipement;
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	Telephone Number	
Oasis Petroleum North America LLC	**281-404-9436**	
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Jennifer Swenson	
Title	Date	
Regulatory Specialist	**January 3, 2019**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: January 10, 2019
By:
Title: PETROLEUM ENGINEER

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
APR 18
ND Oil & Gas Division

Well File No.
28194

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

☑ Notice of Intent	Approximate Start Date **April 30, 2018**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ 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	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☑ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other **SHL and BHL Changes**	

Well Name and Number					
Lewis Federal 5300 21-31 5B					
Footages		Qtr-Qtr	Section	Township	Range
2497 F S L	**251 F W L**	**LOT3**	**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 Petroleum respectfully requests the following changes to the above referenced permitted well:

SHL change: 2552' FNL & 259' FWL Lot 2 Sec. 31 T153N R100W (Previously 2497' FSL & 251' FWL Lot 3 Sec. 31 T153N R100W)

BHL change: 2611' FSL & 150' FEL NESE Sec. 32 T153N R100W (Previously 2285' FSL & 212' FEL NESE Sec. 32 T153N R100W)

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.

TD Change: 20911' MD / 10860' TVD (Previously 20616' MD / 10868' TVD)

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

Please see attached supporting documents.

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

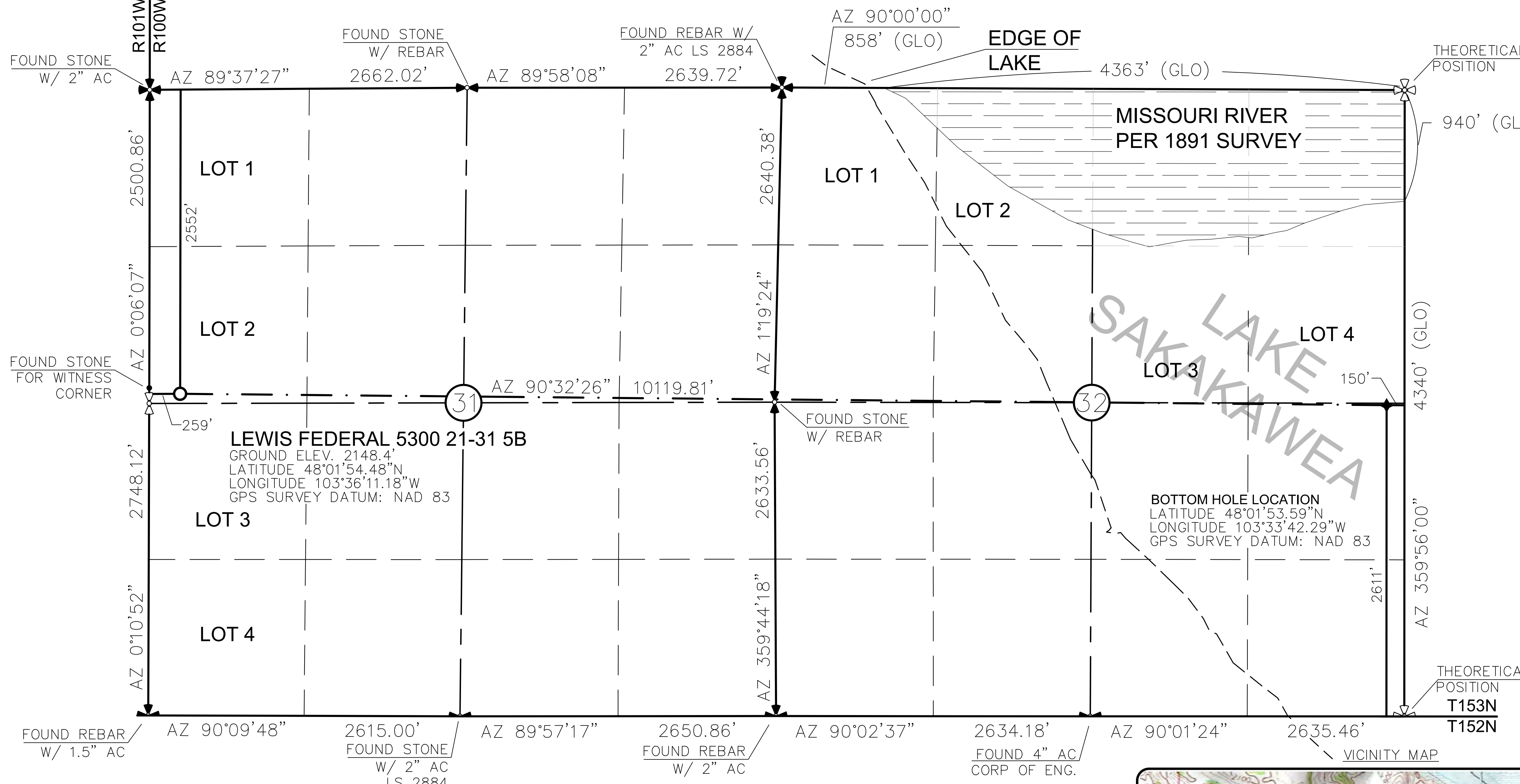
Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9494**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature *Sadie Goodrum*	Printed Name **Sadie Goodrum**	
Title **Regulatory Specialist II**	Date **April 18, 2018**	
Email Address **sgoodrum@oasispetroleum.com**		

FOR STATE USE ONLY

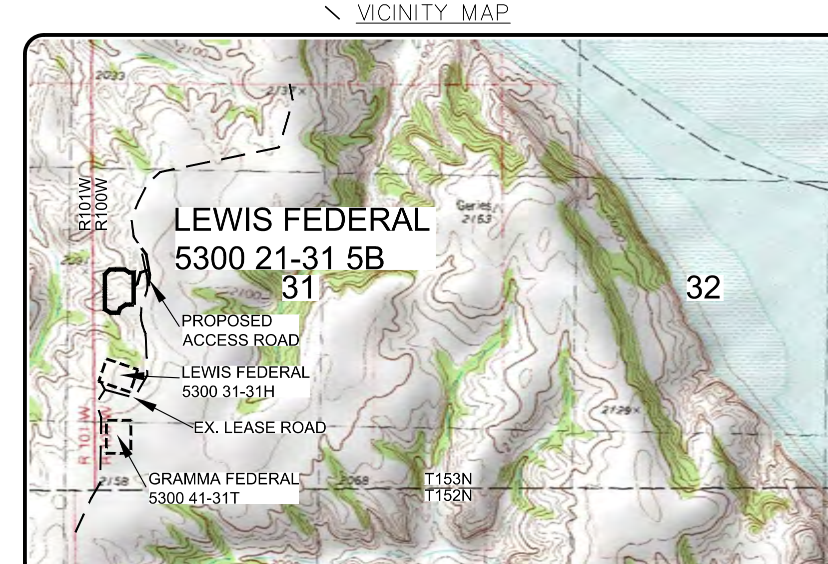
☐ Received	☒ Approved
Date 4/24/2018	
By *David Burns*	
Title Engineering Tech.	

WELL LOCATION

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
LEWIS FEDERAL 5300 21-31 5B
2552 FEET FROM NORTH LINE AND 259 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP



STAKED ON 1/9/14
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 ERIC BAYES 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

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 3-27-18
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.

N

0 1000
1" = 1000'

– MONUMENT – RECOVERED
– MONUMENT – NOT RECOVERED

Revision No.	Date	By	Description

5300 21-31 6-Well Pad to New Standards\CADD\LEWIS 5B\LEWIS 5B.dwg – 3/27/2018 1:44 PM josh.schmierer

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION
SECTION 31, T153N, R100W, 5TH P.M.,
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S17-09-184
Checked By: D.D.K. Date: MARCH 2018

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
Other offices in Minnesota, North Dakota and South Dakota

INTERSTATE ENGINEERING
Professionals you need, people you trust

SHEET NO. 1/9

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Lewis Federal 5300 21-31 5B	**RIG**	0
WELL TYPE	Middle Bakken		
LOCATION	T153N R100W S31 SWNW Surface Location (survey plat): 2552' FNL	259' FWL	
EST. T.D.	20,911'	**FINISH PAD ELEV:**	2,132' **Sub Height:** 25'
	TOTAL LATERAL: 9,850'	**KB ELEV:**	2,157'

MARKER		TVD	Subsea TVD
Pierre	NDIC MAP	2,007	150'
Greenhorn		4,615	-2,458'
Mowry (Dakota Group)		5,029	-2,872'
Inyan Kara (Dakota Group)		5,451	-3,294'
Swift (Base Dakota Group)		5,874	-3,717'
Rierdon		6,390	-4,233'
Dunham Salt		6,917	-4,760'
Dunham Salt Base		6,974	-4,817'
Pine Salt		7,281	-5,124'
Pine Salt Base		7,342	-5,185'
Opeche Salt		7,460	-5,303'
Opeche Salt Base		7,486	-5,329'
Amsden		7,682	-5,525'
Tyler		7,870	-5,713'
Otter/Base Minnelusa		8,088	-5,931'
Kibbey Lime		8,435	-6,278'
Charles Salt		8,581	-6,424'
Base Last Salt		9,252	-7,095'
Mission Canyon		9,466	-7,309'
Lodgepole		10,025	-7,868'
False Bakken		10,739	-8,582'
Upper Bakken Shale		10,749	-8,592'
Middle Bakken		10,765	-8,608'
Target Top		10,775	-8,618'
Target Landing		10,784	-8,627'
Target Base		10,793	-8,636'
Lower Bakken		10,803	-8,646'
-		-	-
-		-	-
-		-	-
-		-	-
-		-	-
-		-	-
-		-	-
Est. Average Dip Rate:	89.58		
Max. Anticipated BHP:	4,706'		

LOGS:

	Type	Interval
OH Logs:	Triple Combo	KOP to Kibbey (or min run of 1800' whichever is greater)
	GR/Resistivity	Bottom of surface casing
	GR	To surface
	CND	Through Dakota Group (Inyan Kara Sands)
CBL/GR:		Above top of cement/GR to base of casing
MWD GR:		KOP to lateral TD

DEVIATION:

Surf:	3 deg. max., 1 deg / 100'; srvy every 500'
Prod:	5 deg. max., 1 deg / 100'; srvy every 100'

DST'S:

CORES:

Core Planned?	NO
Core Type:	-
Formations/Depths:	

MUDLOGGING:

Company:	TBD
Starting Depth:	Begin 200' above Kibbey
Sample Protocol:	30' samples in curve, 50' samples in lateral

BOP:

11" 5000 psi blind, pipe & annular

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0'	- 2,157'	FW/Gel Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,157'	- 11,061'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,061'	- 20,911'	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"	2,157'	To Surface	12 hours	150' into Pierre
Intermediate: (Dakota)	9-5/8"	36#	12-1/4"	5,974'	To Surface	24 hours	Set Casing across Dakota
Intermediate:	7"	32#	8-3/4"	11,061'	4829	24 hours	200' above Mowry
Production Liner:	4.5"	13.5#	6"	20,911'	10236		50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,157'	2,157'	2552 FNL	259 FWL	**Sec 31 T153N R100W**	-
KOP:	10,286'	10,279'	2625 FNL	40 FWL	**Sec 31 T153N R100W**	-
EOC:	11,061'	10,784'	2611 FSL	513 FWL	**Sec 31 T153N R100W**	90.0
Casing Point:	11,061'	10,784'	2611 FSL	513 FWL	**Sec 31 T153N R100W**	90.0
TD:	20,911'	10,860'	2611 FSL	150 FEL	**Sec 32 T153N R100W**	90.0

Survey Company:

Build Rate: 12 deg /100'

Comments:

Request waiver of open hole logs. Justification well: Lewis Federal 5300 31-31H (33053034330000) ~0.22 miles S of SHL

The above open hole logs will be run if Oasis does not submit and receive an approved logging waiver from the NDIC.

Currently planned for 50 stages. No frac string planned. 4-1/2" cemented liner completed using plug & perf method

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)

OASIS PETROLEUM	**Geology:**	LRH 4/3/2018	**Engineering:**	TR 4/16/18
	Revision:		**Revision:**	
	Revision 2:		**Revision 2:**	

Oasis Petroleum
Well Summary
Lewis Federal 5300 21-31 5B
Section 31 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift
13-3/8"	0' - 2157'	54.5	J-55	STC	12.615"	12.459"

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 2157'	13-3/8", 54.5#, J-55, LTC, 8rd	1130 / 1.11	2730 / 1.87	514 / 2.55

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 9 ppg fluid on backside (2157' setting depth).

b) Burst pressure based on 13 ppg fluid with no fluid on backside (2157' setting depth).

c) Based on string weight in 9 ppg fluid at 2157' TVD plus 100k# overpull. (Buoyed weight equals 101k 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: **728 sks** (376 bbls), 11.5 lb/gal, 2.97 cu. Ft./sk Varicem Cement with 0.125 il/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 21-31 5B
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' - 5974'	36	J-55	LTC	8.921"	8.765"

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 5974'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.29	3520 / 1.37	453 / 1.61

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (5974' 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 5974' TVD plus 100k# overpull. (Buoyed weight equals 181k 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: **520 sks** (268 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 21-31 5B
Section 31 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift**
7"	0' - 11061'	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 / 2.10*	12460 / 1.28	897 / 2.24
5000' - 11061'	6061'	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 10784' 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: **568 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 21-31 5B
Section 31 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**
4-1/2"	10236' - 20911'	13.5	P-110	GB CD BTC	3.920"	3.795"

Interval	**Length**	**Description**	**Collapse**	**Burst**	**Tension**
		4-1/2", 13.5 lb, P-110, GB CD BTC	(psi) a	(psi) b	(1000 lbs) c
10236' - 20911'	10675		10670 / 1.98	12410 / 1.28	443 / 1.98

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10860' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10860' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 123k lbs.) plus 100k lbs overpull.

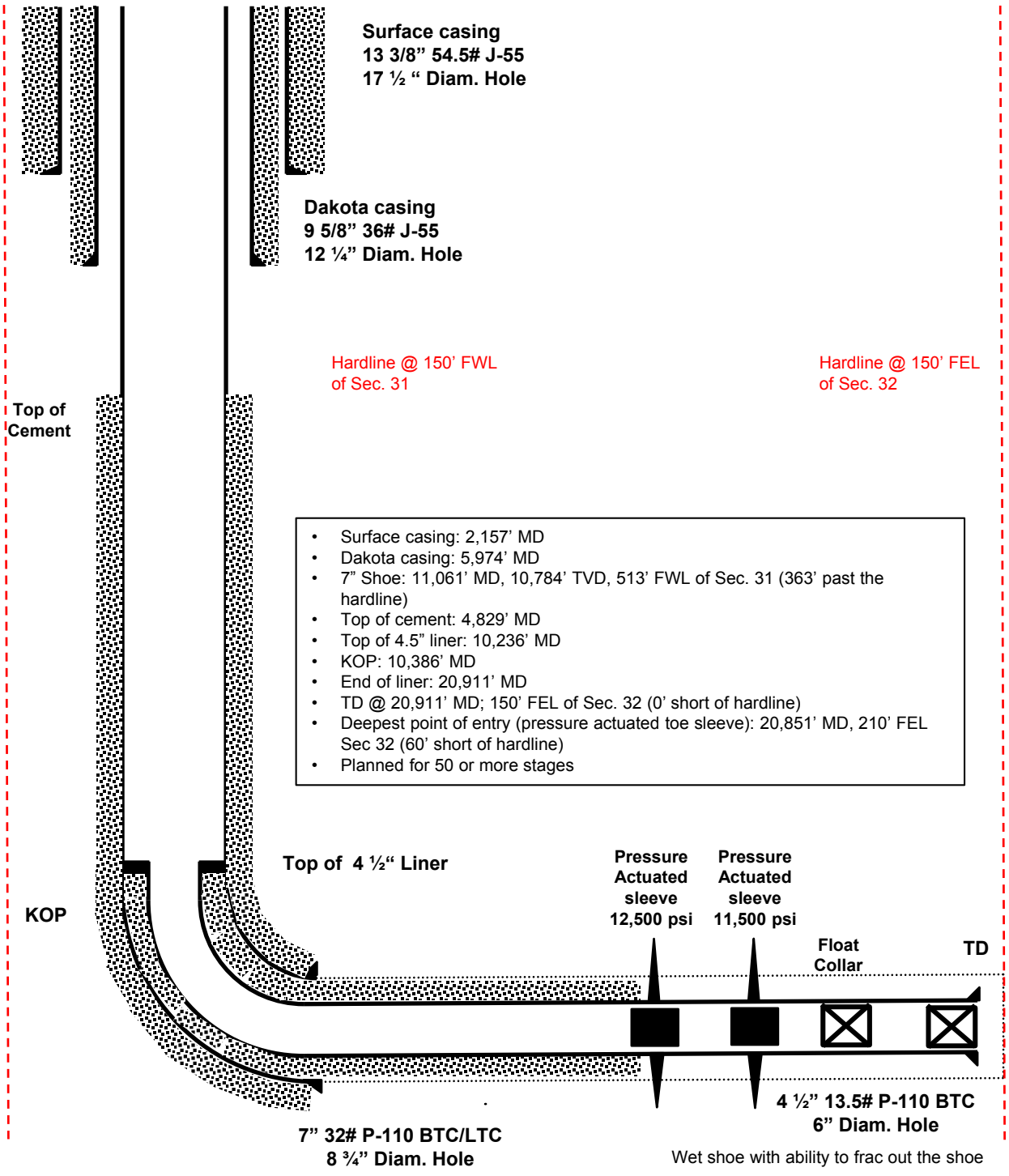
Cement volumes are estimates based on 4-1/2" casing hung from 7" casing, and into 6" OH. 20% excess.
Mix and pump the cement slurry. Follow cement with liner dart and then saltwater displacement

Pre-flush (Spacer):	**20 bbls**	Viscous spacer
Cement Slurry:	**727 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 10236ft @ 0.011bbl/ft 4.5" casing: 10236ft to 20858ft; 0.0149bbl/ft

ELEVATION: 2,132' SL

Lewis Federal 5300 21-31 5B
Proposed Wellbore Schematic

FORMATION: Bakken

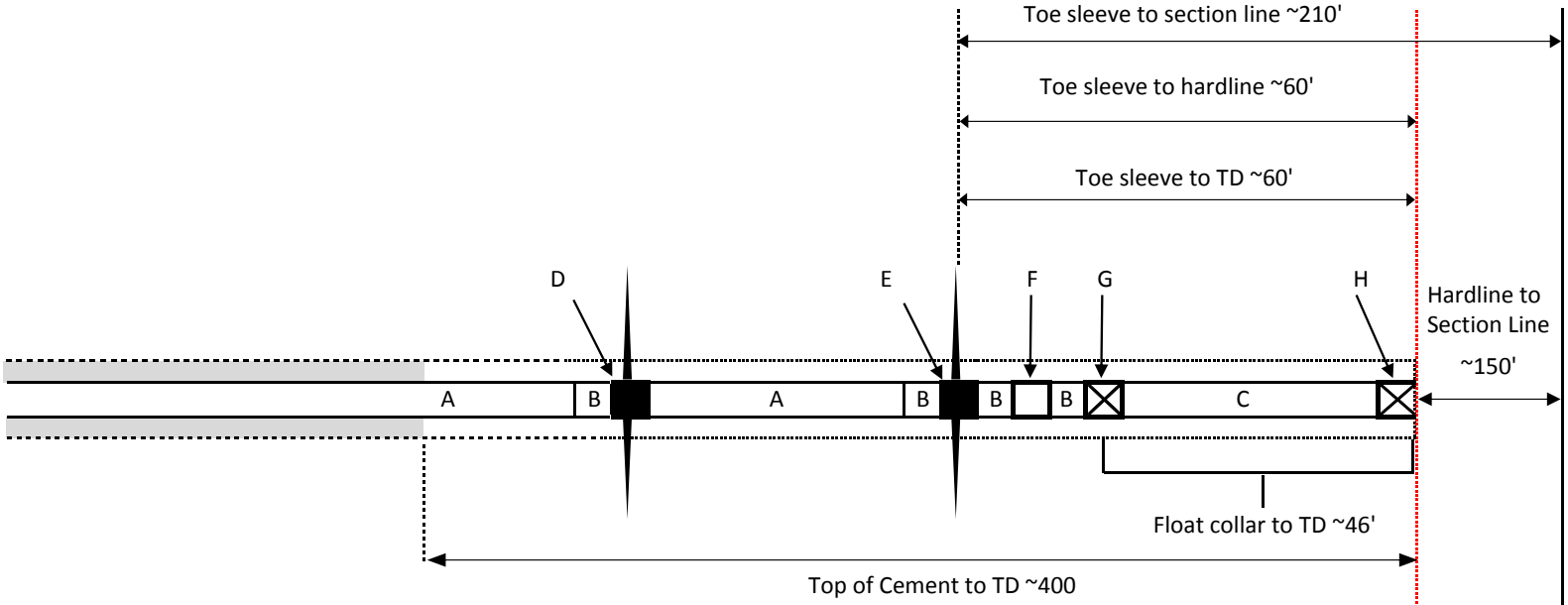


OASIS PETROLEUM NA LLC

Lewis Federal 5300 21-31 5B
Wellbore: T153N-R100W Sec. 31 & 32
SHL: 2552' FNL & 259' FWL T153N-R100W Sec. 31

Williams County, North Dakota
Updated: 4-12-2018 TR

Lewis Federal 5300 21-31 5B 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 as "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 21-31 5B
Wellbore: Lewis Federal 5300 21-31 5B
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Lewis Federal 5300 21-31 5B

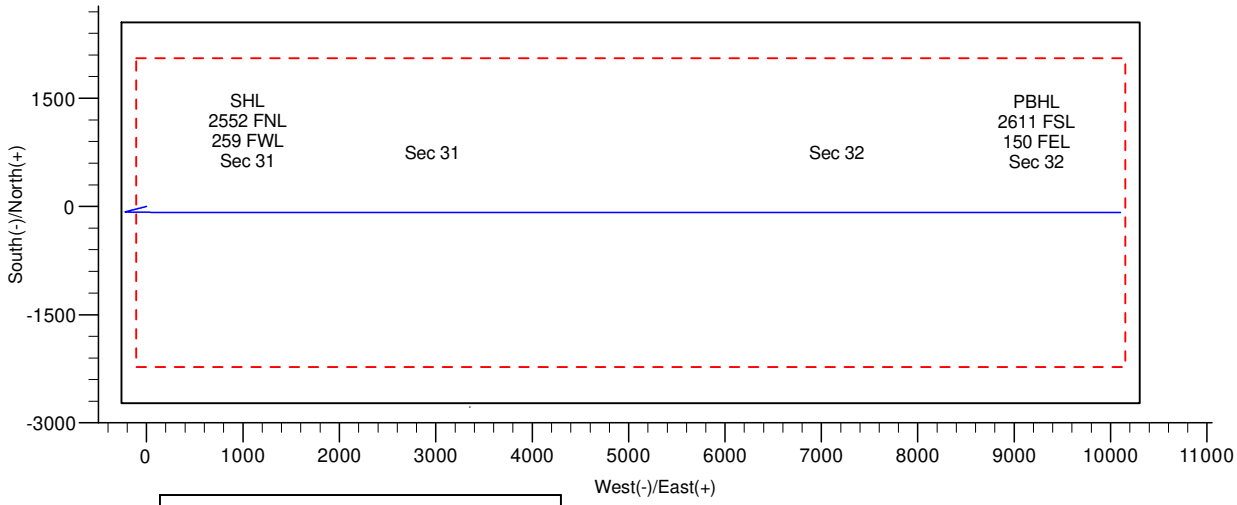
Ground Level: 2132.0

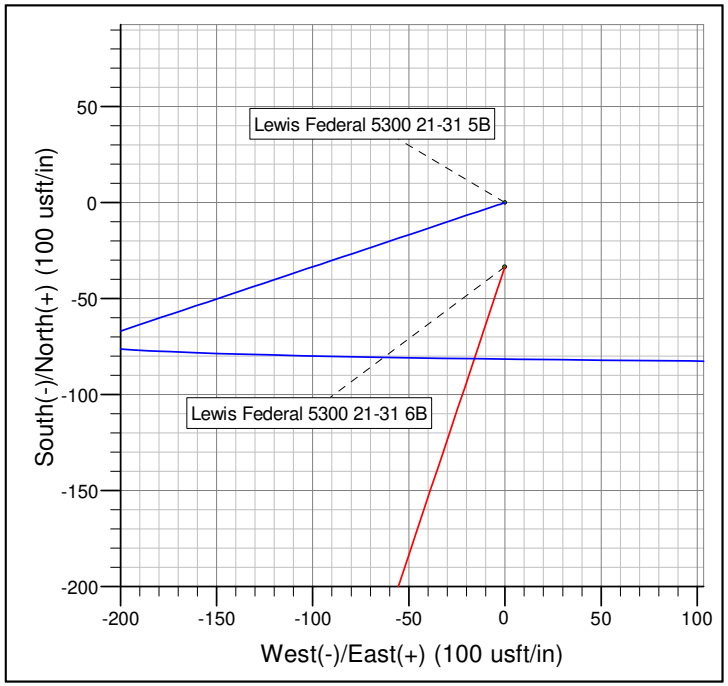
Northing	Easting	Latitude	Longitude
391661.91	1209477.20	48° 1' 54.480 N	103° 36' 11.180 W

T M

Azimuths to True North
Magnetic North: 7.95°

Magnetic Field
Strength: 55883.8snT
Dip Angle: 72.78°
Date: 4/11/2018
Model: IGRF2015



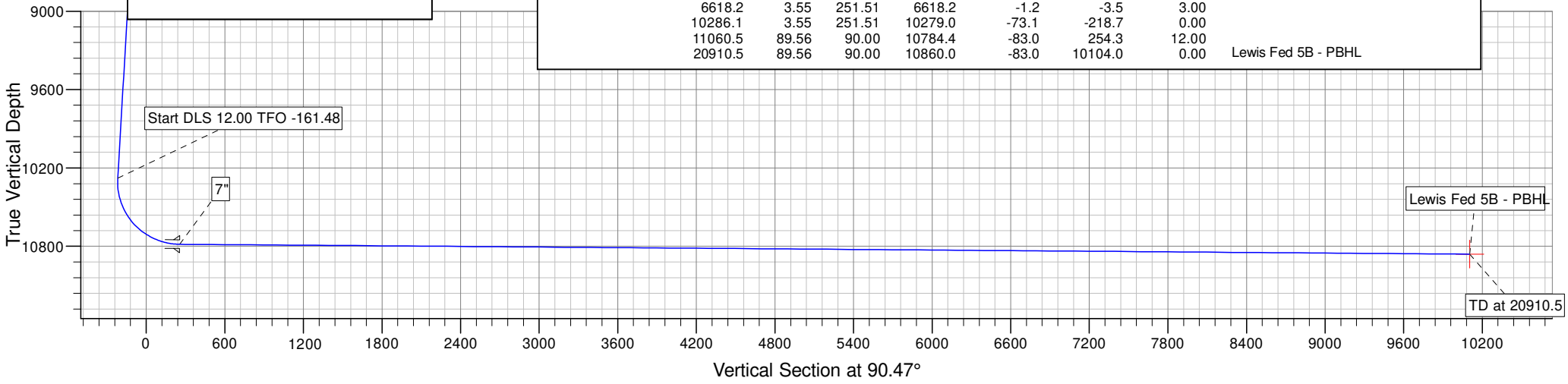


CASING DETAILS

TVD	MD	Name	Size
2157.0	2157.0	13 3/8"	13.375
5974.0	5974.0	9 5/8"	9.625
10784.4	11060.5	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	
6500.0	0.00	0.00	6500.0	0.0	0.0	0.00	
6618.2	3.55	251.51	6618.2	-1.2	-3.5	3.00	
10286.1	3.55	251.51	10279.0	-73.1	-218.7	0.00	
11060.5	89.56	90.00	10784.4	-83.0	254.3	12.00	
20910.5	89.56	90.00	10860.0	-83.0	10104.0	0.00	Lewis Fed 5B - PBHL



Oasis

Indian Hills
153N-100W-31/32
Lewis Federal 5300 21-31 5B

Lewis Federal 5300 21-31 5B

Plan: Design #1

Standard Planning Report

16 April, 2018

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Company:	Oasis	**TVD Reference:**	WELL @ 2157.0usft
Project:	Indian Hills	**MD Reference:**	WELL @ 2157.0usft
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 21-31 5B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Federal 5300 21-31 5B		
Design:	Design #1		

Project	Indian Hills		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site	153N-100W-31/32				
Site Position:		**Northing:**	390,397.86 usft	**Latitude:**	48° 1' 42.010 N
From:	Lat/Long	**Easting:**	1,209,464.32 usft	**Longitude:**	103° 36' 10.620 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.31 °

Well	Lewis Federal 5300 21-31 5B, DEV				
Well Position	**+N/-S**	1,263.5 usft	**Northing:**	391,661.91 usft	**Latitude:**	48° 1' 54.480 N
	+E/-W	-38.1 usft	**Easting:**	1,209,477.20 usft	**Longitude:**	103° 36' 11.180 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,132.0 usft

Wellbore	Lewis Federal 5300 21-31 5B			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	4/11/2018	7.95	72.78	55,884

Design	Design #1			
Audit Notes:				
Version:	**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	90.47

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	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
6,618.2	3.55	251.51	6,618.2	-1.2	-3.5	3.00	3.00	0.00	251.51	
10,286.1	3.55	251.51	10,279.0	-73.1	-218.7	0.00	0.00	0.00	0.00	
11,060.5	89.56	90.00	10,784.4	-83.0	254.3	12.00	11.11	-20.86	-161.48	
20,910.5	89.56	90.00	10,860.0	-83.0	10,104.0	0.00	0.00	0.00	0.00	Lewis Fed 5B - PBHL

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Company:	Oasis	**TVD Reference:**	WELL @ 2157.0usft
Project:	Indian Hills	**MD Reference:**	WELL @ 2157.0usft
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 21-31 5B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Federal 5300 21-31 5B		
Design:	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)
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 3.00									
6,600.0	3.00	251.51	6,600.0	-0.8	-2.5	-2.5	3.00	3.00	0.00
6,618.2	3.55	251.51	6,618.2	-1.2	-3.5	-3.5	3.00	3.00	0.00
Start 3667.9 hold at 6618.2 MD									
6,700.0	3.55	251.51	6,699.8	-2.8	-8.3	-8.2	0.00	0.00	0.00
6,800.0	3.55	251.51	6,799.6	-4.7	-14.1	-14.1	0.00	0.00	0.00
6,900.0	3.55	251.51	6,899.4	-6.7	-20.0	-19.9	0.00	0.00	0.00
7,000.0	3.55	251.51	6,999.2	-8.7	-25.9	-25.8	0.00	0.00	0.00
7,100.0	3.55	251.51	7,099.0	-10.6	-31.7	-31.6	0.00	0.00	0.00
7,200.0	3.55	251.51	7,198.8	-12.6	-37.6	-37.5	0.00	0.00	0.00
7,300.0	3.55	251.51	7,298.6	-14.5	-43.5	-43.4	0.00	0.00	0.00
7,400.0	3.55	251.51	7,398.4	-16.5	-49.3	-49.2	0.00	0.00	0.00
7,500.0	3.55	251.51	7,498.2	-18.5	-55.2	-55.1	0.00	0.00	0.00
7,600.0	3.55	251.51	7,598.0	-20.4	-61.1	-60.9	0.00	0.00	0.00
7,700.0	3.55	251.51	7,697.9	-22.4	-66.9	-66.8	0.00	0.00	0.00
7,800.0	3.55	251.51	7,797.7	-24.4	-72.8	-72.6	0.00	0.00	0.00
7,900.0	3.55	251.51	7,897.5	-26.3	-78.7	-78.5	0.00	0.00	0.00
8,000.0	3.55	251.51	7,997.3	-28.3	-84.5	-84.3	0.00	0.00	0.00
8,100.0	3.55	251.51	8,097.1	-30.2	-90.4	-90.2	0.00	0.00	0.00
8,200.0	3.55	251.51	8,196.9	-32.2	-96.3	-96.0	0.00	0.00	0.00
8,300.0	3.55	251.51	8,296.7	-34.2	-102.1	-101.9	0.00	0.00	0.00
8,400.0	3.55	251.51	8,396.5	-36.1	-108.0	-107.7	0.00	0.00	0.00
8,500.0	3.55	251.51	8,496.3	-38.1	-113.9	-113.6	0.00	0.00	0.00
8,600.0	3.55	251.51	8,596.1	-40.1	-119.8	-119.4	0.00	0.00	0.00
8,700.0	3.55	251.51	8,695.9	-42.0	-125.6	-125.3	0.00	0.00	0.00
8,800.0	3.55	251.51	8,795.7	-44.0	-131.5	-131.1	0.00	0.00	0.00
8,900.0	3.55	251.51	8,895.6	-45.9	-137.4	-137.0	0.00	0.00	0.00
9,000.0	3.55	251.51	8,995.4	-47.9	-143.2	-142.8	0.00	0.00	0.00
9,100.0	3.55	251.51	9,095.2	-49.9	-149.1	-148.7	0.00	0.00	0.00
9,200.0	3.55	251.51	9,195.0	-51.8	-155.0	-154.5	0.00	0.00	0.00
9,300.0	3.55	251.51	9,294.8	-53.8	-160.8	-160.4	0.00	0.00	0.00
9,400.0	3.55	251.51	9,394.6	-55.8	-166.7	-166.2	0.00	0.00	0.00
9,500.0	3.55	251.51	9,494.4	-57.7	-172.6	-172.1	0.00	0.00	0.00
9,600.0	3.55	251.51	9,594.2	-59.7	-178.4	-177.9	0.00	0.00	0.00
9,700.0	3.55	251.51	9,694.0	-61.6	-184.3	-183.8	0.00	0.00	0.00
9,800.0	3.55	251.51	9,793.8	-63.6	-190.2	-189.6	0.00	0.00	0.00
9,900.0	3.55	251.51	9,893.6	-65.6	-196.0	-195.5	0.00	0.00	0.00
10,000.0	3.55	251.51	9,993.4	-67.5	-201.9	-201.3	0.00	0.00	0.00
10,100.0	3.55	251.51	10,093.3	-69.5	-207.8	-207.2	0.00	0.00	0.00
10,200.0	3.55	251.51	10,193.1	-71.4	-213.6	-213.0	0.00	0.00	0.00
10,286.1	3.55	251.51	10,279.0	-73.1	-218.7	-218.1	0.00	0.00	0.00
Start DLS 12.00 TFO -161.48									
10,300.0	2.03	236.41	10,292.9	-73.4	-219.3	-218.7	12.00	-10.87	-108.57
10,400.0	10.37	96.16	10,392.4	-75.4	-211.8	-211.2	12.00	8.33	-140.25
10,500.0	22.33	92.73	10,488.2	-77.2	-183.8	-183.1	12.00	11.97	-3.43
10,600.0	34.32	91.64	10,576.0	-79.0	-136.5	-135.8	12.00	11.99	-1.09
10,700.0	46.32	91.07	10,652.2	-80.5	-71.9	-71.2	12.00	11.99	-0.57
10,800.0	58.31	90.69	10,713.2	-81.6	7.1	7.8	12.00	12.00	-0.38
10,900.0	70.31	90.39	10,756.4	-82.5	97.0	97.7	12.00	12.00	-0.29
11,000.0	82.31	90.14	10,780.1	-82.9	194.0	194.7	12.00	12.00	-0.25
11,060.5	89.56	90.00	10,784.4	-83.0	254.3	255.0	11.99	11.99	-0.24
Start 9850.0 hold at 11060.5 MD - 7"									

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Company:	Oasis	**TVD Reference:**	WELL @ 2157.0usft
Project:	Indian Hills	**MD Reference:**	WELL @ 2157.0usft
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 21-31 5B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Federal 5300 21-31 5B		
Design:	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)
11,100.0	89.56	90.00	10,784.7	-83.0	293.8	294.5	0.00	0.00	0.00
11,200.0	89.56	90.00	10,785.4	-83.0	393.8	394.5	0.00	0.00	0.00
11,300.0	89.56	90.00	10,786.2	-83.0	493.8	494.5	0.00	0.00	0.00
11,400.0	89.56	90.00	10,787.0	-83.0	593.8	594.5	0.00	0.00	0.00
11,500.0	89.56	90.00	10,787.7	-83.0	693.8	694.5	0.00	0.00	0.00
11,600.0	89.56	90.00	10,788.5	-83.0	793.8	794.5	0.00	0.00	0.00
11,700.0	89.56	90.00	10,789.3	-83.0	893.8	894.5	0.00	0.00	0.00
11,800.0	89.56	90.00	10,790.0	-83.0	993.8	994.5	0.00	0.00	0.00
11,900.0	89.56	90.00	10,790.8	-83.0	1,093.8	1,094.5	0.00	0.00	0.00
12,000.0	89.56	90.00	10,791.6	-83.0	1,193.8	1,194.4	0.00	0.00	0.00
12,100.0	89.56	90.00	10,792.3	-83.0	1,293.8	1,294.4	0.00	0.00	0.00
12,200.0	89.56	90.00	10,793.1	-83.0	1,393.8	1,394.4	0.00	0.00	0.00
12,300.0	89.56	90.00	10,793.9	-83.0	1,493.8	1,494.4	0.00	0.00	0.00
12,400.0	89.56	90.00	10,794.6	-83.0	1,593.8	1,594.4	0.00	0.00	0.00
12,500.0	89.56	90.00	10,795.4	-83.0	1,693.8	1,694.4	0.00	0.00	0.00
12,600.0	89.56	90.00	10,796.2	-83.0	1,793.8	1,794.4	0.00	0.00	0.00
12,700.0	89.56	90.00	10,796.9	-83.0	1,893.8	1,894.4	0.00	0.00	0.00
12,800.0	89.56	90.00	10,797.7	-83.0	1,993.8	1,994.4	0.00	0.00	0.00
12,900.0	89.56	90.00	10,798.5	-83.0	2,093.8	2,094.4	0.00	0.00	0.00
13,000.0	89.56	90.00	10,799.3	-83.0	2,193.8	2,194.4	0.00	0.00	0.00
13,100.0	89.56	90.00	10,800.0	-83.0	2,293.8	2,294.4	0.00	0.00	0.00
13,200.0	89.56	90.00	10,800.8	-83.0	2,393.8	2,394.4	0.00	0.00	0.00
13,300.0	89.56	90.00	10,801.6	-83.0	2,493.8	2,494.4	0.00	0.00	0.00
13,400.0	89.56	90.00	10,802.3	-83.0	2,593.8	2,594.4	0.00	0.00	0.00
13,500.0	89.56	90.00	10,803.1	-83.0	2,693.8	2,694.4	0.00	0.00	0.00
13,600.0	89.56	90.00	10,803.9	-83.0	2,793.8	2,794.3	0.00	0.00	0.00
13,700.0	89.56	90.00	10,804.6	-83.0	2,893.8	2,894.3	0.00	0.00	0.00
13,800.0	89.56	90.00	10,805.4	-83.0	2,993.8	2,994.3	0.00	0.00	0.00
13,900.0	89.56	90.00	10,806.2	-83.0	3,093.8	3,094.3	0.00	0.00	0.00
14,000.0	89.56	90.00	10,806.9	-83.0	3,193.7	3,194.3	0.00	0.00	0.00
14,100.0	89.56	90.00	10,807.7	-83.0	3,293.7	3,294.3	0.00	0.00	0.00
14,200.0	89.56	90.00	10,808.5	-83.0	3,393.7	3,394.3	0.00	0.00	0.00
14,300.0	89.56	90.00	10,809.2	-83.0	3,493.7	3,494.3	0.00	0.00	0.00
14,400.0	89.56	90.00	10,810.0	-83.0	3,593.7	3,594.3	0.00	0.00	0.00
14,500.0	89.56	90.00	10,810.8	-83.0	3,693.7	3,694.3	0.00	0.00	0.00
14,600.0	89.56	90.00	10,811.5	-83.0	3,793.7	3,794.3	0.00	0.00	0.00
14,700.0	89.56	90.00	10,812.3	-83.0	3,893.7	3,894.3	0.00	0.00	0.00
14,800.0	89.56	90.00	10,813.1	-83.0	3,993.7	3,994.3	0.00	0.00	0.00
14,900.0	89.56	90.00	10,813.8	-83.0	4,093.7	4,094.3	0.00	0.00	0.00
15,000.0	89.56	90.00	10,814.6	-83.0	4,193.7	4,194.3	0.00	0.00	0.00
15,100.0	89.56	90.00	10,815.4	-83.0	4,293.7	4,294.3	0.00	0.00	0.00
15,200.0	89.56	90.00	10,816.1	-83.0	4,393.7	4,394.2	0.00	0.00	0.00
15,300.0	89.56	90.00	10,816.9	-83.0	4,493.7	4,494.2	0.00	0.00	0.00
15,400.0	89.56	90.00	10,817.7	-83.0	4,593.7	4,594.2	0.00	0.00	0.00
15,500.0	89.56	90.00	10,818.5	-83.0	4,693.7	4,694.2	0.00	0.00	0.00
15,600.0	89.56	90.00	10,819.2	-83.0	4,793.7	4,794.2	0.00	0.00	0.00
15,700.0	89.56	90.00	10,820.0	-83.0	4,893.7	4,894.2	0.00	0.00	0.00
15,800.0	89.56	90.00	10,820.8	-83.0	4,993.7	4,994.2	0.00	0.00	0.00
15,900.0	89.56	90.00	10,821.5	-83.0	5,093.7	5,094.2	0.00	0.00	0.00
16,000.0	89.56	90.00	10,822.3	-83.0	5,193.7	5,194.2	0.00	0.00	0.00
16,100.0	89.56	90.00	10,823.1	-83.0	5,293.7	5,294.2	0.00	0.00	0.00
16,200.0	89.56	90.00	10,823.8	-83.0	5,393.7	5,394.2	0.00	0.00	0.00
16,300.0	89.56	90.00	10,824.6	-83.0	5,493.7	5,494.2	0.00	0.00	0.00
16,400.0	89.56	90.00	10,825.4	-83.0	5,593.7	5,594.2	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Company:	Oasis	**TVD Reference:**	WELL @ 2157.0usft
Project:	Indian Hills	**MD Reference:**	WELL @ 2157.0usft
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 21-31 5B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Federal 5300 21-31 5B		
Design:	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)
16,500.0	89.56	90.00	10,826.1	-83.0	5,693.7	5,694.2	0.00	0.00	0.00
16,600.0	89.56	90.00	10,826.9	-83.0	5,793.7	5,794.2	0.00	0.00	0.00
16,700.0	89.56	90.00	10,827.7	-83.0	5,893.7	5,894.2	0.00	0.00	0.00
16,800.0	89.56	90.00	10,828.4	-83.0	5,993.7	5,994.1	0.00	0.00	0.00
16,900.0	89.56	90.00	10,829.2	-83.0	6,093.7	6,094.1	0.00	0.00	0.00
17,000.0	89.56	90.00	10,830.0	-83.0	6,193.7	6,194.1	0.00	0.00	0.00
17,100.0	89.56	90.00	10,830.7	-83.0	6,293.7	6,294.1	0.00	0.00	0.00
17,200.0	89.56	90.00	10,831.5	-83.0	6,393.7	6,394.1	0.00	0.00	0.00
17,300.0	89.56	90.00	10,832.3	-83.0	6,493.7	6,494.1	0.00	0.00	0.00
17,400.0	89.56	90.00	10,833.0	-83.0	6,593.6	6,594.1	0.00	0.00	0.00
17,500.0	89.56	90.00	10,833.8	-83.0	6,693.6	6,694.1	0.00	0.00	0.00
17,600.0	89.56	90.00	10,834.6	-83.0	6,793.6	6,794.1	0.00	0.00	0.00
17,700.0	89.56	90.00	10,835.3	-83.0	6,893.6	6,894.1	0.00	0.00	0.00
17,800.0	89.56	90.00	10,836.1	-83.0	6,993.6	6,994.1	0.00	0.00	0.00
17,900.0	89.56	90.00	10,836.9	-83.0	7,093.6	7,094.1	0.00	0.00	0.00
18,000.0	89.56	90.00	10,837.6	-83.0	7,193.6	7,194.1	0.00	0.00	0.00
18,100.0	89.56	90.00	10,838.4	-83.0	7,293.6	7,294.1	0.00	0.00	0.00
18,200.0	89.56	90.00	10,839.2	-83.0	7,393.6	7,394.1	0.00	0.00	0.00
18,300.0	89.56	90.00	10,840.0	-83.0	7,493.6	7,494.1	0.00	0.00	0.00
18,400.0	89.56	90.00	10,840.7	-83.0	7,593.6	7,594.0	0.00	0.00	0.00
18,500.0	89.56	90.00	10,841.5	-83.0	7,693.6	7,694.0	0.00	0.00	0.00
18,600.0	89.56	90.00	10,842.3	-83.0	7,793.6	7,794.0	0.00	0.00	0.00
18,700.0	89.56	90.00	10,843.0	-83.0	7,893.6	7,894.0	0.00	0.00	0.00
18,800.0	89.56	90.00	10,843.8	-83.0	7,993.6	7,994.0	0.00	0.00	0.00
18,900.0	89.56	90.00	10,844.6	-83.0	8,093.6	8,094.0	0.00	0.00	0.00
19,000.0	89.56	90.00	10,845.3	-83.0	8,193.6	8,194.0	0.00	0.00	0.00
19,100.0	89.56	90.00	10,846.1	-83.0	8,293.6	8,294.0	0.00	0.00	0.00
19,200.0	89.56	90.00	10,846.9	-83.0	8,393.6	8,394.0	0.00	0.00	0.00
19,300.0	89.56	90.00	10,847.6	-83.0	8,493.6	8,494.0	0.00	0.00	0.00
19,400.0	89.56	90.00	10,848.4	-83.0	8,593.6	8,594.0	0.00	0.00	0.00
19,500.0	89.56	90.00	10,849.2	-83.0	8,693.6	8,694.0	0.00	0.00	0.00
19,600.0	89.56	90.00	10,849.9	-83.0	8,793.6	8,794.0	0.00	0.00	0.00
19,700.0	89.56	90.00	10,850.7	-83.0	8,893.6	8,894.0	0.00	0.00	0.00
19,800.0	89.56	90.00	10,851.5	-83.0	8,993.6	8,994.0	0.00	0.00	0.00
19,900.0	89.56	90.00	10,852.2	-83.0	9,093.6	9,093.9	0.00	0.00	0.00
20,000.0	89.56	90.00	10,853.0	-83.0	9,193.6	9,193.9	0.00	0.00	0.00
20,100.0	89.56	90.00	10,853.8	-83.0	9,293.6	9,293.9	0.00	0.00	0.00
20,200.0	89.56	90.00	10,854.5	-83.0	9,393.6	9,393.9	0.00	0.00	0.00
20,300.0	89.56	90.00	10,855.3	-83.0	9,493.6	9,493.9	0.00	0.00	0.00
20,400.0	89.56	90.00	10,856.1	-83.0	9,593.6	9,593.9	0.00	0.00	0.00
20,500.0	89.56	90.00	10,856.8	-83.0	9,693.6	9,693.9	0.00	0.00	0.00
20,600.0	89.56	90.00	10,857.6	-83.0	9,793.6	9,793.9	0.00	0.00	0.00
20,700.0	89.56	90.00	10,858.4	-83.0	9,893.6	9,893.9	0.00	0.00	0.00
20,800.0	89.56	90.00	10,859.2	-83.0	9,993.5	9,993.9	0.00	0.00	0.00
20,900.0	89.56	90.00	10,859.9	-83.0	10,093.5	10,093.9	0.00	0.00	0.00
20,910.5	89.56	90.00	10,860.0	-83.0	10,104.0	10,104.3	0.00	0.00	0.00
TD at 20910.5									

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Company:	Oasis	**TVD Reference:**	WELL @ 2157.0usft
Project:	Indian Hills	**MD Reference:**	WELL @ 2157.0usft
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 21-31 5B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Federal 5300 21-31 5B		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lewis Fed 5B - PBHL - plan hits target center - Point	0.00	0.00	10,860.0	-83.0	10,104.0	391,171.87	1,219,569.65	48° 1' 53.634 N	103° 33' 42.512 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,157.0	2,157.0	13 3/8"	13.375	17.500
5,974.0	5,974.0	9 5/8"	9.625	12.250
11,060.5	10,784.4	7"	7.000	8.750

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,007.0	2,007.0	Pierre			
4,615.0	4,615.0	Greenhorn			
5,029.0	5,029.0	Mowry (Dakota Group)			
5,451.0	5,451.0	Inyan Kara (Dakota Group)			
5,874.0	5,874.0	Swift (Base Dakota Group)			
6,390.0	6,390.0	Rierdon			
6,917.6	6,917.0	Dunham Salt			
6,974.8	6,974.0	Dunham Salt Base			
7,282.3	7,281.0	Pine Salt			
7,343.5	7,342.0	Pine Salt Base			
7,461.7	7,460.0	Opeche Salt			
7,487.7	7,486.0	Opeche Salt Base			
7,684.1	7,682.0	Amsden			
7,872.5	7,870.0	Tyler			
8,090.9	8,088.0	Otter/Base Minnelusa			
8,438.6	8,435.0	Kibbey Lime			
8,584.8	8,581.0	Charles Salt			
9,257.1	9,252.0	Base Last Salt			
9,471.5	9,466.0	Mission Canyon			
10,031.6	10,025.0	Lodgepole			
10,854.3	10,739.0	False Bakken			
10,879.2	10,749.0	Upper Bakken Shale			
10,927.6	10,765.0	Middle Bakken			
10,969.4	10,775.0	Target Top			
11,045.3	10,784.0	Target Landing			
12,185.8	10,793.0	Target Base			
13,488.0	10,803.0	Lower Bakken			

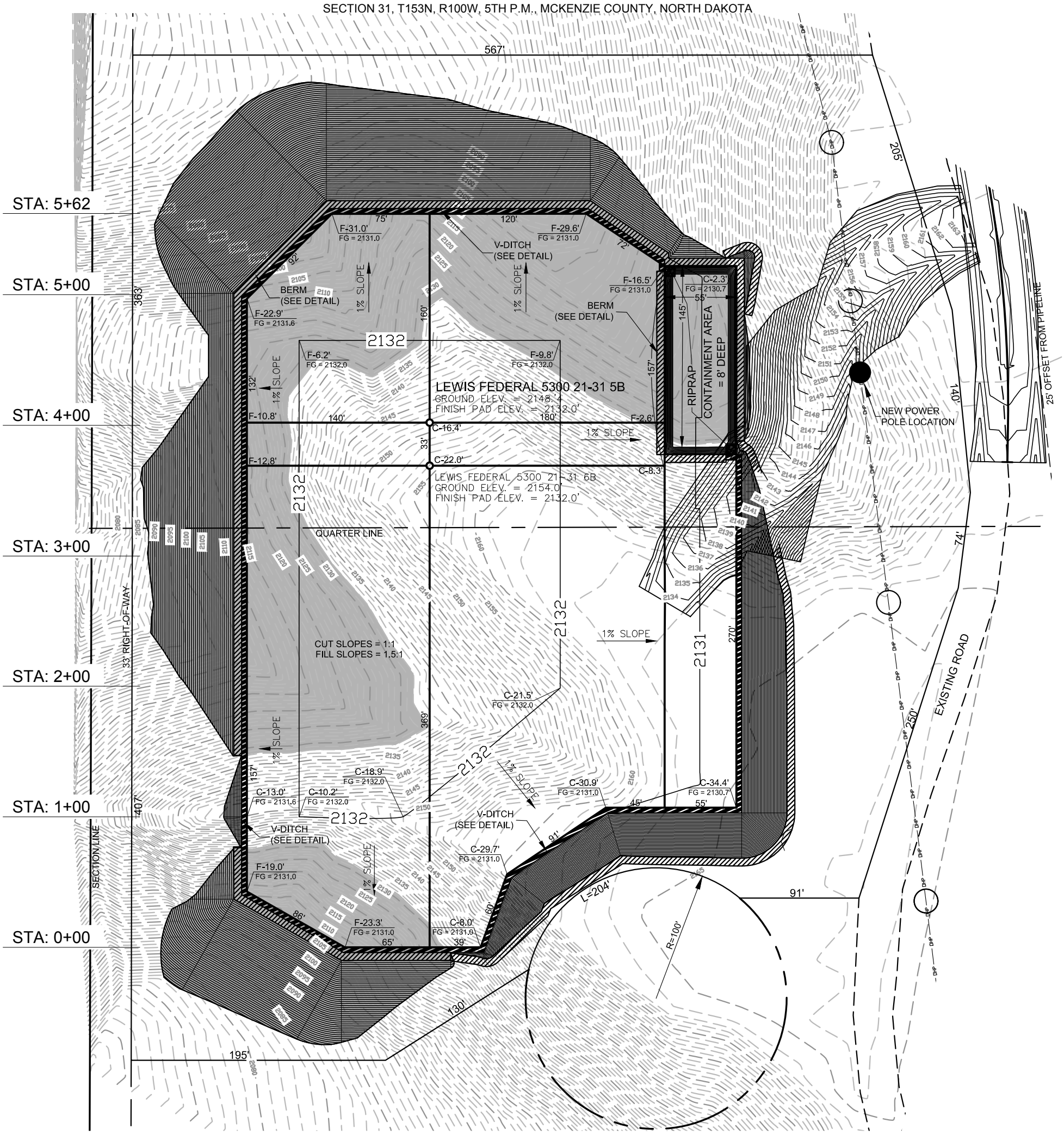
Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 21-31 5B
Company:	Oasis	**TVD Reference:**	WELL @ 2157.0usft
Project:	Indian Hills	**MD Reference:**	WELL @ 2157.0usft
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 21-31 5B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Federal 5300 21-31 5B		
Design:	Design #1		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
6,500.0	6,500.0	0.0	0.0	Start Build 3.00
6,618.2	6,618.2	-1.2	-3.5	Start 3667.9 hold at 6618.2 MD
10,286.1	10,279.0	-73.1	-218.7	Start DLS 12.00 TFO -161.48
11,060.5	10,784.4	-83.0	254.3	Start 9850.0 hold at 11060.5 MD
20,910.5	10,860.0	-83.0	10,104.0	TD at 20910.5

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
LEWIS FEDERAL 5300 21-31 5B
2552 FEET FROM NORTH LINE AND 259 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

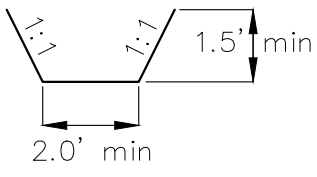


NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

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.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 3-27-18
NORTH DAKOTA

V-DITCH DETAIL



BERM — Proposed Contours
DITCH — Original Contours

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

0 80
1" = 80'

INTERSTATE ENGINEERING
Professionals you need, people you trust

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
Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 31, T153N, R100W, 5TH P.M.,
MCKENZIE COUNTY, NORTH DAKOTA

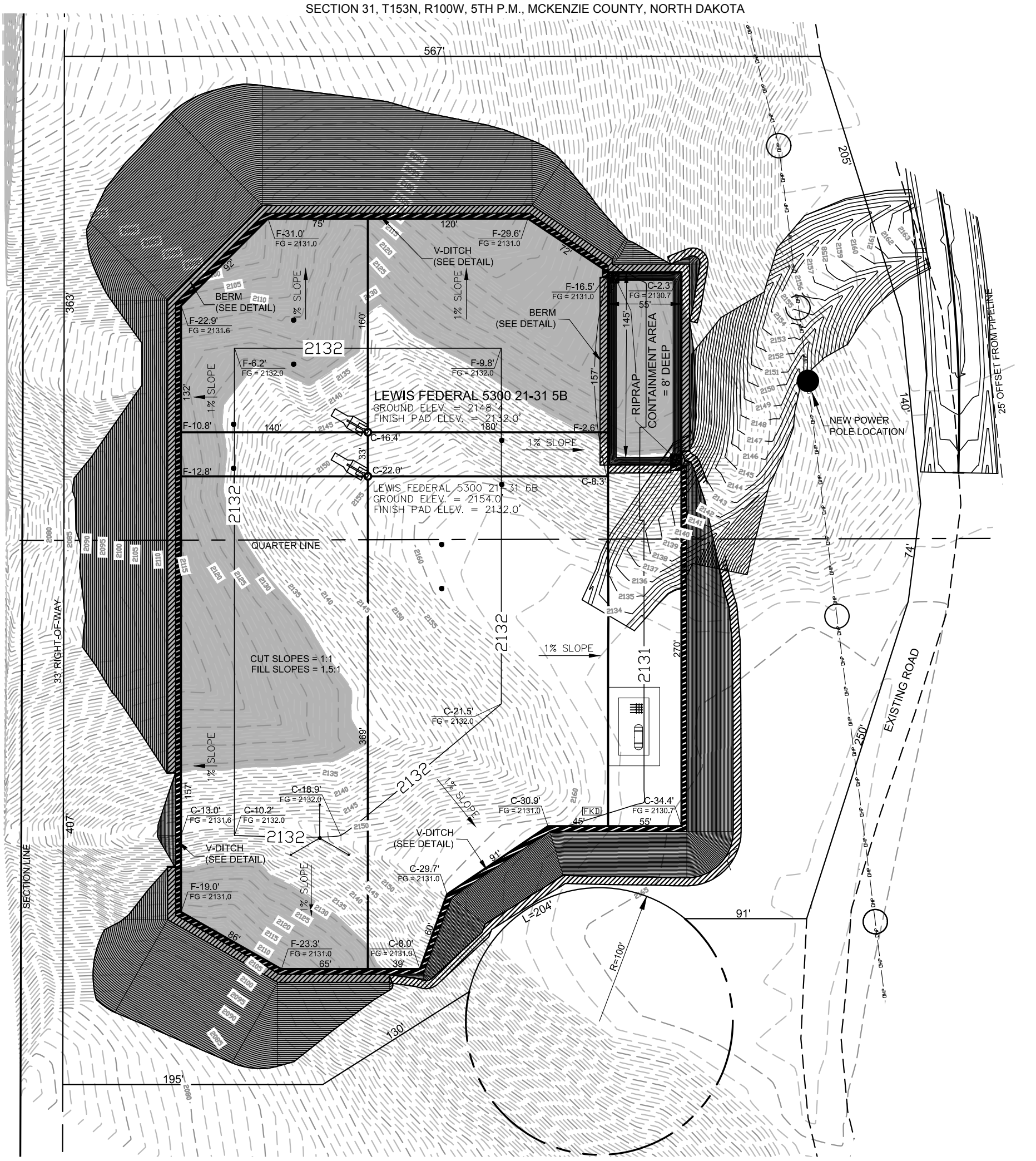
Drawn By: J.J.S. | Project No.: S17-09-184
Checked By: D.D.K. | Date: MARCH 2018

Revision No.	Date	By	Description

G:\2017\Oct 06 \104 - Oasis Petroleum - Update Well Designs on the Lewis Federal 5300 21-31 6-Well Pad to New Standards\CADD\LEWIS 5B\LEWIS 5B.dwg - 3/27/2018 5:44 PM josh schmierer

PRODUCTION LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
LEWIS FEDERAL 5300 21-31 5B
2552 FEET FROM NORTH LINE AND 259 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

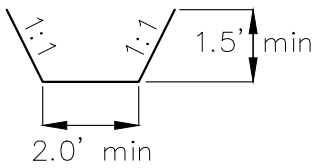


NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

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.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 3-27-18
NORTH DAKOTA

V-DITCH DETAIL



— BERM
— DITCH
Proposed Contours
Original Contours

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

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1" = 80'

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OASIS PETROLEUM NORTH AMERICA, LLC
PRODUCTION LAYOUT
SECTION 31, T153N, R100W, 5TH P.M.,
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S17-09-184
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Revision No.	Date	By	Description

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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
ND Oil & Gas Division

APR

ND Oil & Gas Division

Received

Well File No.
28194

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

☑ Notice of Intent	Approximate Start Date **April 30, 2018**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ 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	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other **Name Change**	

Well Name and Number
Lewis Federal 5300 31-31 10B

Footages	Qtr-Qtr	Section	Township	Range
2497 F **S** L **251** F **W** L	**LOT3**	**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 folling change to the above referenced well:

Name Change: Lewis Federal 5300 21-31 5B (Previously Lewis Federal 5300 31-31 10B).

Please utilize credit card on file for the associated fees.

CC $75.00

Company	Telephone Number
Oasis Petroleum North America LLC	**281 404-9494**
Address: **1001 Fannin, Suite 1500**	
City: **Houston**	State: **TX** Zip Code: **77002**
Signature: Sadie Goodrum	Printed Name: **Sadie Goodrum**
Title: **Regulatory Specialist II**	Date: **April 18, 2018**
Email Address: **sgoodrum@oasispetroleum.com**	

FOR STATE USE ONLY

☐ Received	☑ Approved
Date: 4-24-2018	
By:	
Title: **DAVID BURNS** Engineering Technician	

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
APR 24 2018
ND Oil & Gas Division

Well File No. **28194**

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

☑ Notice of Intent	Approximate Start Date: April 23, 2018	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed:	☐ Redrilling or Repair	☐ Shooting
☐ 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:	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other **APD Renewal**	

Well Name and Number: **Lewis Federal 5300 ~~21-31 5B~~** 31-31 10B

Footages	Qtr-Qtr	Section	Township	Range
~~2552~~ 2497' F N L ~~259~~ 251' F W L	LOT3	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 Petroleum requests a permit renewal for above referenced well. Changes to this wellbore have been submitted under separate cover, including a name change from the Lewis Federal 5300 21-31 10B to the Lewis Federal 5300 21-31 5B.

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

PERMIT EXPIRES 4/21/19.

Company	Telephone Number
Oasis Petroleum North America LLC	281-404-9436
Address: 1001 Fannin St, Suite 1500	
City: Houston	State: TX / Zip Code: 77002
Signature	Printed Name: Jennifer Swenson
Title: Regulatory Specialist	Date: April 23, 2018
Email Address: jswenson@oasispetroleum.com	

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 4/24/18	
By: Alice D. Webber	
Title: Engineering Technician	

NORTH DAKOTA
OIL AND GAS DIVISION

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/

28194

March 19, 2018

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

RE: LEWIS FEDERAL 5300 31-31 10B
LOT3 Sec. 31-153N-100W
MCKENZIE COUNTY
WELL FILE NO. 28194

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire April 21, 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

NORTH DAKOTA
OIL AND GAS DIVISION

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/

28194

March 20, 2017

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

RE: LEWIS FEDERAL 5300 31-31 10B
LOT3 Sec. 31-153N-100W
MCKENZIE COUNTY
WELL FILE NO. 28194

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire April 21, 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

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
APR 20 2017
ND Oil & Gas Division

Well File No.
28194

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

- [x] Notice of Intent — Approximate Start Date: **April 20, 2017**
- [ ] 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
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [x] Other **APD Renewal**
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [ ] Change Production Method
- [ ] Reclamation

Well Name and Number: **Lewis Federal 5300 31-31 10B**

Footages	Qtr-Qtr	Section	Township	Range
2497 F S L 251 F W L	LOT3	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 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 gas capture plan.

Dnv# 50908
Permit Expires 4/21/18. cc $100.00 4/25/17 th

Company	Telephone Number
Oasis Petroleum North America LLC	281-404-9436

Address		
1001 Fannin St, Suite 1500		
City: Houston	State: TX	Zip Code: 77002

Signature	Printed Name
	Jennifer Swenson
Title: Regulatory Specialist	Date: April 20, 2017
Email Address: jswenson@oasispetroleum.com	

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 4/21/17
By: Alice D. Webber
Title: Engineering Technician

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 31-31 10B well, with a surface location in Lot 3 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 ~ 2nd Quarter 2018, with an initial gas production rate of approximately 983 mcf/day.

Robert H. Eason
Marketing Manager

Subscribed and sworn to before me this 15th day of March, 2017.

STEVEN DOELING
Notary Public, State of Texas
Comm. Expires 10-31-2020
Notary ID 130882302

Notary Public in and for the State of Texas
My Commission expires:

GAS CAPTURE PLAN – OASIS PETROLEUM

Lewis Federal 5300 31-31 10B

Section 31-T153N-R100W
Baker Field
McKenzie County, North Dakota

Anticipated first flow date	~Q2 2018
Gas Gatherer:	Hiland Partners (Kinder Morgan)
Gas to be processed at*:	Hiland Operated Watford City Plant
Maximum Daily Capacity of Existing Gas Line*:	92,500 MCFD
Current Throughput of Existing Gas Line*:	81,000 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	92,500 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	72,000 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	There are no expansion plans at this time.
Map:	Attached
Affidavit:	Attached

*Provided by Gatherer

Flowback Strategy

Total Number of Wells at Location: 6

Multi-Well Start-up Plan: Initial production from the 1st new well at the CTB is anticipated ~ Q2 2018 with each following well making 1st production every 5th day thereafter

Estimated Flow Rate:

	Lewis Federal 5300 31-31 10B		5300 31-32 CTB A	
	MCFD	BOPD	MCFD	BOPD
30 Days:	705	784	3,524	3,884
60 Days:	565	628	2,733	3,005
180 Days:	346	384	1,631	1,782

Oasis Flaring Percentage

	Statewide	Baker Field
Oasis % of Gas Flared:	**13%**	**17%**

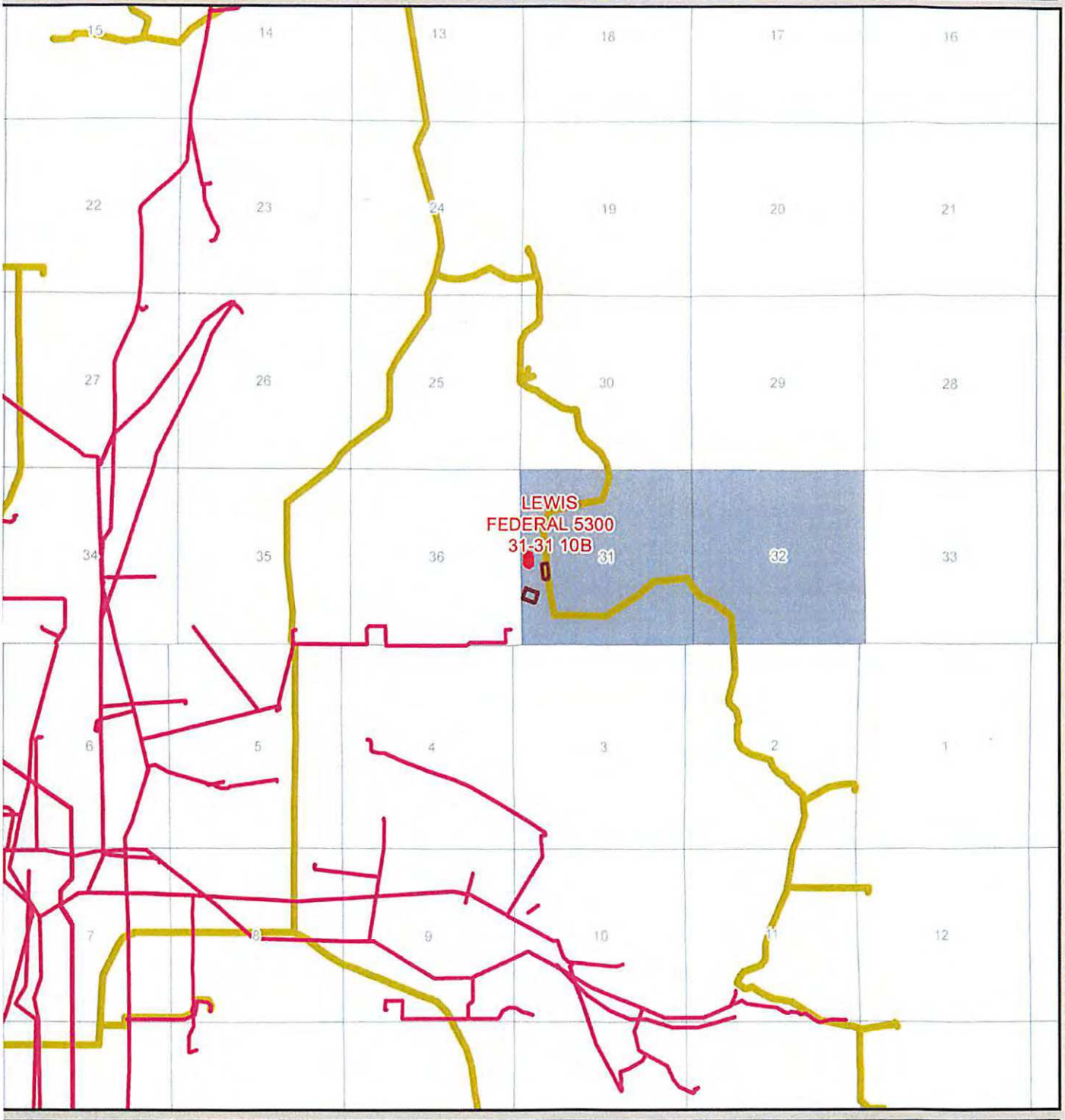
**Flared percentage reflects December 2016*

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%

Source: Oasis Marketing (281) 404-9464

Gas Capture Plan - Detail View
LEWIS FEDERAL 5300 31-31 10B
Section 31 T153N R100W
McKenzie County, North Dakota

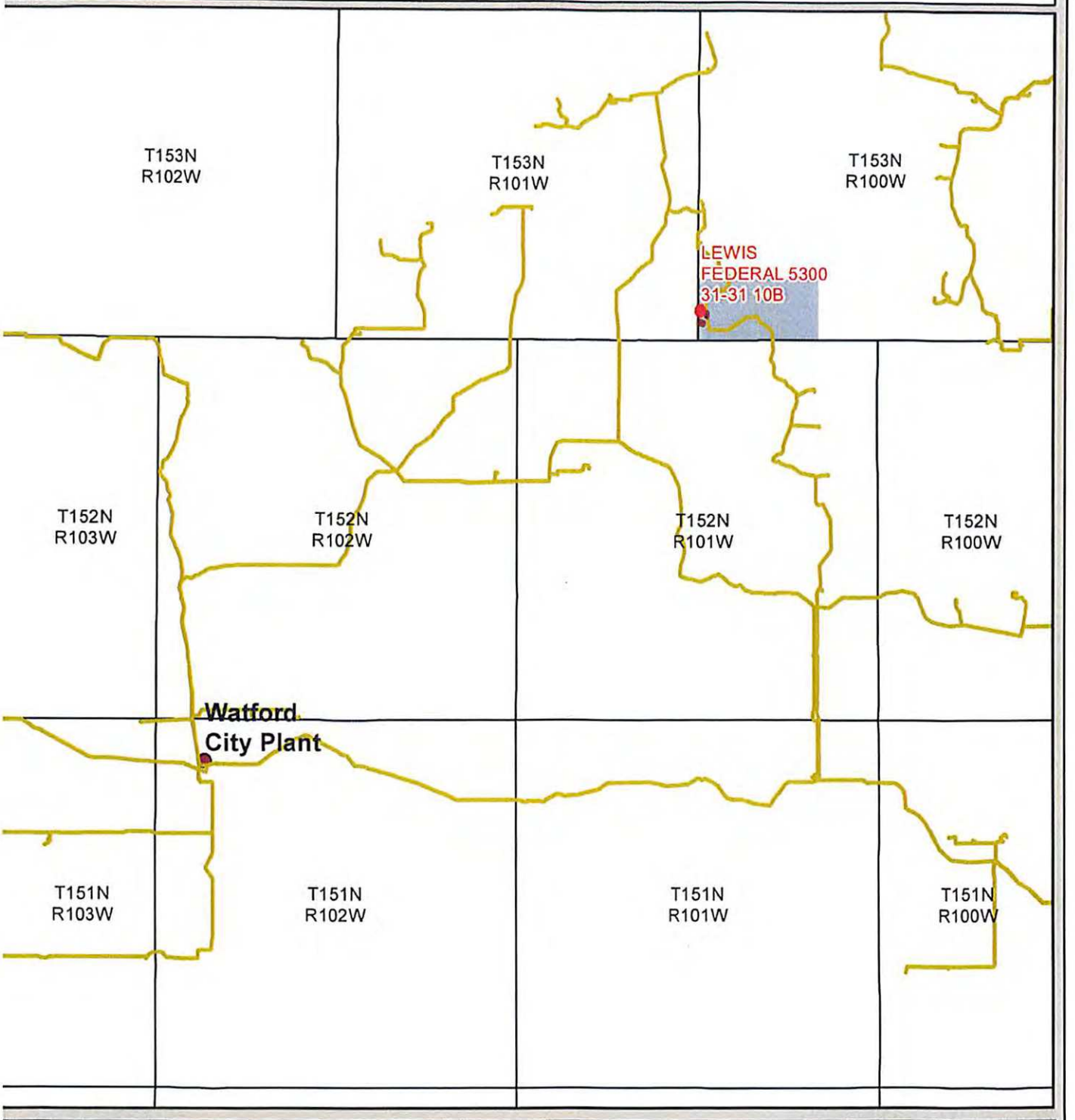


Gas Gatherer: Hiland Partners, LP
Gas to be processed at: Watford City Plant

CTB Outline
Proposed Well
Hiland Gas Line
Oneok Gas Line

OASIS PETROLEUM

Gas Capture Plan - Overview
LEWIS FEDERAL 5300 31-31 10B
Section 31 T153N R100W
McKenzie County, North Dakota



Proposed Well
CTB Outline
Hiland Gas Line
Processing Plant

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

OASIS PETROLEUM

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)

5

Received
APR 15 2016
ND Oil & Gas Division

Well File No.
28194

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

- [x] Notice of Intent — Approximate Start Date: **April 21, 2016**
- [ ] 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
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [x] Other **APD Renewal**
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [ ] Change Production Method
- [ ] Reclamation

Well Name and Number: **Lewis Federal 5300 31-31 10B**

Footages	Qtr-Qtr	Section	Township	Range
2497 F S L 251 F W L	**LOT3**	**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 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 gas capture plan.

Permit Expires 4/21/17. CC 100.00 4-22-16 KB

Company	Telephone Number
Oasis Petroleum North America LLC	**281-404-9436**

Address		
1001 Fannin St, Suite 1500		
City: **Houston**	State: **TX**	Zip Code: **77002**

Signature	Printed Name
	Jennifer Swenson
Title: **Regulatory Specialist**	Date: **April 14, 2016**
Email Address: **jswenson@oasispetroleum.com**	

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 4/21/16
By: Alicia D. Webber
Title: Engineering Technician

GAS CAPTURE PLAN AFFIDAVIT

STATE OF TEXAS §
§
COUNTY OF HARRIS §

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2. This affidavit is submitted in conjunction with the Application for Permit to Drill for the Lewis Federal 5300 31-31 10B well, with a surface location in Lot 3 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 ~ 2nd Quarter 2017, with an initial gas production rate of approximately 983 mcf/day.

Robert H. Eason
Marketing Manager

Subscribed and sworn to before me this 11th day of April, 2016.

ALEXA N. CARDONA
Notary Public, State of Texas
Comm. Expires 12-04-2019
Notary ID 130458574

Notary Public in and for the State of Texas

GAS CAPTURE PLAN – OASIS PETROLEUM

Lewis Federal 5300 31-31 10B

Section 31-T153N-R100W
Baker Field
McKenzie County, North Dakota

Anticipated first flow date	~Q2 2017
Gas Gatherer:	Hiland Partners
Gas to be processed at*:	Hiland Operated Watford City Plant
Maximum Daily Capacity of Existing Gas Line*:	92,500 MCFD
Current Throughput of Existing Gas Line*:	81,000 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	92,500 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	72,000 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	There are no expansion plans at this time.
Map:	Attached
Affidavit:	Attached

*Provided by Gatherer

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	MCFD	BOPD	MCFD	BOPD
30 Days:	705	784	3,524	3,884
60 Days:	565	628	2,733	3,005
180 Days:	346	384	1,631	1,782

Oasis Flaring Percentage

	Statewide	Baker Field
Oasis % of Gas Flared:	**6%**	**6%**

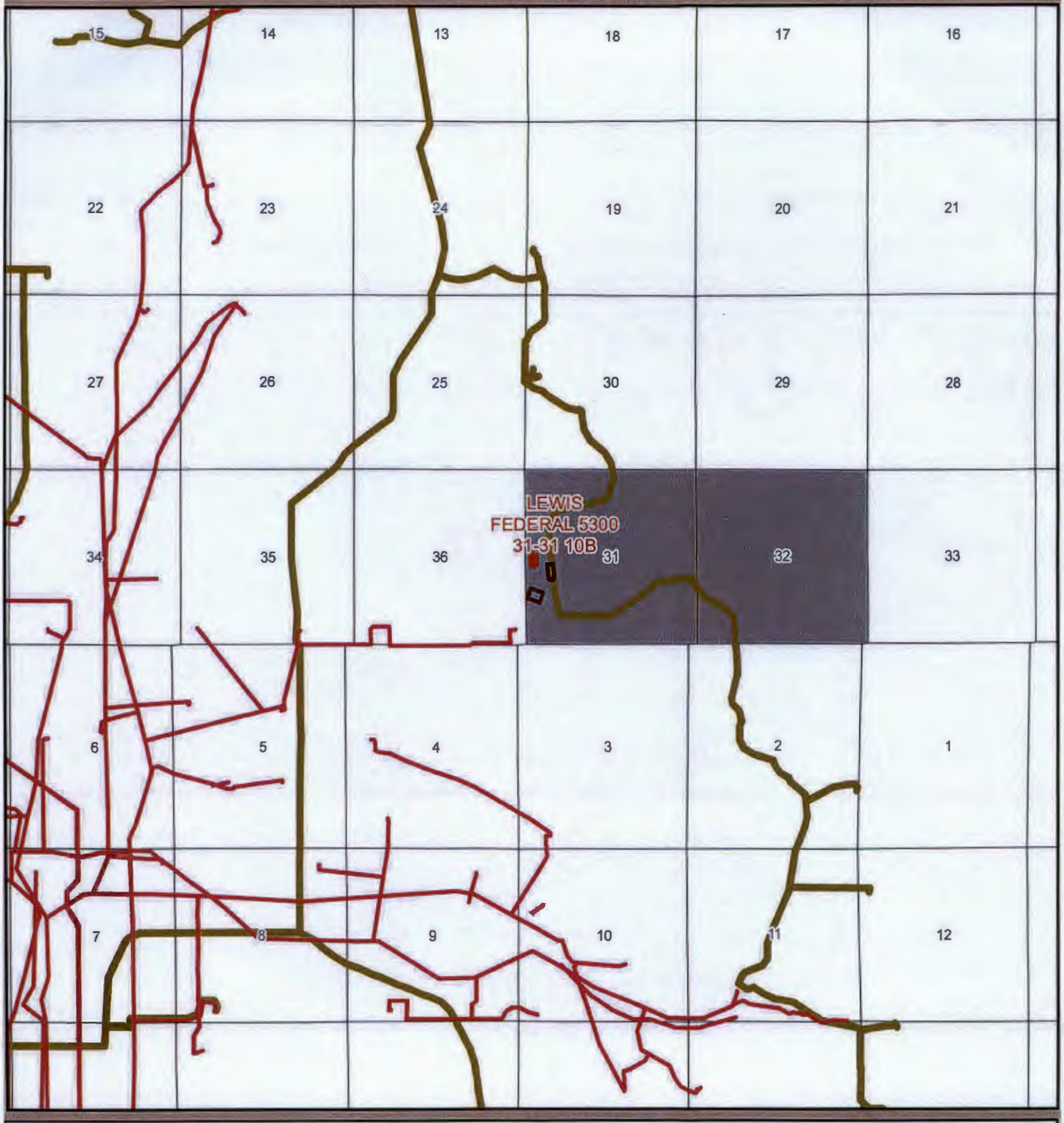
**Flared percentage reflects March 2016*

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%

Source: Oasis Marketing (281) 404-9661

Gas Capture Plan - Detail View
LEWIS FEDERAL 5300 31-31 10B
Section 31 T153N R100W
McKenzie County, North Dakota



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CTB Outline
Proposed Well
Hiland Gas Line
Oneok Gas Line

OASIS PETROLEUM

Gas Capture Plan - Overview
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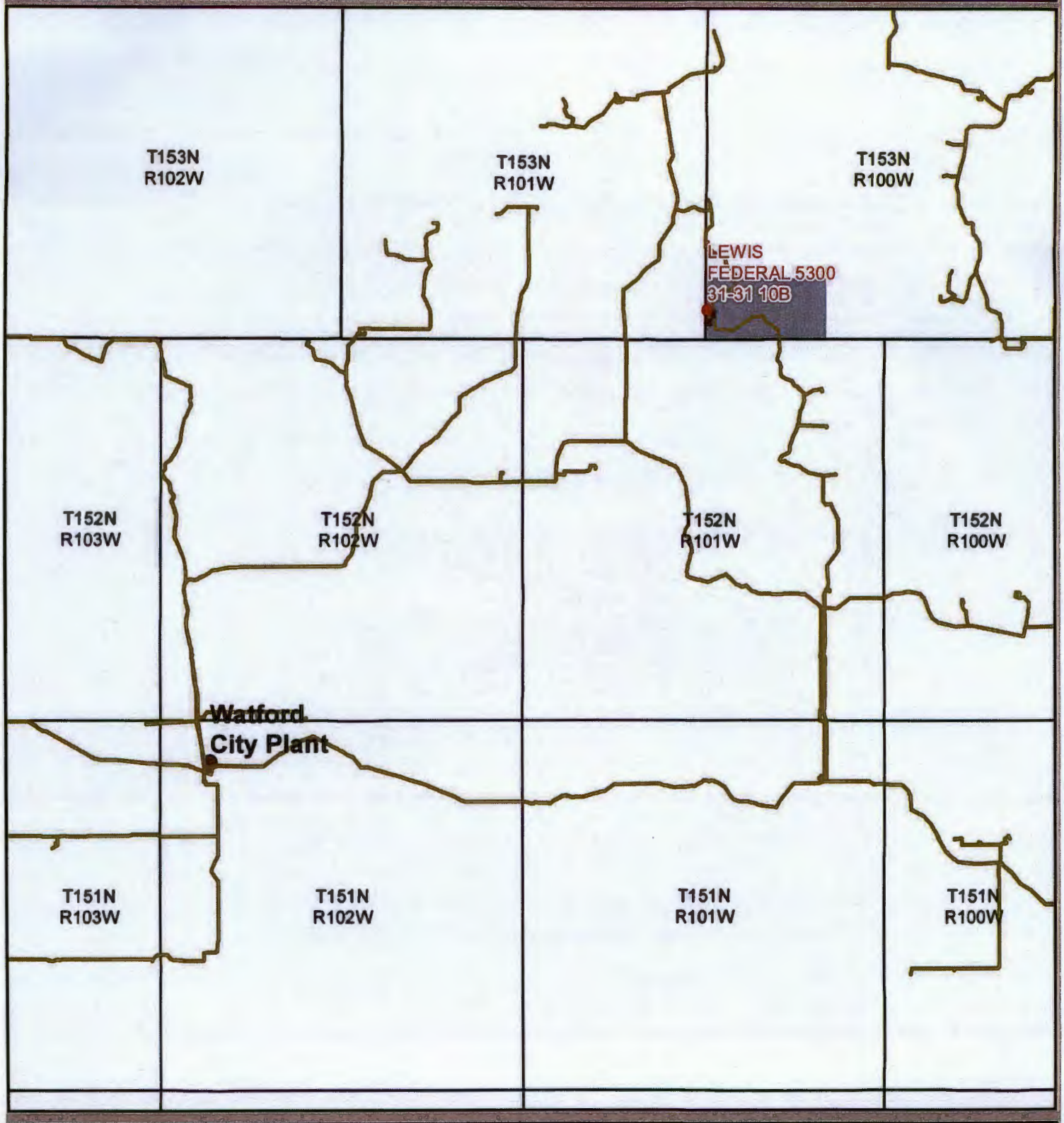
Section 31 T153N R100W
McKenzie County, North Dakota



- Proposed Well
- CTB Outline
- Hiland Gas Line
- Processing Plant

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

OASIS PETROLEUM

NORTH DAKOTA
OIL AND GAS DIVISION

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

28194

March 21, 2016

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

RE: LEWIS FEDERAL 5300 31-31 10B
LOT3 Sec. 31-153N-100W
MCKENZIE COUNTY
WELL FILE NO. 28194

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire April 21, 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 5749 (09-2006)

APR 2015
RECEIVED
ND OIL & GAS DIVISION

Well File No.
28194

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

- [x] Notice of Intent — Approximate Start Date: **April 21, 2015**
- [ ] 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
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- [ ] Plug Well
- [ ] Fracture Treatment
- [ ] Supplemental History
- [ ] Change Production Method
- [ ] Temporarily Abandon
- [ ] Reclamation
- [x] Other **APD Renewal**

Well Name and Number					
Lewis Federal 5300 31-31 10B					
Footages		Qtr-Qtr	Section	Township	Range
2497 F S L	**251 F W L**	**LOT3**	**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 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 documents including frac fluid statement, physical address statement and gas capture plan.

Permit Expires 4/21/16. CC 100 4-22-15 KB

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9500**
Address		
1001 Fannin St, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Victoria Siemieniewski	
Title	Date	
Regulatory Specialist	**April 15, 2015**	
Email Address		
vsiemieniewski@oasispetroleum.com		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 4/22/15

By: Alice D. Webber

Title: **Engineering Technician**

4/7/15

Victoria Siemieniewski
Regulatory Specialist
Oasis Petroleum
1001 Fannin St.
Suite 1500
Houston, TX 77002

Alice Webber
Engineering Technician
North Dakota Industrial Commission
600 East Boulevard Avenue Dept. 405
Bismarck, ND 58505-0840

RE: Lewis Federal 5300 21-31 6B
Lewis Federal 5300 31-31 7T2
Lewis Federal 5300 31-31 8T
Lewis Federal 5300 31-31 9T2
Lewis Federal 5300 31-31 10B
Lewis Federal 5300 31-31 11T
Frac Fluid Statement

Dear Ms. Webber:

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: Fuel, 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)

Thank you for your consideration.

Respectfully,

Victoria Siemieniewski
Regulatory Specialist
Oasis Petroleum
281-404-9652

OASIS PETROLEUM

4/15/2015

Victoria Siemieniewski
Regulatory Specialist
Oasis Petroleum
1001 Fannin St.
Suite 1500
Houston, TX 77002

Alice Webber
Engineering Technician
North Dakota Industrial Commission
600 East Boulevard Avenue Dept. 405
Bismarck, ND 58505-0840

RE: Lewis Federal 5300 21-31 6B
Lewis Federal 5300 31-31 7T2
Lewis Federal 5300 31-31 8T
Lewis Federal 5300 31-31 9T2
Lewis Federal 5300 31-31 10B
Lewis Federal 5300 31-31 11T
Request for a legal street address

Dear Ms. Webber:

Oasis Petroleum has requested a physical street address for the subject well/well facility. The request was made to Aaron Chisholm, GIS Specialist, McKenzie County. Upon receiving a legal street address, Oasis will submit the address to the NDIC on a Sundry Notice (form 4) pursuant to 43-02-03-28.

Thank you for your consideration.

Respectfully,

Victoria Siemieniewski
Regulatory Specialist
Oasis Petroleum
281-404-9652

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 31-31 10B well, with a surface location in Lot 3 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 ~ 2nd Quarter 2016, with an initial gas production rate of approximately 983 mcf/day.

Robert H. Eason
Marketing Manager

Subscribed and sworn to before me this 7th day of April, 2015.

Notary Public in and for the State of Texas
My Commission expires: 6.5.18

ARMANDINA BARRON
Notary Public, State of Texas
My Commission Expires
June 05, 2018

GAS CAPTURE PLAN – OASIS PETROLEUM

Lewis Federal 5300 31-31 10B

Section 31-T153N-R100W
Baker Field
McKenzie County, North Dakota

Anticipated first flow date	~Q2 2016
Gas Gatherer:	Hiland Partners
Gas to be processed at*:	Hiland Operated Watford City Plant
Maximum Daily Capacity of Existing Gas Line*:	55,000 MCFD
Current Throughput of Existing Gas Line*:	37,000 MCFD
Anticipated Daily Capacity of Existing Gas Line at Date of First Gas Sales*:	71,500 MCFD
Anticipated Throughput of Existing Gas Line at Date of First Gas Sales*:	70,000 MCFD
Gas Gatherer's Issues or Expansion Plans for the Area*:	~17 miles of line looping, installation of the River's Edge compressor station and the addition of new compression at the Forthune compressor station. All scheduled to be completed and in service by 3rd Q of 2015.
Map:	Attached
Affidavit:	Attached

*Provided by Gatherer

Flowback Strategy

Total Number of Wells at Location: 5

Multi-Well Start-up Plan: Initial production from the 1st new well at the CTB is anticipated ~ Q2 2016 with each following well making 1st production every 5th day thereafter

Estimated Flow Rate:	Lewis Federal 5300 31-31 10B		5300 31-32 CTB A	
	MCFD	BOPD	MCFD	BOPD
30 Days:	705	784	3,524	3,884
60 Days:	565	628	2,733	3,005
180 Days:	346	384	1,631	1,782

Oasis Flaring Percentage

	Statewide	Baker Field
Oasis % of Gas Flared:	**13%**	**21%**

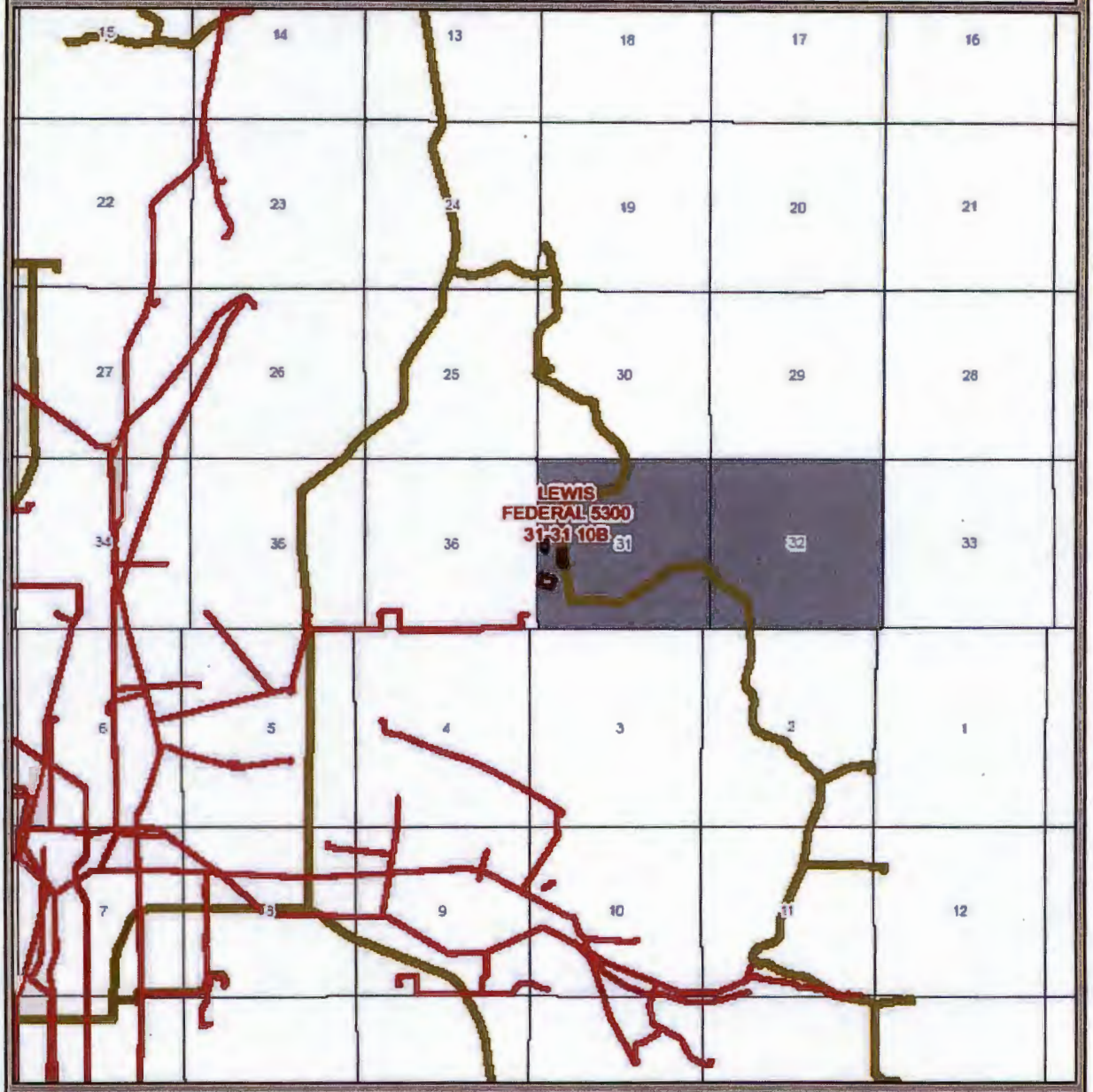
**Flared percentage reflects February 2015*

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%

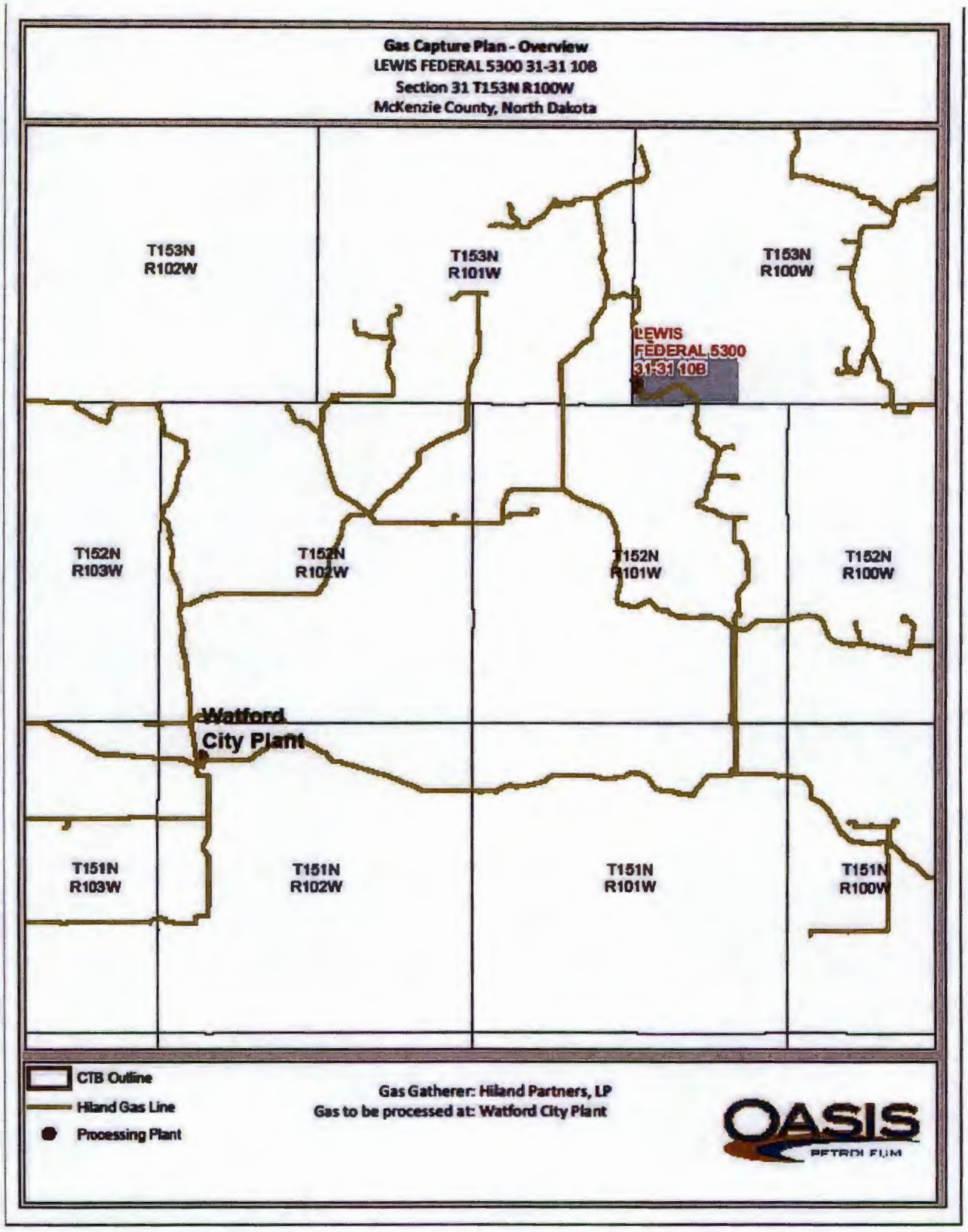
Source: Oasis Marketing (281) 404-9435

Gas Capture Plan - Detail View
LEWIS FEDERAL 5300 31-31 10B
Section 31 T153N R100W
McKenzie County, North Dakota



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

OASIS PETROLEUM


Gas Capture Plan - Overview
LEWIS FEDERAL 5300 31-31 10B
Section 31 T153N R100W
McKenzie County, North Dakota
T153N R102W
T153N R101W
T153N R100W
LEWIS FEDERAL 5300 31-31 10B
T152N R103W
T152N R102W
T152N R101W
T152N R100W
Watford City Plant
T151N R103W
T151N R102W
T151N R101W
T151N R100W
CTB Outline
Hiland Gas Line
Processing Plant
Gas Gatherer: Hiland Partners, LP
Gas to be processed at: Watford City Plant
OASIS
PETROLEUM

28194

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

March 23, 2015

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

RE: LEWIS FEDERAL 5300 31-31 10B
LOT3 Sec. 31-153N-100W
MCKENZIE COUNTY
WELL FILE NO. 28194

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire April 21, 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,

Jeanette Bean
Administrative Assistant

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/

28194

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

Date: **4/28/2014**

RE: CORES AND SAMPLES

Well Name: **LEWIS FEDERAL 5300 31-31 10B** Well File No.: **28194**
Location: **LOT3 31-153-100** County: MCKENZIE
Permit Type: **Development - HORIZONTAL**
Field: **BAKER** Target Horizon: BAKKEN

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 - 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.
28194

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

☑ Notice of Intent	Approximate Start Date: April 1, 2014	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed:	☐ Redrilling or Repair	☐ Shooting
☐ 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:	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	Variance to Rule 43-02-03-31

Well Name and Number: **Lewis Federal 5300 31-31 10B**

Footages	Qtr-Qtr	Section	Township	Range
2497 F S L 251 F W L	Lot3	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 Petroleum North America, LLC requests a variance to rule 43-02-03-31 requiring electrical, radioactive or other similar logs to be run to determine formation tops and zones of porosity. The surface location of this well will be very near our Lewis 5300 31-31T (API #33-053-03433 NDIC # 20314) in Lot 3 Section 31, T153N, R100W and the logs run on this well should be sufficient to determine formation tops in the vertical section of the well bore. As outlined in our application for permit to drill, Oasis Petroleum North America, LLC will run gamma ray logs from KOP to the total depth and cement bond log from the production casing total depth to surface. Two digital copies of all mud logs (one tif and one las) will be submitted to the NDIC.

Company	Telephone Number
Oasis Petroleum North America, LLC	(281) 404-9562
Address: 1001 Fannin, Suite 1500	
City: Houston	State: TX / Zip Code: 77002
Signature	Printed Name: Lauri M. Stanfield
Title: Regulatory Specialist	Date: March 13, 2014
Email Address: lstanfield@oasispetroleum.com	

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 4-21-2014	
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. 28194

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

☑ Notice of Intent	Approximate Start Date: April 1, 2014	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed:	☐ Redrilling or Repair	☐ Shooting
☐ 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:	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	NDAC 43-02-03-55 Waiver

Well Name and Number					
Lewis Federal 5300 31-31 10B					
Footages	Qtr-Qtr	Section	Township	Range	
2497 F S L 251 F W L	Lot 3	31	153 N	100 W	
Field	Pool	County			
Baker	Bakken/~~Three Forks~~	McKenzie			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Advanced Energy Services			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis intends to drill the surface hole with freshwater based drilling mud and set surface casing with a small drilling rig and move off within 3 to 5 days. The casing will be set at a depth pre-approved by the NDIC per the Application for Permit to Drill NDAC 43-02-03-21. No saltwater will be used in the drilling and cementing operations of the surface casing. Once the surface casing is cemented, a plug or mechanical seal will be placed at the top of the casing to prevent any foreign matter from getting into the well. A rig capable of drilling to TD will move onto the location within the 90 days previously outlined to complete the drilling and casing plan as per the APD. The undersigned states that this request for suspension of drilling operations in accordance with the Subsection 4 of Section 43-02-03-55 of the NDAC, is being requested to take advantage of the cost savings and time savings of using an initial rig that is smaller than the rig necessary to drill a well to total depth but is not intended to alter or extend the terms and conditions of, or suspend any obligation under, any oil and gas lease with acreage in or under the spacing or drilling unit for the above-referenced well. Oasis understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The lined reserve pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis will plug and abandon the well and reclaim the well site if the well is not drilled by the larger rotary rig within 90 days after spudding the well with the smaller drilling rig.

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

Company		Telephone Number
Oasis Petroleum North America, LLC		(281) 404-9562
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	TX	77002
Signature	Printed Name	
	Lauri M. Stanfield	
Title	Date	
Regulatory Specialist	March 13, 2014	
Email Address		
lstanfield@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☑ Approved
Date	4-21-2014
By	
Title	~~David Burns~~ Engineering Tech.

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

April 21, 2014

Lauri M. Stanfield
Regulatory Specialist
OASIS PETROLEUM NORTH AMERICA LLC
1001 Fannin Street, Suite 1500
Houston, TX 77002

RE: HORIZONTAL WELL
LEWIS FEDERAL 5300 31-31 10B
LOT3 Section 31-153N-100W
McKenzie County
Well File # 28194

Dear Lauri:

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.

PERMIT STIPULATIONS: Due to a drainage adjacent to the well site, a dike is required surrounding the entire location. 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 coordinate from the well head is: 10084 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.

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

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	Type of Well	Approximate Date Work Will Start	Confidential Status
New Location	**Oil & Gas**	**04 / 01 / 2014**	**No**

Operator	Telephone Number
OASIS PETROLEUM NORTH AMERICA LLC	**281-404-9562**

Address	City	State	Zip Code
1001 Fannin Street, Suite 1500	**Houston**	**TX**	**77002**

☑ 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	Well Number
LEWIS FEDERAL	**5300 31-31 10B**

Surface Footages	Qtr-Qtr	Section	Township	Range	County
2497 F **S** L **251** F **W** L	**LOT3**	**31**	**153 N**	**100 W**	**McKenzie**
Longstring Casing Point Footages					
2355 F **S** L **774** F **W** L	**LOT3**	**31**	**153 N**	**100 W**	**McKenzie**

Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth
142 S From WH **523 E** From WH	**106 º**	**11071** Feet MD **10784** Feet TVD

Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
2285 F **S** L **212** F **E** L	**NESE**	**32**	**153 N**	**100 W**	**McKenzie**

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
212 S From WH **10062 E** From WH	**10306** Feet MD	**90 º**	**20617** Feet MD **10868** Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 01 ' 52.48 "	**-103 ° 36 ' 11.33 "**	**NAD83**	**Spacing Unit: Sections 31 & 32 T153N R100W**

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
2133 Feet Above S.L.	**1280**	**500** Feet N/S **200** Feet E/W	**23752**

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
10522 Feet	**10535** Feet	**5280** Feet	**5248** Feet

Objective Horizons	Pierre Shale Top
Bakken	**2008**

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	**13 - 3/8 "**	**54** Lb./Ft.	**2110** Feet	**1184** Sacks	**NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.**

Proposed	Size	Weight(s)	Longstring Total Depth	Cement Volume	Cement Top	Top Dakota Sand
Longstring Casing	**7 - "**	**29/32** Lb./Ft.	**11071** Feet MD **10784** Feet TVD	**822** Sacks	**3909** Feet	**5409** Feet

Base Last Charles Salt (If Applicable)	
9254 Feet	**NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.**

Proposed Logs
Triple Combo: KOP to Kibbey GR/RES to BSC GR to Surf CND through the Dakota

Drilling Mud Type (Vertical Hole - Below Surface Casing)	Drilling Mud Type (Lateral)
Invert	**Salt Water Gel**

Survey Type in Vertical Portion of Well	Survey Frequency: Build Section	Survey Frequency: Lateral	Survey Contractor
MWD Every 100 Feet	**30** Feet	**90** Feet	**Ryan**

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

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	From WH	Bottom Hole Coordinates From Well Head From WH	From WH		
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	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	From WH	Bottom Hole Coordinates From Well Head From WH	From WH		
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	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	From WH	Bottom Hole Coordinates From Well Head From WH	From WH		
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	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	From WH	Bottom Hole Coordinates From Well Head From WH	From WH		
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County

I hereby swear or affirm the information provided is true, complete and correct as determined from all available records.	Date 03 / 17 / 2014
ePermit	Printed Name Lauri M. Stanfield	Title Regulatory Specialist

FOR STATE USE ONLY

Permit and File Number 28194	API Number 33 - 053 - 05849
Field BAKER	
Pool BAKKEN	Permit Type DEVELOPMENT

FOR STATE USE ONLY

Date Approved 4 / 21 / 2014
By David Burns
Title Engineering Technician

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

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.

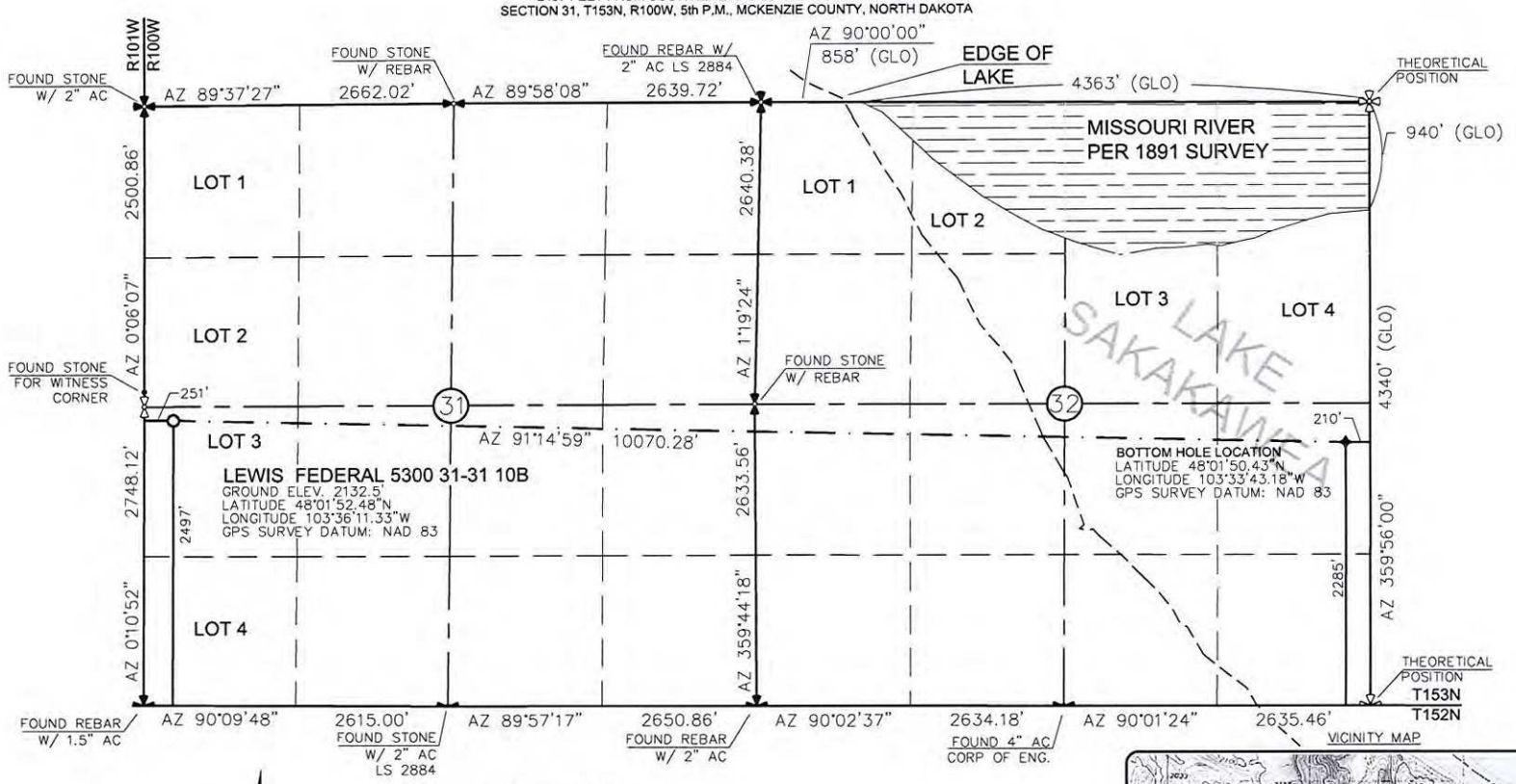
Thank you for your cooperation.

Sincerely,

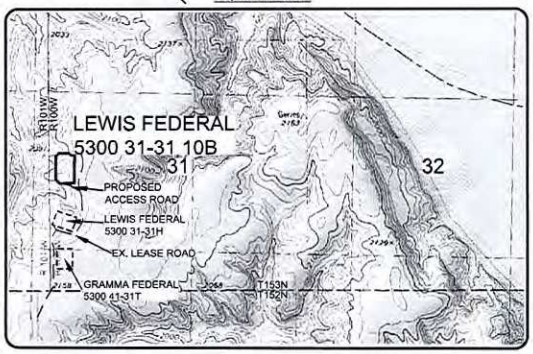
Bruce E. Hicks
Assistant Director

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP



THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 1/20/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

– MONUMENT – RECOVERED
– MONUMENT – NOT RECOVERED

STAKED ON 1/9/14
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 ERIC BAYES 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

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 1/20/14
NORTH DAKOTA

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Drawn By: B.H.H. Project No.: 513-09-379.06
Checked By: D.D.K. Date: JAN. 2014

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
Other offices in Minnesota, North Dakota and South Dakota

INTERSTATE ENGINEERING
Professionals you need, people you trust

SHEET NO. 1/8

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Lewis Federal 5300 31-31 10B	**RIG**	Nabors B22
WELL TYPE	Horizontal Middle Bakken		
LOCATION	NW SW 31-153N-100W Surface Location (survey plat): 2497' FSL	251' FWL	
EST. T.D.	20,616'	**GROUND ELEV:** 2,133'	**Sub Height:** 25'
	TOTAL LATERAL: 9,545'	**KB ELEV:** 2,158'	

MARKER		TVD	Subsea TVD
Pierre	NDIC MAP	2,008	150
Greenhorn		4,608	-2,450
Mowry		5,021	-2,863
Dakota		5,409	-3,251
Rierdon		6,371	-4,213
Dunham Salt		6,901	-4,743
Dunham Salt Base		6,971	-4,813
Pine Salt		7,273	-5,115
Pine Salt Base		7,338	-5,180
Opeche Salt		7,404	-5,246
Opeche Salt Base		7,495	-5,337
Amsden		7,717	-5,559
Tyler		7,865	-5,707
Otter/Base Minnelusa		8,089	-5,931
Kibbey Lime		8,432	-6,274
Charles Salt		8,585	-6,427
Base Last Salt		9,254	-7,096
Mission Canyon		9,470	-7,312
Lodgepole		10,011	-7,853
False Bakken		10,740	-8,582
Upper Bakken Shale		10,752	-8,594
Middle Bakken (Top of Target)		10,779	-8,621
Middle Bakken (Base of target)		10,789	-8,631
Lower Bakken Shale		10,804	-8,646
Threeforks		10,834	-8,676

Est. Dip Rate: -0.50

Max. Anticipated BHP: 4681

LOGS:	Type	Interval
	OH Logs: Request Log waiver based on the Lewis Federal 5300 31-31H 1,250' S of surface location	
	CBL/GR: Above top of cement/GR to base of casing	
	MWD GR: KOP to lateral TD	
DEVIATION:	Surf:	3 deg. max., 1 deg / 100'; srvy every 500'
	Prod:	5 deg. max., 1 deg / 100'; srvy every 100'
DST'S:	None planned	
CORES:	None planned	
MUDLOGGING:	Two-Man:	Begin 200' above Kibbey 30' samples in curve and lateral
BOP:	11" 5000 psi blind, pipe & annular	

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,110'	FW	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,110' -	11,071'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,071' -	20,616'	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#	17.5"	2,110'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,071'		3909	24	1500' above Dakota
Production Liner:	4.5"	11.6#	6"	20,616'	TOL @ 10,256'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI	
Surface:	2,110	2,110	2497' FSL	251' FWL	S31-T153N-R100W		Survey Company:
KOP:	10,306'	10,306'	2487' FSL	299' FWL	S31-T153N-R100W		Build Rate: 12 deg /100'
EOC:	11,052'	10,784'	2360' FSL	755' FWL	S31-T153N-R100W	105.0	Turn Rate: 3 deg /100'
Casing Point:	11,071'	10,784'	2355' FSL	774' FWL	S31-T153N-R100W	105.0	
Middle Bakken Lateral TD:	20,616'	10,868'	2285' FSL	200' FEL	S32-T153N-R100W	90.0	

Comments:

Request Log waiver based on the Lewis Federal 5300 31-31H 1,250' S of surface location
35 packers and 25 sleeves
No frac string planned

Geology: NAG 1/22/2014 **Engineering:** M. Brown 3-6-2014

March 3, 2014
NDIC – Oil and Gas Division

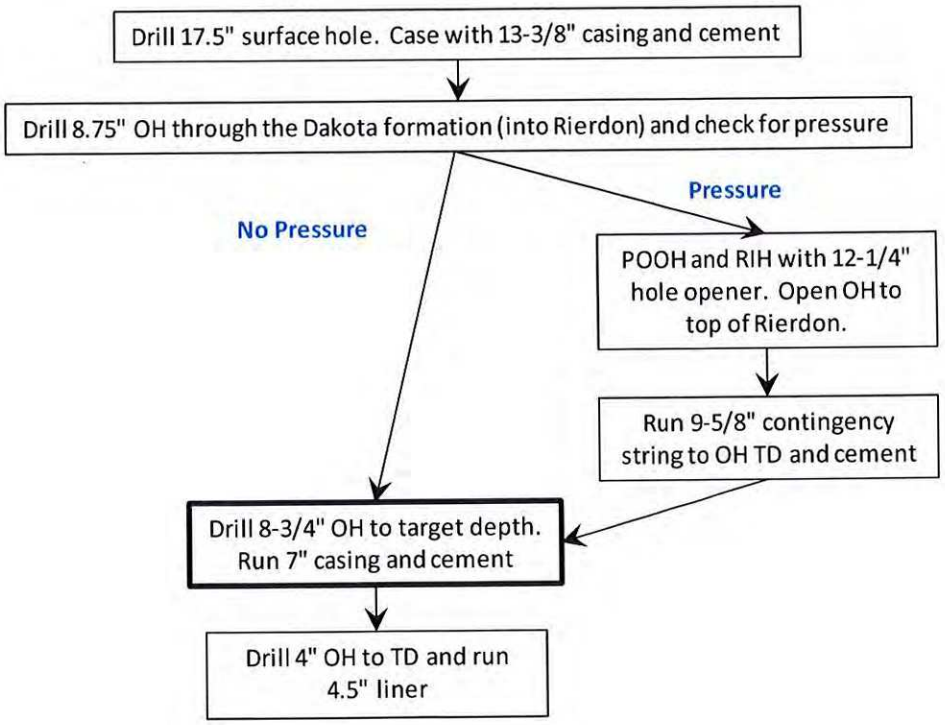
To whom it may concern:

When Oasis Petroleum drilled the Gramma Federal 5300 41-31T (NDIC #23350) in October of 2012, the following issues were encountered:

- Dakota formation (est. 11.2 EMW) causing an influx of brine
- Loss zone in the Mission Canyon at weights above ~10.2ppg resulting in significant losses as a result of high EMW needed for Dakota

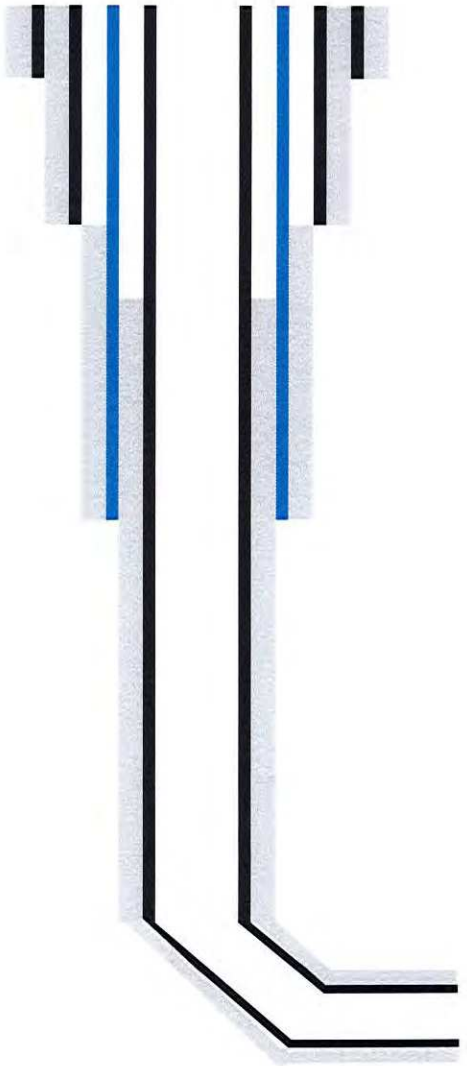
The pressured Dakota formation was again seen on the Buck Shot SWD 5201 11-3 (NDIC #90244) at an estimated equivalent mud weight (EMW) of 11.2ppg.

As a result of proximity, Oasis Petroleum is anticipating the possibility of seeing both the pressured Dakota and the loss zone in the Mission Canyon. In order to manage this, Oasis Petroleum is proposing to allow for a contingency string across the Dakota Formation. Contingency plan outlined below in flow chart. Please refer to attached wellbore diagram for representation of proposed casing design.



Sincerely,
Mike Brown
Drilling Engineer II

Lewis Infill 9-5/8" Contingency String



Hole Section	Hole Size	Casing Size	Weight	Drift	TD	TOC
Conductor	24	20	52.8	19.5	70	SFC
Surface	17.5	13.375	54.5	12.459	2100	SFC
		Contingency 9-5/8" casing string across Dakota				
INT - Dakota	12.25	9.625	40	8.75	6400	SFC Shoe
Prod Casing	8.75	7	29/32	6.0+	11100	3888

Oasis Petroleum
3/4/2014

Oasis Petroleum
Well Summary
Lewis Federal 5300 31-31 10B
Sec. 31 T153N R100W
McKenzie County, North Dakota

SURFACE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
13-3/8”	0’ to 2110	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 2110	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 (2110' setting depth).
b) Burst pressure based on 9 ppg fluid with no fluid on backside (2110' setting depth).
c) Based on string weight in 9 ppg fluid at 2110' TVD plus 100k# overpull. (Buoyed weight equals 99k lbs.)

Cement volumes are based on 13-3/8" casing set in 17-1/2" 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 31-31 10B
Sec. 31 T153N R100W
McKenzie County, North Dakota

CONTINGENCY INTERMEDIATE CASING AND CEMENT DESIGN

Intermediate Casing Design

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
9-5/8"	0' - 6400'	40	L-80	LTC	8.835"	8.75"**	5,450	7,270	9,090

**Special Drift

Interval	Description	Collapse	Burst	Tension
		(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 9-5/8" casing set in a 12-1/4" 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% CaCl2, 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 31-31 10B
Sec. 31 T153N R100W
McKenzie County, North Dakota

INTERMEDIATE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
7”	0' - 6750'	29	P-110	LTC	6.184”	6.059”	5,980	7,970	9,960
7”	6750' - 10306'	32	HCP-110	LTC	6.094”	6.000”**	6,730	8,970	11210
7”	10306' - 11071'	29	P-110	LTC	6.184”	6.059”	5,980	7,970	9,960

****Special Drift**

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' - 6750'	7”, 29#, HCP-110, LTC, 8rd	8530 / 2.43*	11220 / 1.19	797 / 2.09
6750' - 10306'	7”, 32#, HCP-110, LTC, 8rd	11820 / 2.20*	12460 / 1.29	
6750' - 10306'	7”, 32#, HCP-110, LTC, 8rd	11820 / 1.05**	12460 / 1.29	
10306' - 11071'	7”, 32#, HCP-110, LTC, 8rd	8530 / 1.52*	11220 / 1.15	

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 10784' TVD.
c. Based on string weight in 10 ppg fluid, (281k 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: **217 sks** (87 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: **605 sks** (166 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 31-31 10B
Sec. 31 T153N R100W
McKenzie County, North Dakota

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Estimated Torque
4-1/2”	10256' - 20792'	11.6	P-110	BTC	4.000"	3.875"	4,500psi

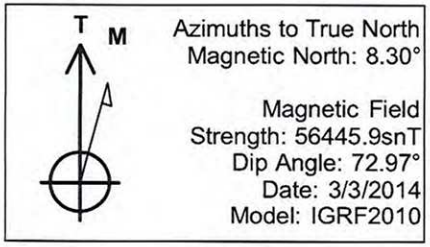
Interval	Description	Collapse	Burst	Tension	Condition
		(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10256' - 20792'	4-1/2”, 11.6 lb, P-110, BTC, 8rd	7560 / 1.40	10690 / 1.10	385 / 1.89	New

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10868' TVD.
b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10868' TVD.
c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 107k lbs.) plus 100k lbs overpull.

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)



Azimuths to True North
Magnetic North: 8.30°

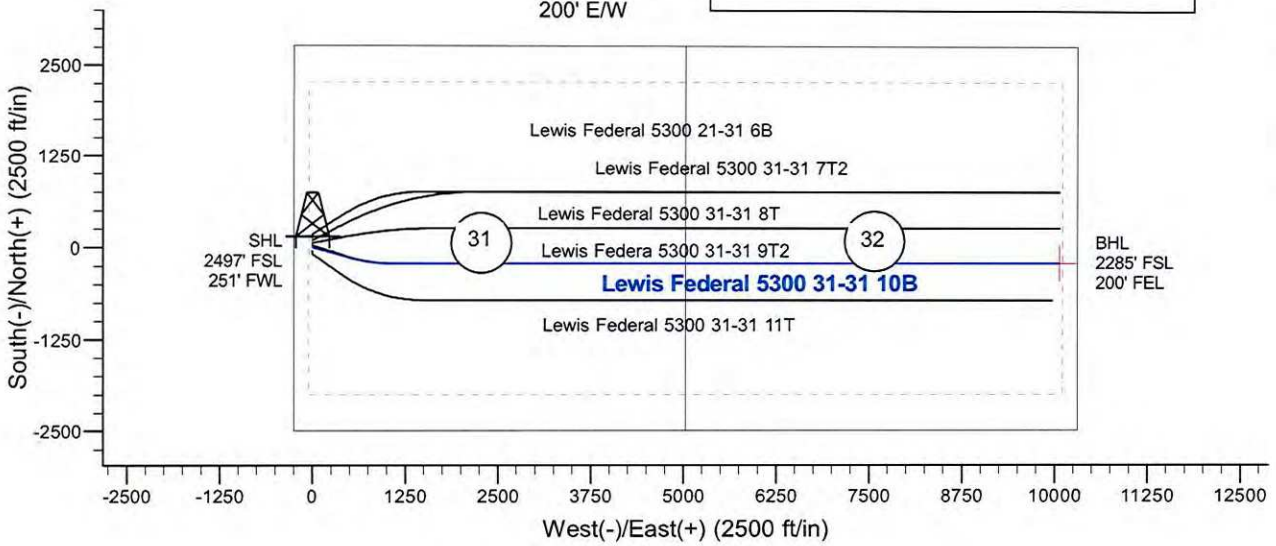
Magnetic Field
Strength: 56445.9snT
Dip Angle: 72.97°
Date: 3/3/2014
Model: IGRF2010

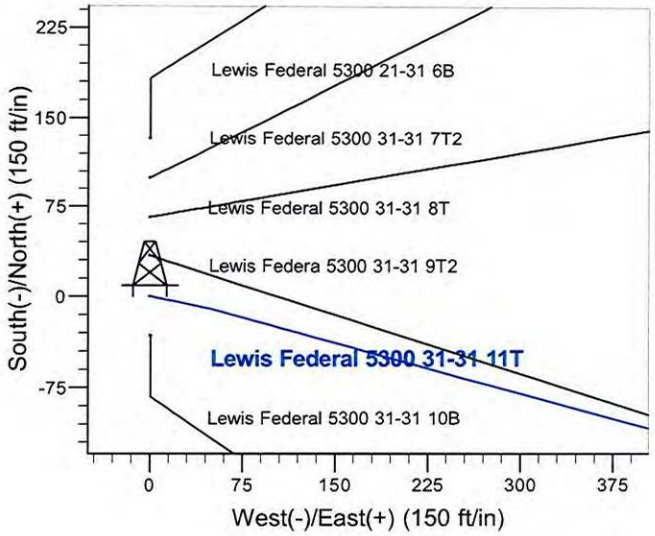
OASIS PETROLEUM

SITE DETAILS: 153N-100W-31/32
Site Centre Latitude: 48° 1' 52.480 N Longitude: 103° 36' 11.330 W
Positional Uncertainity: 0.0 Convergence: -2.31 Local North: True

Project: Indian Hills
Site: 153N-100W-31/32
Well: Lewis Federal 5300 31-31 10B
Wellbore: Lewis Fed #10B
Design: Plan #1

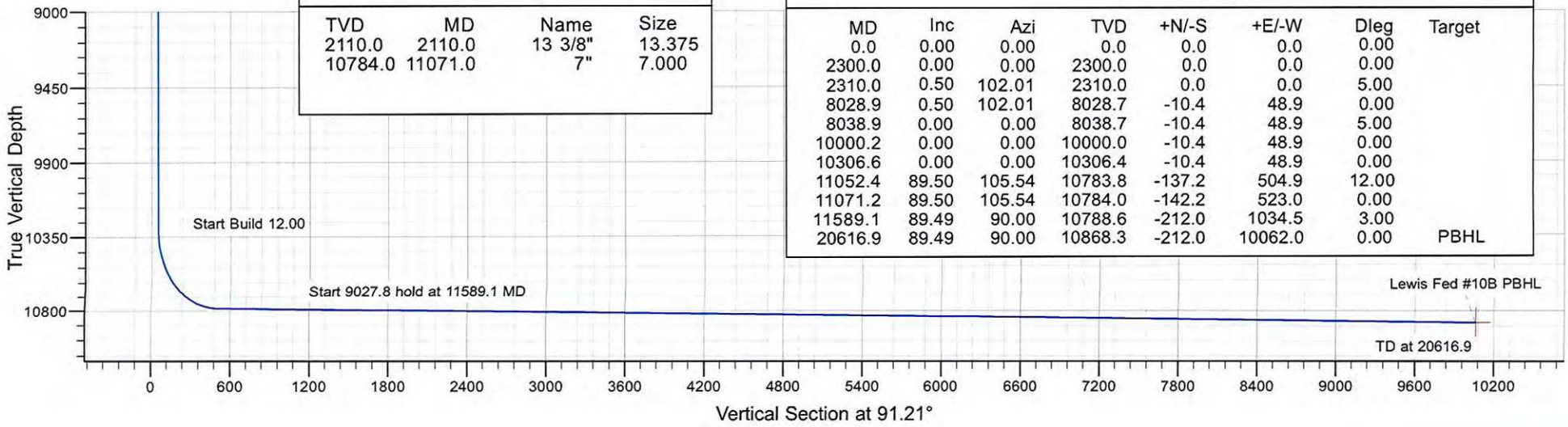
Setbacks
500' N/S
200' E/W





CASING DETAILS			
TVD	MD	Name	Size
2110.0	2110.0	13 3/8"	13.375
10784.0	11071.0	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	
2300.0	0.00	0.00	2300.0	0.0	0.0	0.00	
2310.0	0.50	102.01	2310.0	0.0	0.0	5.00	
8028.9	0.50	102.01	8028.7	-10.4	48.9	0.00	
8038.9	0.00	0.00	8038.7	-10.4	48.9	5.00	
10000.2	0.00	0.00	10000.0	-10.4	48.9	0.00	
10306.6	0.00	0.00	10306.4	-10.4	48.9	0.00	
11052.4	89.50	105.54	10783.8	-137.2	504.9	12.00	
11071.2	89.50	105.54	10784.0	-142.2	523.0	0.00	
11589.1	89.49	90.00	10788.6	-212.0	1034.5	3.00	
20616.9	89.49	90.00	10868.3	-212.0	10062.0	0.00	PBHL



Oasis

Indian Hills
153N-100W-31/32
Lewis Federal 5300 31-31 10B

Lewis Fed #10B

Plan: Plan #1

Standard Planning Report

04 March, 2014

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	Plan #1		

Project	Indian Hills		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site	153N-100W-31/32				
Site Position:		**Northing:**	390,399.32 ft	**Latitude:**	48° 1' 42.010 N
From:	Lat/Long	**Easting:**	1,209,468.83 ft	**Longitude:**	103° 36' 10.620 W
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.31 °

Well	Lewis Federal 5300 31-31 10B					
Well Position	**+N/-S**	1,060.9 ft	**Northing:**	391,461.29 ft	**Latitude:**	48° 1' 52.480 N
	+E/-W	-48.3 ft	**Easting:**	1,209,463.36 ft	**Longitude:**	103° 36' 11.330 W
Position Uncertainty		0.0 ft	**Wellhead Elevation:**		**Ground Level:**	2,133.0 ft

Wellbore	Lewis Fed #10B				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	3/3/2014	8.30	72.97	56,446

Design	Plan #1			
Audit Notes:				
Version:	**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.0	0.0	0.0	91.21

Plan Sections

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	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,310.0	0.50	102.01	2,310.0	0.0	0.0	5.00	5.00	0.00	102.01	
8,028.9	0.50	102.01	8,028.7	-10.4	48.9	0.00	0.00	0.00	0.00	
8,038.9	0.00	0.00	8,038.7	-10.4	48.9	5.00	-5.00	0.00	180.00	
10,000.2	0.00	0.00	10,000.0	-10.4	48.9	0.00	0.00	0.00	0.00	
10,306.6	0.00	0.00	10,306.4	-10.4	48.9	0.00	0.00	0.00	0.00	
11,052.4	89.50	105.54	10,783.8	-137.2	504.9	12.00	12.00	0.00	105.54	
11,071.2	89.50	105.54	10,784.0	-142.2	523.0	0.00	0.00	0.00	0.00	
11,589.1	89.49	90.00	10,788.6	-212.0	1,034.5	3.00	0.00	-3.00	269.91	
20,616.9	89.49	90.00	10,868.3	-212.0	10,062.0	0.00	0.00	0.00	0.00	Lewis Fed #10B PBH

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	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
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,008.0	0.00	0.00	2,008.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre									
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,110.0	0.00	0.00	2,110.0	0.0	0.0	0.0	0.00	0.00	0.00
13 3/8"									
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 5.00									
2,310.0	0.50	102.01	2,310.0	0.0	0.0	0.0	5.00	5.00	0.00
Start 5718.9 hold at 2310.0 MD									
2,400.0	0.50	102.01	2,400.0	-0.2	0.8	0.8	0.00	0.00	0.00
2,500.0	0.50	102.01	2,500.0	-0.4	1.7	1.7	0.00	0.00	0.00
2,600.0	0.50	102.01	2,600.0	-0.5	2.5	2.5	0.00	0.00	0.00
2,700.0	0.50	102.01	2,700.0	-0.7	3.4	3.4	0.00	0.00	0.00
2,800.0	0.50	102.01	2,800.0	-0.9	4.2	4.2	0.00	0.00	0.00
2,900.0	0.50	102.01	2,900.0	-1.1	5.1	5.1	0.00	0.00	0.00
3,000.0	0.50	102.01	3,000.0	-1.3	5.9	6.0	0.00	0.00	0.00
3,100.0	0.50	102.01	3,100.0	-1.4	6.8	6.8	0.00	0.00	0.00
3,200.0	0.50	102.01	3,200.0	-1.6	7.6	7.7	0.00	0.00	0.00
3,300.0	0.50	102.01	3,300.0	-1.8	8.5	8.5	0.00	0.00	0.00
3,400.0	0.50	102.01	3,400.0	-2.0	9.3	9.4	0.00	0.00	0.00
3,500.0	0.50	102.01	3,500.0	-2.2	10.2	10.2	0.00	0.00	0.00
3,600.0	0.50	102.01	3,600.0	-2.4	11.1	11.1	0.00	0.00	0.00
3,700.0	0.50	102.01	3,699.9	-2.5	11.9	12.0	0.00	0.00	0.00
3,800.0	0.50	102.01	3,799.9	-2.7	12.8	12.8	0.00	0.00	0.00
3,900.0	0.50	102.01	3,899.9	-2.9	13.6	13.7	0.00	0.00	0.00
4,000.0	0.50	102.01	3,999.9	-3.1	14.5	14.5	0.00	0.00	0.00
4,100.0	0.50	102.01	4,099.9	-3.3	15.3	15.4	0.00	0.00	0.00
4,200.0	0.50	102.01	4,199.9	-3.4	16.2	16.2	0.00	0.00	0.00
4,300.0	0.50	102.01	4,299.9	-3.6	17.0	17.1	0.00	0.00	0.00
4,400.0	0.50	102.01	4,399.9	-3.8	17.9	18.0	0.00	0.00	0.00
4,500.0	0.50	102.01	4,499.9	-4.0	18.7	18.8	0.00	0.00	0.00
4,600.0	0.50	102.01	4,599.9	-4.2	19.6	19.7	0.00	0.00	0.00
4,608.1	0.50	102.01	4,608.0	-4.2	19.7	19.7	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	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)
Greenhorn									
4,700.0	0.50	102.01	4,699.9	-4.3	20.4	20.5	0.00	0.00	0.00
4,800.0	0.50	102.01	4,799.9	-4.5	21.3	21.4	0.00	0.00	0.00
4,900.0	0.50	102.01	4,899.9	-4.7	22.1	22.2	0.00	0.00	0.00
5,000.0	0.50	102.01	4,999.9	-4.9	23.0	23.1	0.00	0.00	0.00
5,021.1	0.50	102.01	5,021.0	-4.9	23.2	23.3	0.00	0.00	0.00
Mowry									
5,100.0	0.50	102.01	5,099.9	-5.1	23.9	24.0	0.00	0.00	0.00
5,200.0	0.50	102.01	5,199.9	-5.3	24.7	24.8	0.00	0.00	0.00
5,300.0	0.50	102.01	5,299.9	-5.4	25.6	25.7	0.00	0.00	0.00
5,400.0	0.50	102.01	5,399.9	-5.6	26.4	26.5	0.00	0.00	0.00
5,409.1	0.50	102.01	5,409.0	-5.6	26.5	26.6	0.00	0.00	0.00
Dakota									
5,500.0	0.50	102.01	5,499.9	-5.8	27.3	27.4	0.00	0.00	0.00
5,600.0	0.50	102.01	5,599.9	-6.0	28.1	28.2	0.00	0.00	0.00
5,700.0	0.50	102.01	5,699.9	-6.2	29.0	29.1	0.00	0.00	0.00
5,800.0	0.50	102.01	5,799.9	-6.3	29.8	30.0	0.00	0.00	0.00
5,900.0	0.50	102.01	5,899.9	-6.5	30.7	30.8	0.00	0.00	0.00
6,000.0	0.50	102.01	5,999.9	-6.7	31.5	31.7	0.00	0.00	0.00
6,100.0	0.50	102.01	6,099.9	-6.9	32.4	32.5	0.00	0.00	0.00
6,200.0	0.50	102.01	6,199.9	-7.1	33.2	33.4	0.00	0.00	0.00
6,300.0	0.50	102.01	6,299.8	-7.3	34.1	34.2	0.00	0.00	0.00
6,371.2	0.50	102.01	6,371.0	-7.4	34.7	34.9	0.00	0.00	0.00
Rierdon									
6,400.0	0.50	102.01	6,399.8	-7.4	35.0	35.1	0.00	0.00	0.00
6,500.0	0.50	102.01	6,499.8	-7.6	35.8	36.0	0.00	0.00	0.00
6,600.0	0.50	102.01	6,599.8	-7.8	36.7	36.8	0.00	0.00	0.00
6,700.0	0.50	102.01	6,699.8	-8.0	37.5	37.7	0.00	0.00	0.00
6,800.0	0.50	102.01	6,799.8	-8.2	38.4	38.5	0.00	0.00	0.00
6,900.0	0.50	102.01	6,899.8	-8.3	39.2	39.4	0.00	0.00	0.00
6,901.2	0.50	102.01	6,901.0	-8.3	39.2	39.4	0.00	0.00	0.00
Dunham Salt									
6,971.2	0.50	102.01	6,971.0	-8.5	39.8	40.0	0.00	0.00	0.00
Dunham Salt Base									
7,000.0	0.50	102.01	6,999.8	-8.5	40.1	40.2	0.00	0.00	0.00
7,100.0	0.50	102.01	7,099.8	-8.7	40.9	41.1	0.00	0.00	0.00
7,200.0	0.50	102.01	7,199.8	-8.9	41.8	42.0	0.00	0.00	0.00
7,273.2	0.50	102.01	7,273.0	-9.0	42.4	42.6	0.00	0.00	0.00
Pine Salt									
7,300.0	0.50	102.01	7,299.8	-9.1	42.6	42.8	0.00	0.00	0.00
7,338.2	0.50	102.01	7,338.0	-9.1	43.0	43.1	0.00	0.00	0.00
Pine Salt Base									
7,400.0	0.50	102.01	7,399.8	-9.2	43.5	43.7	0.00	0.00	0.00
7,404.2	0.50	102.01	7,404.0	-9.3	43.5	43.7	0.00	0.00	0.00
Opeche Salt									
7,495.2	0.50	102.01	7,495.0	-9.4	44.3	44.5	0.00	0.00	0.00
Opeche Salt Base									
7,500.0	0.50	102.01	7,499.8	-9.4	44.3	44.5	0.00	0.00	0.00
7,600.0	0.50	102.01	7,599.8	-9.6	45.2	45.4	0.00	0.00	0.00
7,700.0	0.50	102.01	7,699.8	-9.8	46.0	46.2	0.00	0.00	0.00
7,717.2	0.50	102.01	7,717.0	-9.8	46.2	46.4	0.00	0.00	0.00
Amsden									
7,800.0	0.50	102.01	7,799.8	-10.0	46.9	47.1	0.00	0.00	0.00
7,865.2	0.50	102.01	7,865.0	-10.1	47.5	47.7	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	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)
Tyler									
7,900.0	0.50	102.01	7,899.8	-10.2	47.8	48.0	0.00	0.00	0.00
8,000.0	0.50	102.01	7,999.8	-10.3	48.6	48.8	0.00	0.00	0.00
8,028.9	0.50	102.01	8,028.7	-10.4	48.9	49.1	0.00	0.00	0.00
Start Drop -5.00									
8,038.9	0.00	0.00	8,038.7	-10.4	48.9	49.1	5.00	-5.00	0.00
Start 1961.3 hold at 8038.9 MD									
8,089.2	0.00	0.00	8,089.0	-10.4	48.9	49.1	0.00	0.00	0.00
Otter/Base Minnelusa									
8,100.0	0.00	0.00	8,099.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,200.0	0.00	0.00	8,199.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,300.0	0.00	0.00	8,299.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,400.0	0.00	0.00	8,399.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,432.2	0.00	0.00	8,432.0	-10.4	48.9	49.1	0.00	0.00	0.00
Kibbey Lime									
8,500.0	0.00	0.00	8,499.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,585.2	0.00	0.00	8,585.0	-10.4	48.9	49.1	0.00	0.00	0.00
Charles Salt									
8,600.0	0.00	0.00	8,599.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,699.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,800.0	0.00	0.00	8,799.8	-10.4	48.9	49.1	0.00	0.00	0.00
8,900.0	0.00	0.00	8,899.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,000.0	0.00	0.00	8,999.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,100.0	0.00	0.00	9,099.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,200.0	0.00	0.00	9,199.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,254.2	0.00	0.00	9,254.0	-10.4	48.9	49.1	0.00	0.00	0.00
Base Last Salt									
9,300.0	0.00	0.00	9,299.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,400.0	0.00	0.00	9,399.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,470.2	0.00	0.00	9,470.0	-10.4	48.9	49.1	0.00	0.00	0.00
Mission Canyon									
9,500.0	0.00	0.00	9,499.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,600.0	0.00	0.00	9,599.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,700.0	0.00	0.00	9,699.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,800.0	0.00	0.00	9,799.8	-10.4	48.9	49.1	0.00	0.00	0.00
9,900.0	0.00	0.00	9,899.8	-10.4	48.9	49.1	0.00	0.00	0.00
10,000.2	0.00	0.00	10,000.0	-10.4	48.9	49.1	0.00	0.00	0.00
Start 306.4 hold at 10000.2 MD									
10,011.2	0.00	0.00	10,011.0	-10.4	48.9	49.1	0.00	0.00	0.00
Lodgepole									
10,100.0	0.00	0.00	10,099.8	-10.4	48.9	49.1	0.00	0.00	0.00
10,200.0	0.00	0.00	10,199.8	-10.4	48.9	49.1	0.00	0.00	0.00
10,306.6	0.00	0.00	10,306.4	-10.4	48.9	49.1	0.00	0.00	0.00
Start Build 12.00									
10,325.0	2.21	105.54	10,324.8	-10.5	49.2	49.5	12.00	12.00	0.00
10,350.0	5.21	105.54	10,349.7	-10.9	50.8	51.0	12.00	12.00	0.00
10,375.0	8.21	105.54	10,374.5	-11.7	53.6	53.8	12.00	12.00	0.00
10,400.0	11.21	105.54	10,399.2	-12.8	57.7	57.9	12.00	12.00	0.00
10,425.0	14.21	105.54	10,423.6	-14.3	63.0	63.3	12.00	12.00	0.00
10,450.0	17.21	105.54	10,447.6	-16.1	69.5	69.8	12.00	12.00	0.00
10,475.0	20.21	105.54	10,471.3	-18.3	77.2	77.6	12.00	12.00	0.00
10,500.0	23.21	105.54	10,494.5	-20.7	86.1	86.5	12.00	12.00	0.00
10,525.0	26.21	105.54	10,517.2	-23.5	96.2	96.7	12.00	12.00	0.00
10,550.0	29.21	105.54	10,539.4	-26.7	107.4	107.9	12.00	12.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,575.0	32.21	105.54	10,560.9	-30.1	119.7	120.3	12.00	12.00	0.00
10,600.0	35.21	105.54	10,581.7	-33.8	133.0	133.7	12.00	12.00	0.00
10,625.0	38.21	105.54	10,601.7	-37.8	147.4	148.2	12.00	12.00	0.00
10,650.0	41.21	105.54	10,620.9	-42.1	162.8	163.7	12.00	12.00	0.00
10,675.0	44.21	105.54	10,639.3	-46.6	179.2	180.1	12.00	12.00	0.00
10,700.0	47.21	105.54	10,656.8	-51.4	196.4	197.4	12.00	12.00	0.00
10,725.0	50.21	105.54	10,673.3	-56.4	214.5	215.6	12.00	12.00	0.00
10,750.0	53.21	105.54	10,688.7	-61.7	233.4	234.7	12.00	12.00	0.00
10,775.0	56.21	105.54	10,703.2	-67.2	253.1	254.4	12.00	12.00	0.00
10,800.0	59.21	105.54	10,716.5	-72.8	273.4	274.9	12.00	12.00	0.00
10,825.0	62.21	105.54	10,728.8	-78.7	294.4	296.0	12.00	12.00	0.00
10,850.0	65.21	105.54	10,739.8	-84.7	316.0	317.7	12.00	12.00	0.00
10,850.4	65.25	105.54	10,740.0	-84.7	316.3	318.1	12.00	12.00	0.00
False Bakken									
10,875.0	68.21	105.54	10,749.7	-90.8	338.1	340.0	12.00	12.00	0.00
10,881.2	68.95	105.54	10,752.0	-92.4	343.7	345.6	12.00	12.00	0.00
Upper Bakken Shale									
10,900.0	71.21	105.54	10,758.4	-97.1	360.7	362.7	12.00	12.00	0.00
10,925.0	74.21	105.54	10,765.8	-103.5	383.7	385.8	12.00	12.00	0.00
10,950.0	77.21	105.54	10,772.0	-110.0	407.1	409.3	12.00	12.00	0.00
10,975.0	80.21	105.54	10,776.9	-116.5	430.7	433.0	12.00	12.00	0.00
10,988.5	81.82	105.54	10,779.0	-120.1	443.5	445.9	12.00	12.00	0.00
Middle Bakken (Top of Target)									
11,000.0	83.21	105.54	10,780.5	-123.2	454.5	457.0	12.00	12.00	0.00
11,025.0	86.21	105.54	10,782.8	-129.8	478.5	481.1	12.00	12.00	0.00
11,052.4	89.50	105.54	10,783.8	-137.2	504.9	507.7	12.00	12.00	0.00
Start 18.8 hold at 11052.4 MD									
11,071.0	89.50	105.54	10,784.0	-142.1	522.8	525.7	0.00	0.00	0.00
7"									
11,071.2	89.50	105.54	10,784.0	-142.2	523.0	525.9	0.00	0.00	0.00
Start DLS 3.00 TFO 269.91									
11,100.0	89.50	104.67	10,784.3	-149.7	550.8	553.8	3.00	0.00	-3.00
11,200.0	89.50	101.67	10,785.1	-172.5	648.1	651.6	3.00	0.00	-3.00
11,300.0	89.49	98.67	10,786.0	-190.1	746.5	750.4	3.00	0.00	-3.00
11,400.0	89.49	95.67	10,786.9	-202.6	845.8	849.8	3.00	0.00	-3.00
11,500.0	89.49	92.67	10,787.8	-209.9	945.5	949.7	3.00	0.00	-3.00
11,589.1	89.49	90.00	10,788.6	-212.0	1,034.5	1,038.7	3.00	0.00	-3.00
Start 9027.8 hold at 11589.1 MD									
11,600.0	89.49	90.00	10,788.7	-212.0	1,045.4	1,049.7	0.00	0.00	0.00
11,700.0	89.49	90.00	10,789.6	-212.0	1,145.4	1,149.6	0.00	0.00	0.00
11,800.0	89.49	90.00	10,790.4	-212.0	1,245.4	1,249.6	0.00	0.00	0.00
11,900.0	89.49	90.00	10,791.3	-212.0	1,345.4	1,349.6	0.00	0.00	0.00
12,000.0	89.49	90.00	10,792.2	-212.0	1,445.4	1,449.6	0.00	0.00	0.00
12,100.0	89.49	90.00	10,793.1	-212.0	1,545.4	1,549.5	0.00	0.00	0.00
12,200.0	89.49	90.00	10,794.0	-212.0	1,645.4	1,649.5	0.00	0.00	0.00
12,300.0	89.49	90.00	10,794.8	-212.0	1,745.4	1,749.5	0.00	0.00	0.00
12,400.0	89.49	90.00	10,795.7	-212.0	1,845.4	1,849.5	0.00	0.00	0.00
12,500.0	89.49	90.00	10,796.6	-212.0	1,945.4	1,949.4	0.00	0.00	0.00
12,600.0	89.49	90.00	10,797.5	-212.0	2,045.4	2,049.4	0.00	0.00	0.00
12,700.0	89.49	90.00	10,798.4	-212.0	2,145.4	2,149.4	0.00	0.00	0.00
12,800.0	89.49	90.00	10,799.3	-212.0	2,245.4	2,249.4	0.00	0.00	0.00
12,900.0	89.49	90.00	10,800.1	-212.0	2,345.4	2,349.3	0.00	0.00	0.00
13,000.0	89.49	90.00	10,801.0	-212.0	2,445.4	2,449.3	0.00	0.00	0.00
13,100.0	89.49	90.00	10,801.9	-212.0	2,545.4	2,549.3	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	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)
13,200.0	89.49	90.00	10,802.8	-212.0	2,645.4	2,649.3	0.00	0.00	0.00
13,300.0	89.49	90.00	10,803.7	-212.0	2,745.4	2,749.2	0.00	0.00	0.00
13,400.0	89.49	90.00	10,804.6	-212.0	2,845.4	2,849.2	0.00	0.00	0.00
13,500.0	89.49	90.00	10,805.4	-212.0	2,945.4	2,949.2	0.00	0.00	0.00
13,600.0	89.49	90.00	10,806.3	-212.0	3,045.4	3,049.1	0.00	0.00	0.00
13,700.0	89.49	90.00	10,807.2	-212.0	3,145.4	3,149.1	0.00	0.00	0.00
13,800.0	89.49	90.00	10,808.1	-212.0	3,245.3	3,249.1	0.00	0.00	0.00
13,900.0	89.49	90.00	10,809.0	-212.0	3,345.3	3,349.1	0.00	0.00	0.00
14,000.0	89.49	90.00	10,809.9	-212.0	3,445.3	3,449.0	0.00	0.00	0.00
14,100.0	89.49	90.00	10,810.7	-212.0	3,545.3	3,549.0	0.00	0.00	0.00
14,200.0	89.49	90.00	10,811.6	-212.0	3,645.3	3,649.0	0.00	0.00	0.00
14,300.0	89.49	90.00	10,812.5	-212.0	3,745.3	3,749.0	0.00	0.00	0.00
14,400.0	89.49	90.00	10,813.4	-212.0	3,845.3	3,848.9	0.00	0.00	0.00
14,500.0	89.49	90.00	10,814.3	-212.0	3,945.3	3,948.9	0.00	0.00	0.00
14,600.0	89.49	90.00	10,815.2	-212.0	4,045.3	4,048.9	0.00	0.00	0.00
14,700.0	89.49	90.00	10,816.0	-212.0	4,145.3	4,148.9	0.00	0.00	0.00
14,800.0	89.49	90.00	10,816.9	-212.0	4,245.3	4,248.8	0.00	0.00	0.00
14,900.0	89.49	90.00	10,817.8	-212.0	4,345.3	4,348.8	0.00	0.00	0.00
15,000.0	89.49	90.00	10,818.7	-212.0	4,445.3	4,448.8	0.00	0.00	0.00
15,100.0	89.49	90.00	10,819.6	-212.0	4,545.3	4,548.8	0.00	0.00	0.00
15,200.0	89.49	90.00	10,820.5	-212.0	4,645.3	4,648.7	0.00	0.00	0.00
15,300.0	89.49	90.00	10,821.3	-212.0	4,745.3	4,748.7	0.00	0.00	0.00
15,400.0	89.49	90.00	10,822.2	-212.0	4,845.3	4,848.7	0.00	0.00	0.00
15,500.0	89.49	90.00	10,823.1	-212.0	4,945.3	4,948.7	0.00	0.00	0.00
15,600.0	89.49	90.00	10,824.0	-212.0	5,045.3	5,048.6	0.00	0.00	0.00
15,700.0	89.49	90.00	10,824.9	-212.0	5,145.3	5,148.6	0.00	0.00	0.00
15,800.0	89.49	90.00	10,825.7	-212.0	5,245.3	5,248.6	0.00	0.00	0.00
15,900.0	89.49	90.00	10,826.6	-212.0	5,345.3	5,348.5	0.00	0.00	0.00
16,000.0	89.49	90.00	10,827.5	-212.0	5,445.3	5,448.5	0.00	0.00	0.00
16,100.0	89.49	90.00	10,828.4	-212.0	5,545.3	5,548.5	0.00	0.00	0.00
16,200.0	89.49	90.00	10,829.3	-212.0	5,645.3	5,648.5	0.00	0.00	0.00
16,300.0	89.49	90.00	10,830.2	-212.0	5,745.3	5,748.4	0.00	0.00	0.00
16,400.0	89.49	90.00	10,831.0	-212.0	5,845.2	5,848.4	0.00	0.00	0.00
16,500.0	89.49	90.00	10,831.9	-212.0	5,945.2	5,948.4	0.00	0.00	0.00
16,600.0	89.49	90.00	10,832.8	-212.0	6,045.2	6,048.4	0.00	0.00	0.00
16,700.0	89.49	90.00	10,833.7	-212.0	6,145.2	6,148.3	0.00	0.00	0.00
16,800.0	89.49	90.00	10,834.6	-212.0	6,245.2	6,248.3	0.00	0.00	0.00
16,900.0	89.49	90.00	10,835.5	-212.0	6,345.2	6,348.3	0.00	0.00	0.00
17,000.0	89.49	90.00	10,836.3	-212.0	6,445.2	6,448.3	0.00	0.00	0.00
17,100.0	89.49	90.00	10,837.2	-212.0	6,545.2	6,548.2	0.00	0.00	0.00
17,200.0	89.49	90.00	10,838.1	-212.0	6,645.2	6,648.2	0.00	0.00	0.00
17,300.0	89.49	90.00	10,839.0	-212.0	6,745.2	6,748.2	0.00	0.00	0.00
17,400.0	89.49	90.00	10,839.9	-212.0	6,845.2	6,848.2	0.00	0.00	0.00
17,500.0	89.49	90.00	10,840.8	-212.0	6,945.2	6,948.1	0.00	0.00	0.00
17,600.0	89.49	90.00	10,841.6	-212.0	7,045.2	7,048.1	0.00	0.00	0.00
17,700.0	89.49	90.00	10,842.5	-212.0	7,145.2	7,148.1	0.00	0.00	0.00
17,800.0	89.49	90.00	10,843.4	-212.0	7,245.2	7,248.1	0.00	0.00	0.00
17,900.0	89.49	90.00	10,844.3	-212.0	7,345.2	7,348.0	0.00	0.00	0.00
18,000.0	89.49	90.00	10,845.2	-212.0	7,445.2	7,448.0	0.00	0.00	0.00
18,100.0	89.49	90.00	10,846.1	-212.0	7,545.2	7,548.0	0.00	0.00	0.00
18,200.0	89.49	90.00	10,846.9	-212.0	7,645.2	7,647.9	0.00	0.00	0.00
18,300.0	89.49	90.00	10,847.8	-212.0	7,745.2	7,747.9	0.00	0.00	0.00
18,400.0	89.49	90.00	10,848.7	-212.0	7,845.2	7,847.9	0.00	0.00	0.00
18,500.0	89.49	90.00	10,849.6	-212.0	7,945.2	7,947.9	0.00	0.00	0.00
18,600.0	89.49	90.00	10,850.5	-212.0	8,045.2	8,047.8	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
18,700.0	89.49	90.00	10,851.4	-212.0	8,145.2	8,147.8	0.00	0.00	0.00
18,800.0	89.49	90.00	10,852.2	-212.0	8,245.2	8,247.8	0.00	0.00	0.00
18,900.0	89.49	90.00	10,853.1	-212.0	8,345.1	8,347.8	0.00	0.00	0.00
19,000.0	89.49	90.00	10,854.0	-212.0	8,445.1	8,447.7	0.00	0.00	0.00
19,100.0	89.49	90.00	10,854.9	-212.0	8,545.1	8,547.7	0.00	0.00	0.00
19,200.0	89.49	90.00	10,855.8	-212.0	8,645.1	8,647.7	0.00	0.00	0.00
19,300.0	89.49	90.00	10,856.6	-212.0	8,745.1	8,747.7	0.00	0.00	0.00
19,400.0	89.49	90.00	10,857.5	-212.0	8,845.1	8,847.6	0.00	0.00	0.00
19,500.0	89.49	90.00	10,858.4	-212.0	8,945.1	8,947.6	0.00	0.00	0.00
19,600.0	89.49	90.00	10,859.3	-212.0	9,045.1	9,047.6	0.00	0.00	0.00
19,700.0	89.49	90.00	10,860.2	-212.0	9,145.1	9,147.6	0.00	0.00	0.00
19,800.0	89.49	90.00	10,861.1	-212.0	9,245.1	9,247.5	0.00	0.00	0.00
19,900.0	89.49	90.00	10,861.9	-212.0	9,345.1	9,347.5	0.00	0.00	0.00
20,000.0	89.49	90.00	10,862.8	-212.0	9,445.1	9,447.5	0.00	0.00	0.00
20,100.0	89.49	90.00	10,863.7	-212.0	9,545.1	9,547.5	0.00	0.00	0.00
20,200.0	89.49	90.00	10,864.6	-212.0	9,645.1	9,647.4	0.00	0.00	0.00
20,300.0	89.49	90.00	10,865.5	-212.0	9,745.1	9,747.4	0.00	0.00	0.00
20,400.0	89.49	90.00	10,866.4	-212.0	9,845.1	9,847.4	0.00	0.00	0.00
20,500.0	89.49	90.00	10,867.2	-212.0	9,945.1	9,947.3	0.00	0.00	0.00
20,600.0	89.49	90.00	10,868.1	-212.0	10,045.1	10,047.3	0.00	0.00	0.00
20,616.9	89.49	90.00	10,868.3	-212.0	10,062.0	10,064.2	0.00	0.00	0.00
TD at 20616.9 - Lewis Fed #10B PBHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lewis Fed #10B PBHL - plan hits target center - Point	0.00	0.00	10,868.3	-212.0	10,062.0	390,844.05	1,219,508.67	48° 1' 50.361 N	103° 33' 43.283 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,110.0	2,110.0	13 3/8"	13.375	17.500
11,071.0	10,784.0	7"	7.000	8.750

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Company:	Oasis	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site:	153N-100W-31/32	**North Reference:**	True
Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lewis Fed #10B		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,008.0	2,008.0	Pierre			
4,608.1	4,608.0	Greenhorn			
5,021.1	5,021.0	Mowry			
5,409.1	5,409.0	Dakota			
6,371.2	6,371.0	Rierdon			
6,901.2	6,901.0	Dunham Salt			
6,971.2	6,971.0	Dunham Salt Base			
7,273.2	7,273.0	Pine Salt			
7,338.2	7,338.0	Pine Salt Base			
7,404.2	7,404.0	Opeche Salt			
7,495.2	7,495.0	Opeche Salt Base			
7,717.2	7,717.0	Amsden			
7,865.2	7,865.0	Tyler			
8,089.2	8,089.0	Otter/Base Minnelusa			
8,432.2	8,432.0	Kibbey Lime			
8,585.2	8,585.0	Charles Salt			
9,254.2	9,254.0	Base Last Salt			
9,470.2	9,470.0	Mission Canyon			
10,011.2	10,011.0	Lodgepole			
10,850.4	10,740.0	False Bakken			
10,881.2	10,752.0	Upper Bakken Shale			
10,988.5	10,779.0	Middle Bakken (Top of Target)			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
2,300.0	2,300.0	0.0	0.0	Start Build 5.00
2,310.0	2,310.0	0.0	0.0	Start 5718.9 hold at 2310.0 MD
8,028.9	8,028.7	-10.4	48.9	Start Drop -5.00
8,038.9	8,038.7	-10.4	48.9	Start 1961.3 hold at 8038.9 MD
10,000.2	10,000.0	-10.4	48.9	Start 306.4 hold at 10000.2 MD
10,306.6	10,306.4	-10.4	48.9	Start Build 12.00
11,052.4	10,783.8	-137.2	504.9	Start 18.8 hold at 11052.4 MD
11,071.2	10,784.0	-142.2	523.0	Start DLS 3.00 TFO 269.91
11,589.1	10,788.6	-212.0	1,034.5	Start 9027.8 hold at 11589.1 MD
20,616.9	10,868.3	-212.0	10,062.0	TD at 20616.9

Oasis

Indian Hills
153N-100W-31/32
Lewis Federal 5300 31-31 10B

Lewis Fed #10B
Plan #1

Anticollision Report

03 March, 2014

Oasis Petroleum

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Project:	Indian Hills	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Reference Site:	153N-100W-31/32	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lewis Fed #10B	**Database:**	OpenWellsCompass - EDM Prod
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

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

Survey Tool Program **Date** 3/3/2014

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	20,616.9	Plan #1 (Lewis Fed #10B)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
153N-100W-31/32						
Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #	2,300.0	2,300.0	32.4	22.4	3.224	CC
Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #	20,616.9	20,872.0	503.9	-78.0	0.866	Level 1, ES, SF

Offset Design 153N-100W-31/32 - Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	178.80	-32.4	0.7	32.4				
100.0	100.0	100.0	100.0	0.1	0.1	178.80	-32.4	0.7	32.4	32.3	0.17	192.388	
200.0	200.0	200.0	200.0	0.3	0.3	178.80	-32.4	0.7	32.4	31.8	0.62	52.469	
300.0	300.0	300.0	300.0	0.5	0.5	178.80	-32.4	0.7	32.4	31.4	1.07	30.377	
400.0	400.0	400.0	400.0	0.8	0.8	178.80	-32.4	0.7	32.4	30.9	1.52	21.376	
500.0	500.0	500.0	500.0	1.0	1.0	178.80	-32.4	0.7	32.4	30.5	1.97	16.490	
600.0	600.0	600.0	600.0	1.2	1.2	178.80	-32.4	0.7	32.4	30.0	2.42	13.422	
700.0	700.0	700.0	700.0	1.4	1.4	178.80	-32.4	0.7	32.4	29.6	2.87	11.317	
800.0	800.0	800.0	800.0	1.7	1.7	178.80	-32.4	0.7	32.4	29.1	3.32	9.782	
900.0	900.0	900.0	900.0	1.9	1.9	178.80	-32.4	0.7	32.4	28.7	3.76	8.614	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	178.80	-32.4	0.7	32.4	28.2	4.21	7.696	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	178.80	-32.4	0.7	32.4	27.8	4.66	6.954	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	178.80	-32.4	0.7	32.4	27.3	5.11	6.342	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	178.80	-32.4	0.7	32.4	26.9	5.56	5.830	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	178.80	-32.4	0.7	32.4	26.4	6.01	5.394	
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.2	178.80	-32.4	0.7	32.4	26.0	6.46	5.019	
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	178.80	-32.4	0.7	32.4	25.5	6.91	4.692	
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	178.80	-32.4	0.7	32.4	25.1	7.36	4.406	
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	178.80	-32.4	0.7	32.4	24.6	7.81	4.152	
1,900.0	1,900.0	1,900.0	1,900.0	4.1	4.1	178.80	-32.4	0.7	32.4	24.2	8.26	3.926	
2,000.0	2,000.0	2,000.0	2,000.0	4.4	4.4	178.80	-32.4	0.7	32.4	23.7	8.71	3.724	
2,100.0	2,100.0	2,100.0	2,100.0	4.6	4.6	178.80	-32.4	0.7	32.4	23.3	9.16	3.541	
2,200.0	2,200.0	2,200.0	2,200.0	4.8	4.8	178.80	-32.4	0.7	32.4	22.8	9.61	3.375	
2,300.0	2,300.0	2,300.0	2,300.0	5.0	5.0	178.80	-32.4	0.7	32.4	22.4	10.06	3.224	CC
2,310.0	2,310.0	2,309.7	2,309.7	5.0	5.0	76.87	-32.5	0.7	32.5	22.4	10.10	3.215	
2,400.0	2,400.0	2,399.7	2,399.7	5.2	5.2	78.22	-33.3	0.7	33.1	22.7	10.42	3.174	

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

Oasis Petroleum

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Project:	Indian Hills	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Reference Site:	153N-100W-31/32	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lewis Fed #10B	**Database:**	OpenWellsCompass - EDM Prod
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,500.0	2,500.0	2,499.7	2,499.7	5.4	5.4	79.66	-34.1	0.7	33.8	23.0	10.79	3.132	
2,600.0	2,600.0	2,599.7	2,599.7	5.6	5.5	81.04	-35.0	0.7	34.5	23.4	11.16	3.093	
2,700.0	2,700.0	2,699.7	2,699.7	5.8	5.7	82.37	-35.9	0.7	35.3	23.7	11.54	3.056	
2,800.0	2,800.0	2,799.7	2,799.7	6.0	5.9	83.64	-36.7	0.7	36.0	24.1	11.92	3.022	
2,900.0	2,900.0	2,899.7	2,899.7	6.2	6.1	84.86	-37.6	0.7	36.8	24.5	12.30	2.991	
3,000.0	3,000.0	2,999.7	2,999.6	6.4	6.3	86.02	-38.5	0.7	37.6	24.9	12.70	2.961	
3,100.0	3,100.0	3,099.7	3,099.6	6.6	6.5	87.14	-39.4	0.7	38.4	25.3	13.09	2.934	
3,200.0	3,200.0	3,199.7	3,199.6	6.8	6.7	88.21	-40.2	0.7	39.2	25.7	13.49	2.908	
3,300.0	3,300.0	3,299.7	3,299.6	7.0	6.9	89.23	-41.1	0.7	40.1	26.2	13.89	2.885	
3,400.0	3,400.0	3,399.7	3,399.6	7.2	7.1	90.22	-42.0	0.7	40.9	26.6	14.29	2.863	
3,500.0	3,500.0	3,499.6	3,499.6	7.5	7.2	91.16	-42.8	0.7	41.8	27.1	14.70	2.842	
3,600.0	3,600.0	3,599.6	3,599.6	7.7	7.4	92.07	-43.7	0.7	42.7	27.5	15.11	2.823	
3,700.0	3,699.9	3,699.6	3,699.6	7.9	7.7	92.93	-44.6	0.7	43.5	28.0	15.52	2.805	
3,800.0	3,799.9	3,799.6	3,799.6	8.1	7.9	93.77	-45.5	0.7	44.4	28.5	15.94	2.788	
3,900.0	3,899.9	3,899.6	3,899.6	8.3	8.1	94.57	-46.3	0.7	45.3	29.0	16.35	2.772	
4,000.0	3,999.9	3,999.6	3,999.6	8.5	8.3	95.34	-47.2	0.7	46.2	29.5	16.77	2.757	
4,100.0	4,099.9	4,099.6	4,099.5	8.7	8.5	96.08	-48.1	0.7	47.2	30.0	17.19	2.743	
4,200.0	4,199.9	4,199.6	4,199.5	8.9	8.7	96.79	-49.0	0.7	48.1	30.5	17.61	2.730	
4,300.0	4,299.9	4,299.6	4,299.5	9.2	8.9	97.47	-49.8	0.7	49.0	31.0	18.03	2.718	
4,400.0	4,399.9	4,399.6	4,399.5	9.4	9.1	98.13	-50.7	0.7	50.0	31.5	18.46	2.707	
4,500.0	4,499.9	4,499.6	4,499.5	9.6	9.3	98.77	-51.6	0.7	50.9	32.0	18.88	2.696	
4,600.0	4,599.9	4,599.6	4,599.5	9.8	9.5	99.38	-52.4	0.7	51.9	32.5	19.31	2.686	
4,700.0	4,699.9	4,699.6	4,699.5	10.0	9.7	99.97	-53.3	0.7	52.8	33.1	19.74	2.676	
4,800.0	4,799.9	4,799.6	4,799.5	10.2	9.9	100.53	-54.2	0.7	53.8	33.6	20.16	2.667	
4,900.0	4,899.9	4,899.6	4,899.5	10.5	10.1	101.08	-55.1	0.7	54.7	34.1	20.59	2.658	
5,000.0	4,999.9	4,999.6	4,999.5	10.7	10.4	101.61	-55.9	0.7	55.7	34.7	21.02	2.650	
5,100.0	5,099.9	5,099.5	5,099.4	10.9	10.6	102.12	-56.8	0.7	56.7	35.2	21.45	2.642	
5,200.0	5,199.9	5,199.5	5,199.4	11.1	10.8	102.61	-57.7	0.7	57.7	35.8	21.89	2.635	
5,300.0	5,299.9	5,299.5	5,299.4	11.3	11.0	103.09	-58.6	0.7	58.7	36.3	22.32	2.628	
5,400.0	5,399.9	5,399.5	5,399.4	11.5	11.2	103.55	-59.4	0.7	59.7	36.9	22.75	2.622	
5,500.0	5,499.9	5,499.5	5,499.4	11.8	11.4	104.00	-60.3	0.7	60.6	37.5	23.19	2.615	
5,600.0	5,599.9	5,599.5	5,599.4	12.0	11.6	104.43	-61.2	0.7	61.6	38.0	23.62	2.610	
5,700.0	5,699.9	5,699.5	5,699.4	12.2	11.9	104.85	-62.0	0.7	62.6	38.6	24.06	2.604	
5,800.0	5,799.9	5,799.5	5,799.4	12.4	12.1	105.25	-62.9	0.7	63.6	39.2	24.49	2.599	
5,900.0	5,899.9	5,899.5	5,899.4	12.6	12.3	105.64	-63.8	0.7	64.7	39.7	24.93	2.593	
6,000.0	5,999.9	5,999.5	5,999.4	12.9	12.5	106.02	-64.7	0.7	65.7	40.3	25.37	2.589	
6,100.0	6,099.9	6,099.5	6,099.3	13.1	12.7	106.39	-65.5	0.7	66.7	40.9	25.80	2.584	
6,200.0	6,199.9	6,199.5	6,199.3	13.3	13.0	106.75	-66.4	0.7	67.7	41.4	26.24	2.580	
6,300.0	6,299.8	6,299.5	6,299.3	13.5	13.2	107.09	-67.3	0.7	68.7	42.0	26.68	2.575	
6,400.0	6,399.8	6,399.5	6,399.3	13.8	13.4	107.43	-68.2	0.7	69.7	42.6	27.12	2.571	
6,500.0	6,499.8	6,499.5	6,499.3	14.0	13.6	107.76	-69.0	0.7	70.8	43.2	27.56	2.567	
6,600.0	6,599.8	6,599.5	6,599.3	14.2	13.8	108.08	-69.9	0.7	71.8	43.8	28.00	2.564	
6,700.0	6,699.8	6,699.5	6,699.3	14.4	14.0	108.38	-70.8	0.7	72.8	44.4	28.44	2.560	
6,800.0	6,799.8	6,799.4	6,799.3	14.6	14.3	108.68	-71.6	0.7	73.8	45.0	28.88	2.557	
6,900.0	6,899.8	6,899.4	6,899.3	14.9	14.5	108.98	-72.5	0.7	74.9	45.5	29.32	2.553	
7,000.0	6,999.8	6,999.4	6,999.3	15.1	14.7	109.26	-73.4	0.7	75.9	46.1	29.76	2.550	
7,100.0	7,099.8	7,099.4	7,099.2	15.3	14.9	109.54	-74.3	0.7	76.9	46.7	30.20	2.547	
7,200.0	7,199.8	7,199.4	7,199.2	15.5	15.1	109.81	-75.1	0.7	78.0	47.3	30.64	2.544	
7,300.0	7,299.8	7,299.4	7,299.2	15.7	15.4	110.07	-76.0	0.7	79.0	47.9	31.08	2.542	
7,400.0	7,399.8	7,399.4	7,399.2	16.0	15.6	110.32	-76.9	0.7	80.0	48.5	31.53	2.539	
7,500.0	7,499.8	7,499.4	7,499.2	16.2	15.8	110.57	-77.8	0.7	81.1	49.1	31.97	2.536	
7,600.0	7,599.8	7,599.4	7,599.2	16.4	16.0	110.81	-78.6	0.7	82.1	49.7	32.41	2.534	
7,700.0	7,699.8	7,699.4	7,699.2	16.6	16.2	111.05	-79.5	0.7	83.2	50.3	32.85	2.532	

Oasis Petroleum

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Project:	Indian Hills	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Reference Site:	153N-100W-31/32	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lewis Fed #10B	**Database:**	OpenWellsCompass - EDM Prod
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #1

Survey Program: 0-MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,800.0	7,799.8	7,799.4	7,799.2	16.9	16.5	111.28	-80.4	0.7	84.2	50.9	33.30	2.529	
7,900.0	7,899.8	7,899.4	7,899.2	17.1	16.7	111.50	-81.2	0.7	85.3	51.5	33.74	2.527	
8,000.0	7,999.8	7,999.4	7,999.2	17.3	16.9	111.72	-82.1	0.7	86.3	52.1	34.18	2.525	
8,028.9	8,028.7	8,028.3	8,028.1	17.4	17.0	111.79	-82.4	0.7	86.6	52.3	34.31	2.524	
8,038.9	8,038.7	8,038.9	8,038.7	17.4	17.0	-146.20	-82.4	0.7	86.7	52.3	34.34	2.524	
8,100.0	8,099.8	8,100.0	8,099.8	17.5	17.1	-146.20	-82.4	0.7	86.7	52.1	34.59	2.506	
8,200.0	8,199.8	8,200.0	8,199.8	17.7	17.3	-146.20	-82.4	0.7	86.7	51.7	34.98	2.478	
8,300.0	8,299.8	8,300.0	8,299.8	17.9	17.5	-146.20	-82.4	0.7	86.7	51.3	35.38	2.450	
8,400.0	8,399.8	8,400.0	8,399.8	18.1	17.7	-146.20	-82.4	0.7	86.7	50.9	35.78	2.422	
8,500.0	8,499.8	8,500.0	8,499.8	18.3	17.9	-146.20	-82.4	0.7	86.7	50.5	36.19	2.395	
8,600.0	8,599.8	8,600.0	8,599.8	18.5	18.1	-146.20	-82.4	0.7	86.7	50.1	36.59	2.369	
8,700.0	8,699.8	8,700.0	8,699.8	18.8	18.3	-146.20	-82.4	0.7	86.7	49.7	36.99	2.343	
8,800.0	8,799.8	8,800.0	8,799.8	19.0	18.5	-146.20	-82.4	0.7	86.7	49.3	37.40	2.318	
8,900.0	8,899.8	8,900.0	8,899.8	19.2	18.7	-146.20	-82.4	0.7	86.7	48.9	37.80	2.293	
9,000.0	8,999.8	9,000.0	8,999.8	19.4	18.9	-146.20	-82.4	0.7	86.7	48.5	38.21	2.268	
9,100.0	9,099.8	9,100.0	9,099.8	19.6	19.1	-146.20	-82.4	0.7	86.7	48.1	38.62	2.244	
9,200.0	9,199.8	9,200.0	9,199.8	19.8	19.3	-146.20	-82.4	0.7	86.7	47.6	39.03	2.221	
9,300.0	9,299.8	9,300.0	9,299.8	20.0	19.5	-146.20	-82.4	0.7	86.7	47.2	39.44	2.198	
9,400.0	9,399.8	9,400.0	9,399.8	20.2	19.7	-146.20	-82.4	0.7	86.7	46.8	39.85	2.175	
9,500.0	9,499.8	9,500.0	9,499.8	20.4	19.9	-146.20	-82.4	0.7	86.7	46.4	40.26	2.153	
9,600.0	9,599.8	9,600.0	9,599.8	20.6	20.1	-146.20	-82.4	0.7	86.7	46.0	40.67	2.131	
9,700.0	9,699.8	9,700.0	9,699.8	20.9	20.3	-146.20	-82.4	0.7	86.7	45.6	41.09	2.110	
9,800.0	9,799.8	9,800.0	9,799.8	21.1	20.5	-146.20	-82.4	0.7	86.7	45.2	41.50	2.089	
9,900.0	9,899.8	9,900.0	9,899.8	21.3	20.7	-146.20	-82.4	0.7	86.7	44.8	41.91	2.068	
10,000.2	10,000.0	10,000.2	10,000.0	21.5	20.9	-146.20	-82.4	0.7	86.7	44.3	42.33	2.048	
10,100.0	10,099.8	10,100.0	10,099.8	21.7	21.1	-146.20	-82.4	0.7	86.7	43.9	42.74	2.028	
10,200.0	10,199.8	10,200.0	10,199.8	21.9	21.3	-146.20	-82.4	0.7	86.7	43.5	43.16	2.008	
10,306.6	10,306.4	10,306.6	10,306.4	22.1	21.5	-146.20	-82.4	0.7	86.7	43.1	43.61	1.988	
10,325.0	10,324.8	10,325.0	10,324.8	22.2	21.5	108.48	-82.4	0.7	86.8	43.1	43.71	1.985	
10,350.0	10,349.7	10,349.9	10,349.7	22.2	21.6	109.42	-82.4	0.7	87.3	43.5	43.81	1.993	
10,375.0	10,374.5	10,374.8	10,374.5	22.3	21.7	111.08	-82.4	0.7	88.3	44.4	43.90	2.012	
10,400.0	10,399.2	10,399.7	10,399.5	22.4	21.7	113.09	-82.7	1.1	89.9	45.9	43.98	2.044	
10,425.0	10,423.6	10,424.8	10,424.5	22.4	21.8	114.92	-83.8	2.6	92.0	48.0	44.04	2.090	
10,450.0	10,447.6	10,450.1	10,449.6	22.5	21.8	116.53	-85.6	5.2	94.7	50.6	44.08	2.148	
10,475.0	10,471.3	10,475.5	10,474.6	22.6	21.9	117.91	-88.2	8.9	97.8	53.7	44.10	2.218	
10,500.0	10,494.5	10,501.1	10,499.5	22.6	21.9	119.05	-91.5	13.7	101.4	57.3	44.11	2.299	
10,525.0	10,517.2	10,526.7	10,524.1	22.7	22.0	119.97	-95.7	19.6	105.4	61.3	44.10	2.391	
10,550.0	10,539.4	10,552.6	10,548.4	22.8	22.0	120.65	-100.6	26.6	109.9	65.8	44.08	2.493	
10,575.0	10,560.9	10,578.5	10,572.4	22.9	22.1	121.12	-106.3	34.8	114.7	70.6	44.06	2.603	
10,600.0	10,581.7	10,604.5	10,595.8	23.0	22.2	121.38	-112.8	44.0	119.9	75.8	44.05	2.722	
10,625.0	10,601.7	10,630.6	10,618.7	23.0	22.2	121.46	-120.0	54.3	125.4	81.4	44.04	2.848	
10,650.0	10,620.9	10,656.8	10,641.0	23.2	22.3	121.37	-128.0	65.6	131.3	87.2	44.06	2.979	
10,675.0	10,639.3	10,683.1	10,662.5	23.3	22.4	121.12	-136.7	78.0	137.4	93.3	44.10	3.116	
10,700.0	10,656.8	10,709.5	10,683.2	23.4	22.5	120.73	-146.0	91.4	143.8	99.7	44.18	3.256	
10,725.0	10,673.3	10,735.9	10,703.0	23.5	22.6	120.21	-156.1	105.7	150.5	106.2	44.29	3.398	
10,750.0	10,688.7	10,762.4	10,721.9	23.7	22.7	119.59	-166.7	120.9	157.5	113.0	44.45	3.542	
10,775.0	10,703.2	10,789.0	10,739.7	23.9	22.8	118.87	-178.0	137.0	164.6	120.0	44.67	3.686	
10,800.0	10,716.5	10,815.6	10,756.5	24.1	23.0	118.06	-189.9	153.9	172.0	127.1	44.93	3.828	
10,825.0	10,728.8	10,842.3	10,772.1	24.3	23.1	117.17	-202.3	171.6	179.6	134.3	45.25	3.969	
10,850.0	10,739.8	10,869.0	10,786.5	24.5	23.3	116.22	-215.3	190.1	187.4	141.7	45.63	4.106	
10,875.0	10,749.7	10,895.9	10,799.7	24.7	23.5	115.21	-228.7	209.2	195.3	149.2	46.07	4.239	
10,900.0	10,758.4	10,922.8	10,811.6	25.0	23.7	114.16	-242.6	229.0	203.4	156.8	46.56	4.368	
10,925.0	10,765.8	10,949.7	10,822.1	25.2	24.0	113.06	-256.8	249.3	211.5	164.4	47.10	4.491	

Oasis Petroleum

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Project:	Indian Hills	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Reference Site:	153N-100W-31/32	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lewis Fed #10B	**Database:**	OpenWellsCompass - EDM Prod
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #1

Survey Program: 0-MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,950.0	10,772.0	10,976.8	10,831.2	25.5	24.2	111.93	-271.4	270.1	219.8	172.1	47.70	4.609	
10,975.0	10,776.9	11,003.9	10,838.9	25.8	24.5	110.77	-286.4	291.4	228.2	179.9	48.34	4.721	
11,000.0	10,780.5	11,031.2	10,845.1	26.1	24.8	109.59	-301.6	313.2	236.7	187.6	49.03	4.827	
11,025.0	10,782.8	11,058.5	10,849.9	26.5	25.1	108.39	-317.1	335.2	245.1	195.4	49.75	4.927	
11,052.4	10,783.8	11,088.6	10,853.3	26.9	25.5	107.05	-334.3	359.7	254.5	203.9	50.58	5.031	
11,071.2	10,784.0	11,109.4	10,854.5	27.1	25.7	106.82	-346.2	376.6	260.7	209.7	51.09	5.104	
11,100.0	10,784.3	11,138.5	10,855.0	27.5	26.1	106.32	-362.9	400.5	270.3	218.4	51.86	5.212	
11,200.0	10,785.1	11,247.6	10,855.9	29.2	27.7	104.50	-423.1	491.4	304.0	249.1	54.87	5.540	
11,300.0	10,786.0	11,360.0	10,856.9	31.0	29.6	103.06	-479.7	588.5	337.4	279.2	58.16	5.801	
11,400.0	10,786.9	11,475.0	10,857.9	32.9	31.7	101.89	-531.5	691.2	370.3	308.6	61.70	6.001	
11,500.0	10,787.8	11,593.0	10,859.0	35.0	34.1	100.93	-578.2	799.5	402.5	337.1	65.43	6.151	
11,589.1	10,788.6	11,700.5	10,859.9	36.9	36.4	100.21	-614.8	900.6	430.5	361.6	68.88	6.249	
11,600.0	10,788.7	11,713.9	10,860.1	37.2	36.7	100.11	-618.9	913.3	433.8	364.4	69.41	6.250	
11,700.0	10,789.6	11,838.9	10,861.2	39.4	39.5	99.34	-653.5	1,033.5	461.1	386.7	74.39	6.198	
11,800.0	10,790.4	11,968.3	10,862.3	41.8	42.5	98.80	-680.8	1,159.8	482.0	402.3	79.71	6.047	
11,900.0	10,791.3	12,100.8	10,863.4	44.2	45.7	98.46	-699.9	1,291.0	496.2	410.9	85.31	5.817	
12,000.0	10,792.2	12,235.5	10,864.6	46.6	48.9	98.29	-710.0	1,425.2	503.6	412.5	91.13	5.527	
12,100.0	10,793.1	12,355.1	10,865.5	49.2	51.8	98.25	-711.4	1,544.8	504.7	408.0	96.66	5.221	
12,200.0	10,794.0	12,455.1	10,866.4	51.7	54.2	98.25	-711.4	1,644.8	504.7	402.9	101.79	4.958	
12,300.0	10,794.8	12,555.1	10,867.2	54.3	56.7	98.24	-711.4	1,744.8	504.7	397.7	106.98	4.717	
12,400.0	10,795.7	12,655.1	10,868.0	57.0	59.2	98.23	-711.4	1,844.8	504.7	392.4	112.24	4.496	
12,500.0	10,796.6	12,755.1	10,868.8	59.6	61.8	98.22	-711.4	1,944.8	504.6	387.1	117.54	4.293	
12,600.0	10,797.5	12,855.1	10,869.6	62.3	64.4	98.22	-711.4	2,044.8	504.6	381.7	122.89	4.106	
12,700.0	10,798.4	12,955.1	10,870.4	65.0	67.0	98.21	-711.4	2,144.8	504.6	376.3	128.29	3.934	
12,800.0	10,799.3	13,055.1	10,871.2	67.7	69.6	98.20	-711.4	2,244.8	504.6	370.9	133.71	3.774	
12,900.0	10,800.1	13,155.1	10,872.1	70.5	72.3	98.19	-711.4	2,344.8	504.6	365.4	139.17	3.626	
13,000.0	10,801.0	13,255.1	10,872.9	73.2	75.0	98.19	-711.4	2,444.8	504.6	359.9	144.66	3.488	
13,100.0	10,801.9	13,355.1	10,873.7	76.0	77.7	98.18	-711.4	2,544.8	504.6	354.4	150.17	3.360	
13,200.0	10,802.8	13,455.1	10,874.5	78.8	80.4	98.17	-711.4	2,644.8	504.6	348.9	155.70	3.241	
13,300.0	10,803.7	13,555.1	10,875.3	81.6	83.2	98.16	-711.4	2,744.8	504.6	343.3	161.25	3.129	
13,400.0	10,804.6	13,655.1	10,876.1	84.4	85.9	98.15	-711.4	2,844.8	504.6	337.7	166.82	3.025	
13,500.0	10,805.4	13,755.1	10,876.9	87.2	88.7	98.15	-711.4	2,944.8	504.5	332.1	172.41	2.927	
13,600.0	10,806.3	13,855.1	10,877.8	90.0	91.5	98.14	-711.4	3,044.8	504.5	326.5	178.01	2.834	
13,700.0	10,807.2	13,955.1	10,878.6	92.8	94.2	98.13	-711.4	3,144.8	504.5	320.9	183.62	2.748	
13,800.0	10,808.1	14,055.1	10,879.4	95.7	97.0	98.12	-711.4	3,244.8	504.5	315.3	189.25	2.666	
13,900.0	10,809.0	14,155.1	10,880.2	98.5	99.8	98.12	-711.4	3,344.8	504.5	309.6	194.88	2.589	
14,000.0	10,809.9	14,255.1	10,881.0	101.4	102.6	98.11	-711.4	3,444.8	504.5	304.0	200.53	2.516	
14,100.0	10,810.7	14,355.1	10,881.8	104.2	105.4	98.10	-711.4	3,544.8	504.5	298.3	206.19	2.447	
14,200.0	10,811.6	14,455.1	10,882.6	107.0	108.3	98.09	-711.4	3,644.8	504.5	292.6	211.85	2.381	
14,300.0	10,812.5	14,555.1	10,883.5	109.9	111.1	98.09	-711.4	3,744.8	504.5	287.0	217.52	2.319	
14,400.0	10,813.4	14,655.1	10,884.3	112.8	113.9	98.08	-711.4	3,844.7	504.5	281.3	223.20	2.260	
14,500.0	10,814.3	14,755.1	10,885.1	115.6	116.8	98.07	-711.4	3,944.7	504.5	275.6	228.89	2.204	
14,600.0	10,815.2	14,855.1	10,885.9	118.5	119.6	98.06	-711.4	4,044.7	504.4	269.9	234.58	2.150	
14,700.0	10,816.0	14,955.1	10,886.7	121.4	122.4	98.05	-711.4	4,144.7	504.4	264.2	240.28	2.099	
14,800.0	10,816.9	15,055.1	10,887.5	124.2	125.3	98.05	-711.4	4,244.7	504.4	258.4	245.99	2.051	
14,900.0	10,817.8	15,155.1	10,888.3	127.1	128.1	98.04	-711.4	4,344.7	504.4	252.7	251.70	2.004	
15,000.0	10,818.7	15,255.1	10,889.2	130.0	131.0	98.03	-711.4	4,444.7	504.4	247.0	257.41	1.960	
15,100.0	10,819.6	15,355.1	10,890.0	132.9	133.9	98.02	-711.4	4,544.7	504.4	241.3	263.13	1.917	
15,200.0	10,820.5	15,455.1	10,890.8	135.7	136.7	98.02	-711.4	4,644.7	504.4	235.5	268.85	1.876	
15,300.0	10,821.3	15,555.1	10,891.6	138.6	139.6	98.01	-711.4	4,744.7	504.4	229.8	274.58	1.837	
15,400.0	10,822.2	15,655.1	10,892.4	141.5	142.5	98.00	-711.4	4,844.7	504.4	224.1	280.31	1.799	
15,500.0	10,823.1	15,755.1	10,893.2	144.4	145.3	97.99	-711.4	4,944.7	504.4	218.3	286.05	1.763	
15,600.0	10,824.0	15,855.1	10,894.0	147.3	148.2	97.99	-711.4	5,044.7	504.3	212.6	291.78	1.728	

Oasis Petroleum

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Project:	Indian Hills	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Reference Site:	153N-100W-31/32	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lewis Fed #10B	**Database:**	OpenWellsCompass - EDM Prod
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design 153N-100W-31/32 - Lewis Federal 5300 31-31 11T - Lewis Fed #11T - Plan #1 — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

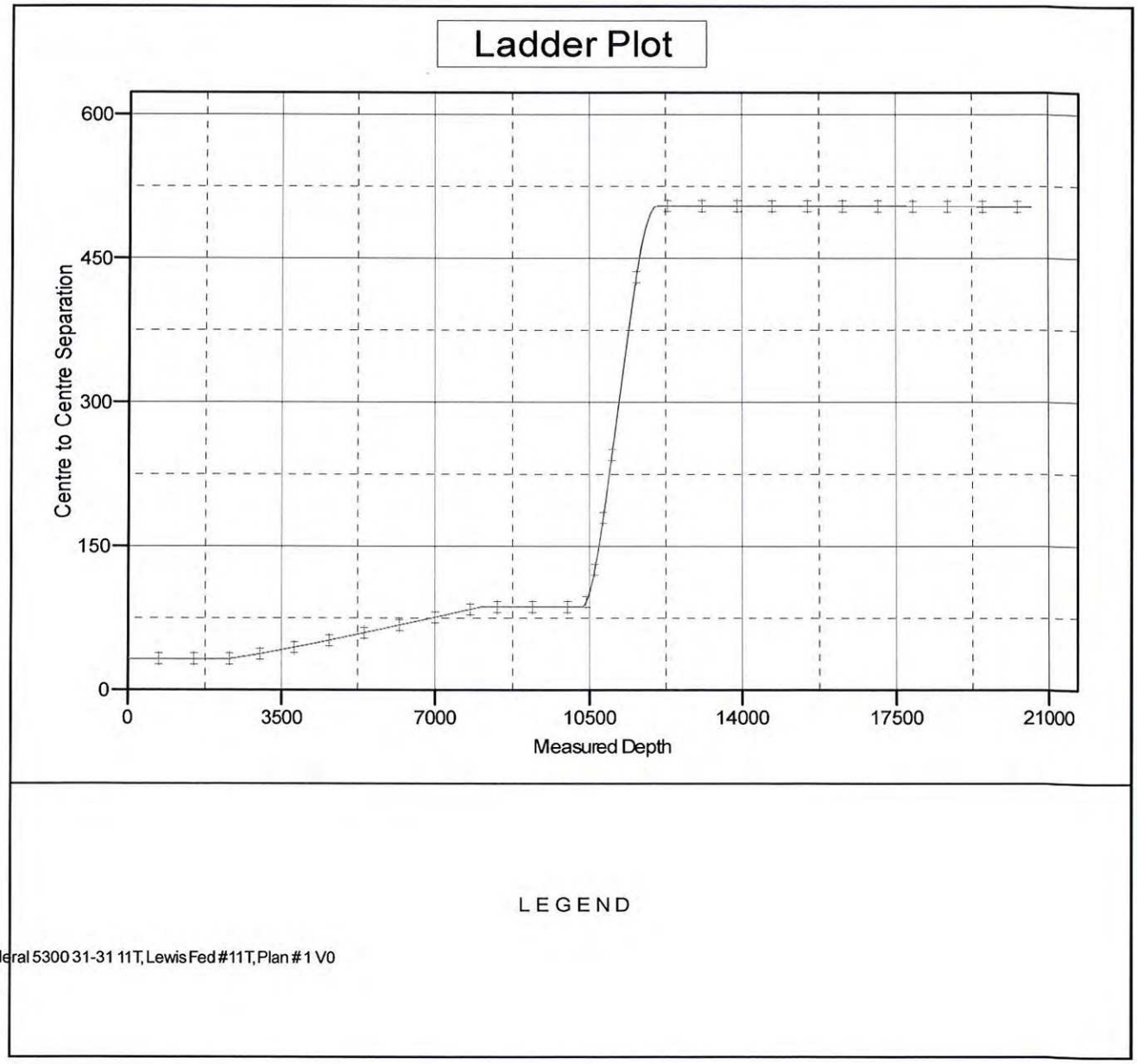
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
15,700.0	10,824.9	15,955.1	10,894.9	150.2	151.1	97.98	-711.4	5,144.7	504.3	206.8	297.53	1.695	
15,800.0	10,825.7	16,055.1	10,895.7	153.1	153.9	97.97	-711.4	5,244.7	504.3	201.1	303.27	1.663	
15,900.0	10,826.6	16,155.1	10,896.5	156.0	156.8	97.96	-711.4	5,344.7	504.3	195.3	309.02	1.632	
16,000.0	10,827.5	16,255.1	10,897.3	158.9	159.7	97.96	-711.4	5,444.7	504.3	189.5	314.77	1.602	
16,100.0	10,828.4	16,355.1	10,898.1	161.8	162.6	97.95	-711.4	5,544.7	504.3	183.8	320.52	1.573	
16,200.0	10,829.3	16,455.1	10,898.9	164.7	165.5	97.94	-711.4	5,644.7	504.3	178.0	326.27	1.546	
16,300.0	10,830.2	16,555.1	10,899.8	167.6	168.4	97.93	-711.4	5,744.7	504.3	172.3	332.03	1.519	
16,400.0	10,831.0	16,655.1	10,900.6	170.5	171.2	97.92	-711.4	5,844.7	504.3	166.5	337.79	1.493	Level 3Level 3
16,500.0	10,831.9	16,755.1	10,901.4	173.4	174.1	97.92	-711.4	5,944.7	504.3	160.7	343.55	1.468	Level 3Level 3
16,600.0	10,832.8	16,855.1	10,902.2	176.3	177.0	97.91	-711.4	6,044.7	504.3	154.9	349.31	1.444	Level 3Level 3
16,700.0	10,833.7	16,955.1	10,903.0	179.2	179.9	97.90	-711.4	6,144.7	504.2	149.2	355.08	1.420	Level 3Level 3
16,800.0	10,834.6	17,055.1	10,903.8	182.1	182.8	97.89	-711.4	6,244.7	504.2	143.4	360.85	1.397	Level 3Level 3
16,900.0	10,835.5	17,155.1	10,904.6	185.0	185.7	97.89	-711.4	6,344.7	504.2	137.6	366.62	1.375	Level 3Level 3
17,000.0	10,836.3	17,255.1	10,905.5	187.9	188.6	97.88	-711.4	6,444.7	504.2	131.8	372.39	1.354	Level 3Level 3
17,100.0	10,837.2	17,355.1	10,906.3	190.8	191.5	97.87	-711.4	6,544.7	504.2	126.0	378.16	1.333	Level 3Level 3
17,200.0	10,838.1	17,455.1	10,907.1	193.7	194.4	97.86	-711.4	6,644.7	504.2	120.3	383.93	1.313	Level 3Level 3
17,300.0	10,839.0	17,555.1	10,907.9	196.6	197.3	97.86	-711.4	6,744.7	504.2	114.5	389.71	1.294	Level 3Level 3
17,400.0	10,839.9	17,655.1	10,908.7	199.5	200.2	97.85	-711.4	6,844.6	504.2	108.7	395.48	1.275	Level 3Level 3
17,500.0	10,840.8	17,755.1	10,909.5	202.4	203.1	97.84	-711.4	6,944.6	504.2	102.9	401.26	1.256	Level 3Level 3
17,600.0	10,841.6	17,855.1	10,910.3	205.3	206.0	97.83	-711.4	7,044.6	504.2	97.1	407.04	1.239	Level 2
17,700.0	10,842.5	17,955.1	10,911.2	208.2	208.9	97.82	-711.4	7,144.6	504.2	91.3	412.82	1.221	Level 2
17,800.0	10,843.4	18,055.1	10,912.0	211.1	211.8	97.82	-711.4	7,244.6	504.1	85.5	418.60	1.204	Level 2
17,900.0	10,844.3	18,155.1	10,912.8	214.1	214.7	97.81	-711.4	7,344.6	504.1	79.7	424.39	1.188	Level 2
18,000.0	10,845.2	18,255.1	10,913.6	217.0	217.6	97.80	-711.4	7,444.6	504.1	74.0	430.17	1.172	Level 2
18,100.0	10,846.1	18,355.1	10,914.4	219.9	220.5	97.79	-711.4	7,544.6	504.1	68.2	435.96	1.156	Level 2
18,200.0	10,846.9	18,455.1	10,915.2	222.8	223.4	97.79	-711.4	7,644.6	504.1	62.4	441.74	1.141	Level 2
18,300.0	10,847.8	18,555.1	10,916.0	225.7	226.3	97.78	-711.4	7,744.6	504.1	56.6	447.53	1.126	Level 2
18,400.0	10,848.7	18,655.1	10,916.9	228.6	229.2	97.77	-711.4	7,844.6	504.1	50.8	453.32	1.112	Level 2
18,500.0	10,849.6	18,755.1	10,917.7	231.5	232.1	97.76	-711.4	7,944.6	504.1	45.0	459.11	1.098	Level 2
18,600.0	10,850.5	18,855.1	10,918.5	234.4	235.0	97.76	-711.4	8,044.6	504.1	39.2	464.90	1.084	Level 2
18,700.0	10,851.4	18,955.1	10,919.3	237.4	237.9	97.75	-711.4	8,144.6	504.1	33.4	470.69	1.071	Level 2
18,800.0	10,852.2	19,055.1	10,920.1	240.3	240.8	97.74	-711.4	8,244.6	504.1	27.6	476.48	1.058	Level 2
18,900.0	10,853.1	19,155.1	10,920.9	243.2	243.8	97.73	-711.4	8,344.6	504.0	21.8	482.27	1.045	Level 2
19,000.0	10,854.0	19,255.1	10,921.7	246.1	246.7	97.72	-711.4	8,444.6	504.0	16.0	488.07	1.033	Level 2
19,100.0	10,854.9	19,355.1	10,922.6	249.0	249.6	97.72	-711.4	8,544.6	504.0	10.2	493.86	1.021	Level 2
19,200.0	10,855.8	19,455.1	10,923.4	251.9	252.5	97.71	-711.4	8,644.6	504.0	4.4	499.66	1.009	Level 2
19,300.0	10,856.6	19,555.1	10,924.2	254.9	255.4	97.70	-711.4	8,744.6	504.0	-1.5	505.46	0.997	Level 1
19,400.0	10,857.5	19,655.1	10,925.0	257.8	258.3	97.69	-711.4	8,844.6	504.0	-7.3	511.25	0.986	Level 1
19,500.0	10,858.4	19,755.1	10,925.8	260.7	261.2	97.69	-711.4	8,944.6	504.0	-13.1	517.05	0.975	Level 1
19,600.0	10,859.3	19,855.1	10,926.6	263.6	264.1	97.68	-711.4	9,044.6	504.0	-18.9	522.85	0.964	Level 1
19,700.0	10,860.2	19,955.1	10,927.4	266.5	267.0	97.67	-711.4	9,144.6	504.0	-24.7	528.65	0.953	Level 1
19,800.0	10,861.1	20,055.1	10,928.3	269.4	270.0	97.66	-711.4	9,244.6	504.0	-30.5	534.45	0.943	Level 1
19,900.0	10,861.9	20,155.1	10,929.1	272.4	272.9	97.66	-711.4	9,344.6	503.9	-36.3	540.25	0.933	Level 1
20,000.0	10,862.8	20,255.1	10,929.9	275.3	275.8	97.65	-711.4	9,444.6	503.9	-42.1	546.05	0.923	Level 1
20,100.0	10,863.7	20,355.1	10,930.7	278.2	278.7	97.64	-711.4	9,544.6	503.9	-47.9	551.85	0.913	Level 1
20,200.0	10,864.6	20,455.1	10,931.5	281.1	281.6	97.63	-711.4	9,644.6	503.9	-53.7	557.65	0.904	Level 1
20,300.0	10,865.5	20,555.1	10,932.3	284.0	284.5	97.62	-711.4	9,744.6	503.9	-59.5	563.46	0.894	Level 1
20,400.0	10,866.4	20,655.1	10,933.2	287.0	287.4	97.62	-711.4	9,844.5	503.9	-65.4	569.26	0.885	Level 1
20,500.0	10,867.2	20,755.1	10,934.0	289.9	290.4	97.61	-711.4	9,944.5	503.9	-71.2	575.07	0.876	Level 1
20,600.0	10,868.1	20,855.1	10,934.8	292.8	293.3	97.60	-711.4	10,044.5	503.9	-77.0	580.87	0.867	Level 1
20,616.9	10,868.3	20,872.0	10,934.9	293.3	293.8	97.60	-711.4	10,061.5	503.9	-78.0	581.85	0.866	Level 1, ES, SF

Oasis Petroleum

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Lewis Federal 5300 31-31 10B
Project:	Indian Hills	**TVD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Reference Site:	153N-100W-31/32	**MD Reference:**	WELL @ 2158.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Lewis Federal 5300 31-31 10B	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lewis Fed #10B	**Database:**	OpenWellsCompass - EDM Prod
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 2158.0ft (Original Well Elev)	Coordinates are relative to: Lewis Federal 5300 31-31 10B
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, North Dakota Northern Zone
Central Meridian is 100° 30' 0.000 W	Grid Convergence at Surface is: -2.31°



Oasis Petroleum

Anticollision Report

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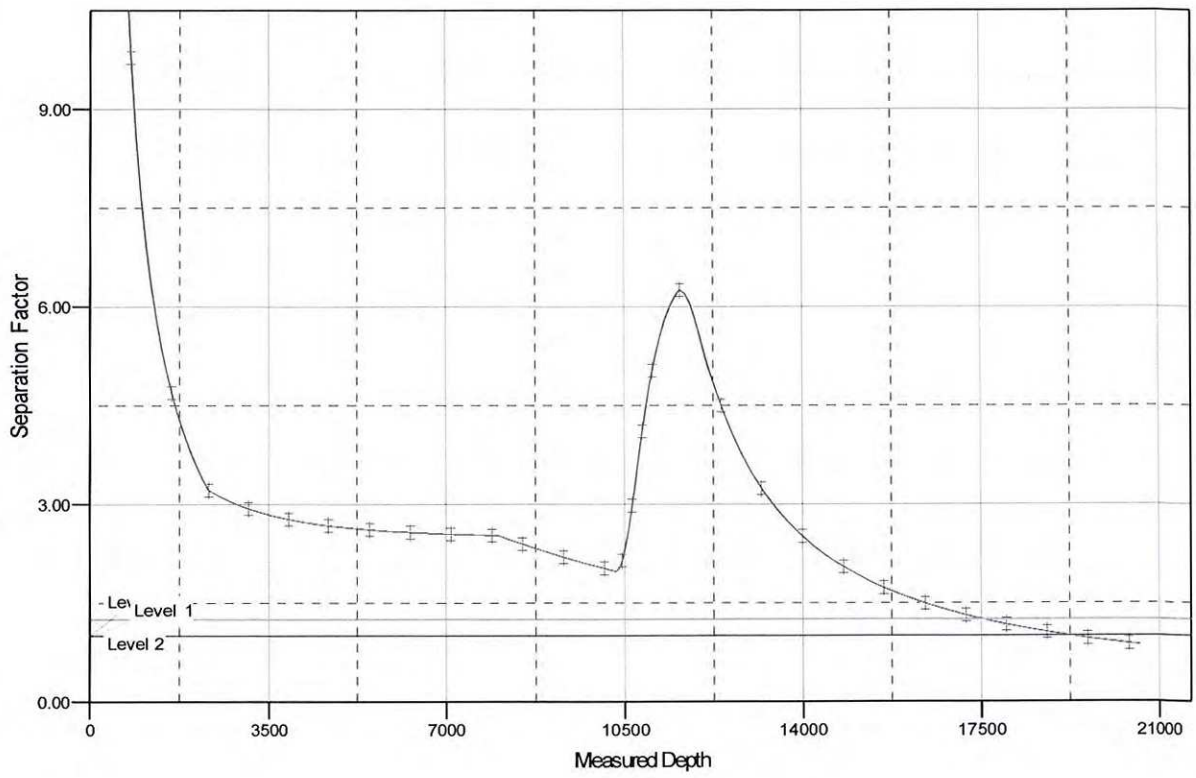
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, North Dakota Northern Zone
Central Meridian is 100° 30' 0.000 W	Grid Convergence at Surface is: -2.31°

Separation Factor Plot

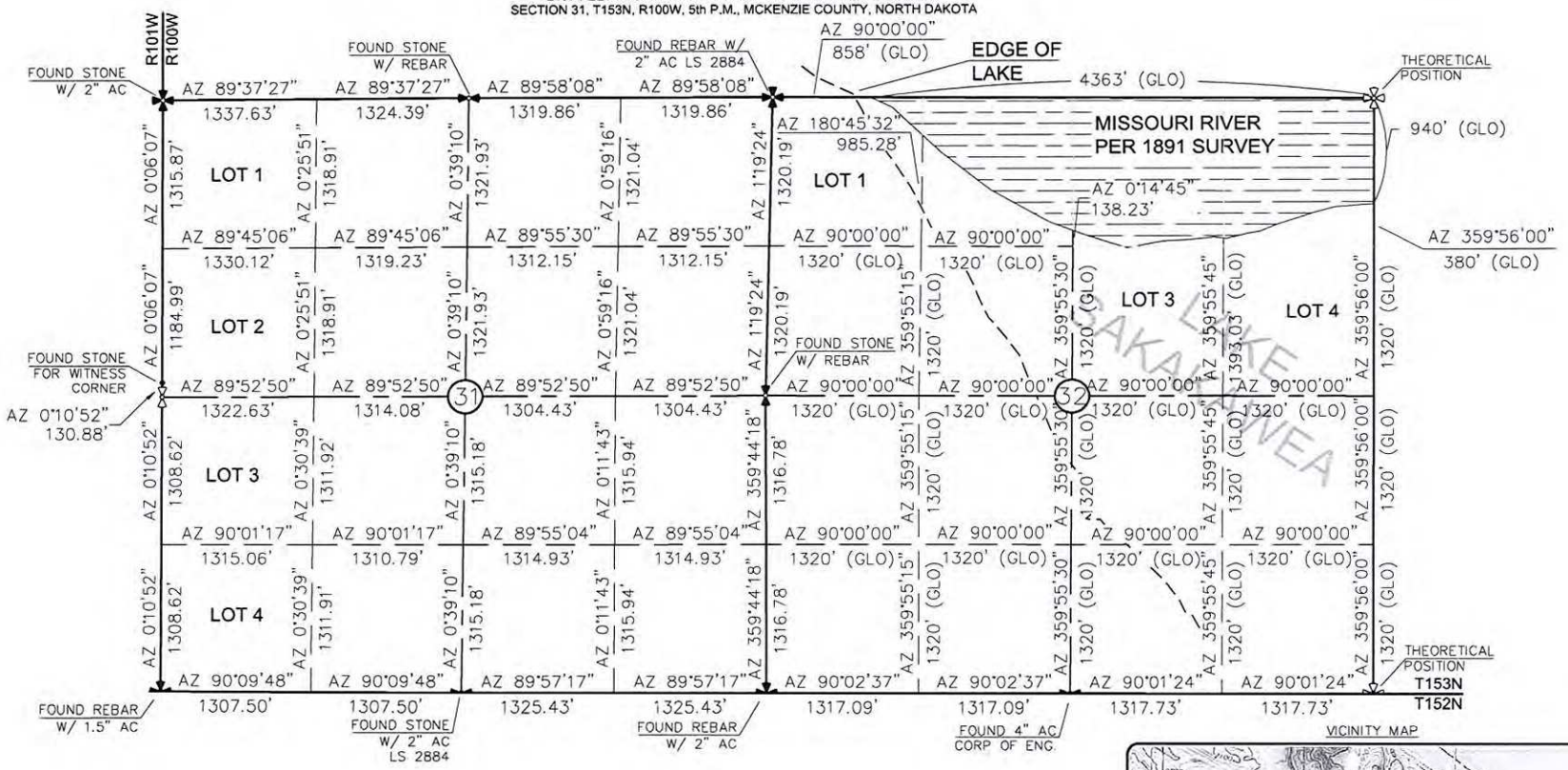


LEGEND

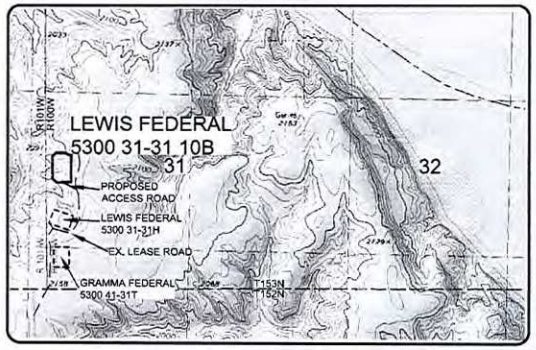
deral 5300 31-31 11T, Lewis Fed #11T, Plan #1 V0

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP



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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'.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 1/20/14
NORTH DAKOTA

- MONUMENT – RECOVERED
- MONUMENT – NOT RECOVERED

0 1000
1" = 1000'

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 31 & 32, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Drawn By: B.H.H. Project No.: 513-09-279.05
Checked By: J.D.S. Date: JAN 2014

Interstate Engineering, Inc.
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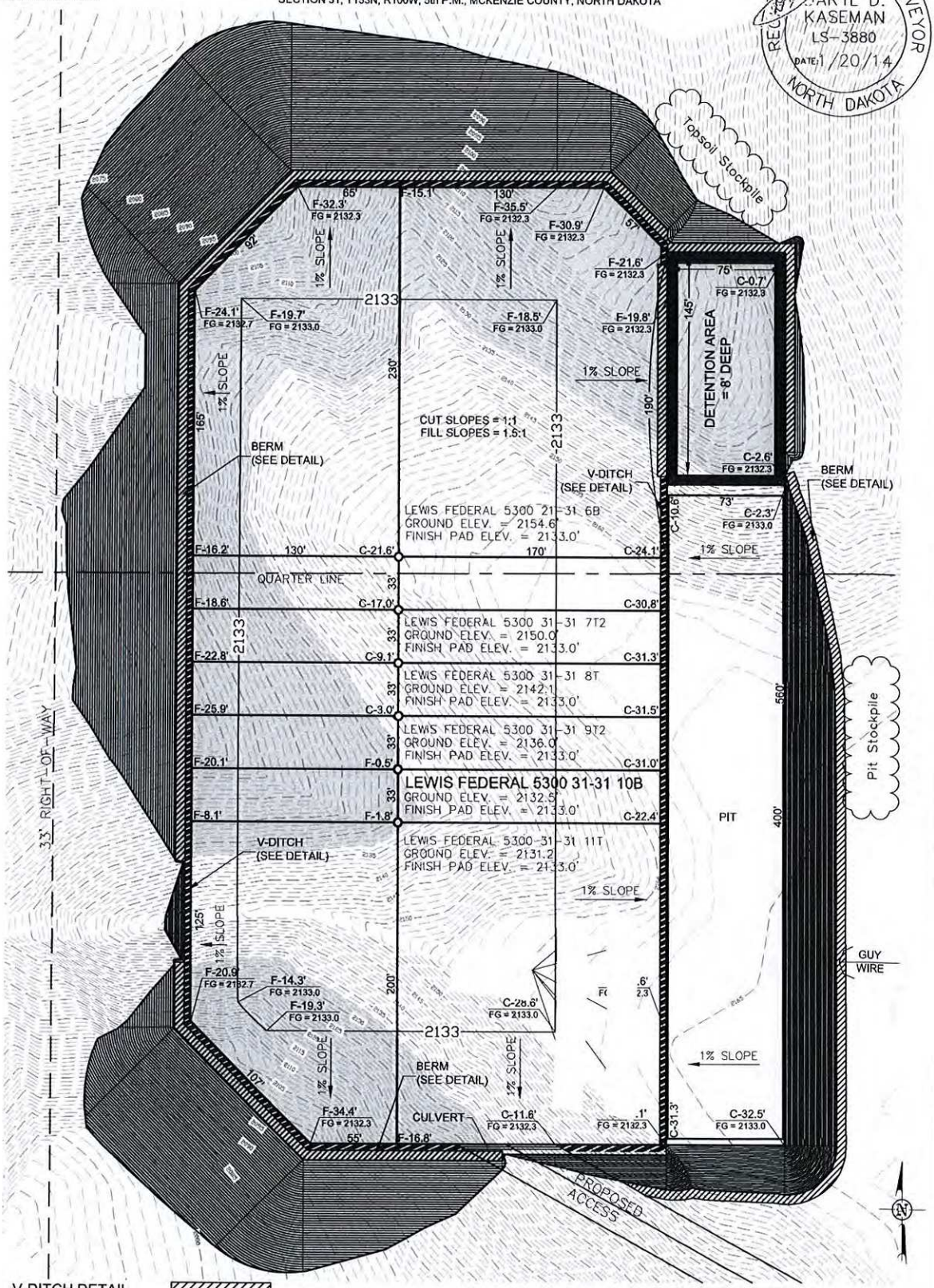
SHEET NO. 2/8

PAD LAYOUT

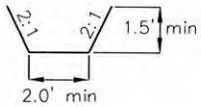
OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 1/20/14
NORTH DAKOTA



V-DITCH DETAIL



BERM — Proposed Contours
DITCH — Original Contours

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

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0 60
1" = 60'

3/8
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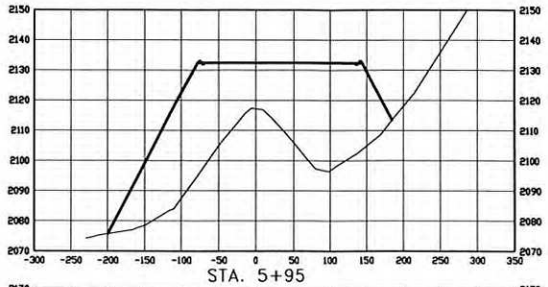
OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

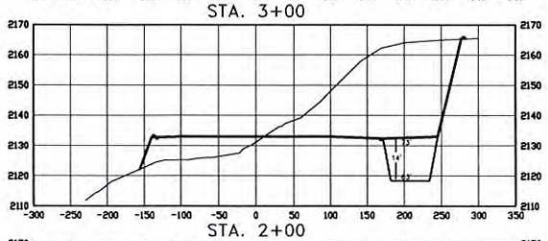
Drawn By: B.H.H. | Project No.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

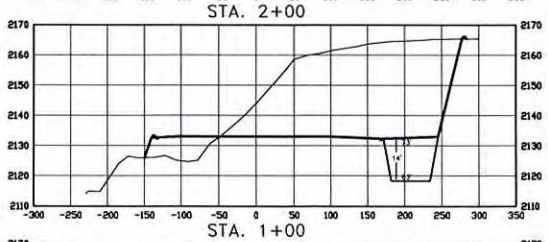
Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

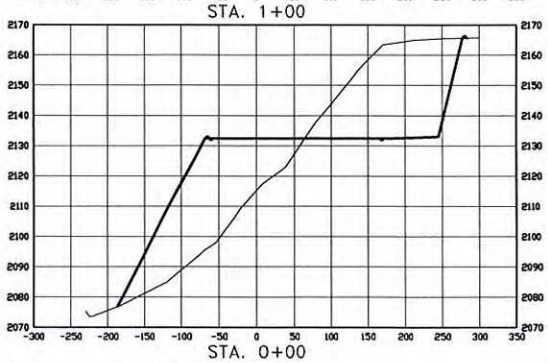
CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA









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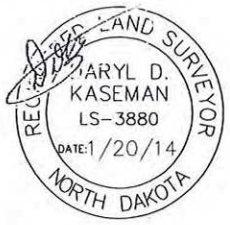

SCALE
HORIZ 1"=160'
VERT 1"=40'

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OASIS PETROLEUM NORTH AMERICA, LLC
CROSS SECTIONS
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Drawn By: B.H.H. Project No.: S13-09-379.05
Checked By: D.D.K. Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2132.5
WELL PAD ELEVATION	2133.0

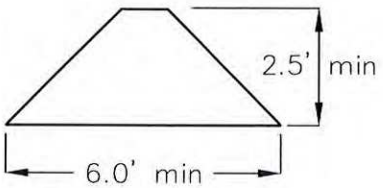
EXCAVATION	110,182
PLUS PIT	12,264
	122,446
EMBANKMENT	83,005
PLUS SHRINKAGE (25%)	20,751
	103,756
STOCKPILE PIT	12,264
STOCKPILE TOP SOIL (6")	5,790
BERMS	1,887 LF = 612 CY
DITCHES	1,441 LF = 220 CY
DETENTION AREA	2,812 CY
STOCKPILE MATERIAL	3,056
DISTURBED AREA FROM PAD	7.18 ACRES

NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS NOTED)
CUT END SLOPES AT 1:1
FILL END SLOPES AT 1.5:1

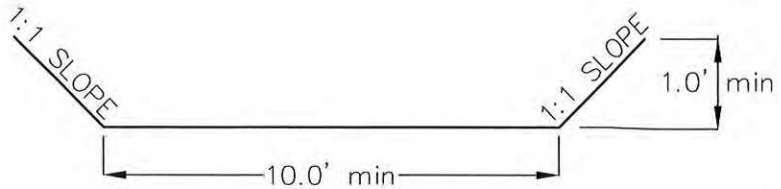
WELL SITE LOCATION

2497' FSL
251' FWL

BERM DETAIL



DITCH DETAIL



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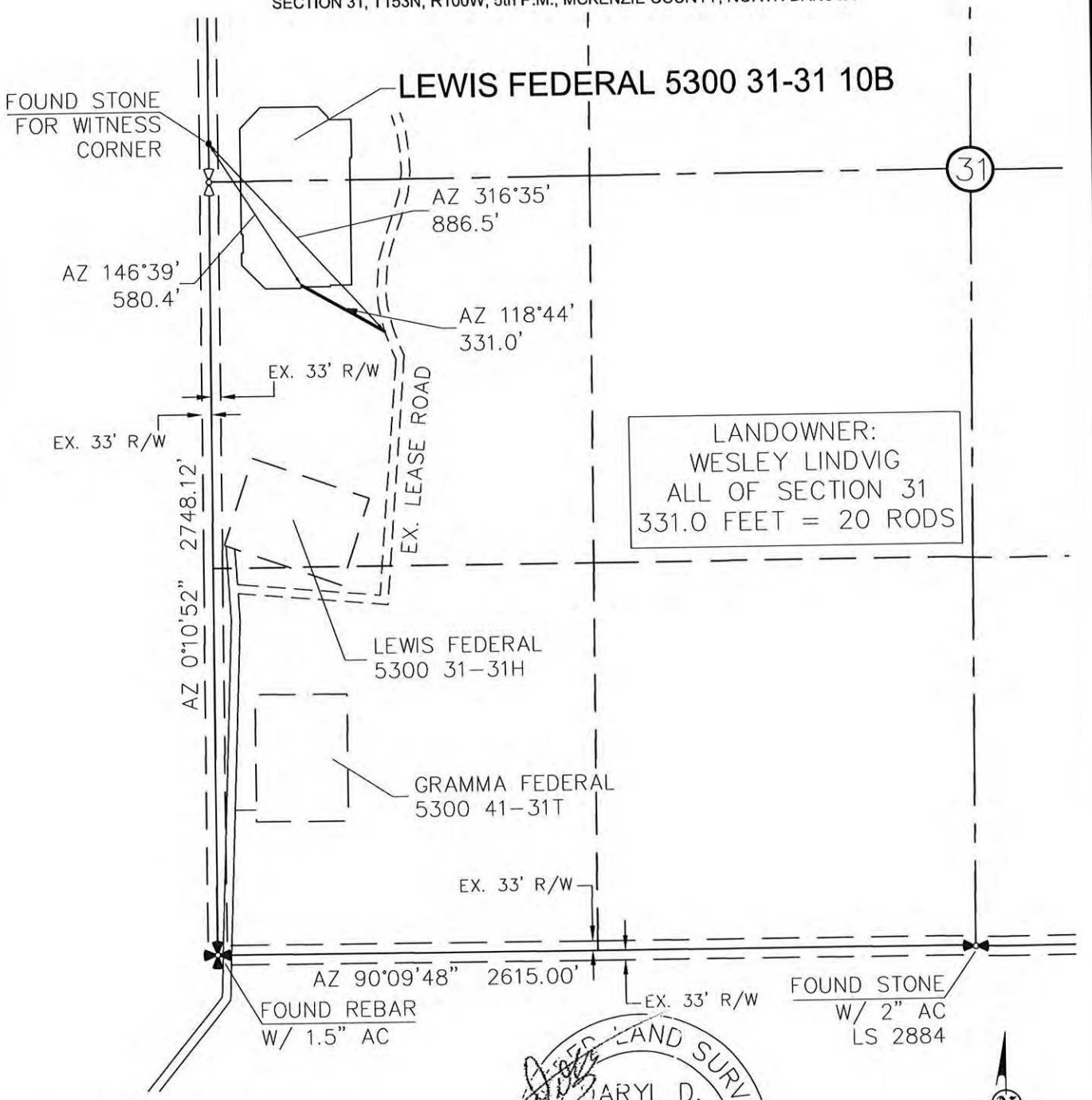
OASIS PETROLEUM NORTH AMERICA, LLC
QUANTITIES
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D.
KASEMAN
LS-3880
DATE: 1/20/14
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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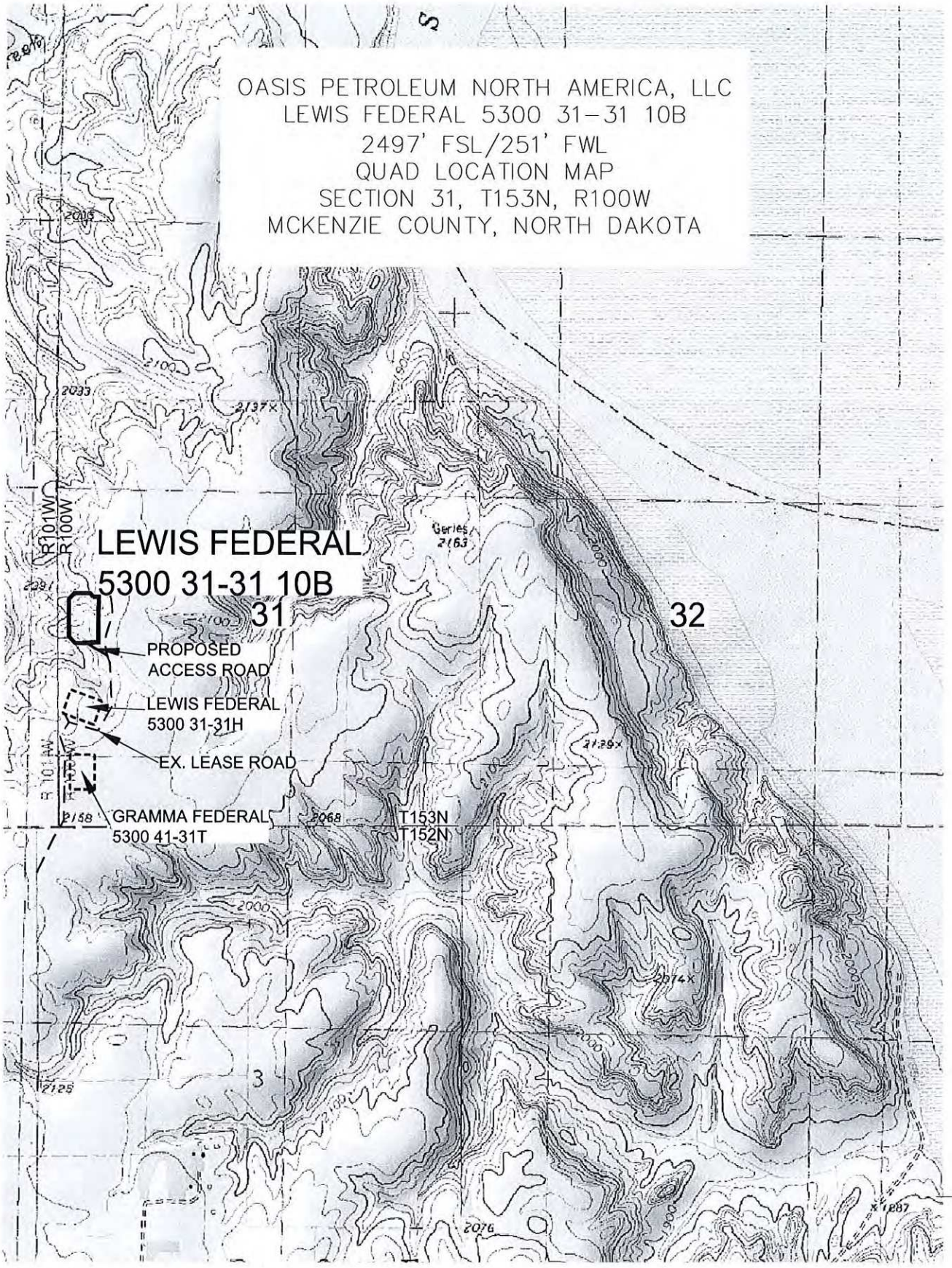
OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

OASIS PETROLEUM NORTH AMERICA, LLC
LEWIS FEDERAL 5300 31-31 10B
2497' FSL/251' FWL
QUAD LOCATION MAP
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA



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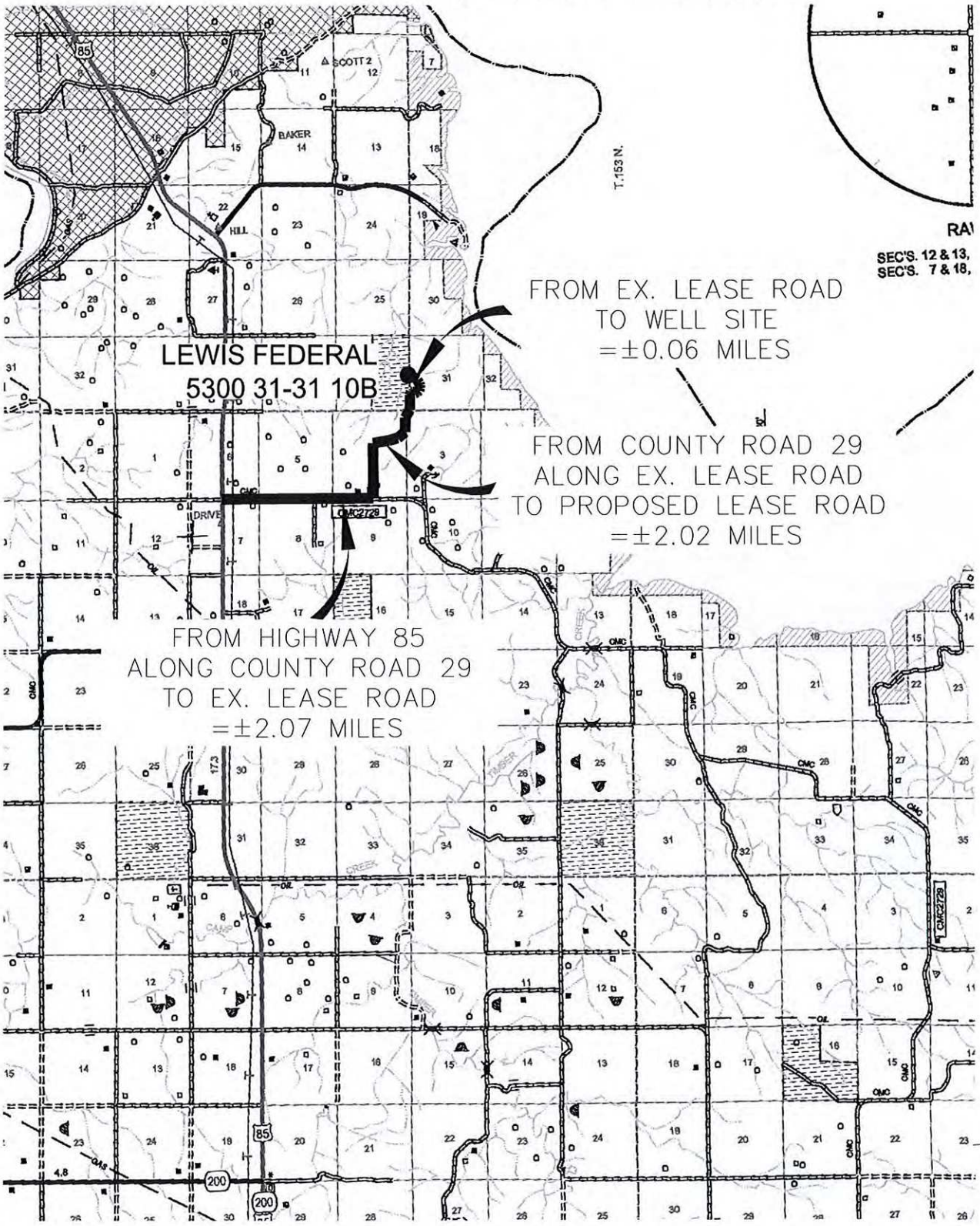
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 31, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"LEWIS FEDERAL 5300 31-31 10B"
2497 FEET FROM SOUTH LINE AND 251 FEET FROM WEST LINE
SECTION 31, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



SCALE: 1" = 2 MILE

6/8
SHEET NO.

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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.: S13-09-379.05
Checked By: D.D.K. | Date: JAN. 2014

Revision No.	Date	By	Description
REV. 1	1/15/14	JJS	ADDED "FEDERAL" TO NAME

Burns, David J.

From: Lauri Stanfield <lstanfield@oasispetroleum.com>
Sent: Thursday, April 10, 2014 3:25 PM
To: Burns, David J.
Cc: Lauri Stanfield; Michael Kukuk; Chelsea Covington; Brandi Terry; Heather McCowan
Subject: Lewis Federal wells

Dave,

Pursuant to the above reference and your recent request, please find the following information for the Lewis Federal wells which will be penetrating BLM Minerals:

Lewis Federal 5300 11-31 3B – Federal APD required
Lewis Federal 5300 11-31 4T2 – Federal APD required
Lewis Federal 5300 11-31 5T – Federal APD required
Lewis Federal 5300 21-31 6B – Federal APD required
Lewis Federal 5300 31-31 7T2 – Federal APD required
Lewis Federal 5300 31-31 8T – Federal APD required
Lewis Federal 5300 31-31 9T2 – Federal APD required
Lewis Federal 5300 31-31 10B – Federal APD required
Lewis Federal 5300 31-31 11T – Federal APD required

The Lewis Federal 5300 11-31 2T does not penetrate federal minerals. The Notice of Staking for these wells was sent to the BLM back in January, and federal permits will be filed with the BLM for the above wells next week pending completion of the Surface Use Plan of Operation being completed.

Should you need additional information, please feel free to contact me.

Kind Regards,

Lauri M. Stanfield

Regulatory Specialist
1001 Fannin, Suite 1500
Houston, TX 77002
Direct: 281-404-9562

OASIS PETROLEUM

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 21-31 6B
Lewis Federal 5300 31-31 7T2
Lewis Federal 5300 31-31 8T
Lewis Federal 5300 31-31 9T2
Lewis Federal 5300 31-31 10B
Lewis Federal 5300 31-31 11T

Brandi Terry
Regulatory Specialist
Oasis Petroleum North America, LLC

OASIS PETROLEUM

3/18/2014

Michael Kukuk
Regulatory Supervisor
Oasis Petroleum
1001 Fannin St.
Suite 1500
Houston, TX 77002

Todd Holweger
Mineral Resources Permit Manager
North Dakota Industrial Commission
600 East Boulevard Avenue Dept. 405
Bismarck, ND 58505-0840

RE: Diesel Fuel Statement for all pending permits

Dear Mr. Holweger:

Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations. This statement applies to all of the wells listed in **Attachment 1.**

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)

Thank you for your consideration.

Respectfully,

Michael Kukuk
Regulatory Supervisor
Oasis Petroleum

OASIS PETROLEUM

Attachment 1:
APD Submissions - Age Report

Well	Date APD Submitted	Days Since Submitted
Holmes 5501 14-5 6T	11/4/2013	134
Cook 5300 41-12 6T	11/19/2013	119
Domalakes 6092 24-16 6T2	11/22/2013	116
Delta 6093 14-15 9B	1/9/2014	68
McCauley 5501 14-4 8T	1/27/2014	50
Delta 6093 44-15 6T	1/29/2014	48
Straw POW 5602 42-17	2/3/2014	43
Harbour 5601 42-33 5T	2/4/2014	42
Harbour 5601 42-33 2B	2/4/2014	42
Harbour 5601 42-33 3T	2/4/2014	42
Harbour 5601 42-33 4B	2/4/2014	42
Wade Federal 5300 41-30 4T	2/4/2014	42
Andre 5601 42-33 2B	2/4/2014	42
Wade Federal 5300 31-30 2B	2/4/2014	42
McCauley 5501 13-3 7T	2/4/2014	42
Wade Federal 5300 31-30 10T2	2/10/2014	36
Wade Federal 5300 31-30 11T	2/10/2014	36
Twobins 5501 13-29 2T	2/11/2014	35
Patsy POW 5198 33-5	2/11/2014	35
Twobins 5501 13-29 3B	2/11/2014	35
Twobins 5501 13-29 4T	2/11/2014	35
Twobins 5501 13-29 5B	2/11/2014	35
Holmes-Harbour 5501 14-5 2B	2/12/2014	34
Shepherd Andre 5501 14-5 4B	2/12/2014	34
Wade Federal 5300 41-30 6B	2/12/2014	34
Wade Federal 5300 41-30 3T2	2/12/2014	34
Wade Federal 5300 41-30 7T	2/12/2014	34
Harbour 5501 14-4 7B	2/13/2014	33
Harbour 5501 14-4 6T	2/13/2014	33
Chalmers 5300 21-19 8T	2/21/2014	25
Chalmers 5300 21-19 6B	2/21/2014	25
Chalmers 5300 21-19 5T	2/21/2014	25
Chalmers 5300 21-19 10B	2/21/2014	25
Chalmers 5300 21-19 11T	2/21/2014	25
Chalmers 5300 21-19 9T2	2/21/2014	25
Chalmers 5300 21-19 7T2	2/21/2014	25

White Federal 5198 13-6 12B	2/21/2014	25
White Federal 5198 13-6 13T3	2/21/2014	25
White Federal 5198 13-6 14T	2/21/2014	25
Drummond 5501 42-21 3B	2/24/2014	22
Drummond 5501 42-21 4T	2/24/2014	22
Drummond 5501 42-21 5B	2/24/2014	22
Drummond 5501 42-21 6T	2/26/2014	20
Drummond 5501 41-21 7B	2/26/2014	20
Drummond 5501 41-21 8T	2/26/2014	20
McCauley Logan 5601 11-26 6T	2/26/2014	20
Harbour 5501 14-5 2T	3/3/2014	15
Andre 5501 14-5 3B	3/3/2014	15
Helling Trust Federal 5494 41-22 11T2	3/10/2014	8
Helling Trust Federal 5494 41-22 14T3	3/10/2014	8
Helling Trust Federal 5494 41-22 2B	3/10/2014	8
Helling Trust Federal 5494 41-22 8T	3/10/2014	8
Helling Trust Federal 5494 43-22 4B	3/11/2014	7
Helling Trust Federal 5494 43-22 10T	3/11/2014	7
Helling Trust Federal 5494 43-22 13T2	3/11/2014	7
Helling Trust Federal 5494 43-22 16T3	3/11/2014	7
Dishon 5893 44-35 1T2	3/12/2014	6
Lewis Federal 5300 21-31 6B	3/12/2014	6
Lewis Federal 5300 31-31 7T2	3/12/2014	6
Helling Trust Federal 5494 44-22 5B	3/12/2014	6
Helling Trust Federal 5494 44-22 6B	3/12/2014	6
Helling Trust Federal 5494 44-22 7B	3/12/2014	6
Helling Trust Federal 5494 42-22 12T2	3/12/2014	6
Helling Trust Federal 5494 42-22 15T3	3/12/2014	6
Helling Trust Federal 5494 42-22 3B	3/12/2014	6
Helling Trust Federal 5494 42-22 9T	3/12/2014	6
Lewis Federal 5300 31-31 8T	3/13/2014	5
Lewis Federal 5300 31-31 10B	3/13/2014	5
Lewis Federal 5300 31-31 11T	3/13/2014	5
Lewis Federal 5300 31-31 9T2	3/13/2014	5
Falcon Federal 2759 44-16 3B	3/17/2014	1
Falcon Federal 2759 44-16 4T	3/17/2014	1
White Federal 5198 13-6 9T	3/17/2014	1
White Federal 5198 13-6 11T2	3/17/2014	1
White Federal 5198 13-6 10T3	3/17/2014	1