August 1, 2016

Via Priority Mail, Return Receipt Requested

Mr. Jason Deardorff
UIC Program - Salt Water Disposal
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

RE: UIC Permit Application
RED SWD 1
SESE Sec. 15, T148N R94W
Dunn County, North Dakota

Dear Mr. Deardorff:

On behalf of 1804 Operating, LLC (1804 Operating), I hereby submit the enclosed Underground Injection Control (UIC) permit application for the RED SWD 1. This is a new well that 1804 Operating seeks to drill and operate as a Class II, Type D salt water disposal well.

Please review the enclosed application and accompanying attachments and notify me if you discover any deficiencies.

Sincerely,

//THOMAS SCHUMACHER//

Thomas Schumacher
Member, Midcon Resource Group, LLC
Agent for 1804 Operating, LLC
701-400-9909
tom@midcongroup.com

Enclosures

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: 1804 OPERATING, LLC

Street Address: 5910 NORTH CENTRAL EXPRESSWAY

Phone Number: 701-484-7106

City: DALLAS

State: TX

ZIP CODE: 75206

III. Operator Name and Address

Owner Name: 1804 OPERATING, LLC

Street Address: 5910 NORTH CENTRAL EXPRESSWAY

Phone Number: 701-484-7106

City: DALLAS

State: TX

ZIP CODE: 75206

IV. Commercial Facility

- [x] Yes
- [ ] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [x] Owner
- [ ] Operator

VII. SIC Codes

1311

VIII. Well Status *(Mark "x")*

- [ ] A. Operating — Date Started mo day year:
- [ ] B. Modification/Conversion
- [x] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [x] A. Individual
- [ ] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
	1	McGREGORY BUTTES

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	D		

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
47	37	59.3	-102	38	1.38	15	148	94	SE	513	S	736	E

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

A. Name and Title *(Type or Print)*: PATRICK WALKER CEO

B. Phone No. *(Area Code and No.)*: 701-484-7106

C. Signature: [REDACTED]

D. Date Signed: 7/29/2016

EPA Form 7520-6 (Rev. 12-11)

UIC PERMIT APPLICATION ATTACHMENTS

1804 Operating, LLC – RED SWD 1
513 FSL 736 FEL SESE of Section 15-148N-94W
McGregory Buttes Field
Dunn County, ND

A. AREA OF REVIEW METHODS

The method that1804 Operating, LLC (1804 Operating) utilized to determine the area of review was to first calculate a .73 mile radius of influence utilizing a potential well life span of 40 years and the requested maximum injection rate of 14,000 B/D. 1804 Operating then added a safety margin of 1,000 B/D to arrive at a radius of influence of .75 miles. 1804 Operating is proposing that the Area of Review reflect this 3/4-mile fixed radius of influence from the well bore of the proposed RED SWD 1. Please note the supporting calculations in Attachment A1 and CND Log of the proposed injection zone in Attachment A2.

CALCULATION OF THE RADIUS OF INFLUENCE
Attachment A1

Injection Zone	Inyan Kara	
Avg. Porosity of Injection Zone (Θ)	22.2%	
Thickness of Injection Zone (H)	122.0	Feet
Water Saturation of Injection Zone (Sw=1)	1.0	
Formation Volume Factor (FVF)	1.1	
Efficiency Factor (Ef=1)	1.0	
Bbls Per Acre-Ft	7,758	
Ft^2 PER ACRE	43,560	
Well Life Span	40	Years
Maximum Injection Rate	14,000	Bbls/day
End of Life Span Injection Volume	204,400,000	Bbls

$$\text{Area (Acres)} = \frac{\text{Bbls} * \text{FVF} * \text{Sw} * \text{Ef}}{7758 * \Theta * \text{H}}$$

$$\text{Radius of Influence(Feet)} = \left[43{,}560 * \text{Acres}/\pi\right]^{1/2}$$

Therfore;

$$\textit{Radius} = \left[\frac{\textit{Bbls} * \textit{FVF} * \textit{Sw} * \textit{Ef} * 43{,}560}{7758 * \Theta * H * \pi}\right]^{1/2}$$

$$\textit{Radius} = \left[\frac{204{,}400{,}000 * 1.1 * 1.0 * 1.0}{7758 * .222 * 122 * 3.14159}\right]^{1/2}$$

Radius = 3,830 feet

Radius of Influence at Given Rates		
Rates (Bbls/day)	14000	14960
40 Year Inj. (Bbls)	204400000	218416000
Radius (feet)	3830	3960
Radius (miles)	0.73	0.75

*** Safety Factor- Expanding the Area of Review to 3/4-mile represents a 960 Bbl/day increase in the daily rate above the proposed maximum rate over a 40 year life span.

Injection Formation Data **

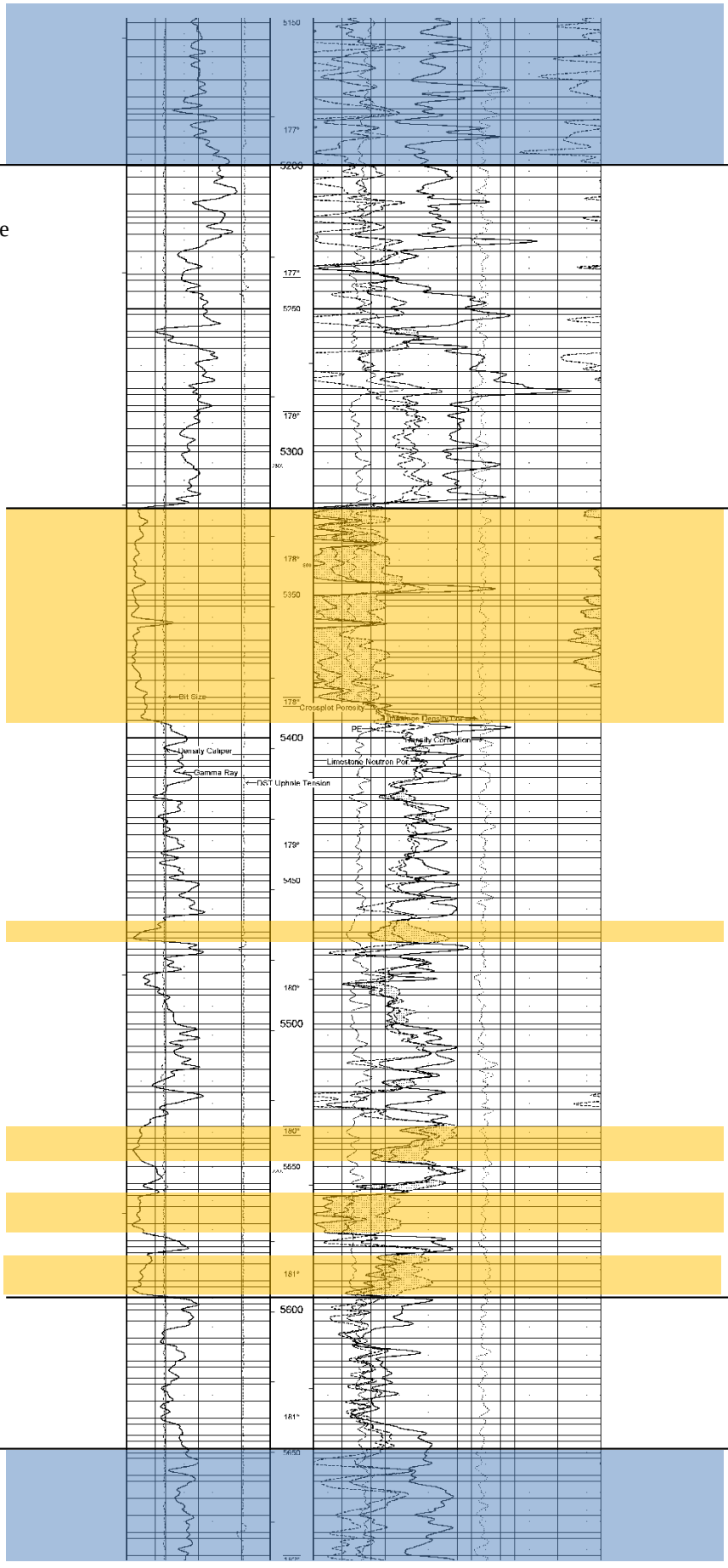
Injection Formation	Zone	Top ft	Bottom ft	Interval ft	Porosity %	
Inyan Kara	Zone 1	5320	5394	74	24%	0.1455738
Inyan Kara	Zone 2	5464	5472	8	18%	0.0118033
Inyan Kara	Zone 3	5536	5548	12	16%	0.0157377
Inyan Kara	Zone 4	5560	5574	14	24%	0.0275410
Inyan Kara	Zone 5	5580	5594	14	19%	0.0218033
			Total	**122**	**Avg Porosity**	22.2%

Perforation Interval 5320-5594

**** Formation depths were referenced from the CND Log of the offsetting FORT BERTHOLD 148-94-22A-27-2H well (NDIC Well File No. 23223) but were not corrected for the elevation changes at the proposed location.

CND Log of Confining & Injections Zones – Attachment A2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



Upper Mowry/Skull Creek Confining Zone
4843-5200' ****

Gross Inyan Kara Injection Zone
5200-5648' ****

Zone 1- 74' @ 24%Φ

Zone 2- 8' @ 18%Φ

Zone 3- 12' @ 16%Φ

Zone 4- 14' @ 24%Φ

Zone 5- 14' @ 19%Φ

Lower Swift Confining Zone
5648-6082' ****

Frac Gradient of Upper Confining Zone estimated to be 0.80

Frac Gradient of Injection Zone estimated to be 0.67

Inyan Kara Perforated Zone
5320-5594' ****

Frac Gradient of Lower Confining Zone estimated to be 0.80

**** Formation depths are referenced from the CND Log of the offsetting FORT BERTHOLD 148-94-22A-27-2H well. (NDIC Well File No. 23223) but have not been corrected for the elevation changes at the proposed location.

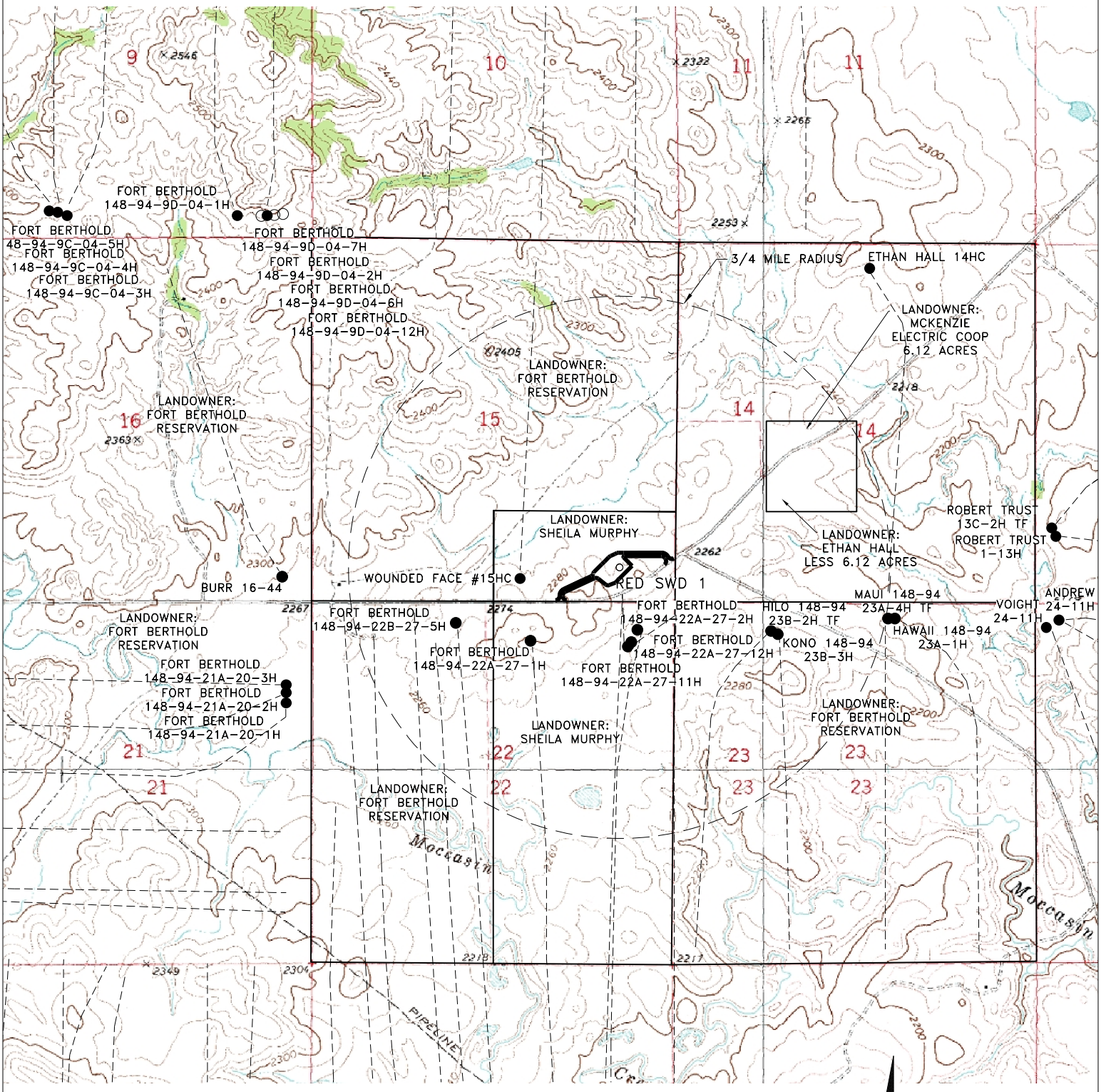
B. MAPS OF WELL/AREA AND AREA OF REVIEW (See Attachments B1-B6)

TOPOGRAPHIC MAP OF AREA AND AREA OF REVIEW

1804 OPERATING, LLC
1706 32nd STREET WEST, WILLISTON, ND 58801

"RED SWD 1"

513 FEET FROM SOUTH LINE AND 736 FEET FROM EAST LINE
SEC. 15, T148N, R94W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA



- OG: OIL AND GAS
- DRL: DRILLING
- LOC: PERMITTED LOCATION
- PNC: PERMIT CANCELLED

---------- LATERALS

N

0 2000

SCALE: 1" = 2000'

B1
SHEET NO.

INTERSTATE ENGINEERING
Professionals you need, people you trust

Interstate Engineering, Inc.
P.O. Box 266
110 2nd Avenue Southwest
Belfield, North Dakota 58622
Ph (701) 575-2247
Fax (701) 575-2251
www.iengi.com
Other offices In Minnesota, Montana and South Dakota

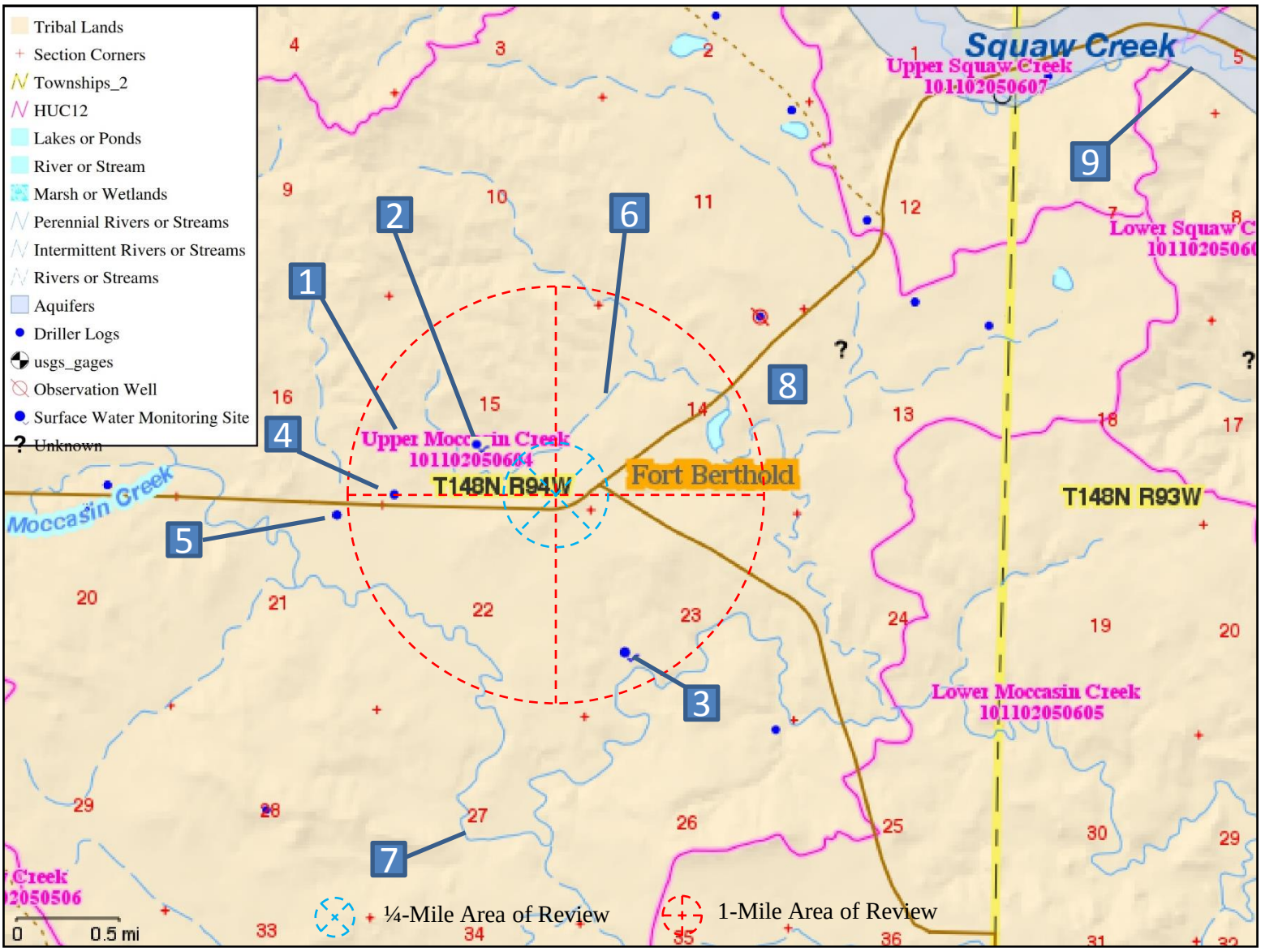
ATTACHMENT B1
1804 OPERATING, LLC
SEC. 15, T148N, R94W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

Drawn By: JMW | Project No.: E16-17-005
Checked By: MWK | Date: JANUARY 2016

Revision No.	Date	By	Description
1	3/3/16	JMW	Moved Well Location, Revised Pad Design
2	5/11/16	JMW	Revised Owner Heading & Area of Review
3	7/26/16	JMW	Updated Well Information and Laterals

Map of Pertinent Surface Features – Attachment B2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



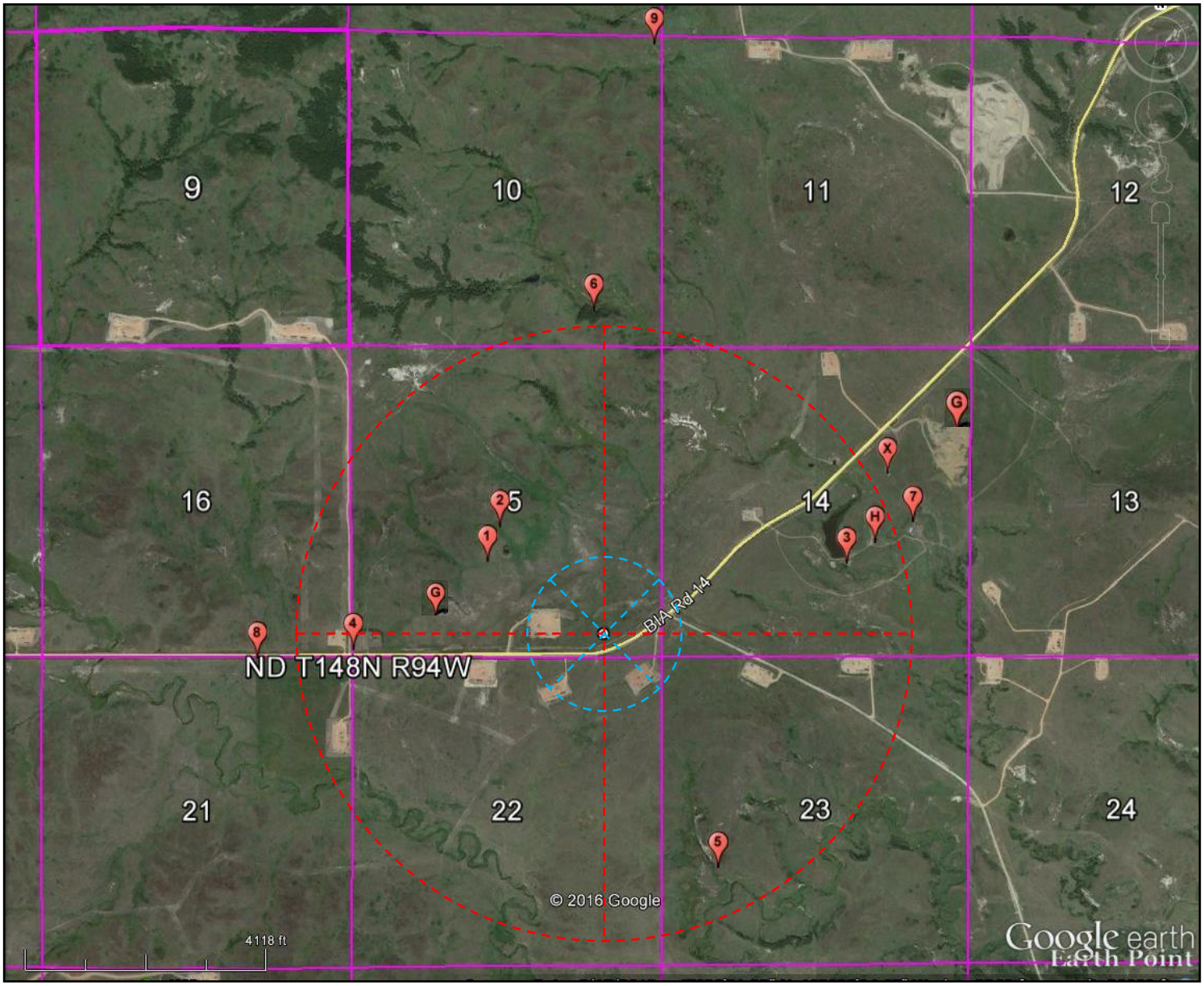
Pertinent Surface Feature Discussion

1. Site is located within the Upper Moccasin Creek Sub-Watershed which is composed of 30.15 square miles or 19,292 acres. Precipitation accumulates in intermittent streams that flow into the Moccasin Creek and eventually southeasterly into Lake Sakakawea.
2. NDSWC Surface Water Monitoring Site 148-094-15 CAD. Reported coordinates of (47.636111, -102.642802)
3. NDSWC Surface Water Monitoring Site 148-094-23 CBD. Reported coordinates of (47.621734, -102.626806)
4. USGS Test Hole 148-094-15-CCC1 PA'd 9/20/94.USGS Monitoring Well 148-094-15-CCC2 is completed with 2" PVC. Per telephone conversation with Greg Wiche of USGS, this well has never been sampled. Reported coordinates 47.63247,-102.65090
5. USGS Monitoring Wells148-094-21-AAB1 and AAB2. Coordinate calculations indicate that these wells are 1.13 miles from the proposed RED SWD 1 (outside the 1-mile AOR). They were reportedly completed with 2" PVC but per telephone conversation with Greg Wiche of USGS, were never sampled. Reported coordinates 47.63069,-102.65626
6. An intermittent stream is located within ¼-mile of the proposed site. This intermittent stream flows through a stock pond to Moccasin Creek and eventually to Lake Sakakawea. 1804 Operating, LLC is confident that the proposed primary and secondary containments of 8,000 & 43,100 Bbls respectively, will minimize any potential risk.
7. The Moccasin Creek flows from the northwest to the southeast and has a drainage area of 54 square miles, all of which lie within the Fort Berthold Reservation boundaries.
8. Gravel pit location.
9. The Squaw Creek Aquifer is approximately 2.5 miles northeast of the proposed RED SWD 1 site. Little public data is available for this aquifer. 1804 Operating, LLC believes the proposed site poses little risk because of distance and the differing sub-watersheds.

**** There are no known wellhead protection areas or faults near the proposed facility that would preclude this site from being an acceptable location for a saltwater disposal facility.

Map of Investigated Freshwater Features – Attachment B3

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



¼-Mile Area of Review

1-Mile Area of Review

Investigated Freshwater Features

1. Reported location of NDSWC Surface Water Monitoring Site 148-094-15 CAD. Water Analysis of sample taken by NDSWC on 7/21/1972 is included as Attachment B3.1
2. Sheila Murphy's flowing stock spring investigated 1/28/2016. Analysis included as Attachment B3.2
3. Hall Ranch flowing feedlot spring investigated 1/28/2016. Analysis included as Attachment B3.3
4. USGS Monitoring Well 148-094-15-CCC2 investigated 1/28/2016. Analysis included as Attachment B3.4
5. Reported location of NDSWC Surface Water Monitoring Site 148-094-23 CBD. Water analysis of sample taken by NDSWC on 7/28/1972 is included as Attachment B3.5
6. Hall Ranch Pasture 805 (South) flowing stock spring investigated 1/28/2016. Analysis included as Attachment B3.6
7. Hall Ranch horse corral well investigated 1/28/2016. Analysis included as Attachment B3.7
8. USGS Monitoring Wells 148-094-15-AAB1&2 investigated 1/28/2016. Wells were located ~15' apart but were not labeled Eastern-most well was sampled and its analysis is included as Attachment B3.8
9. Hall Ranch Pasture 805(North) flowing stock spring investigated 1/28/2016. Analysis included as Attachment B3.9

G. Gravel pit discovered during investigation

H. Hall Ranch residence investigate 1/28/2016. Per ranch hand Gene Bunch, residence is serviced by Fort Berthold Rural Water (FBRW)

X. Colten Hall residence investigated 1/28/2016. Homeowner noted that residence was serviced by FBRW.

Analyses of the Water from the Nearest FW Sources – Attachment B3.1

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

14809415CAD			
General Info			
Date Sampled	1972-07-21	**Downhole Temp**	
Time Sampled	00:00:00	**Dissolved O2**	
Pump Time		**Field Conductivity**	
Yield	8	**Field pH**	
Water Level		**Field Temp**	10.5
Sampling Method		**Lab Conductivity**	693
Stage		**Lab pH**	7.3
Surface Depth	0	**Lab ID**	
General Characteristics			
Suspended Solids (mg/l)		**Alk. as CaCO3**	
TDS Determined (mg/l)	457	**SAR**	2.2
TDS Calculated (mg/l)	439	**RSC**	0
Hardness	216	**Percent Sodium**	42
Non-Carbonate Hardness	6		
Major Cations and Anions			
Silica (mg/l)	14	**Flouride (mg/l)**	0.4
Calcium (mg/l)	50	**Bicarbonate (mg/l)**	257
Magnesium (mg/l)	22	**Carbonate (mg/l)**	0
Potassium (mg/l)	2.6	**Sulfate (mg/l)**	146
Sodium (mg/l)	73	**Chloride (mg/l)**	2
		Bromide (mg/l)	
		Nitrate (mg/l)	1
		Hydroxide (mg/l)	
		Phosphate (mg/l)	
		Boron (mg/l)	0.25
		Iron (mg/l)	0.78
		Manganese (mg/l)	0.29
Trace Elements			
Selenium (ug/l)		**Lithium (ug/l)**	
Lead (ug/l)		**Molybdenum (ug/l)**	
Mercury (ug/l)		**Strontium (ug/l)**	
Arsenic (ug/l)		**Cadmium (ug/l)**	

Analyses of the Water from the Nearest FW Sources – Attachment B3.2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

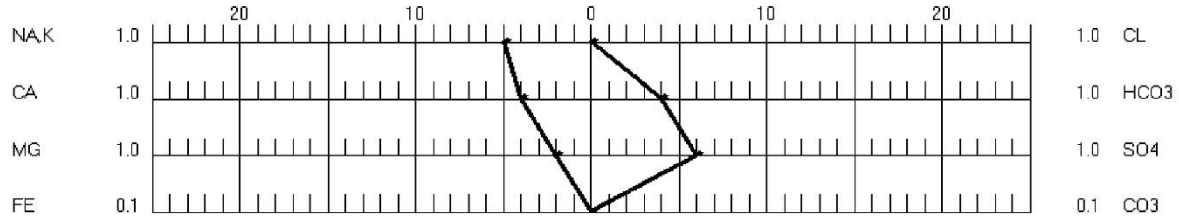
WATER ANALYSIS REPORT

Sample Number: W-16-0436 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: Sheila Murphy
Date Received: 01/28/2016 DST Number:
Sample Source: Spring
Location: NESW Section: 15 Township: 148 Range: 94 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	10.600	Ohm-Meters	pH	6.93
Specific Gravity @ 77 °F	1.000		H2S	Negative
Total Dissolved Solids (Calculated)	784	mg/L	(784	ppm)
Sodium Chloride (Calculated)	13	mg/L	(13	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	4.0	80	CHLORIDE	0.2	8
MAGNESIUM	2.4	29	CARBONATE	0.0	0
SODIUM	5.0	115	BICARBONATE	4.0	244
IRON	0.0	0.5	SULFATE	6.4	305
CHROMIUM	0.0	0.0	NITRATE	0.0	0
BARIUM	0.0	0.0			
POTASSIUM	0.1	3			

WATER ANALYSIS PATTERN



Remarks: Conductivity = 944 µmhos/cm / Sampled 1-28-16
47.63775 / -102.64194

Analyzed By: C. Jungels

Analyses of the Water from the Nearest FW Sources – Attachment B3.3

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

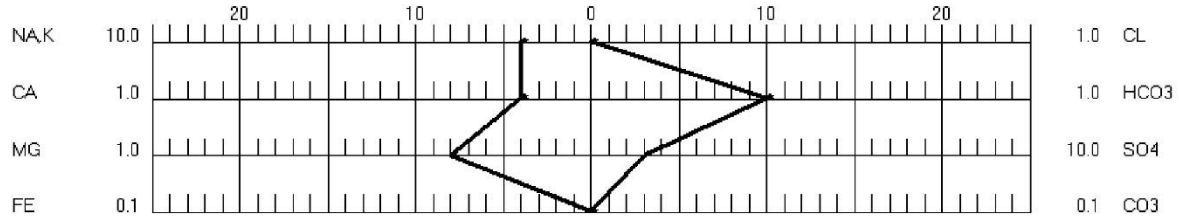
WATER ANALYSIS REPORT

Sample Number: W-16-0433 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: Hall Ranch Feedlot
Date Received: 01/28/2016 DST Number:
Sample Source: Spring
Location: NWSE Section: 14 Township: 148 Range: 94 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	2.750 Ohm-Meters		pH	8.27
Specific Gravity @ 77 °F	1.000		H2S	Negative
Total Dissolved Solids (Calculated)	3200	mg/L	(3200	ppm)
Sodium Chloride (Calculated)	31	mg/L	(31	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	3.8	76	CHLORIDE	0.5	19
MAGNESIUM	7.8	95	CARBONATE	0.0	0
SODIUM	35.2	810	BICARBONATE	10.2	622
IRON	0.0	0.0	SULFATE	32.7	1569
CHROMIUM	0.0	0.0	NITRATE	0.0	0
BARIUM	0.0	0.0			
POTASSIUM	0.2	9			

WATER ANALYSIS PATTERN



Remarks: Conductivity = 3640 µmhos/cm / Sampled 1-28-16
47.63600 / -102.61786

Analyzed By: C. Jungels

Analyses of the Water from the Nearest FW Sources – Attachment B3.4

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

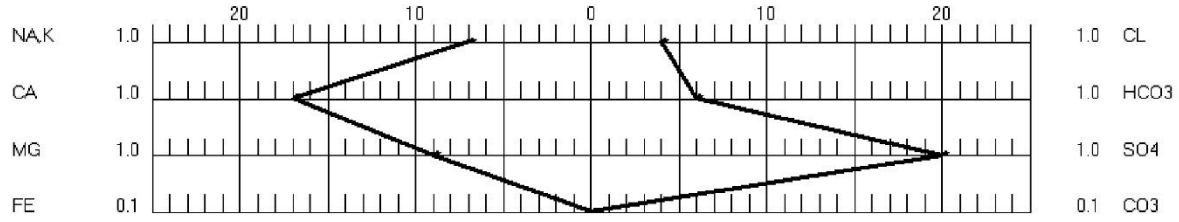
WATER ANALYSIS REPORT

Sample Number: W-16-0430 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: USGS
Date Received: 01/28/2016 DST Number:
Sample Source: Monitoring Well 148-094-15-CCCS
Location: SWSW Section: 15 Township: 148 Range: 94 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	4.030	Ohm-Meters	pH	7.90
Specific Gravity @ 77 °F	1.000		H2S	Negative
Total Dissolved Solids (Calculated)	2054	mg/L	(2054	ppm)
Sodium Chloride (Calculated)	214	mg/L	(214	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	16.6	333	CHLORIDE	3.7	130
MAGNESIUM	9.4	114	CARBONATE	0.0	0
SODIUM	6.5	150	BICARBONATE	5.9	360
IRON	0.0	0.0	SULFATE	19.9	954
CHROMIUM	0.0	0.0	NITRATE	0.2	10
BARIUM	0.0	0.0			
POTASSIUM	0.1	4			

WATER ANALYSIS PATTERN



Remarks: Conductivity = 2477 µmhos/cm / Sampled 1-28-16
47.63200 / -102.65211

Analyzed By: C. Jungels

Analyses of the Water from the Nearest FW Sources – Attachment B3.5

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

14809423CBD			
General Info			
Date Sampled	1972-07-28	**Downhole Temp**	
Time Sampled	00:00:00	**Dissolved O2**	
Pump Time		**Field Conductivity**	
Yield		**Field pH**	
Water Level		**Field Temp**	11.5
Sampling Method		**Lab Conductivity**	1120
Stage		**Lab pH**	7.6
Surface Depth	0	**Lab ID**	
General Characteristics			
Suspended Solids (mg/l)		**Alk. as CaCO3**	
TDS Determined (mg/l)	749	**SAR**	4.6
TDS Calculated (mg/l)	746	**RSC**	3
Hardness	250	**Percent Sodium**	59
Non-Carbonate Hardness	0		
Major Cations and Anions			
Silica (mg/l)	24	**Flouride (mg/l)**	0.4
Calcium (mg/l)	55	**Bicarbonate (mg/l)**	469
Magnesium (mg/l)	27	**Carbonate (mg/l)**	0
Potassium (mg/l)	3.6	**Sulfate (mg/l)**	237
Sodium (mg/l)	166	**Chloride (mg/l)**	0
		Bromide (mg/l)	
		Nitrate (mg/l)	1
		Hydroxide (mg/l)	
		Phosphate (mg/l)	
		Boron (mg/l)	0.39
		Iron (mg/l)	0.25
		Manganese (mg/l)	0.08
Trace Elements			
Selenium (ug/l)		**Lithium (ug/l)**	
Lead (ug/l)		**Molybdenum (ug/l)**	
Mercury (ug/l)		**Strontium (ug/l)**	
Arsenic (ug/l)		**Cadmium (ug/l)**	

Analyses of the Water from the Nearest FW Sources – Attachment B3.6

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

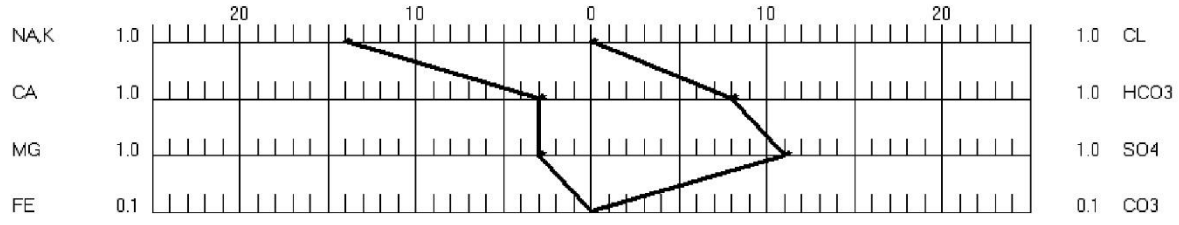
WATER ANALYSIS REPORT

Sample Number: W-16-0435
Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas
State: TX
Well Number: Hall Ranch Pasture 805
Date Received: 01/28/2016
DST Number:
Sample Source: South Spring
Location: SESE Section: 10 Township: 148 Range: 94 County:
Formation:
Depth:
Distribution: Distribution List

Resistivity @ 77 °F	5.590 Ohm-Meters		pH	7.58
Specific Gravity @ 77 °F	1.000		H2S	Negative
Total Dissolved Solids (Calculated)	1413	mg/L	(1413	ppm)
Sodium Chloride (Calculated)	9	mg/L	(9	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	3.4	68	CHLORIDE	0.2	6
MAGNESIUM	3.0	36	CARBONATE	0.0	0
SODIUM	13.7	315	BICARBONATE	7.6	464
IRON	0.0	0.1	SULFATE	10.8	519
CHROMIUM	0.0	0.0	NITRATE	0.0	0
BARIUM	0.0	0.0			
POTASSIUM	0.1	4			

WATER ANALYSIS PATTERN



Remarks: Conductivity = 1789 µmhos/cm / Sampled 1-28-16
47.64781 / -102.63545

Analyzed By: C. Jungels

Analyses of the Water from the Nearest FW Sources – Attachment B3.7

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

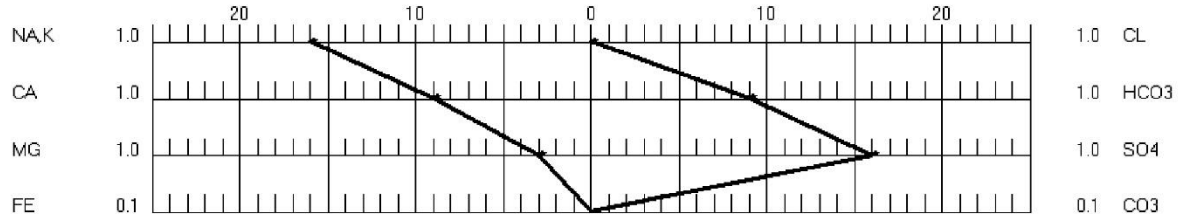
WATER ANALYSIS REPORT

Sample Number: W-16-0432 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: Hall Ranch Horse Corral
Date Received: 01/28/2016 DST Number:
Sample Source: Well
Location: NESE Section: 14 Township: 148 Range: 94 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	4.370 Ohm-Meters		pH	7.41
Specific Gravity @ 77 °F	1.000		H2S	Negative
Total Dissolved Solids (Calculated)	1947	mg/L	(1947	ppm)
Sodium Chloride (Calculated)	21	mg/L	(21	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	8.8	176	CHLORIDE	0.4	13
MAGNESIUM	3.2	39	CARBONATE	0.0	0
SODIUM	16.1	369	BICARBONATE	9.4	574
IRON	0.0	0.0	SULFATE	16.1	772
CHROMIUM	0.0	0.0	NITRATE	0.0	0
BARIUM	0.0	0.0			
POTASSIUM	0.1	5			

WATER ANALYSIS PATTERN



Remarks: Conductivity = 2288 µmhos/cm / Sampled 1-28-16
47.63794 / -102.61324

Analyzed By: C. Jungels

Analyses of the Water from the Nearest FW Sources – Attachment B3.8

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

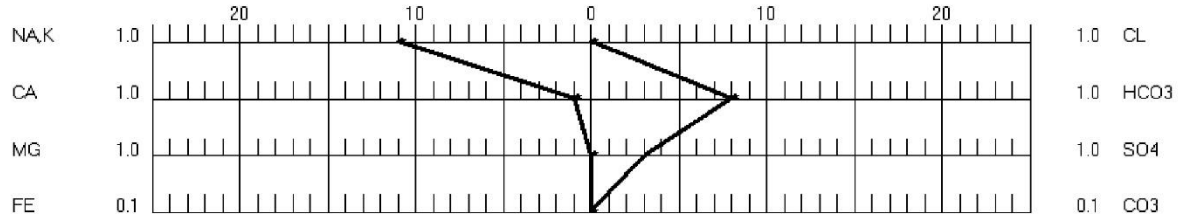
WATER ANALYSIS REPORT

Sample Number: W-16-0431 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: USGS (East Well)
Date Received: 01/28/2016 DST Number:
Sample Source: Monitoring Well 148-094-21-AAB
Location: NWNE Section: 21 Township: 148 Range: 94 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	8.980	Ohm-Meters		pH	8.08
Specific Gravity @ 77 °F	1.000			H2S	Negative
Total Dissolved Solids (Calculated)	920	mg/L	(	920	ppm)
Sodium Chloride (Calculated)	29	mg/L	(	29	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	0.7	14	CHLORIDE	0.5	18
MAGNESIUM	0.2	2	CARBONATE	0.0	0
SODIUM	11.0	254	BICARBONATE	7.8	476
IRON	0.0	0.2	SULFATE	3.2	153
CHROMIUM	0.0	0.0	NITRATE	0.0	2
BARIUM	0.0	0.0			
POTASSIUM	0.1	2			

WATER ANALYSIS PATTERN



Remarks: Conductivity = 1113 µmhos/cm / Sampled 1-28-16
47.63170 / -102.65874

Analyzed By: C. Jungels

Analyses of the Water from the Nearest FW Sources – Attachment B3.9

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

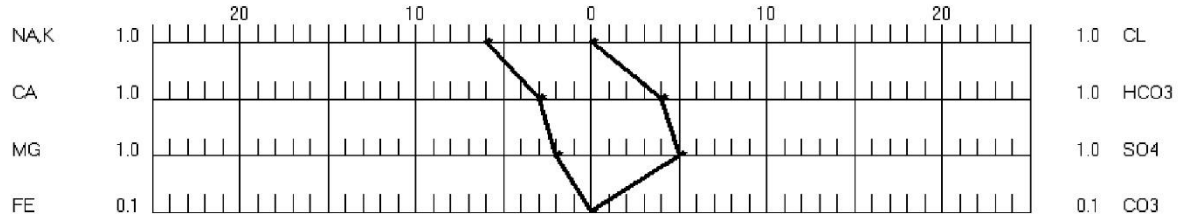
WATER ANALYSIS REPORT

Sample Number: W-16-0434 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: Hall Ranch Pasture 805
Date Received: 01/28/2016 DST Number:
Sample Source: North Spring
Location: NENE Section: 10 Township: 148 Range: 94 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	11.100	Ohm-Meters	pH	7.39
Specific Gravity @ 77 °F	1.000		H2S	Negative
Total Dissolved Solids (Calculated)	717	mg/L	(717	ppm)
Sodium Chloride (Calculated)	19	mg/L	(19	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	2.8	56	CHLORIDE	0.3	12
MAGNESIUM	2.2	27	CARBONATE	0.0	0
SODIUM	5.4	124	BICARBONATE	4.2	256
IRON	0.0	0.1	SULFATE	5.0	239
CHROMIUM	0.0	0.0	NITRATE	0.0	0
BARIUM	0.0	0.0			
POTASSIUM	0.1	3			

WATER ANALYSIS PATTERN

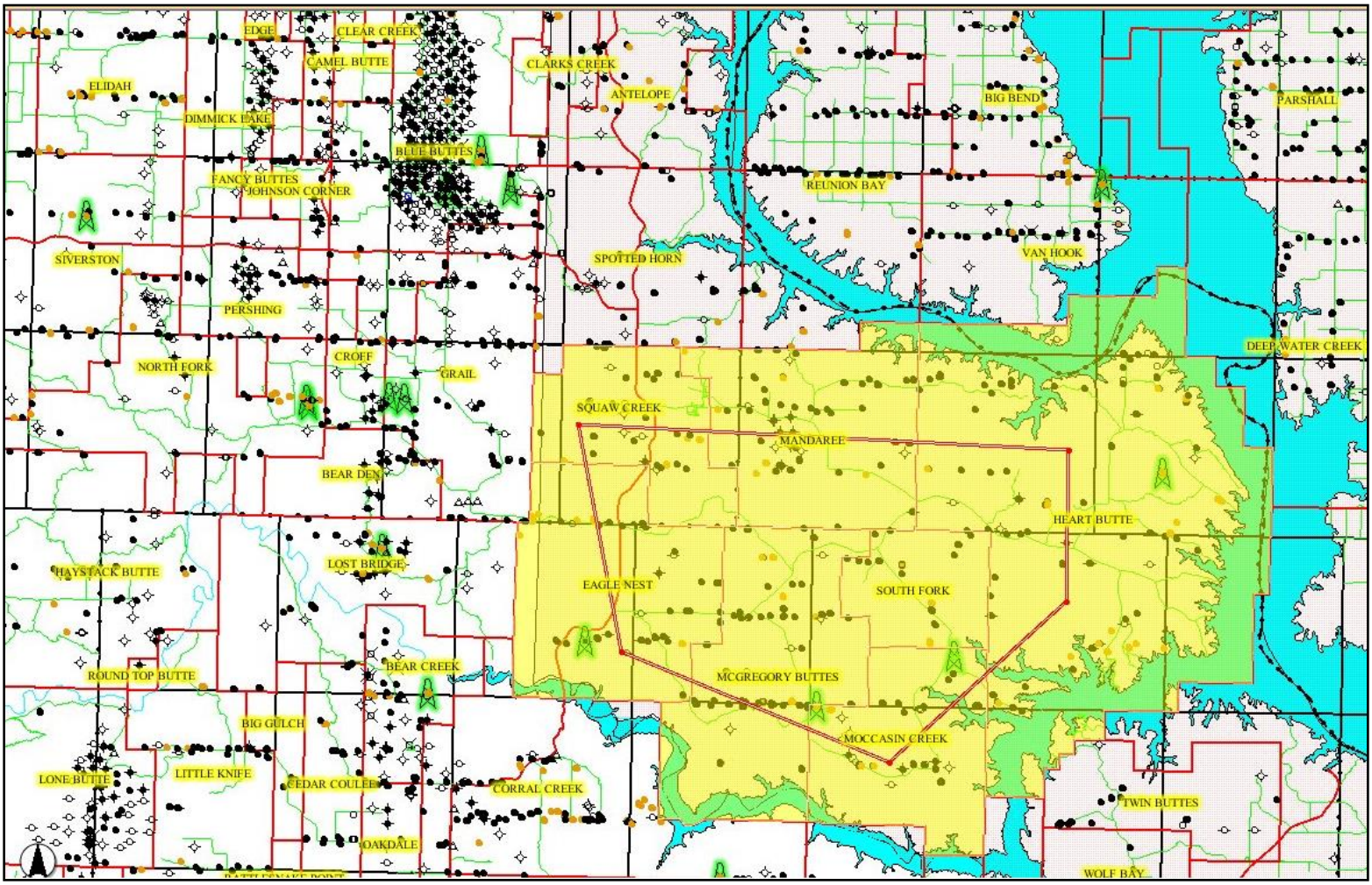


Remarks: Conductivity = 898 µmhos/cm / Sampled 1-28-16
47.66021 / -102.63127

Analyzed By: C. Jungels

Potential Market Area – Attachment B4

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



**** Generally, fields within Fort Berthold Indian Reservation, north of Little Missouri River and south and west of Missouri River

Potential Source Wells in the Area**** - Attachment B5

Field	Well Name	File No	API No	Well Type	Well Status	Status Date	Location	Operator
EAGLE NEST	ACADIA 148-95-02A-11H TF	22575	3302501652		Confidential		LOT1 2-148-95	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	BAIT 149-95-36C-25H	31071	3305306873		Confidential		LOT4 36-149-95	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	BEARSTAIL 32-29H	18419	3305303072	OG	A	2/4/2012	SWSE 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	BEAVER CREEK 149-94-31D-30H TF	24111	3305304490		Confidential		SWSE 31-149-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	BRADFIELD 31-14H	22530	3305304022	OG	A	9/24/2012	LOT4 31-149-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	BRUGH BEAR 2-11H	24112	3305304491		Confidential		SWSE 31-149-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	BUFFALO RUN 5-24H	19476	3302501158	OG	A	4/11/2012	SESW 5-148-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	BURR 16-44H	17304	3302500764	OG	A	2/3/2009	SESE 16-148-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	CIRRUS 149-94-33D-28H	24163	3305304507	OG	A	4/14/2013	SESE 33-149-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	EMERALD 148-95-03A-10H	22531	3305304023	OG	A	9/25/2012	LOT4 31-149-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	ETSTATIS 32-29HA	29881	3305306429		Confidential		SWSW 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	ETSTATIS 32-29HB	29879	3305306427		Confidential		SWSW 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	ETSTATIS 32-29HS	29878	3305306426		Confidential		SWSW 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	ETSTATIS 32-29HW	29882	3305306430		Confidential		SWSW 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	ETSTATIS 32-29HX	29880	3305306428		Confidential		SWSW 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	FETTIG 6-7HC	22270	3302501596	OG	A	9/28/2012	LOT3 6-148-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17C-08-3H	24418	3302501995	OG	A	6/25/2015	SWSW 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17C-08-4H	24417	3302501994	OG	A	6/24/2015	SESW 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17C-8-5H	25502	3302502146	OG	A	6/30/2015	SESW 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17C-8-6H	28280	3302502524	OG	A	6/16/2015	SESW 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17C-8-7H	28281	3302502525	OG	A	6/18/2015	SESW 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17D-08-1H	18094	3302500930	OG	A	2/11/2010	SESE 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17D-08-2H	21066	3302501411	OG	A	12/30/2011	SESE 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17D-8-11H	30267	3302502793	OG	LOC	12/18/2015	SESE 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17D-8-12H	30268	3302502794	OG	A	7/3/2015	SESE 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-17D-8-13H	30269	3302502795	OG	A	7/1/2015	SESE 17-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-19C-18-4H	27277	3302502395	OG	A	8/18/2014	SESW 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-19C-18-5H	27279	3302502397	OG	A	8/21/2014	SESW 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-19D-18-1H	20252	3302501270	OG	A	6/23/2012	SESE 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-19D-18-2H	21079	3302501413	OG	A	6/23/2012	SESE 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-19D-18-3H	23123	3302501762	OG	A	6/20/2013	SWSE 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-20C-21-4H	25989	3302502210	OG	A	6/2/2014	SWSW 20-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-20C-21-5H	25988	3302502209	OG	A	6/1/2014	SWSW 20-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-20C-21-6H	27045	3302502362	OG	A	5/30/2014	SWSW 20-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-21A-20-1H	22560	3302501647	OG	A	2/13/2013	SENE 21-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-21A-20-2H	22561	3302501648	OG	A	2/14/2013	SENE 21-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-21A-20-3H	22562	3302501649	OG	A	2/14/2013	SENE 21-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29A-32-3H	24306	3302501975	OG	A	10/1/2013	NWNE 29-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29A-32-4H	24307	3302501976	OG	A	10/1/2013	NWNE 29-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29A-32-5H	24310	3302501979	OG	A	10/1/2013	NWNE 29-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29A-32-8TFH	25556	3302502157		Confidential		NWNE 29-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29A-32-9TFH	25557	3302502158		Confidential		NWNE 29-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29B-32-1H	19976	3302501224	OG	A	9/4/2012	SWSW 20-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-29B-32-2H	22983	3302501729	OG	A	3/17/2013	SWSW 20-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-30A-31-1H	20253	3302501271	OG	A	6/20/2012	SESE 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-30A-31-2H	21080	3302501414	OG	A	6/20/2012	SESE 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-30A-31-3H	23124	3302501763	OG	A	6/19/2013	SWSE 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-30B-31-4H	27278	3302502396	OG	A	8/16/2014	SESW 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-30B-31-5H	27280	3302502398	OG	A	8/18/2014	SESW 19-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-33C-28-3H	25534	3302502154	OG	A	9/5/2014	SWSW 33-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-9C-04-3H	22981	3302501728	OG	A	7/5/2013	SESW 9-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-9C-04-4H	22980	3302501727	OG	A	7/4/2013	SESW 9-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-9C-04-5H	22979	3302501726	OG	A	7/4/2013	SESW 9-148-94	HRC OPERATING, LLC
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EAGLE NEST	FORT BERTHOLD 148-94-9D-04-2H	20871	3302501383	OG	A	7/30/2012	SESE 9-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-9D-4-12H	32411	3302503097	OG	LOC	12/21/2015	SESE 9-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-9D-4-6H	32410	3302503096	OG	LOC	12/21/2015	SESE 9-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-94-9D-4-7H	32409	3302503095	OG	LOC	12/21/2015	SESE 9-148-94	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13A-24-3H	24299	3302501972	OG	A	9/15/2013	NWNE 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13A-24-4H	24298	3302501971	OG	IA	9/15/2013	NWNE 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13A-24-5H	24297	3302501970	OG	A	9/15/2013	NWNE 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13A-24-6H	31154	3302502923	OG	LOC	4/29/2015	NWNE 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13A-24-7H	31155	3302502924	OG	LOC	4/29/2015	NWNE 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13A-24-8H	31156	3302502925	OG	LOC	4/29/2015	NWNE 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13B-24-10H	30556	3302502834	OG	LOC	1/25/2016	NWNW 13-148-95	HRC OPERATING, LLC
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EAGLE NEST	FORT BERTHOLD 148-95-13B-24-13H	30559	3302502837	OG	LOC	1/25/2016	NENW 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-13B-24-2H	30555	3302502833	OG	LOC	1/25/2016	NWNW 13-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-22C-15-4H	25208	3302502091	OG	A	4/17/2014	NENW 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-22C-15-5H	25210	3302502093	OG	A	4/16/2014	SESW 22-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-22C-15-9H	26323	3302502261	OG	A	4/20/2014	NENW 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-22D-15-1H	18968	3302501086	OG	A	9/26/2012	NWNE 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-22D-15-2H	22300	3302501602		Confidential		NWNE 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-22D-15-3H	22301	3302501603		Confidential		NENE 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23C-14-10H	30564	3302502840	OG	DRL	12/13/2015	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23C-14-3H	27431	3302502425	OG	DRL	12/21/2015	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23C-14-4H	27433	3302502427	OG	DRL	12/19/2015	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23C-14-5H	27435	3302502429	OG	DRL	12/17/2015	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23C-14-8H	27432	3302502426	OG	DRL	12/16/2015	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23C-14-9H	27434	3302502428	OG	DRL	12/14/2015	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23D-14-1H	20172	3302501254	OG	A	6/12/2012	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23D-14-2H	20866	3302501382	OG	A	2/18/2015	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23D-14-6H	27125	3302502370	OG	A	2/13/2015	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-23D-14-7H	27127	3302502372	OG	A	2/17/2015	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-24C-13-1H	20918	3302501389	OG	A	10/4/2012	SWSW 24-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-25B-36-1H	20919	3302501390	OG	A	10/4/2012	SWSW 24-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26A-35-10H	27126	3302502371	OG	A	2/14/2015	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26A-35-14H	27646	3302502464	OG	A	2/9/2015	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26A-35-1H	20173	3302501255	OG	A	6/18/2012	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26A-35-2H	21963	3302501558	OG	A	2/20/2015	SESE 23-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26B-35-3H	27456	3302502439	OG	A	11/25/2014	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26B-35-4H	27458	3302502441	OG	A	11/25/2014	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26B-35-5H	27460	3302502443	OG	A	12/5/2014	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26B-35-8H	27459	3302502442	OG	A	12/3/2014	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-26B-35-9H	27457	3302502440	OG	A	12/10/2014	NENW 26-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-27A-34-1H	18969	3302501087	OG	A	9/26/2012	NWNE 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-27A-34-2H	22298	3302501600	OG	A	10/10/2012	NWNE 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-27A-34-3H	22299	3302501601	OG	A	10/16/2012	NENE 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-27B-34-4H	25207	3302502090	OG	A	5/13/2014	NENW 27-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-27B-34-5H	25209	3302502092	OG	A	4/12/2014	SESW 22-148-95	HRC OPERATING, LLC
EAGLE NEST	FORT BERTHOLD 148-95-27B-34-8H	26322	3302502260	OG	A	4/26/2014	NENW 27-148-95	HRC OPERATING, LLC
EAGLE NEST	GLACIER 148-95-02A-11H TF	22574	3302501651		Confidential		LOT2 2-148-95	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	GRAY WOLF 148-94-05CH TF	21415	3302501452	OG	A	4/7/2012	SESW 5-148-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	LIKES EAGLE #2-31H	20917	3302501388	OG	A	4/18/2012	LOT2 2-148-95	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	NIMBUS 149-94-33D-28H	24164	3305304508	OG	A	4/18/2013	SESE 33-149-94	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	POPLAR 32-29HE	31189	3305306919		Confidential		SWSW 32-149-94	WPX ENERGY WILLISTON, LLC
EAGLE NEST	QUILLFISH 149-95-36C-25H-TF-LLW	32341	3305307421		Confidential		LOT4 36-149-95	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	TACKLE 149-95-36C-25H TF	31072	3305306874		Confidential		LOT4 36-149-95	ENERPLUS RESOURCES USA CORPORATION
EAGLE NEST	TAT [714A] 2-1H	17975	3302500897	OG	A	6/26/2009	LOT2 1-148-95	WPX ENERGY WILLISTON, LLC
EAGLE NEST	TAT 4-35-26TH	28460	3305305957	OG	IA	6/29/2015	SESE 35-149-95	QEP ENERGY COMPANY
EAGLE NEST	ZION 148-95-02B-11H	24113	3305304492		Confidential		SWSE 31-149-94	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	BAKER 20-34H	18809	3302501066	OG	A	8/8/2011	SWSE 20-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	BAKER 29-31H	19769	3302501189	OG	A	7/27/2011	SWSE 20-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	BIRON 20-24H	18810	3302501067	OG	A	7/17/2011	SWSE 20-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	BLACK HAWK 15-34H	18875	3302501079	OG	A	4/28/2011	SESE 34-149-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CACTUS 149-92-35B-05H TF	29788	3302502714	OG	A	7/11/2015	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	CHARLES BLACKHAWK 31-30HA	22649	3302501657	OG	A	11/8/2012	SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CHARLES BLACKHAWK 31-30HB	22651	3302501659	OG	A	11/21/2012	SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CHARLES BLACKHAWK 31-30HC	22653	3302501661		Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CHARLES BLACKHAWK 31-30HD	22655	3302501663		Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CHARLES BLACKHAWK 31-30HX	22650	3302501658	OG	A	11/21/2012	SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CHARLES BLACKHAWK 31-30HY	22652	3302501660		Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CHARLES BLACKHAWK 31-30HZ	22654	3302501662		Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	CURVE 149-92-19C-18H TF	22237	3302501585		Confidential		SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	DEUCE 149-92-30B-31H TF	22239	3302501587		Confidential		SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	EDWARD GOODBIRD 9HA	22827	3302501693		Confidential		NWNW 9-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE	EDWARD GOODBIRD 9HC	22829	3302501695		Confidential		NWNW 9-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE	EDWARD GOODBIRD 9HD	22828	3302501694	OG	A	8/14/2012	NWNW 9-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE	EUPHORBIA 149-92-35B-05H	29789	3302502715	OG	A	7/11/2015	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	FBIR BAKER 34X-25	19292	3302501142	OG	A	7/11/2011	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR BAKER 34X-25A	23394	3302501821	OG	A	1/7/2013	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR BAKER 34X-25E	23395	3302501822	OG	A	1/5/2013	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR BAKER 34X-25F	23393	3302501820	OG	A	1/10/2013	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR BEAKS 24X-8A	23694	3302501854	OG	A	12/17/2013	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BEAKS 24X-8B	19800	3302501195	OG	A	3/4/2012	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BEAKS 24X-8E	23933	3302501881	OG	A	12/31/2013	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BIRD 31X-19	19806	3302501198	OG	A	8/8/2011	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BIRD 31X-19D	23883	3302501874	OG	A	8/25/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BIRD 31X-19G	23881	3302501872	OG	A	9/3/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BIRD 31X-19H	23882	3302501873	OG	A	8/31/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21A	32290	3302503073		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21AXD	32302	3302503076		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21B	20600	3302501341	OG	A	6/8/2012	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21C	32280	3302503069		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21CXD	32282	3302503071		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21D	32472	3302503107		Confidential		SESW 21-149-91	XTO ENERGY INC.

Potential Source Wells in the Area**** - Attachment B5								
Field	Well Name	File No	API No	Well Type	Well Status	Status Date	Location	Operator
HEART BUTTE	FBIR BLACKMEDICINE 24X-21E	32283	3302503072		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21F	32291	3302503074		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21G	32279	3302503068		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR BLACKMEDICINE 24X-21H	32281	3302503070		Confidential		SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR DARCIE 34X-14	20114	3302501245	OG	A	12/4/2011	SWSE 14-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR DARCIE 34X-14D	24038	3302501903	OG	A	6/18/2013	SWSE 14-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR DARCIE 34X-14H	24037	3302501902	OG	A	6/18/2013	SWSE 14-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR GEORGEBLACKHAWK 21X-6B	20483	3302501317	OG	A	7/20/2012	LOT3 6-148-91	XTO ENERGY INC.
HEART BUTTE	FBIR GOESEVERYWHERE 31X-11C	20417	3302501301	OG	A	5/22/2012	NWNW 11-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33A	30773	3302502862		Confidential		SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33B	30771	3302502860		Confidential		SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33C	20419	3302501302	OG	IA	8/2/2012	SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33D	30768	3302502857		Confidential		SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33E	30772	3302502861		Confidential		SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33F	30770	3302502859		Confidential		SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 34X-33G	30769	3302502858		Confidential		SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR GRINNELL 41X-1C	20424	3302501303	OG	A	6/7/2012	LOT1 1-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR GUYBLACKHAWK 24X-27A	26879	3302502342	OG	A	6/24/2014	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR GUYBLACKHAWK 24X-27B	20215	3302501262	OG	A	2/21/2012	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR GUYBLACKHAWK 24X-27ER	27443	3302502430	OG	A	6/24/2014	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR GUYBLACKHAWK 24X-27F	26878	3302502341	OG	A	7/10/2014	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR HEADLESSTURTLE 44X-32C	20273	3302501278	OG	A	9/17/2012	SESE 32-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR HUNTSALONG 31X-2	21120	3302501418	OG	A	9/13/2012	LOT2 2-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR HUNTSMEDICINE 24X-8B	19801	3302501196	OG	A	2/29/2012	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR HUNTSMEDICINE 24X-8E	23693	3302501853	OG	A	12/8/2013	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR IRONWOMAN 21X-10	19948	3302501220	OG	A	12/21/2011	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR LAWRENCE 24X-26B	20143	3302501250	OG	A	5/11/2012	SESW 26-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR LAWRENCE 24X-26E	26970	3302502360		Confidential		SESW 26-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR NELLIEOLDMOUSE 13X-13B	20632	3302501348	OG	A	5/24/2012	NWSW 13-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR REESE 43X-33A	31215	3302502940		Confidential		NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR REESE 43X-33B	31217	3302502942		Confidential		NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR REESE 43X-33E	31216	3302502941		Confidential		NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR SMITH 11X-10	20036	3302501229	OG	A	10/20/2011	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR SMITH 11X-10A	23403	3302501825	OG	A	1/29/2013	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR SMITH 11X-10E	23401	3302501823	OG	A	1/19/2013	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR SMITH 11X-10F	23402	3302501824	OG	A	1/24/2013	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR STEPHEN 31X-19	19805	3302501197	OG	A	8/10/2011	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR STEPHEN 31X-19D	23884	3302501875	OG	A	8/21/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR STEPHEN 31X-19G	24084	3302501919	OG	A	8/11/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR STEPHEN 31X-19H	23885	3302501876	OG	A	8/16/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE	FBIR WALKER 34X-25	19293	3302501143	OG	A	7/13/2011	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR WALTERPACKSWOLF 31X-12C	19696	3302501179	OG	A	1/11/2012	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR WALTERPACKSWOLF 31X-12D	24132	3302501932	OG	A	7/6/2013	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR WALTERPACKSWOLF 31X-12G	24130	3302501930	OG	A	6/7/2013	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR WALTERPACKSWOLF 31X-12H	24131	3302501931	OG	A	6/25/2013	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE	FBIR YELLOWWOLF 21X-10	19940	3302501219	OG	A	1/11/2012	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR YOUNGBEAR 31X-9A	25430	3302502137	OG	A	2/27/2014	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR YOUNGBEAR 31X-9B	20117	3302501248	OG	A	5/16/2012	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR YOUNGBEAR 31X-9E	25431	3302502138	OG	A	2/22/2014	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE	FBIR YOUNGBEAR 31X-9F	25429	3302502136	OG	A	3/3/2014	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE	FINCH 148-92-22A-21H	32528	3302503126		Confidential		SWNW 23-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	FREDERICKS 5-11H	17299	3302500763	OG	A	9/28/2008	LOT 4 5-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	FREDERICKS 6-31H	17634	3302500832	OG	A	3/6/2009	NWNE 6-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	HIGH HAWK 4-9H	18729	3302501052	OG	A	9/9/2010	NWNW 9-149-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	KNUCKLE 149-92-19C-18H	22238	3302501586	OG	A	7/21/2012	SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	MHA 1-03-02H-149-92	23337	3302501807	OG	A	12/6/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-03-34H-150-92	23331	3302501801	OG	A	3/30/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-03-35H-150-92	23333	3302501803	OG	A	3/25/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-04-03H-149-91	20487	3302501318	OG	A	10/23/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-04-33H-150-92	24398	3302501990	OG	A	7/24/2013	SENW 9-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-05-08H-147-92	20116	3302501247	OG	A	7/8/2011	LOT5 5-147-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-06-01H-149-92	18665	3302501037	OG	A	7/7/2010	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-06-05H-149-92	23096	3302501753	OG	A	9/11/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-06-07H-147-92	24846	3302502051	OG	A	6/16/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-06-31H-150-92	18322	3302500971	OG	A	5/29/2010	SESW 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-06-32H-150-92	23101	3302501758	OG	A	2/25/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-10-11H-149-91	25406	3302502127	OG	A	3/2/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-10-14H-149-91	25410	3302502131		Confidential		SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-10-15H-149-91	25414	3302502135	OG	A	11/25/2013	NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-25-36H-148-92	31300	3302502952		Confidential		NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-26-23H-149-91	27173	3302502387		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-26-24H-149-91	27169	3302502383		Confidential		SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-26-25H-149-91	27165	3302502379		Confidential		SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-26-35H-148-92	31298	3302502950		Confidential		NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-27-34H-148-92	26703	3302502314	OG	A	1/15/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-28-29H-148-92	26353	3302502266		Confidential		NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-31-25H-150-92	21561	3302501476	OG	A	5/8/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-31-30H-150-91	21554	3302501470	OG	A	10/20/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-31-36H-150-92	21557	3302501472	OG	A	5/16/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-32-29H-150-91	20490	3302501321	OG	A	10/7/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 1-32-33H-148-92	20964	3302501394	OG	A	1/5/2012	NENW 32-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-03-02H-149-92	23339	3302501809	OG	A	12/10/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-03-35H-150-92	23335	3302501805	OG	A	3/22/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-04-03H-149-91	24367	3302501988	OG	A	7/12/2013	NWSW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-04-33H-150-92	24400	3302501992	OG	A	7/28/2013	SWNE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-05-04H-148-91	22092	3302501567	OG	A	10/6/2012	NWSW 5-148-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-06-01H-149-92	18666	3302501038	OG	A	9/4/2010	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-06-05H-149-92	23094	3302501751	OG	A	9/15/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-06-07H-147-92	21905	3302501543	OG	A	8/17/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-06-31H-150-92	23097	3302501754	OG	A	9/9/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-06-32H-150-92	23099	3302501756	OG	A	2/21/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-10-11H-149-91	25404	3302502125	OG	A	2/24/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-10-14H-149-91	25408	3302502129		Confidential		SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-10-15H-149-91	25412	3302502133		Confidential		NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-25-36H-148-92	32061	3302503029		Confidential		SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-26-23H-149-91	27175	3302502389		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-26-24H-149-91	27171	3302502385		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-26-25H-149-91	27167	3302502381		Confidential		SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-26-35H-148-92	26285	3302502249		Confidential		SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-31-25H-150-92	21552	3302501468	OG	A	10/24/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-32-29H-150-91	22028	3302501562	OG	A	11/26/2012	SESW 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 2-32-33H-148-92	21908	3302501545	OG	A	8/22/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-03-02H-149-92	23338	3302501808	OG	A	12/8/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-03-34H-150-92	23332	3302501802	OG	A	3/28/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-03-35H-150-92	23334	3302501804	OG	A	3/24/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-04-03H-149-91	20488	3302501319	OG	A	11/3/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-04-33H-150-92	24399	3302501991	OG	A	7/26/2013	SWNE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-05-08H-147-92	20115	3302501246	OG	A	7/6/2011	LOT5 5-147-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-06-01H-149-92	21404	3302501450	OG	A	5/14/2012	SENE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-06-07H-147-92	24845	3302502050	OG	A	5/13/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-06-31H-150-92	23093	3302501750	OG	A	9/23/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-06-32H-150-92	23100	3302501757	OG	A	2/23/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-10-11H-149-91	25405	3302502126	OG	A	2/22/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-10-14H-149-91	25409	3302502130		Confidential		SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-10-15H-149-91	25413	3302502134	OG	A	11/27/2013	NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-25-36H-148-92	31301	3302502953		Confidential		NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-26-23H-149-91	27174	3302502388		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-26-24H-149-91	27170	3302502384		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-26-25H-149-91	27166	3302502380		Confidential		SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-26-35H-148-92	31299	3302502951		Confidential		NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-27-34H-148-92	26702	3302502313	OG	A	1/17/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-28-29H-148-92	26352	3302502265		Confidential		NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-31-25H-150-92	21551	3302501467	OG	A	10/26/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-31-30H-150-91	21556	3302501471	OG	A	10/19/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-31-36H-150-92	21558	3302501473	OG	A	5/14/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-32-29-150-91	20489	3302501320	OG	A	11/1/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 3-32-33H-148-92	20965	3302501395	OG	A	1/7/2012	NENW 32-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-03-02H-149-92	23340	3302501810	OG	A	12/12/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-03-35H-150-92	23336	3302501806	OG	A	12/4/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-04-03H-149-91	24366	3302501987	OG	A	7/15/2013	NWSW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-04-33H-150-92	24401	3302501993	OG	A	7/30/2013	SWNE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-05-04H-148-91	22093	3302501568	OG	A	10/8/2012	NWSW 5-148-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-06-01H-149-92	21405	3302501451	OG	A	2/3/2012	SENE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-06-07H-147-92	21904	3302501542	OG	A	8/19/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-06-31H-150-92	23102	3302501759	OG	A	2/27/2013	NWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-06-32H-150-92	23098	3302501755	OG	A	2/19/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-10-11H-149-91	25403	3302502124	OG	A	2/27/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-10-14H-149-91	25407	3302502128		Confidential		SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-10-15H-149-91	25411	3302502132		Confidential		NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-25-36H-148-92	32060	3302503028		Confidential		SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-26-23H-149-91	27176	3302502390		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-26-24H-149-91	27172	3302502386		Confidential		SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-26-25H-149-91	27168	3302502382		Confidential		SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-26-35H-148-92	26286	3302502250		Confidential		SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-28-29H-148-92	26365	3302502273	OG	A	5/29/2015	NESE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-31-25H-150-92	21553	3302501469	OG	A	10/22/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 4-32-29H-150-91	22029	3302501563	OG	A	11/29/2012	SESW 32-150-91	QEP ENERGY COMPANY

Potential Source Wells in the Area**** - Attachment B5

Field	Well Name	File No	API No	Well Type	Well Status	Status Date	Location	Operator
HEART BUTTE	MHA 4-32-33H-148-92	21906	3302501544	OG	A	8/15/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-04-03H-149-91	29970	3302502735	OG	LOC	11/13/2015	SWNW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-04-33H-150-92	24209	3302501949	OG	A	5/29/2013	NENE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-06-01H-149-92	29975	3302502740	OG	LOC	11/13/2015	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-06-05H-149-92	23095	3302501752	OG	A	9/13/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-06-07H-147-92	24848	3302502053	OG	A	5/20/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-25-36H-148-92	31303	3302502955		Confidential		NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-26-35H-148-92	31296	3302502948		Confidential		NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-27-34H-148-92	26705	3302502316	OG	A	1/11/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-28-29H-148-92	26355	3302502268		Confidential		NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-31-25H-150-92	21559	3302501474	OG	A	5/12/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 5-32-29H-150-91	30171	3302502786	OG	LOC	12/10/2015	SWSE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-04-33H-150-92	24207	3302501947	OG	A	5/23/2013	SESE 4-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-06-01H-149-92	29715	3302502705	OG	A	6/28/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-06-07H-147-92	24850	3302502055	OG	A	11/10/2013	NESW 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-25-36H-148-92	32063	3302503031		Confidential		SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-26-35H-148-92	26283	3302502247		Confidential		SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-27-34H-148-92	26731	3302502323		Confidential		NESE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-28-29H-148-92	26362	3302502270		Confidential		NESE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 6-32-29H-150-91	29716	3302502706	OG	A	6/25/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-04-03H-149-91	29971	3302502736	OG	LOC	11/13/2015	SWNW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-04-33H-150-92	24208	3302501948	OG	A	5/21/2013	SESE 4-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-06-01H-149-92	29976	3302502741	OG	LOC	11/13/2015	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-06-07H-147-92	24847	3302502052	OG	A	5/18/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-25-36H-148-92	31302	3302502954		Confidential		NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-26-35H-148-92	31297	3302502949		Confidential		NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-27-34H-148-92	26704	3302502315	OG	A	1/13/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-28-29H-148-92	26354	3302502267		Confidential		NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-31-25H-150-92	21560	3302501475	OG	A	5/10/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 7-32-29H-150-91	30172	3302502787	OG	LOC	12/10/2015	SWSE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-04-33H-150-92	24206	3302501946	OG	A	5/25/2013	SESE 4-149-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-06-01H-149-92	29714	3302502704	OG	A	6/30/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-06-07H-147-92	24849	3302502054	OG	A	11/8/2013	NESW 31-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-25-36H-148-92	32062	3302503030		Confidential		SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-26-35H-148-92	26284	3302502248		Confidential		SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-27-34H-148-92	26732	3302502324		Confidential		NESE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-28-29H-148-92	26363	3302502271		Confidential		NESE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE	MHA 8-32-29H-150-91	29717	3302502707	OG	A	6/23/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE	NET 149-92-30B-31H	22240	3302501588	OG	A	7/21/2012	SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	OCOTILLO 149-92-35A-04H	31288	3302502947		Confidential		NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	PACKINEAU 15-32H	20236	3302501266	OG	A	6/20/2011	SWSE 32-149-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE	REBUTIA 149-92-35B-05H	29819	3302502719	OG	A	7/11/2015	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	ROBIN 148-92-23B-24H	32527	3302503125		Confidential		SWNW 23-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	SAGUARO 149-92-35A-04H	29790	3302502716		Confidential		NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE	SARAH YELLOW WOLF 22-27HC	23169	3302501776	OG	A	10/22/2012	NENW 22-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE	SKUNK CREEK 12-7-8-8H	22468	3302501636	OG	A	10/18/2012	LOT3 7-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 12-7-8-9H	22467	3302501635	OG	A	10/21/2012	LOT3 7-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 12-7-8-9H3	22466	3302501634	OG	A	11/22/2012	LOT3 7-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 13-18-17-16H3	21700	3302501500	OG	A	6/7/2012	SWSW 18-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 13-18-17-9H	21701	3302501501	OG	A	6/7/2012	SWSW 18-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 4-18-17-1H	24115	3302501926	OG	A	11/8/2015	LOT1 18-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 4-18-17-1H3	24116	3302501927	OG	A	10/31/2015	LOT1 18-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 4-18-17-8H	24117	3302501928	OG	A	11/4/2015	LOT1 18-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	SKUNK CREEK 4-18-17-8H3	31170	3302502927	OG	A	11/3/2015	LOT1 18-148-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 13-22-16-1H	30643	3302502848	OG	A	8/7/2015	SWSW 22-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 13-22-16-1H3	30641	3302502846	OG	A	8/7/2015	SWSW 22-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 13-22-33-16H	30642	3302502847	OG	A	9/4/2015	SWSW 22-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 14-21-16-2HS	18987	3302501092	OG	A	3/3/2013	SESW 21-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 14-21-33-15H	18988	3302501093	OG	A	12/14/2010	SESW 21-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 14-21-33-16H3	18989	3302501094	OG	A	12/16/2010	SESW 21-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 14-21-4H	18455	3302501001	OG	A	12/11/2010	SESW 21-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 14-33-28H	18051	3302500918	OG	A	8/9/2009	SESW 33-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 14-33-6H	18107	3302500934	OG	A	9/6/2009	SESW 33-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 16-8-16H	18022	3302500911	OG	A	6/21/2009	SESE 8-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 16-8-7H	17981	3302500900	OG	A	6/7/2009	SESE 8-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 5-7-8-1H	19263	3302501137	OG	A	10/3/2012	LOT 2 7-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	TWO SHIELDS BUTTE 5-7-8-1H3	20511	3302501325	OG	A	10/3/2012	LOT 2 7-149-92	WHITING OIL AND GAS CORPORATION
HEART BUTTE	WOOLY TORCH 149-92-35A-04H	31187	3302502933		Confidential		NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	AGAVE 149-93 06C-4H TF	20103	3302501242	OG	A	11/15/2011	SESW 6-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	ALISIA FOX 16-9H	17943	3302500892	OG	A	10/28/2009	SESE 9-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	ARABIAN 149-93-29B-32H	22664	3302501668	OG	A	3/9/2013	NENW 29-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	ARNICA 149-93-21A-22H TF	22747	3302501678		Confidential		SENE 20-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	ATLAS 149-93-33C-28H	23227	3302501785	OG	A	2/10/2013	SESW 33-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	BANJO 149-94-02B-01H TF	24963	3305304787		Confidential		LOT4 2-149-94	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	BEAKS 36-35H	19289	3302501141	OG	A	5/20/2011	SENE 36-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BEAKS 36-35HA	26432	3302502288		Confidential		SENE 36-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BEAKS 36-35HC	29852	3302502726	OG	A	12/3/2015	SENE 36-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BEAKS 36-35HD	29851	3302502725	OG	A	12/6/2015	SENE 36-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BEAKS 36-35HX	26430	3302502286		Confidential		SENE 36-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BEAKS 36-35HZ	29853	3302502727	OG	A	12/15/2016	SENE 36-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BIRDBEAR 6C-1H	20102	3302501241	OG	A	11/14/2011	SESW 6-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	BIRDSBILL 14-16H	18520	3302501013	OG	A	4/23/2010	SESW 16-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	BLUESTEM 149-93-21C-22H TF	22746	3302501677	OG	A	6/9/2013	NWSW 21-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	BUFFALO 1-36HC	20508	3302501324	OG	A	5/9/2012	SESE 1-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	CALYPSO 149-93-33C-28H TF	23226	3302501784	OG	A	2/9/2013	SESW 33-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	CHEETAH 149-93-30A-31H	24235	3302501958		Confidential		NWNE 30-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	CHOKECHERRY 149-93-21A-22H	22748	3302501679	OG	A	11/6/2012	SENE 20-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	CLARA 14-17H	18564	3302501019	OG	A	4/8/2010	SESW 17-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	CORRAL 1-36HD	21609	3302501489	OG	A	5/2/2012	SESE 1-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	CROSS 2-13H	18128	3305303025	OG	A	11/23/2009	NWNE 13-149-94	WPX ENERGY WILLISTON, LLC
MANDAREE	ELM 19-18HQ	32231	3302503059		Confidential		SESE 19-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	FOX 14-8H	21232	3302501427	OG	A	1/23/2012	SESW 8-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	FOX RIDGE 10-21H	20499	3302501323	OG	A	12/10/2011	NENW 10-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	GRASSY KNOLL 2-11H	24962	3305304786		Confidential		LOT4 2-149-94	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	HIDATSA HILLS 26-21H	20343	3302501287		Confidential		NENW 26-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	HORSE CAMP 101-11H	20090	3302501236	OG	A	10/2/2011	NWNW 11-149-93	EOG RESOURCES, INC.
MANDAREE	HORSE CAMP 102-16H	20244	3302501268	OG	A	10/21/2011	NWNE 16-149-93	EOG RESOURCES, INC.
MANDAREE	HORSE CAMP 2-11H	20091	3302501237	OG	A	9/30/2011	NWNW 11-149-93	EOG RESOURCES, INC.
MANDAREE	HORSE CAMP 3-16H	20243	3302501267	OG	A	10/21/2011	NWNE 16-149-93	EOG RESOURCES, INC.
MANDAREE	HUDSON 13-21H	20087	3305303391		Confidential		NENW 13-149-94	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	HYENA 149-93-30A-31H-TF	24234	3302501957		Confidential		NWNE 30-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	INDEPENDENCE 2-35 HI	27711	3302502468	OG	A	5/13/2014	NWNE 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	INDEPENDENCE 2-35HC	23021	3302501739	OG	A	10/8/2012	NWNE 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	INDEPENDENCE 2-35HD	26519	3302502299	OG	A	5/12/2014	NWNE 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	INDEPENDENCE 2-35HY	26517	3302502297	OG	A	5/25/2014	NWNE 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	INDEPENDENCE 2-35HZ	26518	3302502298	OG	A	5/23/2014	NWNE 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	JACKAL 149-93-31A-30-1H	21785	3302501518	OG	A	6/13/2012	LOT1 3-148-94	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	JOSEPH EAGLE 19-18HD	30278	3302502799		Confidential		SESE 19-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	JOSEPH EAGLE 19-18HZ	30277	3302502798		Confidential		SESE 19-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	JOSEPH EAGLE 2-19H	20517	3302501328	OG	A	10/10/2011	NENE 19-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	LEVINGS ESTATE 1-08H	18560	3302501018	OG	A	6/1/2010	SESE 8-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	LION 149-93-31A-30-2H TF	21784	3302501517	OG	A	6/13/2012	LOT1 3-148-94	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	MABEL LEVINGS 14-23HA	26513	3302502296	OG	A	4/25/2014	SWSW 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MABEL LEVINGS 14-23HB	26511	3302502294	OG	A	4/25/2014	SWSW 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MABEL LEVINGS 14-23HW	26512	3302502295	OG	A	4/25/2014	SWSW 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MABEL LEVINGS 14-23HX	26510	3302502293	OG	A	4/25/2014	SWSW 11-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARS 149-93 08D-2H TF	21229	3302501426		Confidential		SESE 8-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	MARTIN FOX 20-17HA	23684	3302501847	OG	A	9/28/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HB	23682	3302501845	OG	A	9/28/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HC	23680	3302501843	OG	A	2/19/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HD	23678	3302501841	OG	A	2/19/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HF	28713	3302502598	OG	A	10/1/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HW	28712	3302502597	OG	A	10/18/2014	SWSW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HX	23681	3302501844	OG	A	9/28/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MARTIN FOX 20-17HZ	23679	3302501842	OG	A	2/19/2014	SESW 20-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	MORGAN 149-93-29B-32H TF	22663	3302501667		Confidential		NWNW 29-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	MORRISON 149-93-10AH	20977	3302501397	OG	A	12/10/2011	NWNE 10-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	MUSTANG 149-93-29A-32H TF	22665	3302501669	OG	A	9/10/2013	NENE 29-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	NATHAN HALE 3-18H	17658	3302500835	OG	A	4/8/2009	NENW 18-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	NEEDLE 149-93-05AH	22727	3302501675	OG	A	1/9/2013	LOT1 5-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	PATRICIA CHARGING 4-15H	18166	3302500942	OG	A	4/13/2010	NWNW 15-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	PINTO 149-93-29A-32H	22666	3302501670	OG	A	9/11/2013	NENE 29-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	PLUTO 149-93 05C-2H TF	21004	3302501405		Confidential		SESW 5-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	RAIN 149-93-07A-12H TF	25735	3302502177	OG	A	6/15/2015	SENE 7-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	RED ROCKS 149-93-10AH	20978	3302501398	OG	A	12/12/2011	NENW 10-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	RUBIA 16-24H	20033	3305303381	OG	A	11/16/2011	SESE 24-149-94	WPX ENERGY WILLISTON, LLC
MANDAREE	SERGER 149-93-04B-03H TF	22726	3302501674	OG	A	10/5/2012	LOT1 5-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	SITKA 149-93 06A-3H TF	20101	3302501240	OG	A	3/1/2012	LOT 2 6-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	SKUNK CREEK 1-24-25-16H	30931	3302502893	OG	LOC	3/19/2015	NENE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	SKUNK CREEK 1-24-25-16H3	30932	3302502894	OG	LOC	3/19/2015	NENE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	SKUNK CREEK 2-24-25-15H	19825	3302501202	OG	A	9/17/2011	NWNE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	SKUNK CREEK 2-24-25-16H	19827	3302501204	OG	A	10/5/2011	NWNE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	SKUNK CREEK 23-14 HC	21269	3302501431	OG	A	3/13/2012	SESE 23-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	SKUNK CREEK 3-24-25-13H	20258	3302501274	OG	A	4/15/2014	NENW 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	SKUNK CREEK 3-24-25-14H3	20259	3302501275	OG	A	4/20/2014	NENW 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	SNOW 149-93-07A-12H	25736	3302502178	OG	A	6/15/2015	SENE 7-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	SOWARD 1-05H	17920	3302500890	OG	A	6/13/2010	SESW 5-149-93	ENERPLUS RESOURCES USA CORPORATION

Potential Source Wells in the Area**** - Attachment B5

Field	Well Name	File No	API No	Well Type	Well Status	Status Date	Location	Operator
MANDAREE	SUN 149-93-07D-12H	25738	3302502180	OG	A	8/20/2014	SESE 7-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	TAT {1922} 14-2H	18007	3302500908	OG	A	9/1/2009	SESW 2-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	TAT 15-1H	18396	3302500993	OG	A	4/29/2010	SWSE 1-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	TEKAKWITHA 9-24H	17024	3302500716	OG	A	5/5/2008	SESW 9-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	TWO SHIELDS BUTTE 1-24-12-1H	30929	3302502891	OG	LOC	3/19/2015	NENE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	TWO SHIELDS BUTTE 1-24-12-1H3	30930	3302502892	OG	LOC	3/19/2015	NENE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	TWO SHIELDS BUTTE 2-24-12-1H3	19826	3302501203	OG	A	9/18/2011	NWNE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	TWO SHIELDS BUTTE 2-24-12-2H	18517	3302501011	OG	A	9/24/2011	NWNE 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	TWO SHIELDS BUTTE 3-24-12-3H3	20257	3302501273	OG	A	4/17/2014	NENW 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	TWO SHIELDS BUTTE 3-24-12-4H	18518	3302501012	OG	A	4/12/2014	NENW 24-149-93	WHITING OIL AND GAS CORPORATION
MANDAREE	WICKER 34-27H	19267	3302501138	OG	A	5/5/2011	SESW 34-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WIND 149-93-07D-12H TF	25737	3302502179	OG	A	8/20/2014	SESE 7-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	WOLF CHIEF 27-34HA	26834	3302502331		Confidential		NENW 27-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WOLF CHIEF 27-34HB	26836	3302502333	OG	A	2/20/2015	NENW 27-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WOLF CHIEF 27-34HC	26837	3302502334	OG	A	2/19/2015	NENW 27-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WOLF CHIEF 27-34HD	26839	3302502336		Confidential		NENW 27-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WOLF CHIEF 27-34HW	26835	3302502332		Confidential		NENW 27-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WOLF CHIEF 27-34HZ	26838	3302502335	OG	A	2/20/2015	NENW 27-149-93	WPX ENERGY WILLISTON, LLC
MANDAREE	WORMWOOD 149-93-21C-22H	22745	3302501676	OG	A	6/11/2013	NWSW 21-149-93	ENERPLUS RESOURCES USA CORPORATION
MANDAREE	YELLOWBIRD 6A-1H	20100	3302501239	OG	A	7/6/2014	NWNE 6-149-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	ANDREW 24-11H	18260	3302500959	OG	A	12/14/2009	NWNW 24-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	ANNA G. BAKER 6B-30-2H TF	19624	3302501172	OG	DRL	10/26/2015	NENW 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	ANVIL 148-94 11B-4H TF	20852	3302501378		Confidential		NENW 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	AXE 148-94 11A-1H	20846	3302501372		Confidential		NWNE 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	BEARS GHOST USA 11-4H	27838	3302502488	OG	A	12/11/2014	NWNW 4-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	BEARS GHOST USA 11-4TFH	27839	3302502489	OG	A	12/23/2014	NWNW 4-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	BEARS GHOST USA 21-4TFH	27837	3302502487	OG	A	12/31/2014	NWNW 4-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	BEARS GHOST USA 31-4H	20824	3302501371	OG	A	1/3/2012	NWNE 4-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	BEARS GHOST USA 31-4TFH	21349	3302501447	OG	A	1/10/2012	NWNE 4-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	BELUGA 148-93-06B-05-3H	21752	3302501510	OG	A	1/28/2013	LOT5 6-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	BUGLE 148-94-13B-4H TF	21794	3302501523		Confidential		SWNW 13-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	CALICO 148-93-31D-30H	31125	3302502913		Confidential		NENE 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	CAYENNE 148-94 02D-2H TF	20849	3302501375		Confidential		NWNE 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	CEDAR 148-94 12D-01-4H	20782	3302501362	OG	A	4/12/2012	SWSE 12-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	CHORD 148-93-18D-07-3H	21274	3302501432	OG	A	6/28/2013	SWSE 18-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	DUET 148-93-18C-07-1H	21276	3302501434	OG	A	8/13/2012	SESW 18-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	EAGLE USA 41-5H	23802	3302501867	OG	A	1/24/2013	SWSE 32-148-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	EAGLE USA 41-5TFH	23801	3302501866		Confidential		SWSE 32-148-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	EAGLES NEST 34-44H	19477	3302501159	OG	A	3/23/2011	SESE 34-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	ETHAN HALL 14HC	18129	3302500938	OG	A	11/28/2011	NWNE 14-148-94	WPX ENERGY WILLISTON, LLC
MCGREGORY BUTTES	ETHAN HALL 6B-31-30-1H	18546	3302501017	OG	A	12/24/2010	NENW 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	FORGE 148-94 11B-3H	20851	3302501377	OG	A	12/31/2011	NENW 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1A-12-10H	30679	3302502851	OG	A	8/10/2015	NWNE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1A-12-11H	32503	3302503115	OG	LOC	2/1/2016	NENE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1A-12-12H	32505	3302503117	OG	LOC	2/1/2016	NENE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1A-12-1H	18341	3302500976	OG	A	10/26/2011	NWNE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1A-12-2H	20879	3302501385	OG	A	1/20/2014	NENE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1A-12-9H	30680	3302502852		Confidential		NWNE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1B-12-3H	23382	3302501816	OG	A	5/21/2013	NWNW 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1B-12-4H	26280	3302502244		Confidential		SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1B-12-5H	26282	3302502246		Confidential		SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1B-12-6H	29135	3302502642	OG	LOC	8/13/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1B-12-7H	29136	3302502643	OG	LOC	8/13/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-1B-12-8H	29137	3302502644	OG	LOC	8/13/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2A-11-1H	18206	3302500947	OG	A	1/26/2011	NWNE 2-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2A-11-2H	21900	3302501540	OG	A	10/13/2012	NENE 2-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-10H	31079	3302502904	OG	LOC	4/16/2015	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-3H	25598	3302502167	OG	A	7/28/2014	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-4H	25597	3302502166	OG	A	7/29/2014	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-5H	25596	3302502165	OG	A	7/25/2014	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-6H	31076	3302502901		Confidential		SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-7H	31077	3302502902		Confidential		SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-8H	31078	3302502903		Confidential		SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-2B-11-9H	31080	3302502905		Confidential		SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3A-10-10H	29848	3302502723	OG	A	6/3/2015	NENE 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3A-10-12H	29849	3302502724	OG	A	6/2/2015	NENE 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3A-10-1H	18458	3302501002	OG	A	10/4/2010	NENE 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3A-10-2H	23258	3302501788	OG	A	3/25/2013	SESE 34-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3A-10-6H	29847	3302502722	OG	A	6/5/2015	NENE 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3B-10-3H	24272	3302501964	OG	A	4/28/2014	NENW 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3B-10-4H	24271	3302501963	OG	A	4/25/2014	NENW 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3B-10-5H	24270	3302501962	OG	A	4/25/2014	NENW 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3B-10-7H	25801	3302502186	OG	A	4/26/2014	NENW 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3B-10-8TFH	25800	3302502185		Confidential		NENW 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 147-94-3B-10-9TFH	26671	3302502306		Confidential		NENW 3-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-22A-27-11H	31161	3302502926	OG	LOC	4/29/2015	NENE 22-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-22A-27-12H	31697	3302502974	OG	LOC	7/24/2015	NENE 22-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-22A-27-1H	18335	3302500975	OG	A	6/17/2010	NWNE 22-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-22A-27-2H	23223	3302501781	OG	A	3/3/2013	NENE 22-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-22B-27-5H	22878	3302501700	OG	A	5/9/2013	NENW 22-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-25A-36-1H	18332	3302500973	OG	A	6/30/2010	NWNE 25-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-27C-22-3H	24150	3302501938	OG	A	5/25/2015	SWSW 27-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-27C-22-4H	27107	3302502369	OG	A	5/23/2015	SWSW 27-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-27C-22-6H	27106	3302502368	OG	A	5/21/2015	SWSW 27-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-27C-22-7H	27105	3302502367	OG	A	5/18/2015	SWSW 27-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-27C-22-8H	27103	3302502366	OG	A	5/18/2015	SWSW 27-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-27C-22-9H	27102	3302502365	OG	LOC	11/27/2015	SWSW 27-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-28A-33-1H	22312	3302501605	OG	A	11/6/2012	NWNE 28-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-28A-33-2H	22313	3302501606	OG	A	4/11/2013	NWNE 28-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-28B-33-12H	28629	3302502584	OG	LOC	6/16/2015	NWNE 28-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-28B-33-13H	28628	3302502583	OG	LOC	6/16/2015	NWNE 28-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33C-28-10H	26867	3302502339	OG	A	9/6/2014	SWSW 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33C-28-8H	26865	3302502337	OG	A	9/10/2014	SWSW 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33C-28-9H	26866	3302502338	OG	A	9/6/2014	SWSW 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33D-28-4H	24338	3302501983	OG	A	8/13/2013	SESE 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33D-28-5H	24339	3302501984	OG	A	8/13/2013	SESE 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33D-28-6H	29571	3302502681		Confidential		SESE 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-33D-28-7H	29572	3302502682		Confidential		SESE 33-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-10H	31081	3302502906	OG	LOC	4/16/2015	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-3H	26295	3302502256	OG	A	7/26/2014	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-4H	26294	3302502255	OG	A	7/25/2014	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-5H	26293	3302502254	OG	A	7/25/2014	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-6H	31085	3302502910	OG	LOC	4/16/2015	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-7H	31082	3302502907	OG	LOC	4/16/2015	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-8H	31084	3302502909	OG	LOC	4/16/2015	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35C-26-9H	31083	3302502908	OG	LOC	4/16/2015	SESW 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35D-26-1H	18313	3302500970	OG	A	1/14/2011	SWSE 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-35D-26-2H	21901	3302501541	OG	A	10/14/2012	SESE 35-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-3H	23383	3302501817	OG	A	5/24/2013	NWNW 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-4H	26279	3302502243		Confidential		SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-5H	26281	3302502245		Confidential		SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-6H	29134	3302502641	OG	LOC	8/13/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-7H	31462	3302502963	OG	LOC	6/19/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-8H	31464	3302502965	OG	LOC	6/19/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36C-25-9H	31463	3302502964	OG	LOC	6/19/2015	SESW 36-148-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36D-25-10H	32506	3302503118	OG	LOC	2/1/2016	NENE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36D-25-11H	32504	3302503116	OG	LOC	2/1/2016	NENE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	FORT BERTHOLD 148-94-36D-25-2H	20880	3302501386	OG	A	2/17/2013	NENE 1-147-94	HRC OPERATING, LLC
MCGREGORY BUTTES	GIRAFFE 148-94-03B-10-2H TF	21756	3302501513		Confidential		LOT3 3-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HABANERO 148-94 02C-4H TF	20853	3302501379		Confidential		NENW 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HANS #20-21H	20883	3302501387	OG	A	4/26/2012	NENW 20-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HARMONY 148-93-18C-07-2H TF	21277	3302501435	OG	A	8/13/2012	SESW 18-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HAWAII 148-94 23A-1H	20985	3302501401	OG	A	11/26/2011	NWNE 23-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HILO 148-94 23B-2H TF	20983	3302501399	OG	A	12/22/2011	NENW 23-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HIPPO 148-94-03A-10-4H TF	21782	3302501515	OG	A	6/30/2012	LOT1 3-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	HOPKINS USA 15-1TFH	24315	3302501981		Confidential		SWSW 10-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	HOPKINS USA 15-2H	24316	3302501982	OG	A	3/18/2013	SWSW 10-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	HOPKINS USA 15-4H	24314	3302501980		Confidential		NWNW 15-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	HUMPBACK 148-93-06B-05-4H TF	21751	3302501509	OG	A	8/1/2012	LOT5 6-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	IMPALA 148-94-03B-10-1H	21757	3302501514	OG	A	6/28/2012	LOT3 3-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	J.M. HALL 1-19H	18017	3302500910	OG	A	4/23/2010	LOT 1 19-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	JALAPENO 148-94 02C-3H	20850	3302501376	OG	A	12/24/2011	NENW 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	JUPITER 148-93 19B-2H TF	20438	3302501307		Confidential		LOT1 19-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	KONA 148-94 23B-3H	20984	3302501400	OG	A	12/26/2011	NENW 23-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	LINCOLN USA 16-1H	24648	3302502021	OG	A	1/30/2013	NWNW 15-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	MANX 148-93-31D-30H TF	31127	3302502915		Confidential		NENE 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	MAUI 148-94 23A-4H TF	20986	3302501402	OG	A	11/26/2011	NWNE 23-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	MUSIC 148-93-18D-07-4H TF	21275	3302501433	OG	A	6/28/2013	SWSE 18-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	OAK 148-94 12C-01-1H	20785	3302501364	OG	A	5/6/2012	SESW 12-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	PINE 148-94 12D-01-3H	20781	3302501361	OG	A	5/16/2012	SWSE 12-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	POBLANO 148-94 02D-1H	20847	3302501373		Confidential		NWNE 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	RHINO 148-94-03A-10-3H	21783	3302501516	OG	A	6/30/2012	LOT1 3-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	RICHANDA USA 21-4H	27836	3302502486	OG	A	12/19/2014	NWNW 4-147-94	MARATHON OIL COMPANY
MCGREGORY BUTTES	ROBERTS TRUST 1-13H	18355	3302500982	OG	A	4/10/2010	SWSW 13-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	ROBERTS TRUST 13C-2H TF	19873	3302501208	OG	A	4/23/2011	SWSW 13-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	SIAMESE 148-93-31D-30H	31129	3302502917		Confidential		NWNE 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	SPRUCE 148-94 12C-01-2H TF	20784	3302501363	OG	A	2/2/2012	SESW 12-148-94	ENERPLUS RESOURCES USA CORPORATION

Potential Source Wells in the Area**** - Attachment B5

Field	Well Name	File No	API No	Well Type	Well Status	Status Date	Location	Operator
MCGREGORY BUTTES	TOWN HALL 148-93-31C-30H	32052	3302503027		Confidential		NENW 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	TRUMPET 148-94-13B-3H	21795	3302501524		Confidential		SWNW 13-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	VISE 148-94 11A-2H TF	20848	3302501374		Confidential		NWNE 11-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	VOIGT 24-11H	17203	3302500755	OG	A	8/12/2008	NWNW 24-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	VOIGT 24-21H	17009	3302500714	OG	A	6/28/2008	NENW 24-148-94	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	VOIGT 32-34H	17725	3302500848	OG	A	10/10/2009	SESW 32-148-93	ENERPLUS RESOURCES USA CORPORATION
MCGREGORY BUTTES	WOUNDED FACE #15HC	21215	3302501421	OG	A	9/15/2012	SWSE 15-148-94	WPX ENERGY WILLISTON, LLC
MCGREGORY BUTTES	ZANE 32-24H	18221	3302500949	OG	A	10/10/2009	SESW 32-148-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	ANNA G. BAKER 6B-7-2H TF	21111	3302501415		Confidential		NENW 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	ANTHONY USA 23-14H	28075	3302502507	OG	A	2/1/2015	NESW 14-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	AZURE USA 31-15H	25898	3302502191	OG	A	5/27/2014	SWSE 10-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	BENGAL 147-93-06A-07H	31126	3302502914		Confidential		NENE 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	BLACK HAWK 1-12H	21219	3302501423	OG	A	6/4/2012	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BLACKHAWK 1-12HA	23303	3302501789	OG	A	4/9/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BLACKHAWK 1-12HB	23305	3302501791	OG	A	4/29/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BLACKHAWK 1-12HD	23308	3302501794	OG	A	8/5/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BLACKHAWK 1-12HW	23304	3302501790	OG	A	7/4/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BLACKHAWK 1-12HY	23306	3302501792	OG	A	8/5/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BLACKHAWK 1-12HZ	23307	3302501793	OG	A	8/5/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	BOY CHIEF USA 11-15TFH	20974	3302501396	OG	A	1/6/2012	NWNW 15-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	CHASE USA 21-15H	25897	3302502190	OG	A	5/28/2014	SWSE 10-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	COPPER 147-93-17A-20-2H TF	20931	3302501392		Confidential		NENE 17-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	DANCE HALL 147-93-06B-07H	32051	3302503026		Confidential		NENW 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	ETHAN HALL 6B-7-1H	18545	3302501016	OG	A	2/11/2011	NENW 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	FOX USA 14-1H	24744	3302502035	OG	A	1/14/2015	NWSE 14-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	GOOD BEAR USA 21-14H	20642	3302501349	OG	A	10/3/2011	NENW 14-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	GOOD BEAR USA 31-14H	20644	3302501350	OG	A	12/9/2011	NENW 14-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	GOOD BIRD 36-25HA	23314	3302501800	OG	A	5/24/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	GOOD BIRD 36-25HB	23312	3302501798	OG	A	6/9/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	GOOD BIRD 36-25HC	21218	3302501422	OG	A	7/4/2012	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	GOOD BIRD 36-25HD	23309	3302501795	OG	A	10/20/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	GOOD BIRD 36-25HW	23313	3302501799	OG	A	5/23/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	GOOD BIRD 36-25HX	23311	3302501797	OG	A	11/12/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	GOOD BIRD 36-25HZ	23310	3302501796	OG	A	10/27/2013	SWSE 36-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	HALE USA 23-14TFH	28076	3302502508	OG	A	2/1/2015	NESW 14-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	HENRY BAD GUN 16B-21-1H	18790	3302501063	OG	A	10/7/2010	NWNW 16-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	HENRY BAD GUN 17A-20-1H	18752	3302501057	OG	A	7/23/2010	NENE 17-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	HENRY BAD GUN 8D-5-1H	18753	3302501058	OG	A	7/23/2010	SESE 8-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	HENRY BAD GUN 9C-4-1H	18627	3302501030	OG	A	3/27/2012	SWSW 9-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	HORNED 147-93-18B-19H	25142	3302502085	OG	A	11/28/2013	NENE 13-147-94	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	MELVAIN FOX USA 14-4TFH	24745	3302502036	OG	A	2/1/2015	NWSE 14-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	MOCCASIN CREEK 13-34-28-1H	18707	3302501048	OG	A	8/23/2010	SWSW 34-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 13-34-28-2H	18656	3302501036	OG	A	8/2/2010	SWSW 34-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 13-34-3H	18344	3302500978	OG	A	6/5/2010	SWSW 34-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-11-2-3H	24056	3302501904	OG	A	1/28/2013	SESW 11-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-11-2-3H3	24057	3302501905	OG	A	2/2/2013	SESW 11-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-33-28-2H3	25583	3302502159	OG	A	1/19/2015	SWSE 33-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-33-28-3H	25585	3302502161	OG	A	1/17/2015	SESW 33-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-33-28-3H3A	25586	3302502162	OG	A	1/23/2015	SESW 33-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-33-28-3HS	25584	3302502160	OG	A	6/18/2015	SWSE 33-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-33-28-4H	25587	3302502163	OG	A	1/7/2015	SESW 33-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 14-33-28-4H3	25588	3302502164	OG	A	1/7/2015	SESW 33-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-10-3-2H3	31436	3302502962	OG	LOC	6/18/2015	SESE 10-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-10-3-3H	23084	3302501748	OG	A	1/12/2013	SESE 10-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-10-3-3H3	23085	3302501749	OG	A	12/23/2012	SESE 10-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-26-27-12H	22462	3302501632	OG	A	12/16/2012	SESE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-26-27-12H3	31420	3302502961	OG	LOC	6/17/2015	SESE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-26-27-13H	31419	3302502960	OG	LOC	6/17/2015	SESE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-26-27-13H3	22465	3302501633	OG	A	12/17/2012	SESE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-3-11H	18295	3302500960	OG	A	2/13/2010	SESE 3-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-34-2H	17706	3302500842	OG	A	4/24/2009	SESE 34-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-34H	17847	3302500875	OG	A	5/6/2009	SESE 34-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 16-3H	18261	3302500960	OG	A	3/3/2010	SESE 3-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 4-3-34-3H3	23225	3302501783	OG	A	2/9/2013	LOT4 3-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 4-3-34-4H	23224	3302501782	OG	A	2/9/2013	LOT4 3-147-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 8-26-27-4H	29182	3302502650	OG	DRL	1/23/2016	SENE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 8-26-27-4H3	29183	3302502651	OG	DRL	2/4/2016	SENE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 8-26-27-5H	29180	3302502648	OG	DRL	12/30/2015	SENE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	MOCCASIN CREEK 8-26-27-5H3	29181	3302502649	OG	DRL	1/12/2016	SENE 26-148-93	WHITING OIL AND GAS CORPORATION
MOCCASIN CREEK	PAUL PETER COFFEE 35HA	22431	3302501616	OG	A	10/31/2012	NWNE 35-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	PAUL PETER COFFEE 35HC	22430	3302501615	OG	A	11/1/2012	NWNE 35-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	PAUL PETER COFFEE 35HD	22432	3302501617	OG	A	10/31/2012	NWNE 35-148-93	WPX ENERGY WILLISTON, LLC
MOCCASIN CREEK	PERSIAN 147-93-06A-07H	31130	3302502918		Confidential		NWNE 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	PYGMY 147-93-18B-19H TF	25143	3302502086	OG	A	11/28/2013	NENE 13-147-94	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	ROCKET 147-93-08D-05-2H TF	20932	3302501393		Confidential		SESE 8-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	SATURN 147-93-09C-04-2H	20606	3302501343		Confidential		SWSW 9-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	SWIFT EAGLE USA 31-15TFH	26063	3302502218	OG	A	6/5/2014	SWSE 10-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	TABBY 147-93-06A-07H TF	31128	3302502916		Confidential		NENE 6-147-93	ENERPLUS RESOURCES USA CORPORATION
MOCCASIN CREEK	TWO CROW USA 21-15TFH	26062	3302502217	OG	A	6/11/2014	SWSE 10-147-93	MARATHON OIL COMPANY
MOCCASIN CREEK	VENUS 147-93-16B-21-2H TF	20608	3302501345		Confidential		NWNW 16-147-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	BEANS 148-93-14B-13H	22473	3302501638		Confidential		SWNW 14-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	BENSON 3-9H	20044	3302501230	OG	A	8/22/2011	NENW 9-148-93	WPX ENERGY WILLISTON, LLC
SOUTH FORK	BENSON 3-9HA	23202	3302501777	OG	A	2/26/2013	NENW 9-148-93	WPX ENERGY WILLISTON, LLC
SOUTH FORK	BMX 148-93-23B-24H TF	21788	3302501520	OG	A	3/24/2015	NWNW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	BULLHEAD 148-93-15D-16H TF	23166	3302501775	OG	A	11/16/2012	NWSW 14-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	CARP 148-93-15A-16H	22472	3302501637		Confidential		SWNW 14-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	CATFISH 148-93-15D-16H	24763	3302502037	OG	A	10/10/2013	NWSW 14-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	EARTH LODGE 148-93-22A-21H TF	21789	3302501521	OG	A	8/6/2015	NWNW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	HUFFY 148-93-23C-24H TF	21916	3302501549		Confidential		SWSW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	LOG HOUSE 148-93-22D-21H TF	21915	3302501548		Confidential		SWSW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	LOOK OUT RIDGE 4-31H	18103	3302500932	OG	A	4/20/2011	NWNE 4-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	PUMPKIN 148-93-14C-13H TF	24764	3302502038	OG	A	10/10/2013	NWSW 14-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	ROUND HOUSE 148-93-22D-21H	21914	3302501547		Confidential		SWSW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	SCHWINN 148-93-23C-24H	21917	3302501550		Confidential		SWSW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	SKUNK CREEK 1-12H	18922	3302501085	OG	A	6/15/2011	LOT3 1-148-93	WPX ENERGY WILLISTON, LLC
SOUTH FORK	SKUNK CREEK 12-10-11-9H	19587	3302501167	OG	A	10/9/2011	NWSW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 12-10-11-9H3	20926	3302501391	OG	A	10/13/2011	NWSW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 16-2-3-13H	22162	3302501573	OG	A	12/1/2012	SESE 2-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 16-2-3-13H3	22163	3302501574	OG	A	11/28/2012	SESE 2-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 1-8-17-15H	30599	3302502842	OG	A	7/18/2015	NENE 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 1-8-17-15H3	30598	3302502841	OG	A	7/18/2015	NENE 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 1-8-17-16H	26122	3302502229	OG	A	7/30/2015	NENE 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 1-8-17-16H3	26121	3302502228	OG	A	8/2/2015	NENE 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 2-8-17-14H3	21224	3302501424	OG	A	1/10/2012	NWNE 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 2-8-17-15H	19817	3302501200	OG	A	1/11/2012	NWNE 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-10-11-1H	24110	3302501925	OG	LOC	9/4/2015	NWNW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-10-11-1H3	32089	3302503036	OG	LOC	10/8/2015	NWNW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-10-11-8H	32090	3302503037	OG	LOC	10/8/2015	NWNW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-10-11-8H3	19780	3302501192		Confidential		NWNW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-10-11-8HA	32091	3302503038	OG	LOC	10/8/2015	NWNW 10-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-8-17-13H	27326	3302502402	OG	A	7/13/2014	NWNW 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-8-17-13H3	27325	3302502401	OG	A	7/13/2014	NWNW 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-8-17-14H	19818	3302501201	OG	A	7/18/2014	NWNW 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 4-8-17-14H3	27327	3302502403	OG	A	7/16/2014	NWNW 8-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 9-2-3-12HS	21065	3302501410	OG	A	4/18/2013	NESE 2-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	SKUNK CREEK 9-2-3-5H	21064	3302501409	OG	A	3/15/2012	NESE 2-148-93	WHITING OIL AND GAS CORPORATION
SOUTH FORK	TANDEM 148-93-23B-24H	21787	3302501519	OG	A	8/6/2015	NENW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	TIPI 148-93-22A-21H	21790	3302501522	OG	A	8/6/2015	NWNW 23-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	TOBACCO 148-93-14C-13H	24765	3302502039	OG	A	10/10/2013	NWSW 14-148-93	ENERPLUS RESOURCES USA CORPORATION
SOUTH FORK	WOMAN CREEK 4-11H	17667	3302500836	OG	A	4/21/2009	NWNW 4-148-93	ENERPLUS RESOURCES USA CORPORATION
SQUAW CREEK	ARIKARA 3W-3H-8K	30873	3305306785	OG	A	7/3/2015	SWSW 3-149-94	MISSOURI RIVER RESOURCES ND, LLC
SQUAW CREEK	BENSON 16-3H	21445	3305303753	OG	A	3/17/2012	SESE 3-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	BLUE BUTTES 3-21H	20995	3305303641	OG	A	3/22/2012	NENW 21-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	CALF WOMEN 1-16	15689	3305302619	OG	IA	4/27/2005	SENE 16-149-94	LELAND OIL & GAS, LLC
SQUAW CREEK	CORN STALK 20HC	23216	3305304208	OG	A	1/8/2013	NWSW 20-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	CORN STALK 20HD	23215	3305304207	OG	A	1/11/2013	NWSW 20-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	FETTIG 24-22H	18766	3305303122	OG	A	11/20/2010	SESW 22-149-94	XTO ENERGY INC.
SQUAW CREEK	GROUPER 149-94-36D-25H	21754	3302501511	OG	A	7/12/2012	LOT3 3-148-94	ENERPLUS RESOURCES USA CORPORATION
SQUAW CREEK	HALL 23-21H	19881	3305303344		Confidential		NENW 23-149-94	ENERPLUS RESOURCES USA CORPORATION
SQUAW CREEK	HIDATSA 3W-2H-TF	30518	3305306667	OG	A	6/30/2015	SWSW 3-149-94	MISSOURI RIVER RESOURCES ND, LLC
SQUAW CREEK	KALE BAD BRAVE 19-18HA	27479	3305305610		Confidential		LOT4 19-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	KALE BAD BRAVE 19-18HB	27477	3305305608	OG	A	1/23/2015	LOT 4 19-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	KALE BAD BRAVE 19-18HW	27478	3305305609	OG	A	1/25/2015	LOT 4 19-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	KALE BAD BRAVE 19-18HX2	27480	3305305611	OG	A	1/26/2015	LOT4 19-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	LINSETH 13-12HW	21217	3305303693	OG	A	9/9/2012	LOT4 13-149-95	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	LUCY LONE FIGHT 16-22H	20711	3305303565	OG	A	9/28/2011	SESE 22-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	MANDAN 3W-1H-8K	30517	3305306666	OG	A	6/27/2015	SWSW 3-149-94	MISSOURI RIVER RESOURCES ND, LLC
SQUAW CREEK	MANDAREE 10-05H	18411	3305303069	OG	A	10/2/2010	LOT4 5-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 101-20H	21332	3305303722	OG	A	9/2/2012	NWNW 20-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 102-05H	21003	3305303642	OG	A	10/3/2011	LOT4 5-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 105-0910H	22232	3305303938	OG	LOC	1/11/2016	NWNW 9-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 107-09H	22233	3305303939	OG	LOC	1/11/2016	NWNW 9-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 110-05H	26778	3305305393	OG	A	9/21/2014	LOT3 5-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 1-10H	18464	3305303082	OG	A	9/1/2010	NWNW 10-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 12-07H	19004	3305303164	OG	A	11/19/2010	SESE 7-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 134-05H	26769	3305305391	OG	A	10/1/2014	LOT4 5-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 135-05H	26777	3305305392	OG	A	9/23/2014	LOT3 5-149-94	EOG RESOURCES, INC.

Potential Source Wells in the Area**** - Attachment B5								
Field	Well Name	File No	API No	Well Type	Well Status	Status Date	Location	Operator
SQUAW CREEK	MANDAREE 16-04H	20601	3305303534	OG	A	5/9/2012	SESE 4-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 17-05H	26779	3305305394	OG	A	10/1/2014	LOT3 5-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 2-09H	18927	3305303148	OG	A	8/8/2010	NWNW 9-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 24-0706H	32513	3305307502	OG	LOC	2/8/2016	SESE 7-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 28-05H	26768	3305305390	OG	A	9/28/2014	LOT4 5-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 30-0706H	32512	3305307501	OG	LOC	2/8/2016	SESE 7-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 31-0706H	32514	3305307503	OG	LOC	2/8/2016	SESE 7-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 4-15H	18697	3305303114	OG	A	8/13/2010	SESE 15-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 5-16H	18774	3305303124	OG	A	10/16/2010	NWNW 16-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 6-20H	18908	3305303142	OG	A	9/23/2010	NWNW 20-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 7-17H	18594	3305303098	OG	A	9/27/2010	NWNW 17-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE 9-04H	19426	3305303238	OG	A	3/17/2011	SESE 4-149-94	EOG RESOURCES, INC.
SQUAW CREEK	MANDAREE WARRIOR 14-11H	20320	3305303437	OG	A	5/25/2012	SESW 14-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	NATION 3W-4H-TF	30874	3305306786	OG	A	7/5/2015	SESW 3-149-94	MISSOURI RIVER RESOURCES ND, LLC
SQUAW CREEK	PLENTY SWEET GRASS 18-19HC	20603	3305303536	OG	A	1/16/2012	NWNE 18-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	POINTER 149-94-23A-3H	21301	3305303711		Confidential		NWNE 23-149-94	ENERPLUS RESOURCES USA CORPORATION
SQUAW CREEK	RACHEL WOLF 22HC	31938	3305307256		Confidential		SWSE 22-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	RACHEL WOLF 27-34HC	31941	3305307259		Confidential		SWSE 22-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	RACHEL WOLF 27-34HG	31939	3305307257		Confidential		SWSE 22-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	RACHEL WOLF 27-34HS	31942	3305307260		Confidential		SWSE 22-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	RACHEL WOLF 27-34HY	31940	3305307258		Confidential		SWSE 22-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	SPOTTED HORN 26-35H	20238	3305303421	OG	A	1/4/2012	NENW 26-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	STEVENSON 15-8H	21063	3305303655	OG	A	1/8/2012	SWSE 8-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	STEVENSON 15-8HD	24351	3305304576	OG	A	4/26/2013	SWSE 8-149-94	WPX ENERGY WILLISTON, LLC
SQUAW CREEK	TERRIER 149-94-23A-4H TF	21300	3305303710		Confidential		NWNE 23-149-94	ENERPLUS RESOURCES USA CORPORATION
SQUAW CREEK	WALLEYE 149-94-36D-25H	21755	3302501512		Confidential		LOT3 3-148-94	ENERPLUS RESOURCES USA CORPORATION
SQUAW CREEK	WOLF 27-34H	19973	3305303367	OG	A	7/24/2011	NENW 27-149-94	WPX ENERGY WILLISTON, LLC
	Potential Source Wells in the Area ****	**1038**						

****** Generally, fields within Fort Berthold Indian Reservation, north of Little Missouri River and south and west of the Missouri River**

May 2016 Production Within the Market Area – Attachment B6

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

May 2016 Reported Production Within the Area of the Proposed RED SWD 1****					
Field	Date	BBLS Oil	BBLS Water	MCF Gas	Wells Producing
Eagle Nest-Bakken	May-16	228022	186900	246499	71
Heart Butte-Bakken	May-16	555355	442707	451741	169
Mandaree-Bakken	May-16	333668	177104	359419	81
McGregory Buttes-Bakken	May-16	410277	353513	389103	81
Moccasin Creek-Bakken	May-16	182715	113845	152299	55
South Fork-Bakken	May-16	116404	103901	106693	28
Squaw Creek-Bakken	May-16	71284	39848	127088	37
		1,897,725	**1,417,818**	**1,832,842**	**522**

****** Generally, fields within Fort Berthold Indian Reservation, north of Little Missouri River and south and west of Missouri River**

C. CORRECTIVE ACTION PLAN AND WELL DATA

There are eight completed wells that are within the 3/4-mile area of review. They include:

1. WOUNDED FACE 15HC (NDIC WF#-21215)−This is a horizontal oil & gas well with a surface location in the SWSE of Section 15, Township 148N, Range 94W and having coordinates of 47.632978, -102.638712. The well was spud on 6/29/2102 and drilled to a Total Depth of 15,171'. It has 9-5/8" surface casing set to 2,415' and 7" production casing set to 11,132'. This well's horizontal lateral was completed in the Bakken Pool on 9/15/2012 and is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates excellent cement isolation above and below the injection zone to approximately 4,830' KB. The completion report for this well has been included in this application as Attachment C1.

   No corrective action is required.

2. FORT BERTHOLD 148-94-22A-27-2H (NDIC WF#-23223)−This is a horizontal oil & gas well with a surface location in the NENE of Section 22, Township 148N, Range 94W and having coordinates of 47.630549, -102.631829. The well was spud on 12/14/2012 and drilled to a Total Depth of 20,500. It has 9-5/8" surface casing set to 2,219' and 7" production casing set to 11,174'. This well's horizontal lateral was completed in the Bakken Pool on 3/3/2013 and is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates good cement isolation of the vertical wellbore to approximately 4,915' KB. Additionally, there appears to be several thousand feet of Lite cement above.

   No corrective action is required.

3. The FORT BERTHOLD 148-94-22A-27-1H (WF#-18335)−This is a horizontal oil & gas well with a surface location in the NWNE of Section 22, Township 148N, Range 94W and having coordinates of 47.630005, -102.638001. The well was spud on 2/12/2010 and drilled to a Total Depth of 19,970'. It has 9-5/8" surface casing set to 2,271' and 7" production casing set to 11,162'. This well's horizontal lateral was completed within the Bakken Pool on 6/17/2010 and is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates cement isolation to approximately 5,073' KB with what appears to be additional Lite cement above. The completion report for this well has been included in this application as Attachment C3.

   No corrective action is required.

4. HILO 148-94 23B-2H TF (NDIC WF#-20983)−This is a horizontal oil & gas well with a surface location in the NENW of Section 23, Township 148N, Range 94W and having coordinates of 47.630805, -102.623820. The well was spud on 8/31/2011 and drilled to a Total Depth of 15,609'. It has 9-5/8" surface casing set to 2,306' and 7" production casing set to 11,114'. This well's horizontal lateral was completed in the Bakken Pool on 12/22/2011 and is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBLs of this well on file with the NDIC indicates adequate cement isolation below the injection zone and excellent cement isolation above the injection zone to approximately 4,236' KB.. The completion report for this well has been included in this application as Attachment C4.

   No corrective action is required.

5. KONA 148-94 23B-3H (NDIC WF#-20984)−This is a horizontal oil & gas well with a surface location in the NENW of Section 23, Township 148N, Range 94W and having coordinates of 47.630687, -102.623462. The well was spud on 7/26/2011 and completed to a Total Depth of 15,195'. It has 9-5/8" surface casing set to 2,480' and 7" production casing set to 11,039'. This well's horizontal lateral was completed in the Bakken Pool on 12/26/2011 and is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates excellent cement isolation below the injection zone and good cement isolation above the injection zone to approximately 5,025' KB. The completion report for this well has been included in this application as Attachment C5.

   No corrective action is required.

6. FORT BERTHOLD 148-94-22B-27-5H (NDIC WF#-22878)–This is a horizontal oil & gas well with a surface location in the NENW of Section 22, Township 148N, Range 94W and having coordinates of 47.630762, -102.642678. The well was spud on 2/15/2013 and drilled to a Total Depth of 20,607'. It has 9-5/8" surface casing set to 2,152' and 7" production casing set to 11,130'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates excellent cement isolation above and below the injection zone to approximately 2,180' KB. The completion report for this well has been included in this application as Attachment C6.
   No corrective action is required.
7. FORT BERTHOLD 148-94-22A-27-12H (WF#-31697)–This is a horizontal oil & gas well with a surface location in the NENE of Section 22, Township 148N, Range 94W and having coordinates of 47.630114, -102.632464. The well was spud on 6/1/2016 and drilled to a Total Depth of 20,747'. It has 9-5/8" surface casing set to 2,197' and 7" production casing set to 11,148'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The well is currently shut in and neither the CBL or completion report has been submitted to the NDIC. The APD has been included in this application as Attachment C7.
   Corrective action-1804 Operating, LLC will submit a subsequent report that details the cement isolation of this wellbore when the CBL becomes available.
8. FORT BERTHOLD 148-94-22A-27-11H (WF#-31161)–This is a horizontal oil & gas well with a surface location in the NENE of Section 22, Township 148N, Range 94W and having coordinates of 47.630067, -102.632563. The well was spud on 6/2/2016 and drilled to a Total Depth of 21,056'. It has 9-5/8" surface casing set to 2,205' and 7" production casing set to 11,158'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The well is currently shut in and neither the CBL or completion report has been submitted to the NDIC. The APD has been included in this application as Attachment C8.
   Corrective action-1804 Operating, LLC will submit a subsequent report that details the cement isolation of this wellbore when the CBL becomes available.

Additionally, there are four completed wells that have horizontal laterals (not the vertical wellbore) that fall within the ¾-mile area of review:

9. FORT BERTHOLD 148-94-27C-22-7H (WF#-27105)–This is a horizontal oil & gas well with a surface location in the SWSW of Section 27, Township 148N, Range 94W and having coordinates of 47.603692, -102.647469 (outside of the ¾-mile area of review). The well was spud on 8/24/2014 and drilled to a Total Depth of 20,542'. It has 9-5/8" surface casing set to 2,326' and 7" production casing set to 11,206'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates good cement isolation above and below the injection zone to approximately 2,578' KB. The completion report for this well has been included in this application as Attachment C9.
   No corrective action is required.
10. FORT BERTHOLD 148-94-27C-22-6H (WF#-27106)–This is a horizontal oil & gas well with a surface location in the SWSW of Section 27, Township 148N, Range 94W and having coordinates of 47.603692, -102.647347 (outside of the ¾-mile area of review). The well was spud on 8/21/2014 and drilled to a Total Depth of 20,450'. It has 9-5/8" surface casing set to 2,290' and 7" production casing set to 11,181'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates adequate cement isolation above and below the injection zone to approximately 3,332' KB. The completion report for this well has been included in this application as Attachment C10.
    No corrective action is required.

11. FORT BERTHOLD 148-94-27C-22-4H (WF#-27107)–This is a horizontal oil & gas well with a surface location in the SWSW of Section 27, Township 148N, Range 94W and having coordinates of 47.603692, -102.647226 (outside of the ¾-mile area of review). The well was spud on 8/19/2014 and drilled to a Total Depth of 20,455'. It has 9-5/8" surface casing set to 2,294' and 7" production casing set to 11,125'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates excellent cement isolation above and below the injection zone to approximately 2,656' KB. The completion report for this well has been included in this application as Attachment C11.
    No corrective action is required.
12. FORT BERTHOLD 148-94-27C-22-3H (WF#-24150)–This is a horizontal oil & gas well with a surface location in the SWSW of Section 27, Township 148N, Range 94W and having coordinates of 47.603692, -102.647104 (outside of the ¾-mile area of review). The well was spud on 8/16/2014 and drilled to a Total Depth of 20,391'. It has 9-5/8" surface casing set to 2,290' and 7" production casing set to 11,284'. This well's horizontal lateral is completed in the Bakken Pool which is separated from the injection zone by multiple confining zones composed of shale or salt that eliminate potential communication. The CBL of this well on file with the NDIC indicates adequate cement isolation above and below the injection zone to approximately 2,810' KB. The completion report for this well has been included in this application as Attachment C12.
    No corrective action is required.

Completion Report for NDIC WF#-21215 – Attachment C1

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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
OCT 2012
ND OIL & GAS DIVISION

Well File No. 21215

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
WOUNDED FACE 15HC	SECTION 15 T148N R94W - 640 ACRES

Operator	Telephone Number	Field
WPX ENERGY WILLISTON, LLC	(539) 573-6453	McGREGORY BUTTES

Address	Pool
ONE WILLIAMS CENTER (MD 36-4)	BAKKEN

City	State	Zip Code	Permit Type
TULSA	OK	74172	☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
510 F S L 2090 F E L	SWSE	15	148 N	94 W	DUNN

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
June 29, 2012	August 9, 2012	NABORS B21	2286	2261

Type of Electric and Other Logs Run (See Instructions)
NDIC LOG WAIVER APPROVED 5/21/2012 - CBL AND Gamma

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	Conductor	20	0	106	26	40			270	0
Surface Hole	Surface	9-5/8	0	2415	13.5	36			580	0
Vertical Hole	Intermediate	7	0	11132	8-3/4	32			725	4835
Lateral1	Liner	4.5	10114	15166	6.0	13.5			280	--

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
Sidetrack1	11143		10620	11143						180
Lateral1	15171		11963	14856						

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)	Name of Zone (If Different from Pool Name)
11963 - 14856	MIDDLE BAKKEN

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
September 15, 2012	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
09/15/2012	17	18 /64		415	1117	1256	43.0 °	Flared

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
NOT YET INSTALLED	2826		603	1624	1826	2692

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
KIBBEY LIME	8392	8389
CHARLES	8556	8553
BASE LAST SALT	9123	9119
LODGEPOLE	9891	9886
FALSE BAKKEN	10821	10729
BAKKEN UPPER	10864	10750
BAKKEN MIDDLE	10943	10772

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
09/15/2012	MIDDLE BAKKEN	11963	14856	8	1270225	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		1814453	8867	48.0

Details

SEE ATTACHED WELL COMPLETION SUMMARY FOR WELL SPECIFIC STIMULATIONS

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

ATTACHED WELL COMPLETION SUMMARY

LOCATION OF WELL:
@TOP OF PROD. INTERVAL
SWSE 904.52' FSL 2002.75' FEL SEC.15 T148N R94W
@TD
NWNE 250' FNL 1980' FEL SEC.15 T148N R94W

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address		Date
	GINA.RANDOLPH@WPXENERGY.COM		10/12/2012
[REDACTED]	Printed Name	Title	
	GINA RANDOLPH	PERMIT TECHNICIAN I	

Completion Report for NDIC WF#-23223 – Attachment C2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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 JUN 2013 ND OIL & GAS DIVISION

Well File No. 23223

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
Fort Berthold 148-94-22A-27-2H	Sec 22 & 27 T148N - R94W, 1280 acres

Operator	Telephone Number	Field
G3 Operating, LLC	(303) 297-2028	McGregory Buttes

Address	Pool
475 17th Street, Ste 1500	Three Forks

City	State	Zip Code	Permit Type
Denver	CO	80202	☑ Wildcat ☐ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
382 F N L 383 F E L	NENE	22	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
December 14, 2012	January 16, 2013	Unit Drlg Rig 108 (Petro-Hunt)	2280	2258

Type of Electric and Other Logs Run (See Instructions)
GR = Array Induction & Neutron Density, CBL, MWD Gamma Ray

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	Conductor	16	0	80	20	36				
Vertical Hole	Surface	9.625	0	2219	13.5	36			450	Surface
Directional	Intermediate	7	0	11174	32	8.75			1001	4000
Lateral1	Liner	4.5	8408	20500	6	13.5				

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	20500	Open Hole	11231	20333	10350		02/28/2013			

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 MD: 11,231 - 20,333	Three Forks

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
March 3, 2013	Flowing	N/A	Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
03/03/2013	24	30 /64		1210	2045	1426	41.2 °	Flared

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
1300	0		1210	2045	1426	1690

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Pierre Shale		1930
Greenhorn		4400
Dakota Sand		5195
Rierdon		6055
Pine Salt		6757
Opeche Salt		6979
Kibbey Lime		8378
Charles Salt		8539
Base Last Charles Salt		9096
Ratcliffe Porosity		9216
Rival		9276
Lodgepole		9856
Upper Bakken Shale		10720
Middle Bakken		10742
Lower Bakken		10786
Three Forks		10803
Target Horizon		10823

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
02/28/2013	Three Forks	11231	20333	30	89679	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Other	15	3409197	8529	39.3

Details

Pumped 3,372,866 lbs 20/40 Versaprop AND 36,331 lbs 100 Mesh. ATR = 35.4 bpm, ATP = 7514 psi

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

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

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

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

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

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

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

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address scarson@halconresources.com		Date 06/14/2013
S [REDACTED]	Printed Name Sarah Carson	Title Regulatory	

Completion Report for NDIC WF#-18335 – Attachment C3

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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 (04-2009)

JUN 2010
RECEIVED
ND OIL & GAS
DIVISION

Well File No. **18335**

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
Fort Berthold 148-94-22A-27-1H			SEC 22 & 27 T148N R94W
Operator		Telephone Number	Field
PETRO-HUNT LLC		701-863-6622	MCGREGORY BUTTES
Address			Pool
248 119TH AVE SW			BAKKEN
City	State	Zip Code	Permit Type
KILLDEER	ND	58640	☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface		Qtr-Qtr	Section	Township	Range	County
575 F N L	1900 F E L	NWNE	22	148 N	94 W	DUNN

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
2/12/2010	3/16/2010	BRONCO 22	~~2297~~ 2323	~~2323~~ 2297

Type of Electric and Other Logs Run (See Instructions)
GR,CAL, CBL

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	9 5/8		2271	12 1/4	36			460	0
Vertical Hole	Intermediate	7		11162	8 3/4	32			810	2535
Lateral1	Liner	4 1/2	9880	19827	6	13.5			0	

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	19970	Open Hole	11162	19970	10330		3/16/2010			

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft): **11162-19970**
Name of Zone (If Different from Pool Name):

Date of First Production Through Permanent Wellhead	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
6/17/2010	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
6/18/2010	24	20 /64		806	569	1880	41.3 °	Flared

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
	1984		806	569	1880	706

orig.

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
GREENHORN	4446	4445
DAKOTA	5238	5236
DAKOTA	5238	5236
RIERDON	6099	6098
TYLER	7953	7951
KIBBEY	8432	8430
MADISON	8597	8595
BLS	9152	9150
FROBISHER ALIDA	9340	9338
BAKKEN	10946	10776

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)	Stimulated In	Volume	Volume Units
6/13/2010	BAKKEN	11171	19970	Open/Cased Hole	35965	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		1378618	9680	46.0

Details
6/9/2010 - 6/13/2010 STIMULATED 18 STAGES USING BOTH FRAC PORTS AND PLUG AND PERF METHOD.

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulated In	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)	Stimulated In	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)	Stimulated In	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)	Stimulated In	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

4/07/2010 - RUN CEMENT BOND LOG - TOC = 2535'
4/08/2010 - PRESSURE TEST CASING AND LINER TOP TO 9780 PSIG. LOST 185 PSIG IN 30 MIN.
4/21/2010 - RETREIVE RBP AND PREPARE TO FRAC DOWN 7" CASING

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address KFETZER@PETROHUNT.COM		Date 6/22/2010
Signature [REDACTED]	Printed Name KENT FETZER	Title ENGINEER	

Completion Report for NDIC WF#-20983 – Attachment C4

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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)

Well File No. **20983**

FEB 2012 RECEIVED ND OIL & GAS DIVISION

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
HILO 148-94-23B-2H TF		Sec 23 T148N R94W
Operator	**Telephone Number**	**Field**
Enerplus Resources USA Corporation	(720) 279-5500	McGregory Buttes
Address		**Pool**
950 17th Street, Suite 2200		Bakken
City	**State / Zip Code**	**Permit Type**
Denver	CO 80202	☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
310 F N L 1588 F WL	NENW	23	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
August 31, 2011	October 18, 2011	Precision 631	2283	2259

Type of Electric and Other Logs Run (See Instructions)
CBL/GR/CCL surface to 10010'

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	Conductor	16" J55	0	80		84			26	Surface
Vertical Hole	Surface	9-5/8" J55	0	2306		36			778	Surface
Vertical Hole	Intermediate	7" HCL80/110	0	11114		32			825	4674'
Lateral1	Liner	4-1/2" P110	9923	15609		13.5			Liner	Liner

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	15609	Other	11114	15609	10320		10/26/2011			Liner

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)	Name of Zone (If Different from Pool Name)
11424-15153' Liner	Bakken

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-in)
December 22, 2011	Flowing	None	Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
01/02/2012	24	18 /64		561	768	359	41.2 °	Flared

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
1225			561	768	359	1369

orig

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Base Last Salt		**9089**
Mission Canyon		**9262**
Lodgepole		**9856**
Upper Bakken Shale		**10724**
Middle Bakken		**10746**
Three Forks (Target)		**10814**

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
11/26/2011	Bakken	11424	15153	12	475398	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac	15	1055480	9236	44.8

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

Directional Survey
Logs as listed above

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address		Date
	cwatson@enerplus.com		02/09/2012
Signature	Printed Name	Title	
[REDACTED]	Connie Watson	Operations Technician	

Completion Report for NDIC WF#-20984 – Attachment C5

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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)

FEB 2012 RECEIVED ND OIL & GAS DIVISION

Well File No. **20984**

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
KONA 148-94-23B-3H		Sec 23 T148N R94W
Operator	**Telephone Number**	**Field**
Enerplus Resources USA Corporation	(720) 279-5500	McGregory Buttes
Address		**Pool**
950 17th Street, Suite 2200		Bakken
City	**State / Zip Code**	**Permit Type**
Denver	CO 80202	☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
354 F N L 1677 F WL	NENW	23	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
July 27, 2011	August 21, 2011	Precision 631	2281	2258

Type of Electric and Other Logs Run (See Instructions)
CBL/GR/CCL surface to 10147'

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	Conductor	16" J55	0	80		84			26	Surface
Vertical Hole	Surface	9-5/8" J55	0	2480		36			795	Surface
Vertical Hole	Intermediate	7" HCL80/110	0	11039		32			810	4674'
Lateral1	Liner	4-1/2" P110	10068	15195		13.5			Liner	Liner

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	15195	Other	10039	15195	10280		12/01/2011			Liner

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)							Name of Zone (If Different from Pool Name)	
11039-15195' Liner							Bakken	
Date Well Completed (SEE INSTRUCTIONS)		Producing Method		Pumping-Size & Type of Pump			Well Status (Producing or Shut-In)	
December 26, 2011		Flowing		None			Producing	
Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
12/27/2011	24	14 /64		630	410	600	41.2 °	Flared
Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio		
2900			630	410	600	651		

orig

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Base Last Salt		9089
Mission Canyon		9262
Lodgepole		9856
Upper Bakken Shale		10717
Middle Bakken (Target)		10739

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
12/01/2011	Bakken	11390	14981	12	1252931	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac	15	1187700	8781	41.4

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

Directional Survey
Logs as listed above

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address		Date
	cwatson@enerplus.com		02/01/2012
Sig [REDACTED]	Printed Name	Title	
	Connie Watson	Operations Technician	

Completion Report for NDIC WF#-22878 – Attachment C6

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

Th

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)

JUL 2013
RECEIVED
ND OIL & GAS
DIVISION

Well File No. **22878**

FLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
FLEASE 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
Fort Berthold 148-94-22B-27-5H			Sections 22 & 27, T148N - R94W, 1280 acres
Operator	Telephone Number		Field
HRC Operating, LLC	(303) 297-2028		McGregory Buttes
Address			Pool
475 17th Street, Suite 1210			Middle Bakken
City	State	Zip Code	Permit Type
Denver	CO	80202	☑ Wildcat ☐ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
295 F N L 2244 F WL	NENW	22	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
February 15, 2013	March 28, 2013	Stoneham rig # 16	2307	2281

Type of Electric and Other Logs Run (See Instructions)
MWD GR from surface casing to KOP to landing through lateral

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	Conductor	16	0	60	20	22				
Vertical Hole	Surface	9.625	0	2152	12.25	36			725	Surface
Directional	Intermediate	7	0	11130	8.75	32			835	4227
Lateral1	Liner	4.5	10069	20567	6	13.5				

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	20607	Open Hole	11205	20607	10200		05/07/2013			

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 MD: 11205 - 20607							Bakken	
Date Well Completed (SEE INSTRUCTIONS)		Producing Method	Pumping-Size & Type of Pump				Well Status (Producing or Shut-In)	
May 9, 2013		Flowing	N/A				Producing	
Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
05/09/2013	24	32 /64		1532	2368	1568	37.9 °	Flared
Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio	
2037	1839			1532	2368	1568	1546	

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Pierre		1943
Greenhorn		4431
Dakota		5223
Charles Salt		8583
Base Last Charles Salt		9143
Lodgepole		9908
Bakken Shale		10773
Middle Bakken		10794

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
05/07/2013	Middle Bakken	11205	20272	30	103105	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Other		4245500	8560	35.3

Details
Plug & Perf - 30 stages; 20/40 CMC sand used throughout job totalling 4,425,500#. ATR = 34.6 bpm, ATP = 7,486 psi

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

API 33-025-01700

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address		Date
	scarson@halconresources.com		**07/25/2013**
Sig [REDACTED]	Printed Name	Title	
	Sarah Carson	**Regulatory Agent**	

APD for NDIC WF#-31697 – Attachment C7

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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	03 / 15 / 2015	No

Operator	Telephone Number
HRC OPERATING, LLC	303.279.2028

Address	City	State	Zip Code
1801 CALIFORNIA STREET SUITE 3500	DENVER	CO	80202

☑ 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
FORT BERTHOLD	148-94-22A-27-12H

Surface Footages	Qtr-Qtr	Section	Township	Range	County
540 F N L 537 F E L	NENE	22	148 N	94 W	Dunn
Longstring Casing Point Footages					
1057 F N L 218 F E L	NENE	22	148 N	94 W	Dunn
Longstring Casing Point Coordinates From Well Head	**Azimuth**	**Longstring Total Depth**			
517 S From WH 319 E From WH	151 °	11076 Feet MD	10777 Feet TVD		
Bottom Hole Footages From Nearest Section Line					
249 F S L 13 F W L	SWSW	26	148 N	94 W	Dunn

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
9758 S From WH 550 E From WH	10258 Feet MD	180.0 °	20355 Feet MD 10777 Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
47 ° 37 ' 48.88 "	-102 ° 37 ' 58.46 "	NAD83	Spacing Unit: 22, 23, 26, 27-T148N-R94W

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
2263 Feet Above S.L.	2560	200 Feet N/S	26323

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
10574 Feet	10562 Feet	10551 Feet	10554 Feet

Objective Horizons	Pierre Shale Top
Middle Bakken	1940

	Size	Weight	Depth	Cement Volume	
Proposed Surface Casing	9 - 5/8 "	36 Lb./Ft.	2150 Feet	870 Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.

	Size	Weight(s)	Longstring Total Depth		Cement Volume	Cement Top	Top Dakota Sand
Proposed Longstring Casing	7 - 0 "	32 Lb./Ft.	11076 Feet MD	10777 Feet TVD	698 Sacks	3862 Feet	4862 Feet

Base Last Charles Salt (If Applicable)	
9109 Feet	NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.

Proposed Logs
Triple Combo {w/GR to surf}, GR-MWD thru curve/lateral, CBL {see comments}

Drilling Mud Type (Vertical Hole - Below Surface Casing)	Drilling Mud Type (Lateral)
Invert	Brine

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

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

Form 4 Log Waiver is being requested.
Cuttings will be hauled to Indian Hills or Prairie Disposal.

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 1 / 9 / 2015
ePermit	Printed Name Mark H. Johnson	Title Engineer

FOR STATE USE ONLY

Permit and File Number 31697	API Number 33 - 025 - 02974
Field MCGREGORY BUTTES	
Pool BAKKEN	Permit Type DEVELOPMENT

FOR STATE USE ONLY

Date Approved 7 / 24 / 2015
By David Burns
Title Engineering Technician

APD for NDIC WF#-31161 – Attachment C8

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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	03 / 15 / 2015	No

Operator	Telephone Number
HRC OPERATING, LLC	303.279.2028

Address	City	State	Zip Code
1801 CALIFORNIA STREET SUITE 3500	DENVER	CO	80202

☑ 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
FORT BERTHOLD	148-94-22A-27-11H

Surface Footages	Qtr-Qtr	Section	Township	Range	County
557 F N L 561 F E L	NENE	22	148 N	94 W	Dunn
Longstring Casing Point Footages					
1073 F N L 630 F E L	NENE	22	148 N	94 W	Dunn
Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth			
516 S From WH 69 W From WH	187 °	11074 Feet MD	10777 Feet TVD		
Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
250 F S L 647 F E L	SESE	27	148 N	94 W	Dunn
Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1		
9740 S From WH 86 W From WH	10256 Feet MD	180 °	20299 Feet MD	10777 Feet TVD	

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
47 ° 37 ' 48.71 "	-102 ° 37 ' 58.82 "	NAD83	Spacing Unit: Sections 22 & 27-T148N-R94W

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
2263 Feet Above S.L.	1280	200 Feet N/S 500 Feet E/W	24180

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
5283 Feet	5286 Feet	10547 Feet	10554 Feet

Objective Horizons	Pierre Shale Top
Middle Bakken	1940

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	9 - 5/8 "	36 Lb./Ft.	2150 Feet	870 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 - 0 "	32 Lb./Ft.	11074 Feet MD	10777 Feet TVD	698 Sacks	3862 Feet	4862 Feet

Base Last Charles Salt (If Applicable)	
9109 Feet	NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.

Proposed Logs
Triple Combo {w/GR to surf}, GR-MWD thru curve/lateral, CBL {see comments}

Drilling Mud Type (Vertical Hole - Below Surface Casing)	Drilling Mud Type (Lateral)
Invert	Brine

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

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

Form 4 Log Waiver is being requested.
Cuttings will be hauled to Indian Hills or Prairie Disposal.

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: 1 / 9 / 2015

ePermit	Printed Name: Mark H. Johnson	Title: Engineer

FOR STATE USE ONLY

Permit and File Number	API Number
31161	33 - 025 - 02926
Field: MCGREGORY BUTTES	
Pool: BAKKEN	Permit Type: DEVELOPMENT

FOR STATE USE ONLY

Date Approved
4 / 29 / 2015
By: David Burns
Title: Engineering Technician

Completion Report for NDIC WF#-27105 – Attachment C9

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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)

JUN 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. **27105**

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
Fort Berthold 148-94-27C-22-7H	Sections 22 & 27 T148N R94W, 1280 acres

Operator	Telephone Number	Field
HRC Operating, LLC	(720) 889-6025	McGregory Buttes

Address	Pool
1801 California Street, Suite 3500	Bakken

City	State	Zip Code	Permit Type
Denver	CO	80202	☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
370 F S L 1090 F WL	SWSW	27	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
August 24, 2014	November 22, 2014	Stoneham 16	2319	2293

Type of Electric and Other Logs Run (See Instructions)
GR-Caliper surface to KOP, GR-MDW curve/lateral, CBL

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	Conductor	16	0	100	20	65			60	Surface
Surface Hole	Surface	9 5/8	0	2326	13 1/2	36			1004	Surface
Vertical Hole	Intermediate	7	0	11206	8 3/4	32			805	2650
Lateral1	Liner	4 1/2	10294	20527	6	13 1/2				

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	20542	Perforations	11238	20425	10407		05/09/2015			

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 MD: 11,238' - 20,425'	Three Forks

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
May 18, 2015	Flowing	N/A	Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
05/24/2015	24	32 /64		2552	2976	1125	41.9 °	Sold

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
N/A	2750		2552	2976	1125	1166

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Pierre	1920	
Dakota	4932	
Rierdon	6168	
Kibbey Lime	8408	
Base Charles	9135	
Lodgepole	9920	
Middle Bakken	10865	
Lower Bakken	10944	
Three Forks	11007	

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
05/09/2015	Three Forks	11238	20425	31	5297248	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac	15	4747464	9651	71.0

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

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address mjohnson@halconresources.com		Date 6/18/15
Sigr [REDACTED]	Printed Name Mark H. Johnson	Title Engineer	

Completion Report for NDIC WF#-27106 – Attachment C10

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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)

JUN 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. **27106**

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
Fort Berthold 148-94-27C-22-6H		Sections 22 & 27 T148N R94W, 1280 acres
Operator: HRC Operating, LLC	Telephone Number: (720) 889-6025	Field: McGregory Buttes
Address: 1801 California Street, Suite 3500		Pool: Bakken
City: Denver	State: CO / Zip Code: 80202	Permit Type: ☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
370 F S L 1120 F WL	SWSW	27	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
August 21, 2014	November 15, 2014	Stoneham 16	2319	2293

Type of Electric and Other Logs Run (See Instructions)
GR-Caliper surface to KOP, GR-MDW curve/lateral, CBL

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	Conductor	16	0	100	20	65			60	Surface
Surface Hole	Surface	9 5/8	0	2290	13 1/2	36			952	Surface
Vertical Hole	Intermediate	7	0	11181	8 3/4	32			795	2308
Lateral1	Liner	4 1/2	10208	20440	6	13 1/2				

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	20450	Perforations	11212	20344	10330		04/29/2015			

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 MD: 11,212' - 20,344'				Middle Bakken
Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump		Well Status (Producing or Shut-In)
May 21, 2015	Flowing	N/A		Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
05/26/2015	24	32 /64		2624	2632	1229	42.1 °	Sold

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
N/A	2000		2624	2632	1229	1003

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Pierre	**1920**	
Dakota	**4934**	
Rierdon	**6171**	
Kibbey Lime	**8413**	
Base Charles	**9139**	
Lodgepole	**9925**	
Middle Bakken	**11034**	

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
04/29/2015	Middle Bakken	11212	20344	31	5185057	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac	0	4694239	9579	71.0

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

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address **mjohnson@halconresources.com**		Date 6/2/15
S [REDACTED]	Printed Name **Mark H. Johnson**	Title **Engineer**	

Completion Report for NDIC WF#-27107 – Attachment C11

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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)

JUN 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. 27107

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
Fort Berthold 148-94-27C-22-4H	Sections 22 & 27 T148N R94W, 1280 acres

Operator	Telephone Number	Field
HRC Operating, LLC	(720) 889-6025	McGregory Buttes

Address	Pool
1801 California Street, Suite 3500	Bakken

City	State	Zip Code	Permit Type
Denver	CO	80202	☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
370 F S L 1150 F WL	SWSW	27	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
August 19, 2014	November 2, 2014	Stoneham 16	2319	2293

Type of Electric and Other Logs Run (See Instructions)
GR-Caliper surface to KOP, GR-MDW curve/lateral, CBL

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	Conductor	16	0	100	20	65			60	Surface
Surface Hole	Surface	9 5/8	0	2294	13 1/2	36			733	Surface
Vertical Hole	Intermediate	7	0	11125	8 3/4	32			795	2700
Lateral1	Liner	4 1/2	10302	20427	6	13 1/2				

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	20455	Perforations	11153	20330	10370		04/27/2015			

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 MD: 11,153' - 20,330'	Middle Bakken

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
May 23, 2015	Flowing	N/A	Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
05/28/2015	24	32 /64		2712	3143	1308	42.3 °	Sold

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
N/A	2600		2712	3143	1308	1159

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Pierre	**1920**	
Dakota	**4951**	
Rierdon	**6199**	
Kibbey Lime	**8454**	
Base Charles	**9180**	
Lodgepole	**9974**	
Middle Bakken	**10982**	

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
04/27/2015	Middle Bakken	11153	20330	46	5302182	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac	0	4617814	9569	71.0

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

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address mjohnson@halconresources.com		Date 6/2/15
[REDACTED]	Printed Name Mark H. Johnson	Title Engineer	

Completion Report for NDIC WF#-24150 – Attachment C12

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

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)

JUN 2015
RECEIVED
ND OIL & GAS
DIVISION

Well File No. **24150**

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
Fort Berthold 148-94-27C-22-3H		Sections 22 & 27 T148N R94W, 1280 acres
Operator	Telephone Number	Field
HRC Operating, LLC	(720) 889-6025	McGregory Buttes
Address		Pool
1801 California Street, Suite 3500		Bakken
City / State / Zip Code		Permit Type
Denver / CO / 80202		☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
370 F S L 1180 F WL	SWSW	27	148 N	94 W	Dunn

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
August 16, 2014	October 22, 2014	Stoneham 16	2319	2293

Type of Electric and Other Logs Run (See Instructions)
GR-Caliper surface to KOP, GR-MDW curve/lateral, CBL

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	Conductor	16	0	100	20	65			60	Surface
Surface Hole	Surface	9 5/8	0	2290	13 1/2	36			745	Surface
Vertical Hole	Intermediate	7	0	11284	8 3/4	32			815	2300
Lateral1	Liner	4 1/2	10329	20070	6	13 1/2				

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	20391	Perforations	11308	19972	10420		04/29/2015			

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft): **Lateral 1 MD: 11,308' - 19,972'**
Name of Zone (If Different from Pool Name): **Three Forks**

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
May 25, 2015	Flowing	N/A	Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
05/29/2015	24	32 /64		2760	3024	1286	42.1 °	Sold

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
n/a	2150		2760	3024	1286	1096

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Pierre	1920	
Dakota	4951	
Rierdon	6198	
Kibbey Lime	8451	
Base Charles	9178	
Lodgepole	9968	
Middle Bakken	10944	
Lower Bakken	11055	
Three Forks	11141	

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	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
04/29/2015	Three Forks	11308	19972	44	5067014	Gallons

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac	15	4321616	9839	71.0

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

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address mjohnson@halconresources.com		Date 6/2/15
[REDACTED]	Printed Name Mark H. Johnson	Title Engineer	

D. MAPS AND CROSS SECTION OF USDWs (N/A to Class II wells)

E. NAME AND DEPTH OF USDWs (CLASS II)

Underground Sources of Drinking Water in Dunn County, ND can be found in both preglacial rocks and glacial drift. Glacial drift in Dunn County consists of till and glaciofluvial sand and gravel deposits. The major glacial drift aquifers in Dunn County are the Killdeer, Horse Nose Butte, Knife River, and Goodman Creek aquifers. However, these aquifers are not located near the proposed RED SWD 1 site. According to information available from the North Dakota State Water Commission MapServices web site, the nearest shallow aquifer to the proposed RED SWD 1 site is the Squaw Creek Aquifer at approximately 2.5 miles to the northeast. Little public data is available for this aquifer but it is potentially composed of glaciofluvial sand and gravel. 1804 Operating, LLC believes the proposed site poses no risk to this aquifer because of distance and the differing sub-watersheds.

Preglacial sedimentary rocks in Dunn county were deposited in intermittently subsiding Williston basin. The preglacial aquifers found in these sedimentary rocks near the proposed RED SWD 1 occur in the Upper Cretaceous Fox Hills and Hell Creek Formations and in the Tertiary Cannonball, Ludlow, Tongue River, and Sentinel Butte Formations.

Sentinel Butte Formation

The Sentinel Butte Formation consists of interbedded clay, shale, claystone, siltstone, poorly consolidated sandstone, and lignite. It is continental in origin and occurs throughout Dunn County except in a few areas where it has been eroded. It is exposed in the area of the proposed RED SWD 1 location (the Site) and is approximately 600 feet thick.

The aquifers within the Sentinel Butte Formation consist of poorly consolidated sandstone and fractured lignite. Most of the freshwater wells in Dunn County tap sandstone or lignite aquifers in the upper part of the Sentinel Butte Formation.

> **Sandstone aquifers** — The sandstone aquifers within the Sentinel Butte Formation are composed largely of fine sand enclosed in a matrix of clay and silt. They range in thickness from a few feet to a maximum of about 119 feet and occur at depths throughout the formation. Water from the sandstone aquifers is typically a hard to very hard, sodium bicarbonate type that has a mean dissolved solids concentration of 1,742 mg/L.
>
> **Lignite aquifers** – Lignite beds can be found randomly spaced throughout the entire thickness of the Sentinel Butte Formation. They range in thickness from 1 to about 20 feet and occur at depths ranging from about 15 to 600 feet. Water from the lignite aquifers is typically a hard to very hard, sodium bicarbonate or sodium bicarbonate-sulfate type that has a mean dissolved solids concentration of 1,526 mg/L.

The sandstone and lignite aquifers in the Sentinel Butte Formation are recharged by infiltration of precipitation.

Tongue River Formation (Currently recognized as the Bullion Creek Formation)

The Tongue River Formation consists of interbedded siltstone, claystone or shale, poorly consolidated sandstone, lignite, and occasional limestone lenses or concretions. It is continental in origin and underlies all of Dunn County. The formation underlies the site at an estimated 600 feet and is approximately 450 feet thick.

Aquifers in the Tongue River Formation consist of very fine to fine-grained sandstone beds that range in thickness from 10 to 100 feet. These sandstone beds frequently pinch out or grade laterally into siltstone or sandy clay. Aquifers in the Tongue River Formation are recharged by leakage from aquifers in the overlying Sentinel Butte

Formation. Water from the aquifers is typically a soft, sodium bicarbonate type that has a mean dissolved solids concentration of 2,043 mg/L.

Cannonball Formation

The Cannonball Formation, which is marine in origin, and the Ludlow Formation, which is continental in origin, are interfingered throughout Dunn County. The undifferentiated Cannonball-Ludlow Formations consist of interbedded siltstone, poorly consolidated sandstone, shale or clay, and lignite. The formation underlies the Site at an estimated 1,050 feet and is approximately 500 feet thick.

The aquifers in the undifferentiated Cannonball-Ludlow Formations consist mostly of fine to very fine silty sandstone beds that range in thickness from about 10 to 125 feet. There is no evidence of a hydraulic connection between the beds. Therefore, each bed is considered to be a separate aquifer. Lower aquifers in the formation are recharged beyond Dunn County while aquifers in the upper section are likely recharged by downward movement of water from the Tongue River Formation. Water from the aquifers is typically a soft, sodium bicarbonate type with a mean dissolved solids concentration of 1,855 mg/L.

Hell Creek Formation

The Hell Creek Formation is composed of interbedded siltstone, shale or claystone, poorly consolidated sandstone, and a few thin lignite beds. It is continental in origin and underlies all of Dunn County. The formation underlies the Site at an estimated 1,550 feet and it is approximately 200 feet thick.

The aquifers within the Hell Creek Formation consist of fine-grained sandstone beds that range in thickness from about 10 to 60 feet and have a maximum aggregate thickness of about 106 feet. Because there is no evidence of a hydraulic connection between the beds, each of the sandstone beds is considered to be a separate aquifer. Recharge to the aquifers in the Hell Creek Formation occurs outside of Dunn County. Water from the aquifers is a soft, sodium bicarbonate type with a mean dissolved solids concentration of 1,855 mg/L.

Fox Hills Formation

The Fox Hills Formation is composed of interbedded sandstone, shale, and siltstone. It is marine in origin and underlies all of Dunn County. The formation underlies the Site at an estimated 1,750 feet and is approximately 215 feet thick. It is underlain by the Pierre Formation.

The aquifers within the Fox Hills Formation are generally composed of very fine to medium-grained sandstone beds that range in thickness from about *6* to *92* feet and have a maximum aggregate thickness of about 158 feet. Recharge to the Fox Hills aquifer probably occurs where the formation crops out in the extreme southwestern part of North Dakota and in eastern Montana. Water from the aquifer is generally a soft, sodium bicarbonate type with a mean dissolved solids concentration of 1,486 mg/L.

Klausing, R. 1979. Ground-Water Resources of Dunn County, North Dakota. U.S. Geological Survey.

F. MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA (N/A to Class II wells)

G. GEOLOGIC DATA ON INJECTION AND CONFINING ZONES

Upper Confining Zones:

Name: *Cretaceous Mowry Formation*

Lithologic Description: Shale; medium to dark gray; soft; flaky; traces of bluish gray bentonitic claystone; top is marked by a persistent bentonite that has a strong response on a gamma-ray log. Offshore marine deposits.

Estimated thickness: 115'

Estimated top: 4,840'

Industry accepted standard shale frac gradient = approximately 0.80

Estimated fracture pressure at bottom of zone: 4,955'*0.80=3,964 psi

&

Name: *Cretaceous Skull Creek Formation*

Lithologic description: Shale; medium to dark gray; micaceous; soft, flaky to lumpy and sandstone; light gray; glauconitic, calcareous; fine-grained; friable.

Estimated thickness: 240'

Estimated top: 4,955'

Industry accepted standard shale frac gradient = approximately 0.80

Estimated fracture pressure at bottom of zone: 5,195'*0.80=4,156 psi

Injection Zone:

Name: *Cretaceous Inyan Kara Formation*

Lithologic Description

- Upper part: Sandstone; light gray; quartzose; fine-grained to course-grained. Shale: gray; silty; lumpy. Marine to nonmarine.
- Lower part: Sandstone; gray; quartzose; medium-grained to course-grained; angular to subrounded; occasional lenses of shale; gray; bentonitic; contains manganese and siderite spheres. Most oilfield brine injection occurs in this unit. Primarily nonmarine.

Estimated thickness of gross zone: 450'

Estimated gross zone: 5,195'-5,645'

Estimated perforated interval: 5,315-5,590'

Industry accepted standard Inyan Kara frac gradient = approximately 0.67

Estimated fracture pressure at top of zone: 5,195'*0.67=3,481 psi

Lower Confining Zone:

Name: *Jurassic Swift Formation*

Lithologic description: Shale; dark gray to greenish gray; interbedded with siltstone and sandstone; calcareous; fissile; waxy and grayish green, glauconitic sandstone. Shallow marine deposit

Estimated thickness: 435'

Estimated top: 5,645'

Industry accepted standard shale frac gradient = approximately 0.80

Estimated fracture pressure at top of zone: 5,645'*0.80=4,516 psi

Lithologic Description: Shale; dark gray to greenish gray; interbedded with siltstone and sandstone; calcareous; fissile; waxy and grayish green, glauconitic sandstone. Shallow marine deposit.

**** Lithology Reference: North Dakota Stratigraphic Column.

Depths calculated from the NDIC's call of geologic tops in the offsetting FORT BERTHOLD 148-94-22A-27-2H well (NDIC Well File No. 23223) and the estimated finished pad elevation of 2,882'. Add 11' of correction for KB of proposed Capstar 314 Drilling Rig.

H. OPERATING DATA

1. Average and maximum daily injection: Average of 8,000 bbl/day, maximum of 14,000 bbl/day
2. Average and maximum injection pressure: Average 500 psi, maximum 1450 psi

Maximum injection pressure was determined utilizing the following formula in accordance with § 146.23:

FP = [fg - (0.433 * sg)] * d

Where:

FP = formation fracture pressure (measured at surface)
fg = fracture gradient of confining zone (**** § 146.23) = 0.8 psi/ft
sg = specific gravity (of injected fluid- See Attachment H4.1) = 1.20
d = depth to top of injection zone (See Attachment A2) = 5,195 ft

Therefore:

FP = [0.8 psi/ft - (0.433*1.20)] * 5195ft
FP = 1457 psi
FP ~ 1450 psi

3. Annulus Fluid: A mixture of fresh water and corrosion/scale inhibitors
4. Injection Water Analysis: (See Attachment H4.1 and H4.2)

**** **§ 146.23 Operating, monitoring, and reporting requirements.**

(a) Operating requirements. Operating requirements shall, at a minimum, specify that:

(1) Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure during injection does not initiate new fractures or propagate existing fractures in the confining zone adjacent to the USDWs. In no case shall injection pressure cause the movement of injection or formation fluids into an underground source of drinking water.

Analysis of Representative Sample of Injection Fluid – Attachment H4.1

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

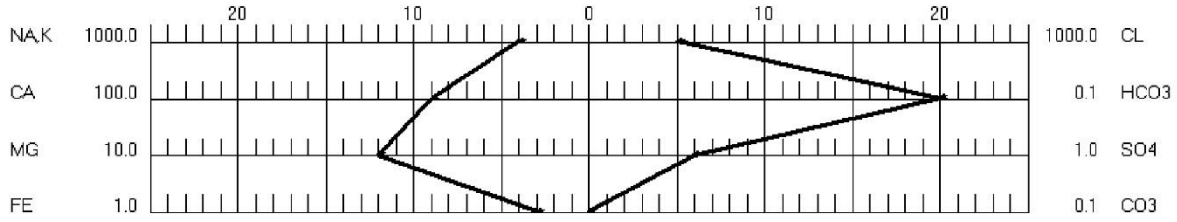
WATER ANALYSIS REPORT

Sample Number: W-16-0429 Date of Analysis: 01/29/2016
Company: FBIR Water Services, LLC.
City: Dallas State: TX
Well Number: Eastview SWD 1
Date Received: 01/28/2016 DST Number:
Sample Source: Produced Water
Location: NENW Section: 15 Township: 147 Range: 95 County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	0.040	Ohm-Meters	pH	6.12
Specific Gravity @ 77 °F	1.200		H2S	Negative
Total Dissolved Solids (Calculated)	295062	mg/L	(245885	ppm)
Sodium Chloride (Calculated)	300046	mg/L	(250038	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	900.0	18035	CHLORIDE	5132.4	181959
MAGNESIUM	120.0	1458	CARBONATE	0.0	0
SODIUM	3784.3	87000	BICARBONATE	2.0	122
IRON	3.2	60.0	SULFATE	5.5	265
CHROMIUM	0.1	0.6	NITRATE	0.0	0
BARIUM	0.5	32.2			
POTASSIUM	156.8	6130			

WATER ANALYSIS PATTERN



Remarks: Sampled 1-28-16
47.55942 / -102.77189

Analyzed By: C. Jungels

Analysis of Representative Sample of Injection Fluid – Attachment H4.2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

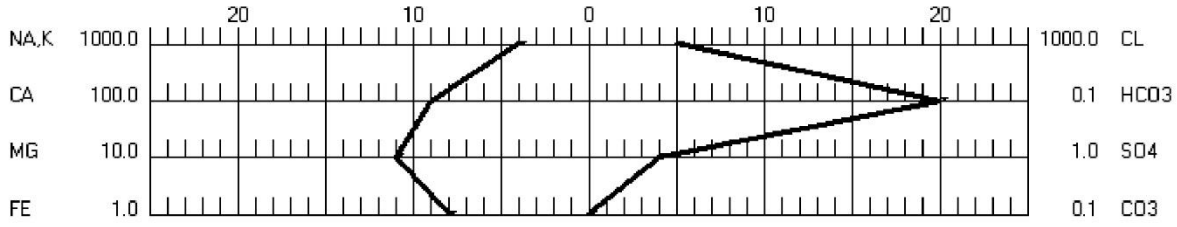
WATER ANALYSIS REPORT

Sample Number: W-14-8014 Date of Analysis: 09/30/2014
Company: MidCon Resource Group , LLC
City: Bismarck State: ND
Well Number:
Date Received: 09/30/2014 DST Number:
Sample Source: Produced Water
Location: NENW Section: 27 Township: 148N Range: 95W County: Dunn
Formation: Depth:
Distribution:

Resistivity @ 77 °F	0.042	Ohm-Meters	pH	6.33
Specific Gravity @ 77 °F	1.190		H2S	Negative
Total Dissolved Solids (Calculated)	284008	mg/L	(238662	ppm)
Sodium Chloride (Calculated)	283560	mg/L	(238286	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	920.0	18436	CHLORIDE	4850.4	171961
MAGNESIUM	110.0	1337	CARBONATE	0.0	0
SODIUM	3740.8	86000	BICARBONATE	2.0	122
IRON	8.0	149.0	SULFATE	4.4	209
CHROMIUM	0.1	0.5	NITRATE-N	0.0	0
BARIUM	0.3	23.4			
POTASSIUM	147.6	5770			

WATER ANALYSIS PATTERN



Remarks:

Analyzed By: C. Jungels

I. FORMATION TESTING PROGRAM

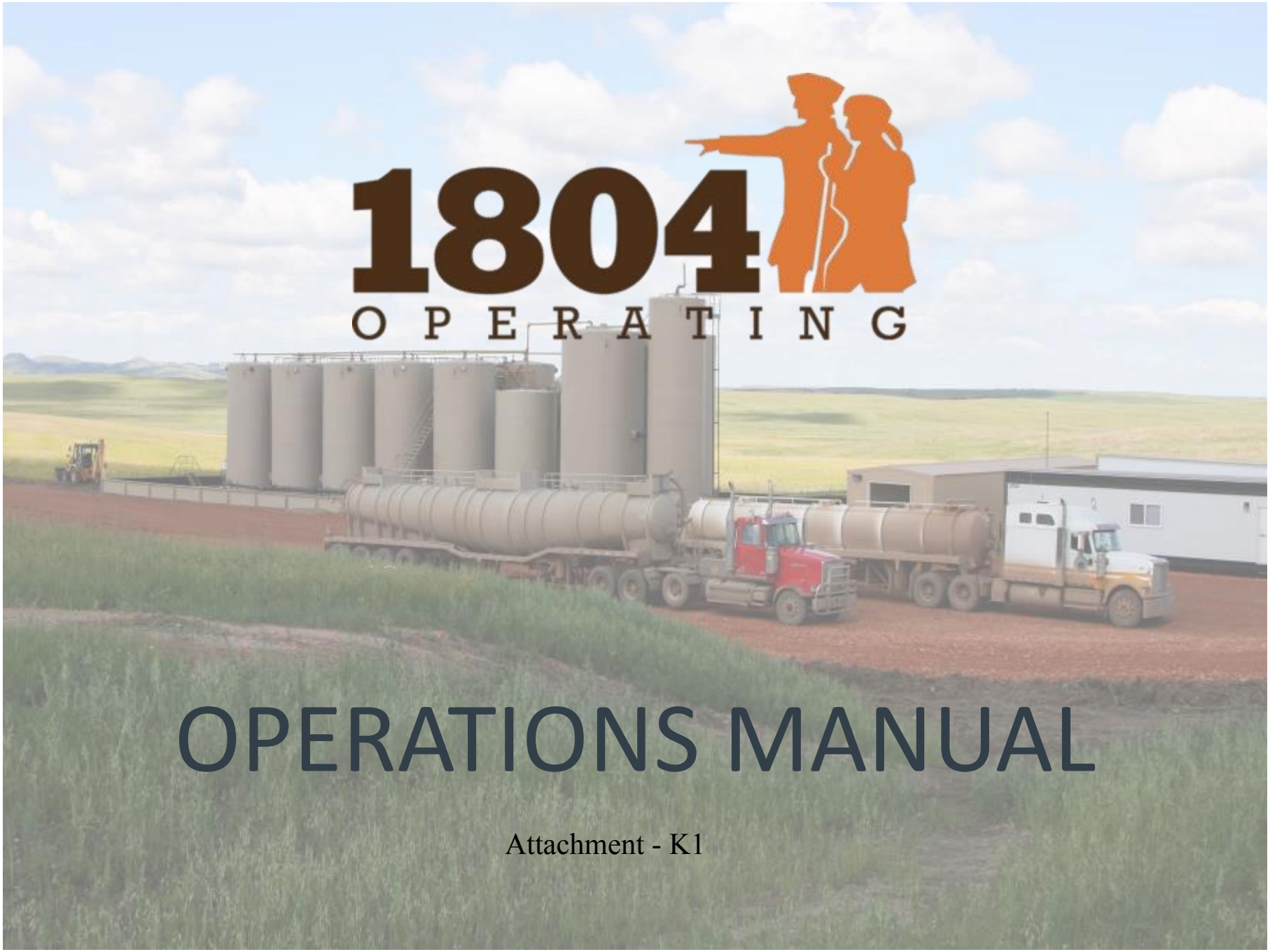
1804 Operating plans on testing the formation in accordance with the requirements of the final EPA permit. The testing program may include the following:

FORMATION TESTING PROGRAM	
TYPE OF TEST	DATE DUE
Injection Zone Water Sample	Required prior to receiving authorization to inject. A representative water sample (determined by stabilized specific conductivity from three consecutive swab runs) from the injection zone shall be analyzed for TDS, pH, specific gravity and specific conductivity. Analysis will determine whether an aquifer exemption is required.
Fluid Level	Record fluid level while swabbing well. This measurement will be utilized along with the specific gravity to perform the pore pressure test below.
Pore Pressure	May be required in the final permit prior to receiving authorization to inject.
Standard Annulus Pressure	Required prior to receiving authorization to inject and at least every five (5) years after the last successful test to demonstrate mechanical integrity.
Radioactive Tracer Survey	May be required prior to receiving authorization to inject if CBL does not show adequate cement. Also required every five (5) years after the last successful test.
Temperature Log	May be required prior to receiving authorization to inject if radioactive tracer survey is inconclusive. Also, required every five (5) years after the last sucessful test.
Step Rate Test	May be required to be completed within a limited 180-day authorization to inject. Step rate test must be as prescribed in final permit or pre-approved by EPA.
Pressure Fall-Off Test	May be required to be completed within a limited 180-day authorization to inject. Fall-off test must be as prescribed in final permit or pre-approved by EPA.

J. STIMULATION PROGRAM (Optional for Class II wells)

1804 Operating is not proposing a stimulation program at this point in time. If, after receiving final approval to inject, 1804 Operating determines that a stimulation program is needed, they will work diligently with authorities at the EPA Region 8 and the NDIC to draft an acceptable stimulation program and submit a request for approval. 1804 will not commence with a stimulation program until they have received written approval from all regulating agencies.

K. INJECTION PROCEDURES (See Attachment K1 – Operations Manual)



OPERATIONS MANUAL

Attachment - K1

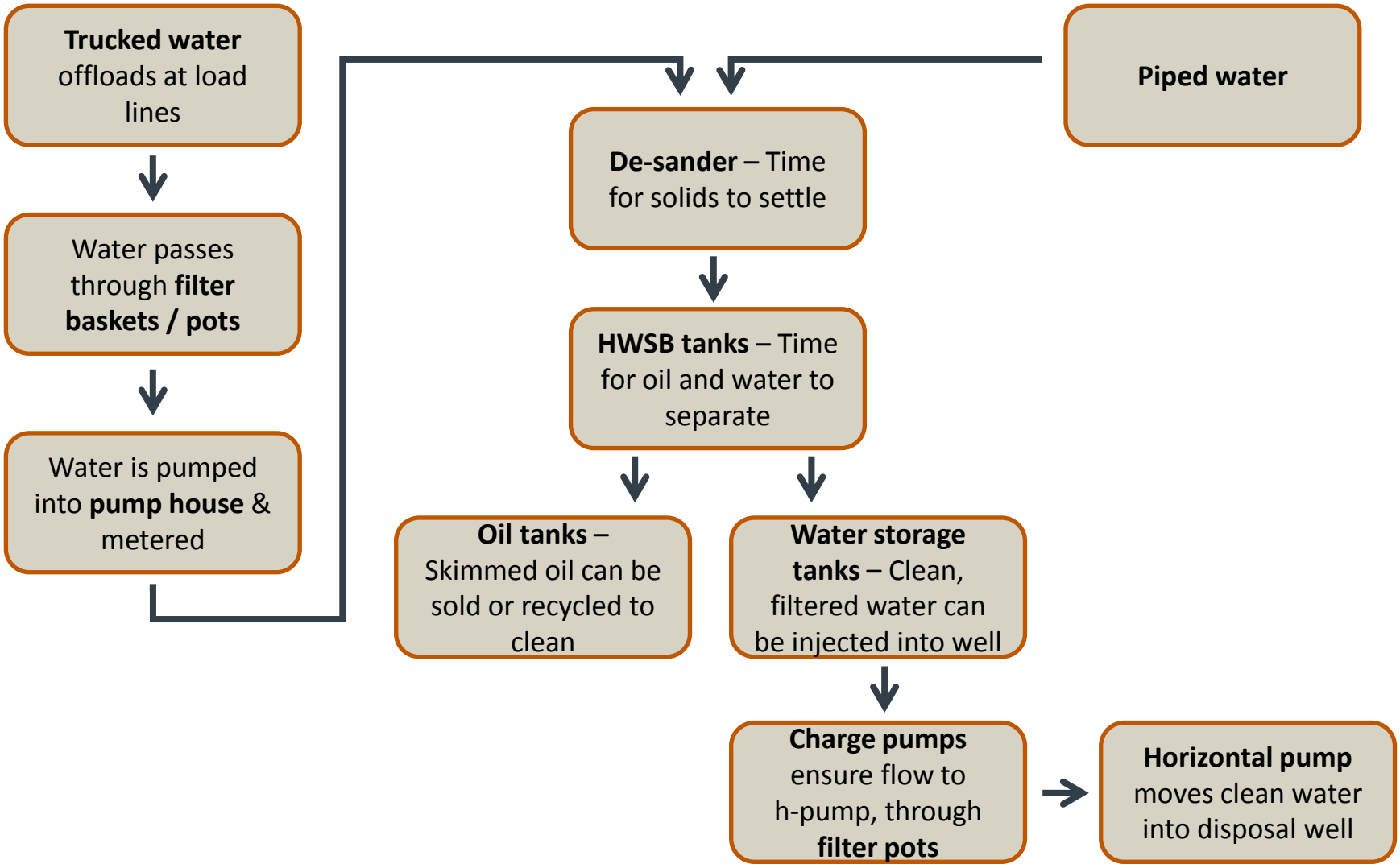
OPERATIONS MANUAL

TABLE OF CONTENTS

THE SWD PROCESS

OPERATIONS MANUAL
THE SWD PROCESS

PROCESS OVERVIEW



Trucked water enters the system through the load line stations. Truckers connect their load hose to our fitting, build there psi on there truck to 15 pounds, open our 4” valve and begin pumping.

Offload station

The load passes through the basket strainer to remove any large debris. If a truck is unable to push water through the basket strainer, debris has collected and must be removed. If this occurs twice with one truck, the load should be classified as mud for disposal. If the trucker refuses the designation, turn him/her away with the load. Be sure to inform the driver that he/she is always welcome to return with clean water.

Basket strainer

Each load line has a separate pump, meter and electronic valve in the pump house to control access and measure volumes.

Offload pumps and meters

Electronic meters

The trucked water collects into a central line and is pushed into the de-sander tank. Pipeline water also enters at the de-sander level. In the de-sander, fluids settle and solids are given time to drop to the bottom. Solids collect until they reach 5 –10 feet in height. Sand in the de-sander is removed periodically by specialized outside crews.

Water and oil, now separated from solids, flow through the de-sander into two HWSB tanks at mid-height. The HWSB tank has a special baffle system to facilitate the separation of oil and water.

The oil is collected off the top of the HWSB tank and drains into one of the two oil storage tanks. Oil can be sold from the oil tanks through the oil load line.

The water flows from the bottom of the HWSB tanks via the water legs into the water storage tanks.

From the water storage tanks, water is piped through a 10” poly line to the filter skid inside the pump house. A charge pump moves the water through the filter pots where any remaining fine particles are removed.

Filter Pots

Water continues into the horizontal pump, where it is pumped through a meter, cyclonic metering valve, and then through a flow line into the disposal well.

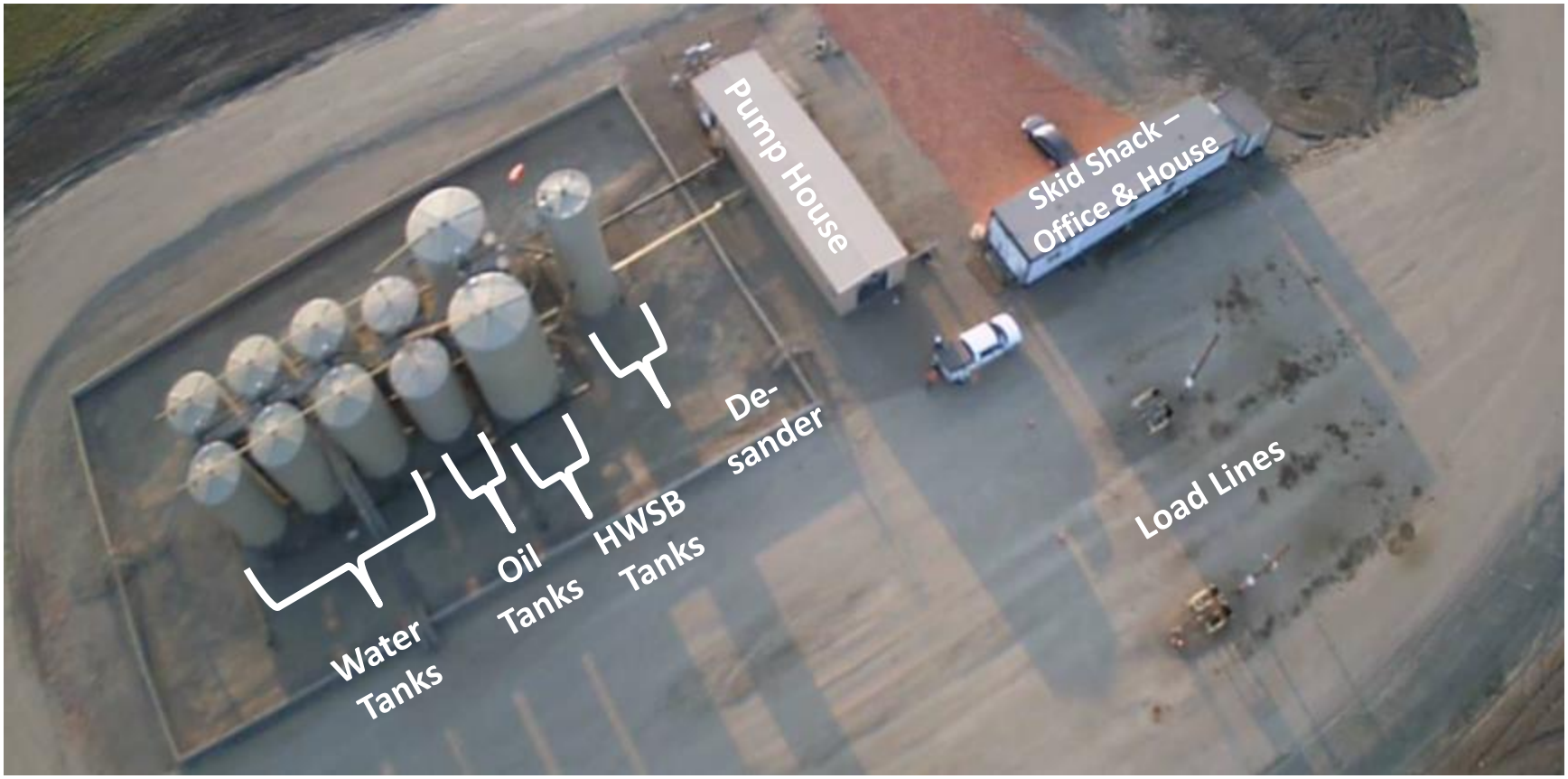
H-Pump

1804 OPERATING

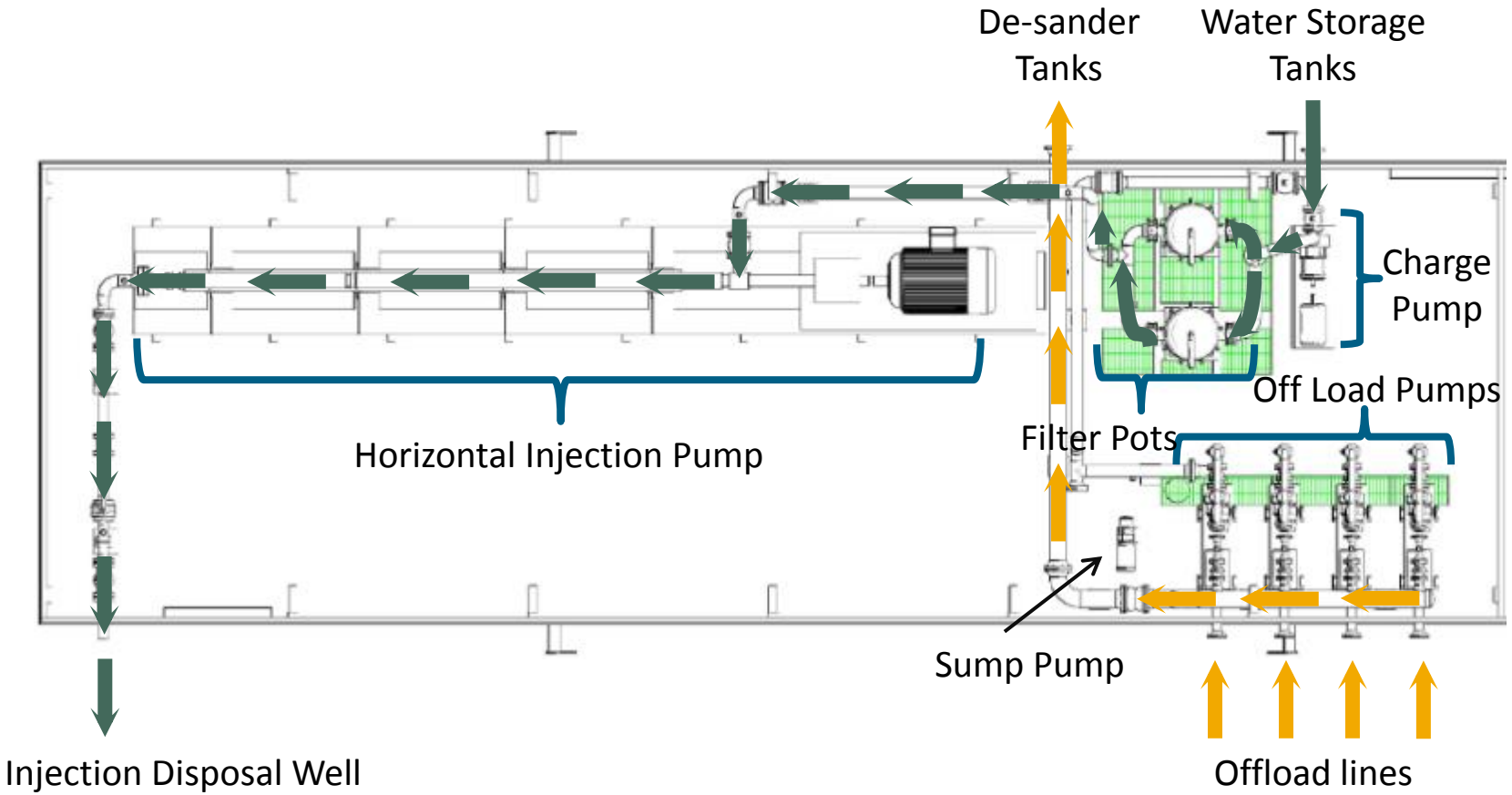
THE SWD FACILITIES

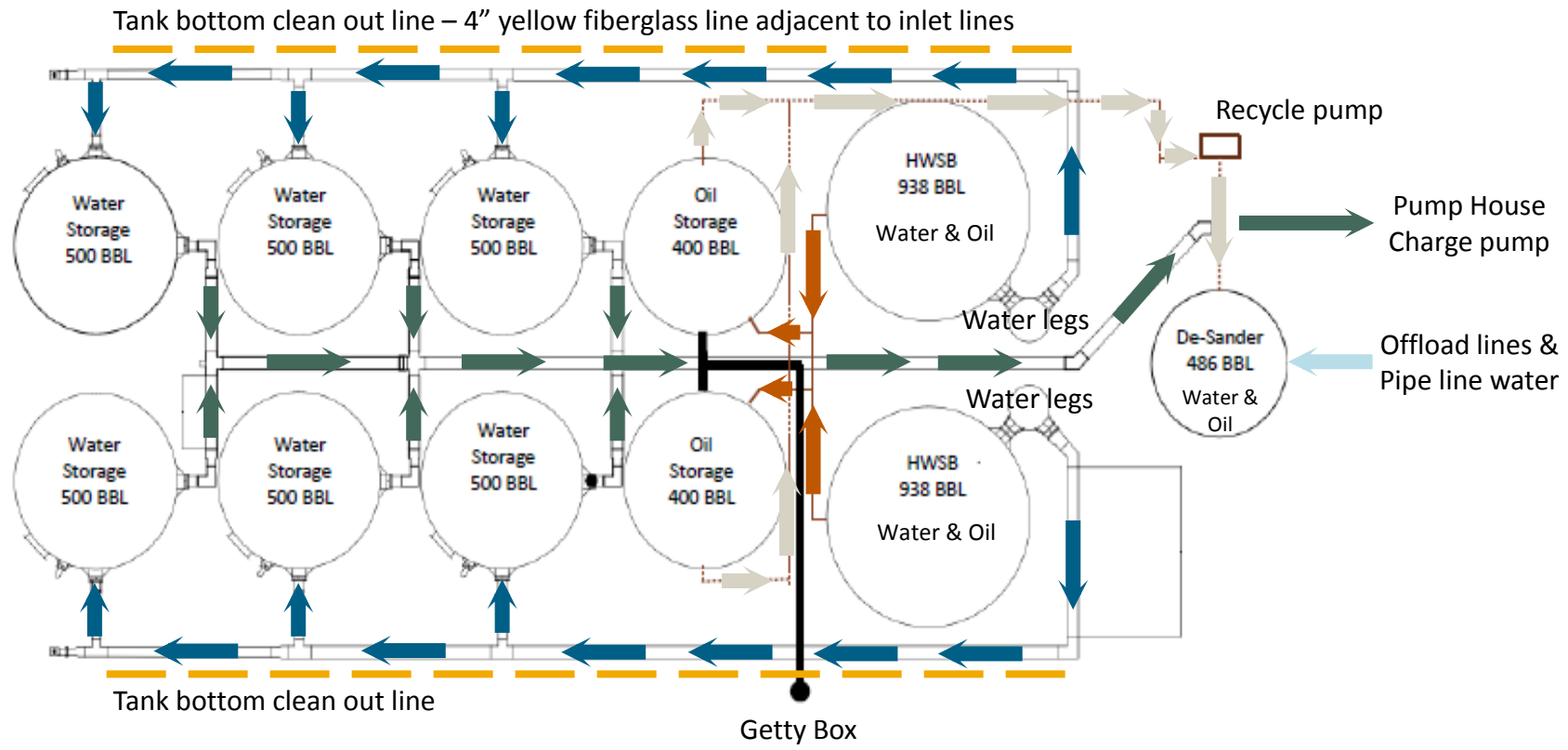
FACILITY LAYOUT

1804 Operating water disposal systems are designed to operate with minimum supervision. Most operations react automatically to the flow of water. The large diameter piping allows fluid to flow through the system without the need of additional pumps or transfer stations.



PUMP HOUSE


De-sander Tanks
Water Storage Tanks
Charge Pump
Off Load Pumps
Filter Pots
Horizontal Injection Pump
Sump Pump
Injection Disposal Well
Offload lines
Incoming trucked water
Filtered, clean water headed to disposal well



Incoming trucked or piped water

Filtered water headed to water tanks

Filtered water headed to disposal well

Oil skimmed off the top of the HWSB

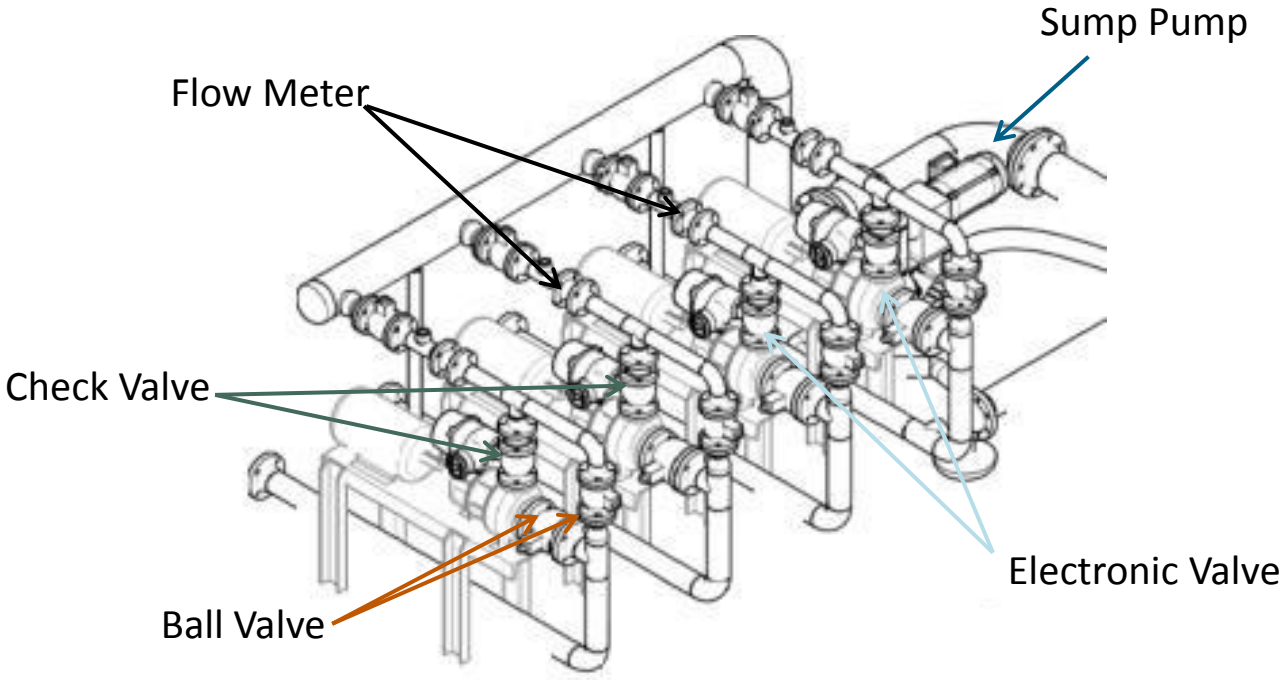
Oil to recycle pump and into de-sander

Oil to sale

LOAD PUMPS

Load pumps assist trucks during unloading and pump water into the de-sanding tank. Each load pump is controlled by the PLC located in the electrical room. Each load pump has a:

- **Flow Meter** – Measures the volume of each load. Controls the on and off for each load
- **Electronic Valve** – Limits access to the load system
- **Ball Valve** – Allows for manual isolation of fluid
- **Check Valve** – Allows fluid to flow in only one direction.

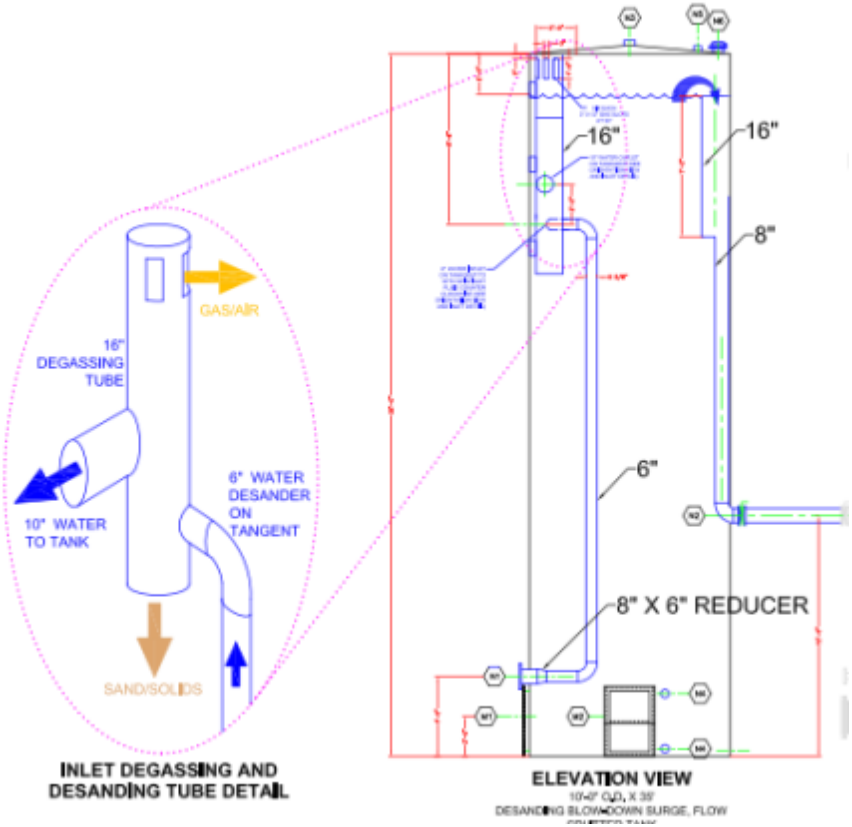


DE-SANDING TANK

The de-sander is designed to handle flow rates of 1500+ BPH and to provide separation of sand and sediment from the fluid.

The inlet port is 4’ from the ground. The inlet port is 8” with a valve at the tank and 8” piping from the load pump manifold in the pump building. Once fluid enters the tank, it enters a 12” column extending from near the bottom to the top of the tank. This allows all new fluid to enter the tank without stirring existing fluid and also allows any gas to exhaust immediately to the top of the tank.

There are 2 outlets 12’ from the ground, one for each HWSB tanks. Both outlets are 8” with a valve at the tank and 8” poly piping to the HWSB tank. The outlet ports have piping inside the de-sanding tank that rise to 33’ from the ground. Fluid enters these outlet risers by spilling into the top of each riser then draining to each HWSB tank. The de-sanding tank will fill to the risers at 33’ before any fluid leaves the tank. The fluid level of the de-sanding tank will remain at 33’ during operations.



Dimensions: 35 feet high, 10 feet wide
Capacity: 486 barrels, (1.158 bbl/inch), (13.896 bbl/ft)

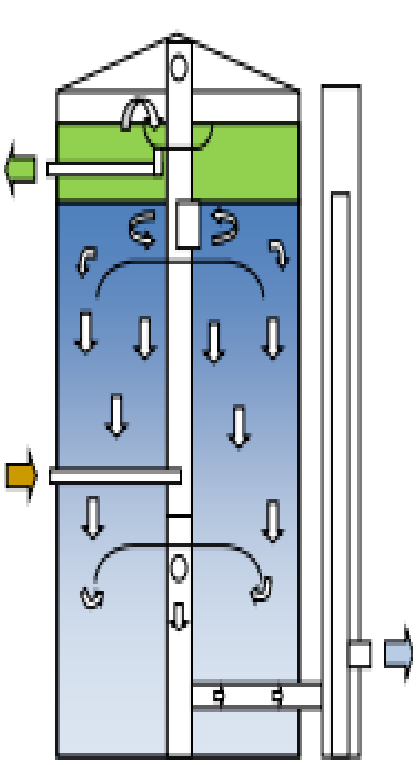
HWSB TANK

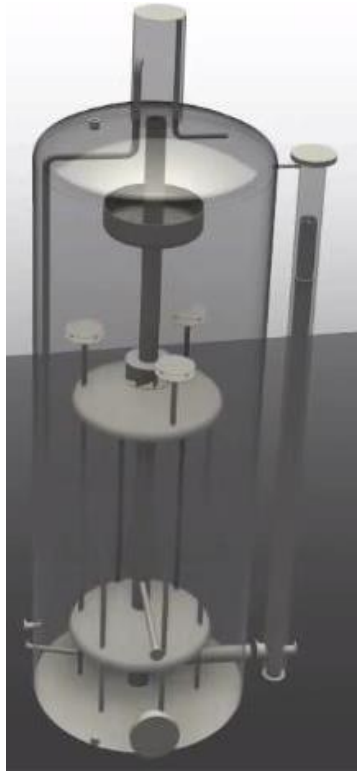
The HWSB tank is designed to allow for collection of oil particles suspended in the water by moving the oil to the top of the tank. Water enters the HWSB at the middle through a 12” column pipe, extending from the middle of the tank to the bottom of the oil section.

As the heavier water settles, oil particles rise in the column. Two circular spanner dishes located along this 12” column help collect and direct the oil back into the column and up to the oil section. At the top of the column, the oil leaves through a directional vent into the oil section. This is a continuous process to clean and separate the oil from the water.

The oil flows into a suspended sump at the top of the tank. Oil exits through a drain on the bottom of the sump into the oil storage tank.

Water exits the HWSB at the bottom and enters a water column attached to the tank. The water column is 24-30” wide and 30’ tall, attached at the bottom with a 12” valve and the top with a 2” valve. Inside this column is an adjustable height “were” tube. Water spills into the adjustable tube, drains out of the column, and is distributed into the water storage tanks.



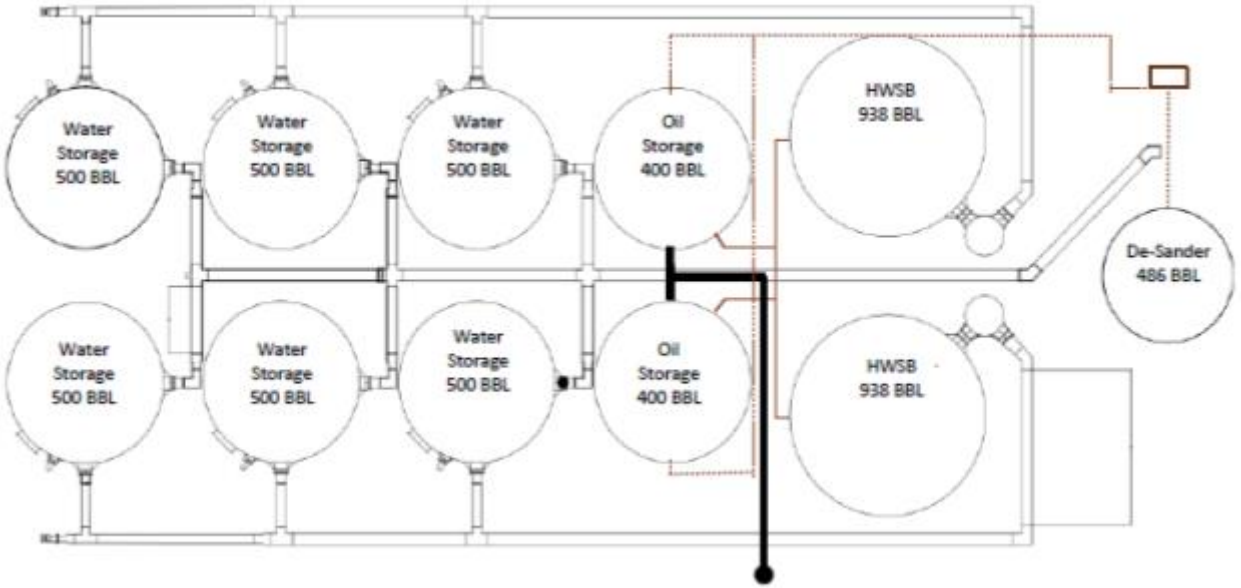


Dimensions: 30 feet high, 15.5 feet wide
Capacity: 938 barrels, (2.6056 bbl/inch), (31.266 bbl/ft)

Oil Entry – Oil enters through a 4" valve on the top. Oil flow can be directed to either oil storage tank with valves on top of the Tank Battery.

Selling / Removing Oil – Oil can be sold or removed from the tanks via a 4" steel load line located between the tanks, 1'3" from the bottom of the tank, extending near the tank berm where a transport can hook up a hose.

Recycle Oil – Recycling oil is done to clean the oil of water and solids. The recycle pump is located near the de-sanding tank, allowing oil to be pumped back through the system for cleaning. The recycle pump inlet is attached to each oil tank at the bottom 4" valve and then into a 2" steel pipe. This allows for flow from either tank.

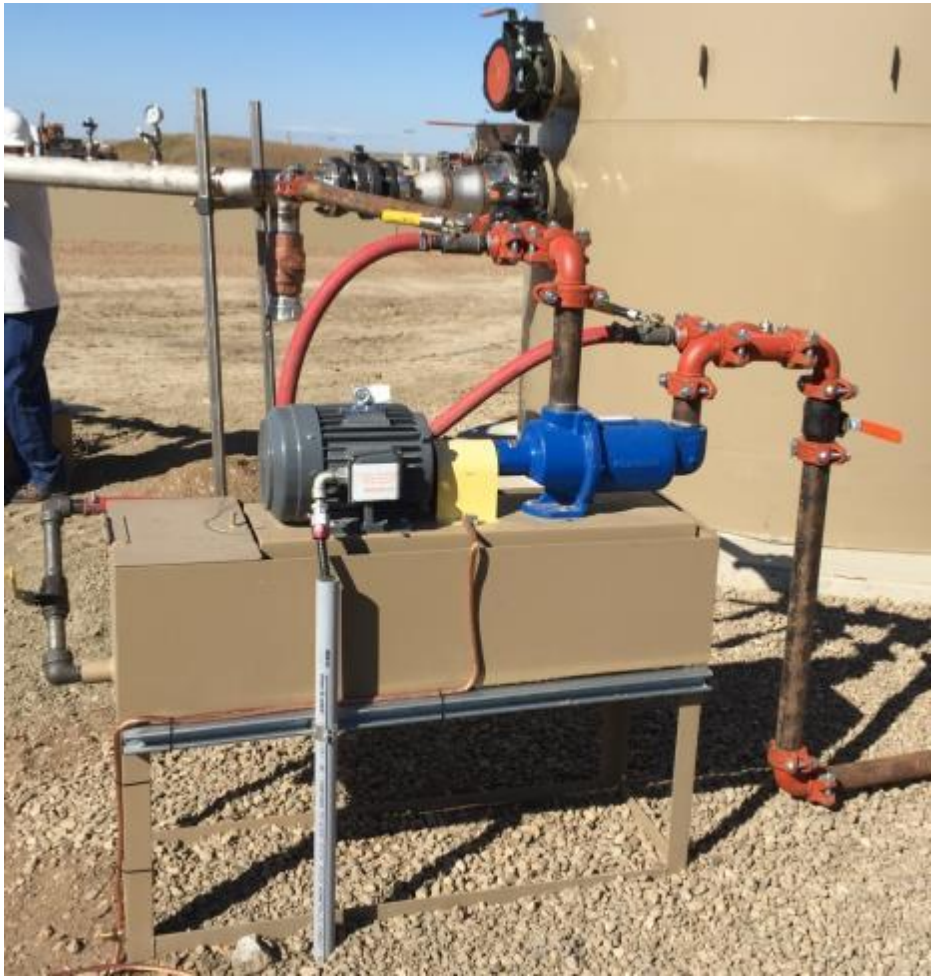


Dimensions: 20 feet high, 12 feet wide
Capacity: 400 barrels, (1.67 bbl/inch), (20 bbl/ft)

or

Dimensions: 25 feet high, 12 feet wide
Capacity: 500 barrels, (1.67 bbl/inch), (20 bbl/ft)

RECYCLE PUMP



The Recycle pump has bleeder valves with open-ended hoses on either side, allowing for air to be bled and the pump to be primed. Also buckets of clean fluid can be sucked up and disposed in the system. The 4” valve on the de-sanding tank should be left open at all times to prevent pressure build-up.

WATER STORAGE TANKS

The Water Storage Tanks store the clean, filtered water from the HWSB. Water in these tanks is ready to be pumped into the disposal well.

Water enters each tank by a 10” pipe line and through a 6” valve at the back of each tank.

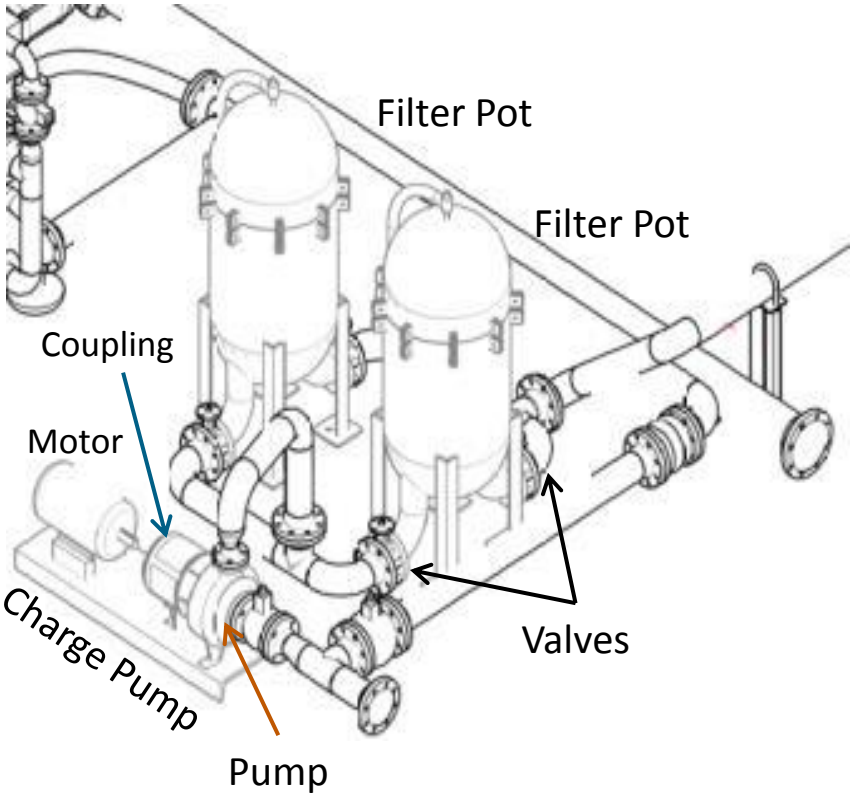
Water leaves each water storage tank through an 8” valve at the side of each tank which collects into a 10” piping line into the filter vessels in the pump house.

Dimensions: 25 feet high, 12 feet wide
Capacity: 500 barrels, (1.67 bbl/inch), (20 bbl/ft)

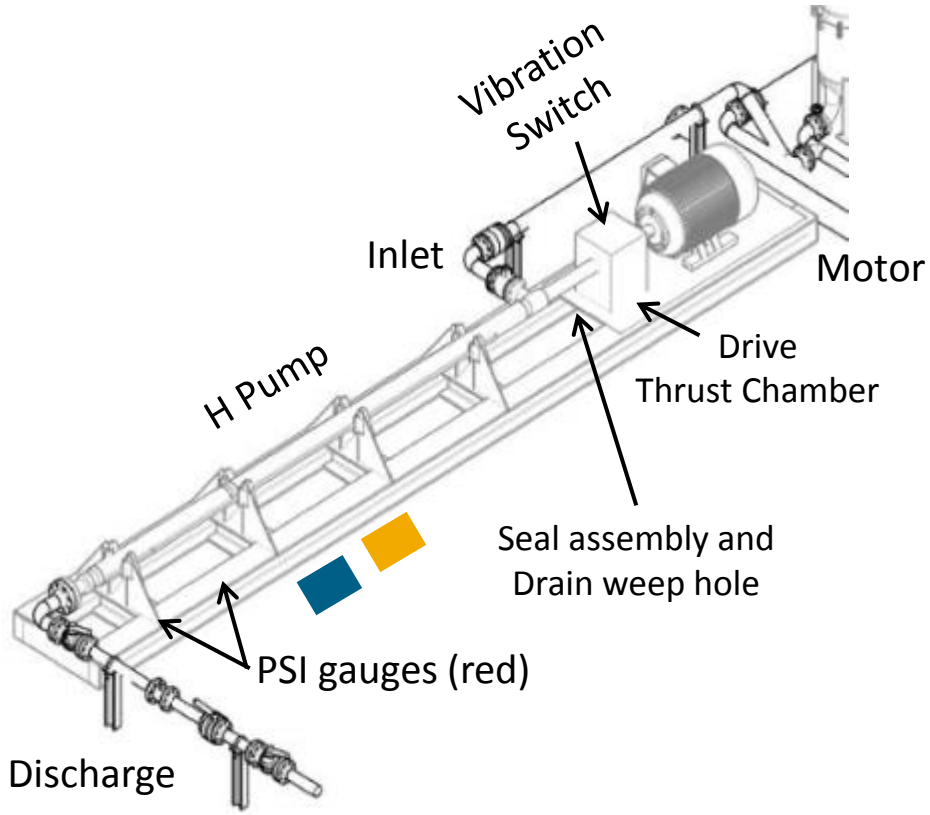
The charge pump discharges water through the filter vessel. Two filter pots allow filters to be changed without shutting down the system. One filter can be in operation while the other is serviced.

Charge Pump – The charge pump should provide at least 40 psi pressure to the main injection pump. The charge pump and filter pots are controlled by the PLC located in the electrical room.

Filter Pot – Each has three, four or 8 filter bags and must be changed when indicated by the differential pressure gauges. The differential pressure is posted on the PLC in the pump house and the operations screen. Differential pressure should be monitored closely. Gauges on each side of the filter vessels allow the system to monitor filter conditions and alert when filters need to be serviced.



The injection pump (horizontal pump) provides enough pressure to inject filtered, clean water into the disposal well.



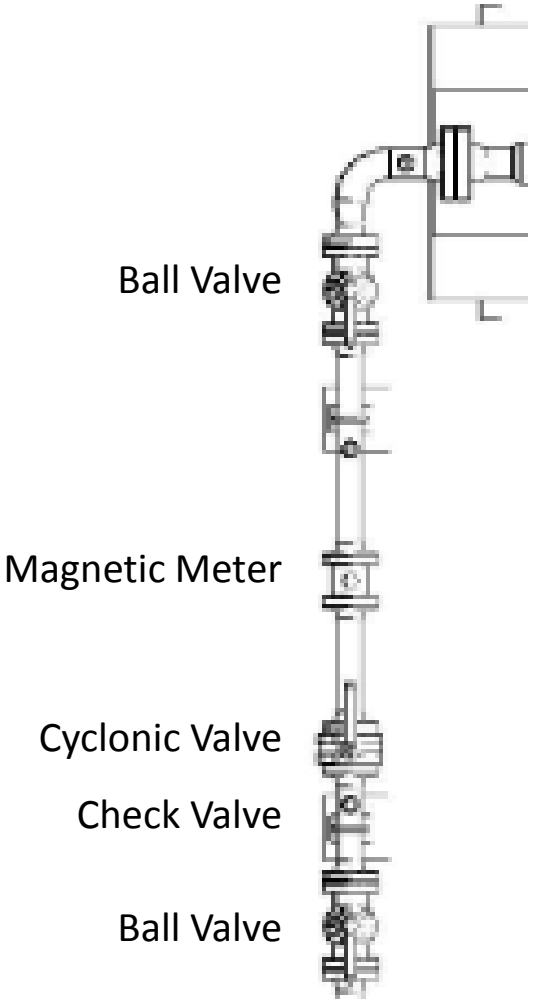
There are two safety psi gauges located near the outlet:

- The **RIGHT** monitors SUCTION PRESSURE and shuts down at 20 psi.
- The **LEFT** monitors DISCHARGE PRESSURE and shuts down at either 1200 or 1500 psi.

The vibration switch is located on the drive thrust chamber between the motor and pump.

The drive thrust chamber is filled with oil. Oil levels must be monitored daily through a small round window on the back side of the case.

IF ANY OF THE SAFETY DEVICES ARE TRIGGERED, CONTACT YOUR SUPERVISOR IMMEDIATELY.



Ball Valve – Allows for manual isolation of fluid

Magnetic Meter – Provides accurate measurement of disposed water

Cyclonic valve (choke valve) – Provides adequate pump back-pressure as needed. This choke is controlled manually by the pumper, not the PLC. Please refer to the pump data sheet for accurate back pressure.

ROLES AND RESPONSIBILITIES

DAILY JOB DUTIES

1. Safety first
2. Be hospitable –
    a) Greet every driver
    b) Check in any guests
3. Clean out basket strainers
4. Sample loads
5. Check for leaks around facility
6. Strap or gauge tanks daily
7. Monitor pump house and control room
8. Wipe down pods & pumps (1X per shift)
9. Clean pump house and control room
10. Clean, maintain office and living quarters daily
11. Wash seal assemblies and pumps with clean water to remove salt build-up. Any salt build-up around fittings must be inspected, taped and sealed

6 / 12 MONTH MANDATORY SKILLS

1. Gauge tanks manually
2. Check battery for leaks
3. Sample off loads
4. Sell oil

Pumpers should meet drivers at the load line. Follow these steps for a successful offload:

Drop slip / Water run ticket – The driver must deliver a clean, legible and accurate copy of a drop slip or water run ticket to the pumper before offload. Tickets must include:

a) Transport company name with a stamped number
b) Driver name
c) Oil production company name
d) Oil production well or facility product of origin
e) Date and time
f) Quality and quantity of water

Truck Hookup – Driver must:

a) Attach his/her grounding cable to the load stand
b) Use an inline (witch's hat) screen with his/her load hose
c) Attach load hose to the load stand, keeping all truck valves closed
d) Open our 4" load line at the load pot
e) Begin offload
   i. Gear pump trucks can open his/her valve and begin
   ii. Vac-trucks must build tank pressure to 15 psi first, then open their valve

Truck Disconnect – Once the truck has emptied it's load, our pump automatically shuts off. The driver must:

a) Turn off their pump
b) Close our 4" load line valve
c) Bleed off pressure and empty their hose and our load pot by reversing his/her pump
d) Close his/her valve
e) Disconnect his/her hose and grounding cable.

1. When a truck pulls up to offload, go out and greet the driver. Find out what kind of fluid he has, who and where it originated, whether he has a witch's hat screen in the hose, and a site glass.
2. Once the driver starts offloading, look at the site glass. Check if it is clear. Light will travel through the glass if it's clean – use a flashlight on the opposite side if necessary. Most likely, the site glass will be clear as the bottom of the load will have the most sediment from settling.
3. If it is dark in color, slowly open the bleeder valve in the getty box and release some of the fluid into a clear bottle. Shut off the off load and truck. Allow the fluid in the sample to settle for a few minutes.
    a. If the sample separates and there is clear water at the bottom of the bottle, continue to offload (as long as the basket strainer does not plug).
    b. If the basket strainer plugs twice during the offload, mark it as dirty water.
    c. If water does not separate, reject the load.
4. Before you unhook the hose, open the bleeder valve in the getty box to ensure the pressure has been relieved.

CHANGE FILTER SOCKS

1. Put on your gloves, eye safety and any other appropriate gear. Shut both the inlet and outlet valves to the filter pot.
2. Bleed off the pressure thru the top ½" valve till all psi is relieved. Leave bleeder valve open.
3. Open the bottom drain (usually a 1" valve into the sump). Expect about 10 gallons of fluid.
4. Loosen all clamp bolts around the lid of the filter housing towards the top of filter.
5. Slowly turn the screw handle located on top of the filter lid to raise the lid. If fluid escapes between lid and housing, lower the lid and wait to drain.
6. Once the lid is fully opened, swing the lid to the side and remove the filter socks. Squeeze the water from socks and hang them on drain barrels to dry.

(continued on next page)

7. Install new filters in the holes and push down. Be careful not to poke a hole in the filter.
8. Clean and inspect gasket. Apply a light coating of grease. Lubricate clamp bolts with any good oil before tightening.
9. Shut drain valve in the bottom. Open inlet valve slightly to fill pot. The open ½" bleeder valve on top will allow all the air to escape. Close bleeder valve when fluid begins flowing from it.
10. Open inlet valve completely. Then open the outlet valve completely.
11. Wash off filter pots with fresh water to remove any salt residue.
12. Once dry, place the filter socks in the hazardous waste container located in the pump house. New or used filter socks MUST be disposed at a federally approved landfill. They may not be placed in any public landfill or regular trash receptacle.

GAUGING TANKS

1. Familiarize yourself with the gauging tools. Make sure your tools are clean, readable and in working condition. Know the height of your tank to be gauged.
2. Carefully climb staircase. Remember to bring your gauging tools, gloves and safety glasses.
3. IMPORTANT - When you open the hatch cover, stand back at arm's length. Do not lean or stand over the cover. Pressure can build inside the tanks and may blow vapor and/or condensation when opened. The tanks are designed to hold 4 oz. of psi.
4. After the tank has vented, hold your gauge tape with a gloved hand and touch it to the metal hand rail to remove any static buildup, or if gauge tape is equipped with a ground strap, make sure it is attached to the metal railing.
5. Unwind the clean tape measure down inside the tank. Gently touch the bottom of the tank so the tape stays tight. Check the measurement for the tank height.
6. Reel the tape up and check the liquid level. Read the measurement and write it down.
7. Repeat the procedure to double-check your measurement. Write down the level.
8. If the fluid is unreadable on your tape, wipe the tape clean and apply baby powder or any kind of dusting powder. Sometimes if you catch the sunlight on the tape, you will see a color change.
9. Clean any drips or fluid spills on the tanks immediately. Be careful not to drop anything in the tank.
10. Please be very careful on the staircase and walkways as weather conditions can make them slick. Avoid gauging tanks during high winds. NEVER climb a tank or open a hatch if a lighting storm is near.

Recycling and selling oil is a very delicate operation. The oil must be clean in order to sell. Recycling daily keeps the oil circulating through the tanks, constantly cleaning itself, and maintains a constant level in the HWSB.

1. Recycle the oil daily for 30 minutes to 1 hour per day. The recycle pump moves approximately 40 bbls/hr. The HWSB is only rated to skim 100 to 200 bbls in a 24-hour period. By recirculating every day, you maintain a constant oil level in the HWSB tanks.
2. When the oil level reaches about 13 feet, you should take an oil sample with the thief. Once the thief is at the desired height, jerk the rope to shut the flapper and take the sample.
3. Sampling the tank:
    a. Take the 1st sample of oil with the thief from the top of the tank. Keep 3-4 oz in a sample bottle.
    b. Take the gravity and temperature from the middle of the tank. Keep the hydrometer in the middle sample for at least 5 minutes.
    c. Pull the 3rd sample from the bottom of the tank, but no lower than 10” from the bottom. Keep 3-4 oz in a sample bottle. You may need to let the oil settle and pull any free water off the bottom with the recycle pump.

(continued on next page)

4. Testing the samples:
   a. Using the hot pot, heat the sample in a test tube to approximately 180 degrees, until little bubbles form. Use a thermometer to measure the temperature.
   b. Put the sample in the centrifuge and hand-crank for approximately 2 to 3 minutes.
   c. Read the gradients on the test tube. Each line is 1/10. The whole numbers on the tube are 1%. Count the number of lines on each tube and divide by 2. This is your BS&W. The purchaser will take 5/10 as long as no water is visible in the bottom. If there is water visible he will take 3/10:
      i. If the sample measures below 5/10, call the purchaser posted in your field office.
      ii. If the sample is above 5/10, start the recycling process again.

(continued on next page)

5. Note that it may take 24 hours for the purchasing truck to arrive to take the oil. Once purchaser arrives:
   a. Greet and stay with the gauger while he is on the tank and while he is sampling and observe the results.
   b. At his truck, the gauger will mix 100 ml oil with 100 ml solvent, heat to 165 to 180 degrees, and put in a centrifuge for 5 minutes. He will then take tubes and read.
   c. Watch the entire process. It is important to note his sample level and temperature of the tank. This will help you through the cleaning and recycling process in the future.
6. After the load is sold, recycle the oil left in the tank below 1". Move it into the oil tank being filled for the next sale. If the oil sits in the dead tank, the solids and heavies will settle onto the tank bottom. This settlement will inhibit the cleaning and recycling process and will result in a future failed tank sale.
7. Good Luck on Your Recirculation and Oil Sale. If you have any questions, please contact your supervisor.

Pipeline flow and pressures are monitored daily, both at the facility as well as at the corporate office.

Physical Inspections – Visual inspections of existing pipelines will be done as follows:

1. Pressure test @ 300 psi after 1 month, 3 months, and annually thereafter
2. Walking inspection after 1 month and annually thereafter
3. Semi-annual ATV inspection
4. Bi-weekly fly-overs by contracted plane

SCADA - Must be monitored consistently for any discrepancies. Automatically balances flow rates every five minutes. If SCADA indicates the system is out of balance, notify supervisors immediately.

Balancing report -- A manual balancing report will be generated within 1 month of each pipeline coming online and weekly thereafter.

Daily: Each facility is staffed and monitored 24/7 by an on-site pumper. In the event of an issue, the pumper will notify the maintenance team immediately.

Weekly inspections of:

- Offload lanes - getty boxes, bleeder valves, rock baskets and main valves
- Offload pumps - seals, love joy coupling, oil, flowmeters, pressure gauges and all valves
- Charge pump - seal, love joy coupling, oil, valves and pressure gauges
- H-pumps - oil, breather filter, murphy gauges, flowmeters and valves
- Recycle pump - seal, love joy coupling and valves
- Sump pumps - seals and valves
- Filter pods - gaskets, valves, automatic actuator and gauges
- All above ground flow lines from the pump house to the well head including gauges and valves
- Pipeline and pipeline manifolds, where applicable, including gauges, flowmeters and valves.
- Well head - casing pressure, gauges and valves
- Tank battery - valves, containment, tank integrity, piping, catwalks. Check for leaking connections or hatches.
- Environmental concerns - weed control, trash and any other

(continued on next page)

Quarterly, or as needed:

- Replace air filters in the control room, pumper shacks and offices at all facilities.
- Suck tank bottoms and recycle through de-sander/HWSB tanks.
- Grease electric motors on H-pumps, charge pumps and all offload pumps at all facilities

Bi-annual, or as needed:

- Change thrust chamber oil and the breather filter on the H-pumps at all facilities.
- Change the oil in the offload pumps and charge pumps at all facilities.

Seasonal: Winterize sewer and water lines. Winterize any applicable equipment at all facilities.

Any spills are cleaned up in accordance with our Spill Prevention, and Countermeasure (SPCC) Plan. The SPCC Plan has been prepared and implemented in accordance with the Code of Federal Regulations 40 CFR Part 112.

L. CONSTRUCTION PROCEDURES (Also note Construction Procedure Details – Attachment L1)

	Construction Procedure Parameters
Purpose of Drilling Program	Salt Water Disposal Well in McGregory Buttes Field
Ground Elevation	2,288.8’
Graded Elevation	2,282’ (estimated)
Mud Program	
Surface	Fresh Water
Production	Salt Water Gel System
Casing Program	
Surface	9-5/8”, 36 lb/ft set at least 50’ into the Pierre Shale to ~2,250’
Production	7”, 26 lb/ft set to ~ 5,850’
Cementing Program	
Surface	Cemented to surface with an estimated 830 sacks ****
Production	Cemented to surface with an estimated 635 sacks ****
Logging Program	
Cement Bond Log	Run from TD to at least 100’ above TOC
Gamma Ray	Run from TD to surface
Perforating Program	Anticipated to be 5,315’ to 5,590’ confirmed with GR ****

Anticipated Formation Tops (Estimated) ****

Pierre	1,965’
Greenhorn	4,405’
Mowry	4,840’
Skull Creek Formation	4,955’
Inyan Kara (Gross Inj. Zone)	5,195’
Swift	5,645’
TD	5,850’

Construction Summary

1804 Operating, LLC plans to drill an Inyan Kara Formation (Dakota Group) salt water disposal well to 5,850’ with rotary tools. This will be a new well in the McGregory Buttes Field. A 13-1/2” surface hole will be drilled with fresh water mud to a depth of at least 50’ below the base of the Fox Hills Formation (lowest most freshwater zone). 9-5/8”, 36 lb/ft surface casing will be set and cemented to surface with approximately 830 sacks of cement. A 8-3/4” bit will be used to drill out of the surface casing with a salt water gel system to an anticipated TD of 5,850’. 7”, 26 lb/ft production casing will be set and cemented to surface with approximately 635 sacks. **A closed loop system will be utilized during the drilling of this well. Drilling fluids will be recirculated through a series of steel open-top storage tanks instead of an earthen pit. Cuttings will be captured and dried through the use of a shale shaker, mud cleaner, and decanter centrifuge and deposited in a 3-sided steel tank. Amendments may be added to help solidify the cuttings if necessary. All cuttings will be hauled off the site to the Indian Hills Waste Disposal located at 14070 43rd St NW, Alexander ND 58831.**

**** Depth to base of lowest most freshwater zone was calculated from the NDIC’s call of the top of the Pierre Formation in the offsetting FORT BERTHOLD 148-94-22A-27-2H well. (Well File No. 23223)−drilling oversight will be required to ensure that surface casing is set at least 50' into the Pierre Formation. Cement volumes are estimates for ideal conditions−actual cement volumes will be adjusted accordingly by operator/cement contractor to compensate for deviations in drilling plan, wellbore, cement type, formation influences, etc. and achieve the required isolation under existing regulations for both surface and production strings. Injection Interval is also estimated−actual Injection Interval will be determined from logs performed on the well during completion. **All depths referenced from the proposed graded elevation of 2282’**.

DRILLING PROGRAM

1804 Operating

Red SWD #1

Sec. 15 T148N R94W Dunn County, ND

1/19/2016

Engineer: Ren Gardner

Contact Information

FIELD CONTACTS

Rig | Company Man | Rig:

RESERVOIR & GEOLOGY

Geologist | Office:

Mud Loggers

EMERGENCY PHONE NUMBERS: **"911" IS AVAILABLE IN THE AREA**

Dunn County Sheriff's Office | Ambulance

COUNTY: | State North Dakota

ELEVATIONS

PRIMARY OBJECTIVE Inyan Kara

DRILLING CONTRACTOR: Capstar

ESTIMATED TOPS from Ground Level

FORMATION DEPTH CALCULATOR			
RED SWD 1			
Formation Name	Offset Formation Depths (wf# 23223) FORT BERTHOLD 148-94-22A-27-2H	Estimated Formation Depths from Finished Pad	Thickness
Ref Elev.	2285	2282	
Pierre	1970	1965	
Greenhorn	4407	4405	
Mowry	4843	4840	115
Skull Creek	4956	4955	240
Inyan Kara	5200	5195	450
Top Perf	5320	5315	275
Btm Perf	5594	5590	
Swift	5648	5645	435
Rierdon	6082	6080	

Set Conductor / Rig Move

□nsure the ne□ location is □uilt □ith □ro□er □ad si□e□

MIRU Capstar 314

13 1/2 Hole: Surface 2250' MD/TVD

P□□ the □ollo□in□□□A to s□ud the □ell□
13-½" re-tipped or rental bit
Bit sub
3 x 6-1/2" DC's
X/O sub
DP to TD

Drill □ertical hole to casin□□oint□- 2250 Casing OD 9 - 5/8"
The mud program for this interval will utilize fresh water system
Circulate and clean the hole with 25 to 50 bbl gel sweeps
Mud up prior to TD with min Vis of 34.

Mud Properties:

Interval	MW ppg	Visc	Fluid loss	Mud Type
0-2250'	8.6-9.0	28-35	No Control	FW

Chec□all □+□□□casin□e□ui□ment □or correct si□es and connections as the□arri□e on location and dri□t casin□□er s□eci□ications □□□□□□□□nsure □ro□er □loat e□ui□ment is on location and correct
At □D□□um□a □□□□l hi-□is s□ee□around □hile □or□in□and rotatin□drill strin□at ma□r□m□
Dro□totco sur□e□tool and P□□□□A □i□er tri□□ill □e made i□ti□ht s□ots are noticed on tri□out□

Rig up and run 9-5/8" casing as specified in the surface casing design (see below).

Run a guide shoe, one casing joint, float collar, and casing to surface. Thread lock guide shoe, float collar and the bottom 2 joints of casing.

Install a total of 5 bow spring centralizers. The first one on a stop collar 5 feet above the guide shoe, then one per collar on the next 4 collars.

Keep casing full while TIH

Casing Specifications

Interval	Size	Weight	Grade	Thread	Opti Torq	ID	Drift
0-2250	9 - 5/8"	36#	J-55	LTC	4530 ftlb	8.921 in	8.765 in

Casing Design

Collapse	Burst	Tensile Str
2020 psi	3520 psi	453K lb

Rig up cementing equipment and test lines to 3,000 psi. Circulate at least 2 casing volumes or 1 bottom up whichever greater at 8 bpm minimum. Keep circulating until shakers are clean and the well is stabilized.

Dry cement and mix water (out of day tank on location) to be used must be checked in the lab for properties before mixing. Keep samples of each.

Don't over-displace by more than ½ of the volume or 1.6 bbls between the guide shoe and the float collar.

Note amount of cement returns and displacement pressure on morning report. Also mention any other losses during casing circulation, displacement, etc.

Be prepared to do a top job if the cement in the annulus falls below ground level. Do this off the critical path while moving forward with other operations.

Pump 20 bbls of freshwater spacer ahead of cement. Mix and pump cement as follows:

Sanjel Cement	Lead Slurry	Tail Slurry
Interval	0'-2000'	2000'-2250'
Type	Control Set 'C' + 0.25 lb/sk LCL-7	0:1:0 'G' + 1% $CaCl_2$ + 0.25 lb/sk LCL-7
Sacks	600	230
Weight	12.0 lb/gal	15.8 lb/gal
Water	14.49 gal/sk	5.00 gal/sk
Yield	2.45 ft3/sk	1.15 ft3/sk
Compressive strengths	580 psi in 24 hrs	2000 psi in 24 hrs
	700 psi in 48 hrs	3300 psi in 48 hrs
Thinkening Time	3 hr	1 hr 30 minutes
Est. pump Time	70 minutes for job	
% Excess	50%	100%

Chase cement with top plug and displace at 8 bpm. Slow pumps down to 3 bpm with 10 barrels short of bumping and do not over displace by more than 1-1/2 bbls (1/2 shoe track). If there is seepage, slow the displacement to 1-1/2 bpm when 10 barrels short of displacement. Bump plug with 500 psi above final displacement pressure. Do not exceed 1500 psi. If float leaks, pressure back up to final displacement pressure and hold that pressure for 2 hrs.

□nstall casin□head and test to 1□00 P□□

□i□□le u□the 11", 3000 □si BOP to □+5/8" casin□head.

□un and land test □lu□. □est ram □□P□s and BOPE to 250 □si □or the lo□-□ressure test and □□□00 □si □or hi□h □ressure

□nsure that the test □lu□is the □ro□er si□e and that the □lu□is landed in the □ro□er □osition

□he □i□e rams □ill □e o□erationall□chec□ed each □4 hours□ □lind rams □ill □e □unction tested each time □i□e is □ulled out o□the hole, no□e□er, □a □re□ious tri□has □een made □ithin last 24 hours a second test is not necessar□. □he annular □re□enter shall □e □unction tested □ee□1□. A □it le□el drill shall □e conducted □ee□1□ □or each drillin□ cre□ □All BOP □unction tests and □it drills shall □e □ro□erl□noted in the □ADC tour sheets as the□are □er□ormed

□tuds on all □ellhead □an□es □ill □e chec□ed □or ti□htness each □ee□

A full open safety valve (FOSV) must be available for all pipe connections as well as an IBOP to □e □laced a□o□e FOSV so □e ha□e the a□ilit□to stri□in the hole□ □he F□SV □ill □e set in the o□en □osition and readil□a□aila□le on the ri□ □loor at all times

□ hile □or□in□on □□P□s□clean mud tan□s and □re□are □or salt □ater mud s□stem. Try to accom□lish this o□□the critical □ath.

□□the □lu□ □um□ed durin□cementin□and a□ter a minimum o□□hrs WOC time close □lind rams and test casin□□□ellhead connection to 1500 □si □□0% o□□+5 □" □urst = 2,464 □si) □or □0 minutes □ith the □ell head tester. If □ressure dro□s more than 150 □si durin□test the casin□must □e re□aired □ith a□□ro□al □rom director□□□□lu□did not □um□durin□cementin□, □□□ □ith □□A to □loat collar and test a□ainst □i□e rams□

Pull test □lu□and install □ear □ushin□□Loc□ □ear □ushin□in □lace as □er casin□head com□an□runnin□ □rocedure

Intermediate Hole:

Hole Size	Starting MD/TVD	Ending MD/TVD
8 3/4	2250'	5850'

□his inter□al should □e drilled □ith one □it and one mud motor□

P/U the following BHA to drill out casing:
8-3/4" PDC bit w/ 6 x 14's
1.5 deg motor
4.5" DP

Hole Size	Casing Size
8 3/4	7"

□ecord slo□ □um□rates in tour □oo□s dail□

Mechanical mud monitorin□e□ui□ment □ith alarms shall □e in □lace to detect □olume chan□es indicatin□loss or □ain o□ circulatin□ □luid □olume

□□□ and drill □loat e□ui□ment and cement □hile dis□lacin□hole □ith □□ □□□oil □ased mud□

WOC shall be adequate to achieve a minimum of 500 psi compressive strength at the shoe prior to drilling out

Bit	Jets	WOB	RPM Surf	GPM	SPP
Smith 813	6x14	25K	45-60	400	2000

Drill the □ertical hole □ith salt □ater mud □ith the □ollo□in□□arameters

□ur□e□e□er□ □□□□rom the casin□shoe □ith the directional tool

□he mud □ro□ram □or this inter□al □ill use salt □ater □ased mud□A mud test shall □e □er□ormed a minimum o□once e□er□ □□hours□□ ei□ht u□as the ta□le □elo□ dictates or as necessar□□ith the □ollo□in□□ro□erties □ro□ided □□mud com□an□ □ield re□resentati□e□

Interval	MW	Visc	Fluid Loss	Mud Type	PV	YP
2250'-5850'	9.1-9.6	27-40	10-20 cc's	Salt Water	10-15	2-10

P□□□ to lo□□ □□□ □□ lo□□in□com□an□and ma□e tri□le com□o run□□nsure mud has □ei□ht o□□□□□al and □is o□□□ □e□ore lo□□in□□□no □□ Lo□s are □lanned□□re□hole □or casin□and C□L□C□L lo□□ill □e run a□ter casin□is set□

At □D□circulate □ottoms u□and circulate until sha□ers are clean□

Check all casing equipment for correct sizes and connections as they arrive on location. Ensure the casing has bee cleaned, threads inspected, and drift 7" casing to specifications (see table below)

At casin□ □oint circulate hole clean to ensure casin□ □ill □o to □ottom□LD DP□collars and □□A□
Pull wear bushing

Casing Specifications

Interval	Size	Weight	Grade	Opt. Torq	ID	Drift
Surface - 5850'	7"	26 ppf	J-55	0	6.276	6.151

Casing Design

Weight&Grade	Collapse	Burst	Tensile
26# J-55	4,320	4980	415,000 lbs

Run float shoe, 1 casing joints, float collar, then 26#/ft casing to surface. Thread lock the float shoe, 1 joint between shoe and float collar, float collar and one joint above collar.

Plug Back Depth (PBD) should be approximately 5,795'□□□□□□casin□- □□□shoe □oint - □□ □loat Collar□□loat □hoe - □□o□□□tm□

□un □o□ s□rin□centrali□ers as □ollo□s□□ne on the shoe □oint and the second □oint and one e□er□ □rd □oint to □□□□□□

□ee□casin□ □ull □hile □□□

□i□u□cementin□unit and test lines to □□□□□ □si□Circulate at least 1-1□□casin□ □olumes or 1 □ottom u□ □hiche□er □reater at **6 bpm.** □ee□circulatin□until sha□ers are clean and the □ell is sta□ili□ed□A□ain□mo□e the □i□e until □e start to cement or the hole □ets stic□□

Cement □olumes are calculated □ased on □□casin□in □+□□□o□en hole □ith □□□ e□cess cement□Actual □olumes □ill □e calculated usin□cali□er □ith cement to□to sur□ace casin□ shoe□

d □ote amount o□cement returns and dis□lacement □ressure on mornin□re□ort□Also mention an□other losses durin□casin□circulation□dis□lacement□etc

Pum□ □ollo□in□□re□lush □luid□1□□1s o□□resh □ater□□□ □□ls Mud□lush □□AC□ -□□1□□□ls □rine □ater □□AC□ -□□ mi□and □um□cement as □ollo□s

Longstring Cement

Sanjel Cement	**Lead Slurry**	**Tail Slurry**
Interval	4850-0'	5850'-4850'
Type	WBL II + 0.5% CFL-3 +0.25% CRF-2 + 0.4% CF-4P+0.05% LTR + 0.25 lb/sk LCL-7	0:1:0 'G' + 0.25% CFR-2 + 0.5% CFL-3 + 10% NaCl(bwow) + 0.4% CDF-4P + 0.2% SPC-2 + 1.0 lb/sk LCL-11 + 0.25 lbs/sk LCL 7
Sacks	455	180
Weight	11.5 ppg	15.8 ppg
Water	12.85 gal/sk	5.25 gal/sk
Yield	2.17 ft3/sk	1.20 ft3/sk
Compressive Str	630/24 hr	2290/ 24 hr
	770/ 48 hr	3542/ 48 hr
Est Pump Time	45 minutes pumping time	
Est Thickening Time	4:20	4:00
% Excess	Above volumes based on 35% excess.	Above volumes based on 35% excess.

□□loats lea□□□ressure □ac□u□to □inal dis□lacement □ressure and hold that □ressure □or □hrs

Make sure you bump the plug with 500 psi over as we only have 200' from btm of Dakota zone to TD we need as much PBTD room as possible.

□ □C□□ressure test casin□to 1□□□ □si □or □□minutes□□□□ressure dro□s 1□□ □si or more the casin□ □ill ha□e to □e re□aired □ith a□□ro□al □rom director□

Release rig, prepare for workover rig.

1804 Operating

Surface Casing Cement
Red SWD #1
Dunn County, North Dakota

Surface Cement Version 1 (01.20.16)

Prepared for:	Ren Gardner	Prepared by:	Kally Schmitt
Phone:		Phone:	406.245.0255
Mobile:		Mobile:	406.647.6212
Email:	Ren@WelterConsulting.com	Email:	Kschmitt01@sanjel.com

9 ⅝" Surface Casing

Depth:	2,250 ft
Hole Size:	13 ½ inch
Casing Size:	9 ⅝ inch, 36 lb/ft
Excess:	100% *(Tail); 50% (Lead)*

Cement Blends

Lead Cement:	Control Set 'C' + 0.25 lb/sk LCL-7 2000 ft to Surface = 2000 ft lead cement
Tail Cement:	0:1:0 'G + 1% $CaCl_2$ + 0.25 lb/sk LCL-7 2000 ft to 2250 ft = 250 ft tail cement

Cement Data — BHST: 100°F — BHCT: 80°

		Lead	Tail
Water Requirement	:gal/sk	14.49	5.00
Yield	:ft^3/sk	2.45	1.15
Density	:lbs/gal	12.0	15.8
Thickening Time	:hrs:min	3:00	2:05
Compressive Strength	:psi/hrs	550/12 700/24 1100/48	1900/12 2900/24

Calculations

Lead	2000 ft × 0.4887 ft^3/ft	= 977.40 ft^3
	977.40 ft^3 × 50% excess	= 1466.10ft^3
	1466.10 ft^3 ÷ 2.45 ft^3/sk	= **600 sks**
Tail	250 ft × 0.4887 ft^3/ft	= 122.18 ft^3
	122.18 ft^3 × 100% excess	= 244.35 ft^3
	40 ft × 0.4341 ft^3/ft Shoe Joint Volume	= 17.36 ft^3
	261.71 ft^3 ÷1.15 ft^3/sk	= **230 sks**

9 ⅝" Surface Casing Procedure

1. Make up float equipment and centralizers as required on 9 ⅝" surface casing and run in to total depth.

2. Break circulation and condition hole and drilling fluid as required prior to cementing.

3. Rig in a Sanjel cementing unit, surface treating lines and a 9 ⅝" head to casing. Conduct safety meeting with Sanjel crew, rig crew, and 1804 Operating representative.

4. Fill lines and pressure test surface treating lines to 2000 psi.

5. Mix and pump the following:

    1) **20 bbls** fresh water + 2.5 gal. WG-1L + 25 lbs. LCL-7
    2) **600 sks** Lead mixed at 12.0 ppg (Control Set 'C' + additives)
    3) **230 sks** Tail mixed at 15.8 ppg (0:1:0 'G + additives)

6. Drop a 9 ⅝" top rubber plug and displace to float at 5-6 bpm with water. Slow displacement to 2 bpm for the last 15 bbls, *stage displacement if needed*.

7. Bump plug with a minimum of 500 psi over final pumping pressure.

8. Hold pressure for 1 minute, then bleed back casing pressure to ensure float is holding.

9. If cement returns are not observed to surface, use 0:1:0 'G' + 2% $CaCl_2$ (chloride on the side) cement for 1" job.

10. W.O.C. a minimum of 12 hours prior to drill out.

NOTE:

This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

1804 Operating

Long String Casing Cement
Red SWD #1
Dunn County, North Dakota

Long String Cement	Version 2 (02.03.16)

Prepared for:	Ren Gardner	Prepared by:	Kally Schmitt
Phone:		Phone:	406.245.0255
Mobile:		Mobile:	406.647.6212
Email:	Ren@WelterConsulting.com	Email:	Kschmitt01@sanjel.com

7 inch Production Casing

Well Information

Hole Size:	8 $^{3}/_{4}$"
Casing	7",
Depth:	5850' (MD)
Excess:	30%
TOC Lead Cement:	0'
TOC Tail Cement:	4850'
Estimated Temp.	130^{0} F.

Cement Blend

Lead Cement: WBL II + 0.50% CFL-3, + 0.25% CFR-2
+ .25 lbs/sk LCL-7 + 0.4% CDF-4P + 0.05% LTR
4850 ft to 0 ft = 4850 ft

Tail Cement: 0-1-0 'G' + 10% NaCl (BWOW), + 0.25% CFR-2, +
0.5% CFL-3, + 0.4% CDF-4P, + 0.2% SPC-2
+ .25 lbs/sk LCL-7, + 1 lb/sk LCL-11
4850 ft to 5850 ft = 1000 ft

Cement Data

		Lead	Tail
Water Requirement:	gal/sk	12.86	5.00
Yield:	ft3/sk	2.17	1.15
Density:	lbs. /gal	11.50	15.80
Thickening Time:	Hrs. min	3:00	2:45
Compressive Strength:	psi/hrs	630/24	2290/24
		770/48	3542/48
Temperature	: °F	130^{0} F (BHST)	

Calculations

Lead Cement: 0.1503 ft^3/ft x 4850 ft.= 728.96 ft^3
728.96 ft^3 x 35 % = 984.09 ft^3
984.09 ÷ 2.17 ft^3/sk = **455 sacks**

Tail Cement: 0.1503 ft^3/ft x 1000 ft.= 150.30 ft^3
150.30 ft^3 x 35 % = 202.91 ft^3
202.91 ft^3 ÷ 1.15 ft^3/sk = **180 sacks**

Casing Cementing Procedure

1. Conduct safety meeting and review procedure

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 7 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 5000 psi.

5. Mix and pump the following:
   A. 10 bbls mud flush
   B. 10 bbls fresh water
   C. 455 sacks LiteFill WBL II + additives at 11.5 lbs. /gal.
   D. 180 sacks 0-1-0 'G' + additives at 15.8 lbs. /gal.

6. Displace cement to float with water at ~6 bpm slowing to 1 bpm for the last 5 bbls.

7. Bump plug 500 psi over final pump pressure.

8. Rig down Sanjel, W.O.C. a minimum of 72 hours before logging and perforating.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location

2011 PRICE BOOK

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

INTERMEDIATE CASING		**7**	**inch**					
SERVICES								
111380	Pumping Unit Travel			60	miles	$7.50	/ mile	$450.00
111035	Pumping Unit Base Charge			5850	feet	$5,400.00	/ 6 hours	$5,400.00
111480	Bulk Cement Blending			635	ft^3	$3.30	/ ft^3	$2,095.50
111484	Bulk Cement Delivery			27.5	tons	$2.55	/ ton*mile	$4,207.50
111497	SAM III - Data Acquisition			1	job	$1,015.00	/ job	$1,015.00
PREFLUSHES AND SPACERS								
113195	MUDFLUSH			420	gals	$2.05	/ gal	$861.00
LEAD CEMENT								
113075	WBL			455	sacks	$46.00	/ sack	$20,930.00
113132	CFL-3	0.50	%	182	lbs	$13.20	/ lb	$2,402.40
113161	CFR-2	0.25	%	91	lbs	$10.00	/ lb	$910.00
113247	LCL-7	0.25	lbs/sk	114	lbs	$5.00	/ lb	$570.00
113263	CDF-4P	0.40	%	146	lbs	$9.30	/ lb	$1,357.80
113110	LTR	0.05	%	19	lbs	$6.60	/ lb	$125.40
TAIL CEMENT								
113000	0:1:0 'G' Cement			180	sacks	$38.40	/ sack	$6,912.00
113132	CFL-3	0.50	%	85	lbs	$13.20	/ lb	$1,122.00
113161	CFR-2	0.25	%	43	lbs	$10.00	/ lb	$430.00
113263	CDF-4P	0.40	%	68	lbs	$9.30	/ lb	$632.40
113220	SPC-2	0.20	%	34	lbs	$46.00	/ lb	$1,564.00
113247	LCL-7	0.25	lbs/sk	45	lbs	$5.00	/ lb	$225.00
113253	LCL-11	1.00	lbs/sk	180	lbs	$3.55	/ lb	$639.00
113103	NaCl	10.00	%bwow	751	lbs	$0.70	/ lb	$525.70
OTHER MATERIALS								
111492	Envirobag	1	bag			$78.00	/ bag	$78.00
NON-DISCOUNTED ITEMS								
111493	Environmental Surcharge	1	job			$50.00	/ job	$50.00
112340	Fuel Surcharge	2	trucks			$400.00	/ truck	$800.00
NON-DISCOUNTED TOTAL								**$53,302.70**
						DISCOUNT:	67%	($35,143.31)
GRAND TOTAL								**$18,159.39**

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follow

Twin Cement Pumping Unit – per unit, per hou
Pumping Time..... $450/h
Standby Time..... $285/h

Bulk Cement Unit – per unit, per hour
Standby Time..... $285/hr

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
Travel charges are an estimate only. Invoice price will be based upon actual distance traveled. Equipment charges are for specified operating times. Hourly rates will be charged for operating times greater than specified. Federal and State taxes where applicable are additional. Quote is valid for 30 days from the date it is submitted.

Sanjel

GENERAL TERMS & CONDITIONS

Under these terms and conditions ("**T&C's**") Sanjel (USA) Inc. ("**Sanjel**") agrees to provide, and you agree to purchase, the goods and services in the attached proposal or work order ("**goods**," "**services**" or "**goods and services**"). You understand and agree that the T&Cs govern and control the provision of all goods or services Sanjel provides to you, including any goods or services Sanjel provides or performs under written or oral requests for goods or services. You accept the T&Cs by informing Sanjel or allowing Sanjel to provide goods and services, whichever is first. You cannot change the T&Cs, and Sanjel rejects any proposals on your forms or otherwise. When used in the T&Cs, "**we**," "**us**," and "**our**" refer to both you and Sanjel, collectively.

1. **Entire Agreement.** If we have signed an agreement applicable to the goods and services, that agreement will apply and the T&Cs do not. If no signed agreement exists between us, the T&Cs are our entire agreement for the goods and services, and no prior discussion, agreement, conduct, or industry practice will affect them. The T&Cs may not be changed, superseded or replaced by any other agreement (including any terms in a purchase order, service order, invoice or other similar document) unless specifically agreed by each of us in writing.

2. **Acknowledgment.** You understand that interpretations, research, analysis, advice or interpretational data furnished by Sanjel ("**Recommendations**") are opinions based on inferences from measurements, empirical relationships and assumptions and industry practice and that Recommendations are not infallible, and the opinions of professional geologists, engineers, drilling consultants and analysts may differ. Sanjel does not warrant the accuracy, correctness, or completeness of the Recommendations, or that your or any third party's reliance on the Recommendations will accomplish any particular results. You assume full responsibility for the use of and decisions based on the Recommendations, and you hereby agree to release, defend, indemnify and hold Sanjel harmless from Claims arising from the use of the Recommendations.

3. **Payment**. You will pay Sanjel for the goods and services at the rates in the applicable proposal or work order (which are good for 90 days) in US dollars within 30 days of receipt of performance or a correct invoice, whichever is later. Sanjel may charge interest at 18% per year on all overdue amounts, and you will bear all costs of collection of overdue accounts, including legal fees.

4. **Services**. You acknowledge and agree that the services Sanjel may perform are of such a nature that results cannot be guaranteed, and Sanjel makes no representations, warranties or guarantees with respect to the results of the services. Sanjel's only warranty with regard to the services is that they will conform to the material aspects of the applicable scope of work.

5. **Goods.** Sanjel may provide goods to you under the T&Cs or in connection with the services. Sanjel warrants that goods will (a) substantially conform to the applicable scope of work (b) be free of defects and of good quality and workmanship, and (c) not be subject to any liens, claims or encumbrances. There are no warranties, express or implied, of merchantability, use, and fitness that extend beyond those expressly stated herein.

6. **Warranty Remedies.** Sanjel will re-perform any non-conforming services if Sanjel is notified before leaving the work site, and will repair or replace any non-conforming or defective goods you notify Sanjel of within 30 days after Sanjel provided them to you free of charge. If Sanjel is unable to repair the non-conforming services, Sanjel will reimburse you for costs of a third party to repair such services, up to 10% of the original work order for such services. If fishing services are required to retrieve goods, Sanjel may specify the provider and be present during recovery. The remedies will not apply if damage is caused by: (i) your failure to properly store or maintain the goods, (ii) abnormal well conditions, abrasive materials, corrosion due to aggressive fluids or incorrect specifications, (iii) unauthorized alteration or repair of the goods, (iv) loss of goods while on your site due to your or any third party's negligence, vandalism or force majeure, (v) Sanjel's lack of or incorrect information regarding well conditions, or (vi) use or handling of the goods in a manner inconsistent with Sanjel's recommendations. Sanjel's warranty obligations will terminate if you fail to perform your obligations, including your failure to pay on time.

7. **Delay and Cancellation.** If Sanjel cannot provide goods or services to you due to circumstances beyond its control, Sanjel may charge you actual costs incurred, including but not limited to: mileage; blending; materials (including handling and hauling); return delivery and restocking charges; and all location time in excess of the location time allowance. Orders for goods or services that you cancel after Sanjel has procured the required materials may be subject to a 25% restocking fee. If Sanjel provides materials to your specifications and you cancel for any reason (including an uncontrollable event) you will be charged a cancellation fee plus actual costs incurred as a result of such cancellation.

8. **Taxes**. Prices are exclusive of any municipal, state, federal, special or use taxes or levies imposed on the sale of goods or services. You will be responsible for all taxes applicable to the provision of the goods or services.

9. **Additional Services Requests**. You will pay for services, equipment or materials not listed in a proposal but purchased or rented by Sanjel at your request at cost plus 25%. Sanjel has no liability to you for such services, equipment or materials.

10. **Proprietary Rights.** You acknowledge that any intellectual property Sanjel uses in connection with the T&Cs, or that is created or developed by Sanjel in the course of performing under the T&Cs, is the property of Sanjel at all times, and you understand that you are not entitled to any intellectual property rights in any of Sanjel's intellectual property, except as required to receive the benefit of the goods or services.

11. **Confidentiality.** Any non-public information that we learn about eachother in connection with the T&Cs, including our relationship, is confidential information of the disclosing party, and neither of us may disclose confidential information of the other to any third party without the prior written consent of the disclosing party. We may each use confidential information of the other to perform under the T&Cs, and may share it only on a need-to-know basis with employees.

12. **Indemnity. (A) Subject to Section 12(b) below, each of us ("Indemnitor") hereby agrees to release, defend, indemnify and hold the other, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier ("Indemnitee Group") harmless for all losses, claims, demands, causes of action, costs and expenses (including reasonable legal fees) (collectively, "Claims"), for personal injury, death and property damage to Indemnitor, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier arising out of or incident to the T&Cs or any goods or services provided hereunder, without regard to whether such Claim is caused, in whole or in part, by the negligence (whether sole, joint or concurrent, active or passive), contractual liability or other fault of any member of the Indemnitee Group or by any defect or pre-existing condition (whether known or unknown, patent or otherwise). (B) You hereby agree to release, defend, indemnify and hold Sanjel harmless for any Claims Sanjel may suffer or incur arising out of or incident to: well blowout or any uncontrolled well condition, fire, cratering, redrill or sidetracking, seepage or reservoir damage, loss or damage to the hole, pollution and contamination (except sudden and accidental pollution originating above the service of the earth and emanating from Sanjel's equipment while in Sanjel's care, custody and control), and loss or damage to Sanjel's (or its contractors') equipment while down the hole at new replacement value; even if caused in whole or in part by the sole, joint or concurrent negligence or other fault (active or passive) of Sanjel or any other person.**

13. **Consequential Damages Exclusion: Notwithstanding anything to the contrary, neither of us will be liable to the other for business interruptions, punitive, indirect or consequential damages relating to the goods or services (including but not limited to any loss of profit, loss of expected revenue, loss of hydrocarbons or loss of rig time).**

14. **Disposal of Chemicals.** You will arrange and be responsible for the disposal of any used chemicals and hazardous materials related to the goods or services.

15. **Insurance.** Each of us will maintain, at its own cost, commercial general liability insurance covering its indemnification obligations under the T&Cs with combined single limits of at least $5,000,000 per occurrence and in the aggregate. We will obtain insurance from carriers with AM Best ratings of at least A-VII (or equivalent), ensure the other party is named as an additional insured, and ensure that our carriers waive rights of subrogation against the other party.

16. **Uncontrollable Events.** Except for payment obligations, if either of us is unable to comply with the T&Cs because of events beyond our reasonable control, we will promptly notify the other in writing and will make reasonable efforts to restore our ability to perform as soon as possible. If the inability to perform continues for more than 10 days, the other party may cancel the applicable job immediately, by giving written notice to the affected party.

17. **Waiver.** Failure to enforce any or all of the T&Cs will not relieve either party of its rights or obligations or constitute a waiver or prevent further enforcement.

18. **Assignment.** You will not assign any of your rights or obligations under this PO without Sanjel's approval, which Sanjel may not unreasonably withhold. Any assignment in violation of this provision will be null and void.

19. **Governing Law.** We agree that the laws of the State of Colorado govern the T&Cs, without the application of choice of law rules. Each of us voluntarily submits to the jurisdiction and venue of the federal or state courts (as applicable) of the State of Colorado for the adjudication of all disputes under the T&Cs.

M. CONSTRUCTION DETAILS (See Attachment M1.1-M3)

Copy of Well Location Survey – Attachment M1.1

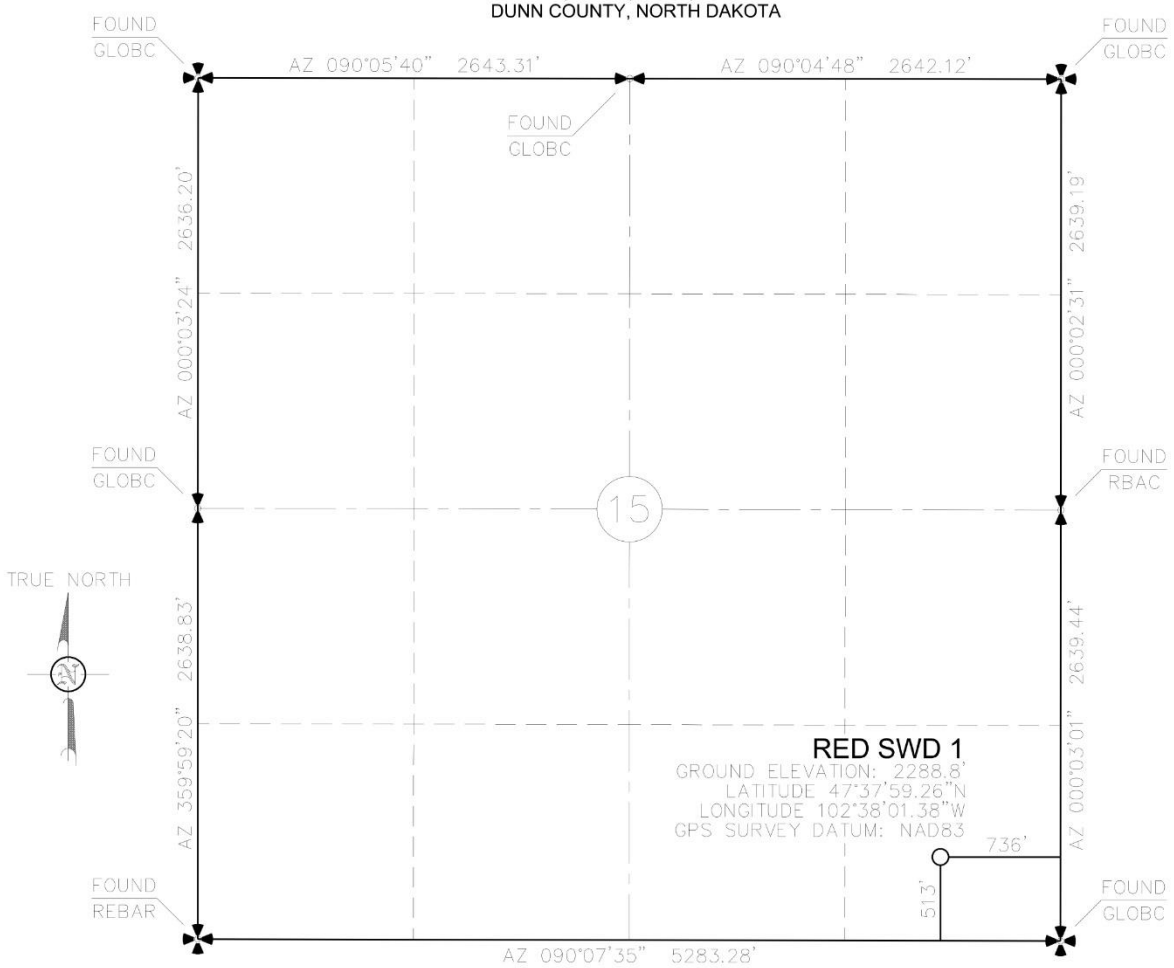
RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

WELL LOCATION

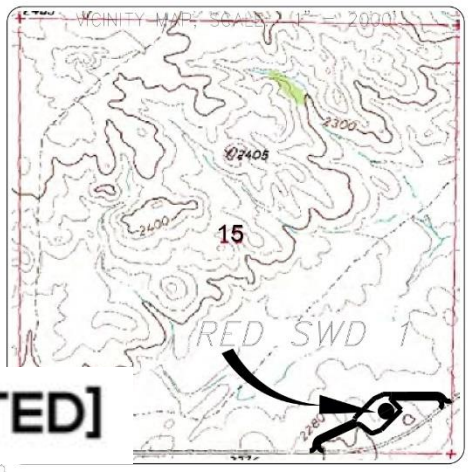
1804 OPERATING, LLC
1706 32nd STREET WEST, WILLISTON, ND 58801

"RED SWD 1"

513 FEET FROM SOUTH LINE AND 736 FEET FROM EAST LINE
SEC. 15, T148N, R94W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA



SCALE: 1" = 1000'



STAKED ON 07/18/13, VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 6 WITH AN ELEVATION OF 2414.5'
THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF ROBERT RUBEY FOR FBIR WATER SYSTEMS, LLC.
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.

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 5/11/16

[REDACTED]

[REDACTED]

INTERSTATE ENGINEERING INC.
P.O. BOX 266
110 2ND AVENUE SW
BELFIELD, NORTH DAKOTA 58622

1
SHEET NO.

INTERSTATE ENGINEERING
Professionals you need, people you trust

Interstate Engineering, Inc.
P.O. Box 266
110 2nd Avenue Southwest
Belfield, North Dakota 58622
Ph (701) 575-2247
Fax (701) 575-2251
www.iengi.com
Other offices in Minnesota, Montana and South Dakota

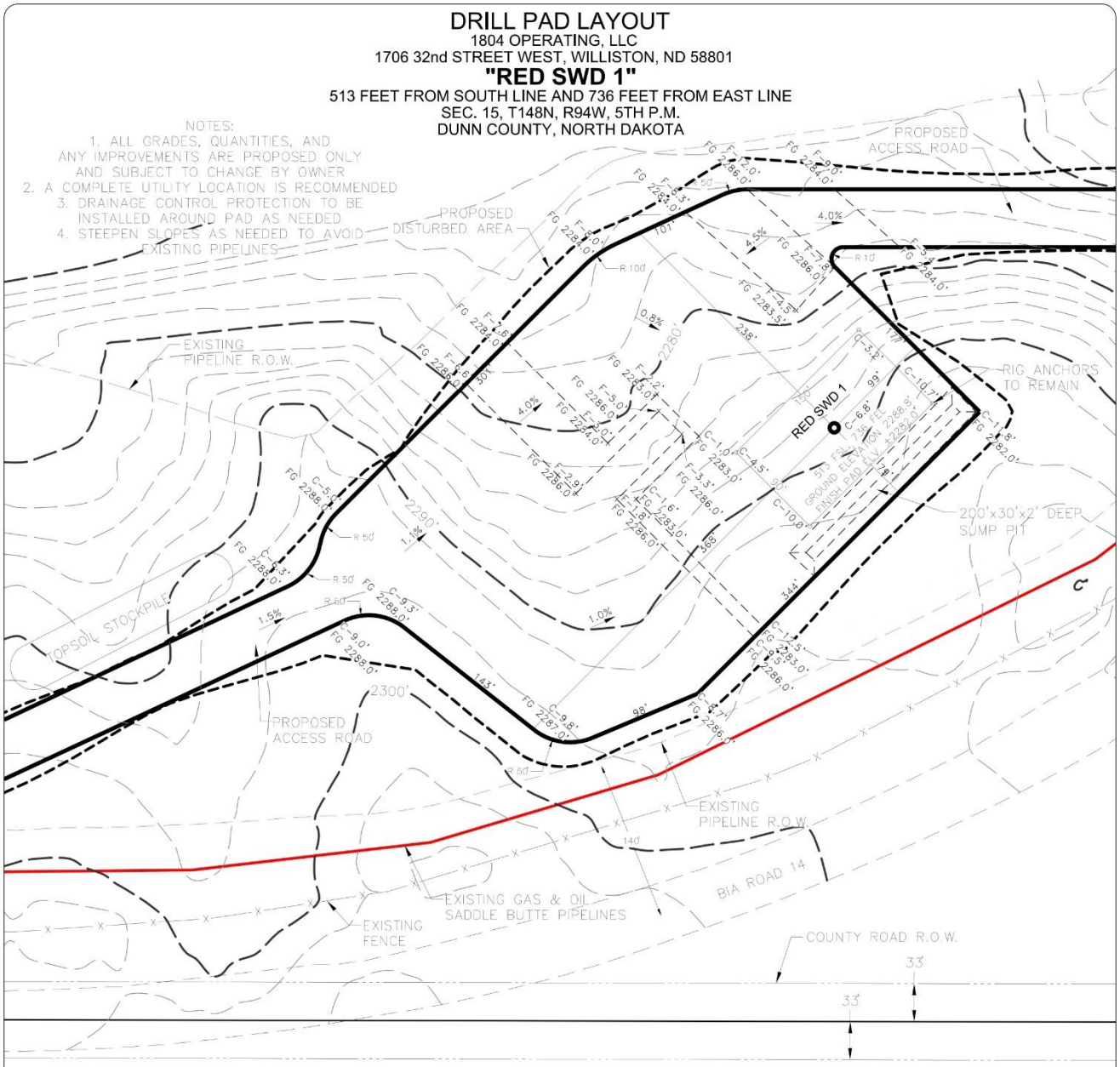
WELL LOCATION
1804 OPERATING, LLC
SEC. 15, T148N, R94W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

Drawn By: V.M.M. | Project No.: E16-17-005
Checked By: R.L.P. | Date: AUGUST 2013

Revision No.	Date	By	Description
1	8/22/13	VMM	MOVED CENTER 50' SE
2	10/31/13	VMM	REVISED WELL NAME & COMPANY
3	11/17/15	JMW	REVISED WELL NAME & COMPANY
4	3/3/16	JMW	Moved Well Location, Revised Pad Design
5	5/11/16	JMW	Revised Owner Heading

Copy of Drill Pad Layout Schematic – Attachment M1.2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



TOTAL QUANTITIES
FACILITIES AND ACCESS ROADS

EXCAVATION	28,000
MINUS TOPSOIL REMOVAL	5,200
TOTAL	22,800
EMBANKMENT	19,600
PLUS SHRINKAGE (±25%)	4,900
TOTAL	24,500
EXCESS EXCAVATION TO BE USED FOR FACILITY PAD	0
BORROW NEEDED	1700
TOTAL TOP SOIL (6") REMOVAL	5,200
DISTURBED AREA	6.4 ACRES

2
SHEET NO.

INTERSTATE ENGINEERING
Professionals you need, people you trust

Interstate Engineering, Inc.
P.O. Box 266
110 2nd Avenue Southwest
Belfield, North Dakota 58622
Ph (701) 575-2247
Fax (701) 575-2251
www.iengi.com
Other offices in Minnesota, Montana and South Dakota

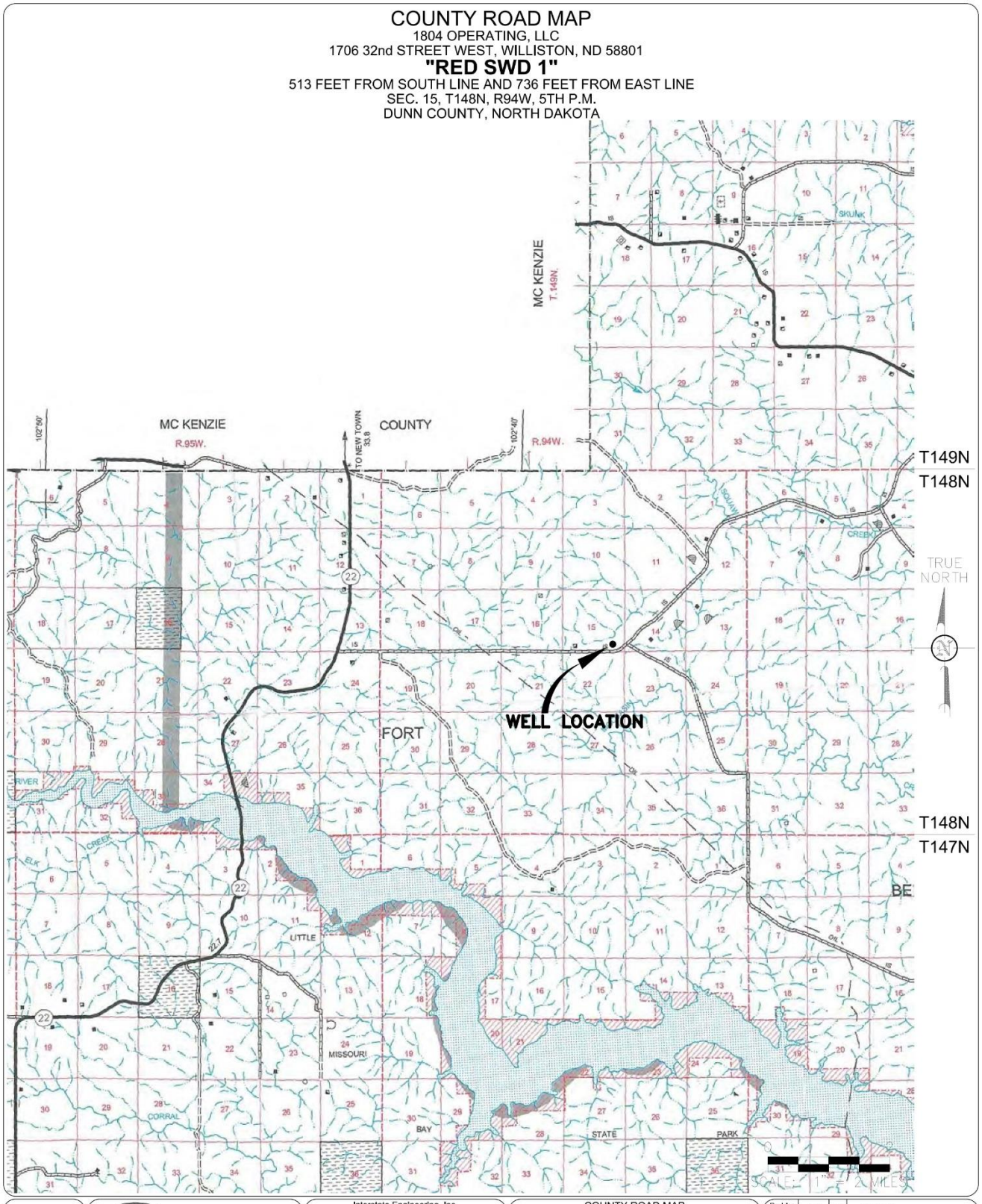
DRILL PAD LAYOUT
1804 OPERATING, LLC
SEC. 15, T148N, R94W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

Drawn By: V.M.M. | Project No.: E16-17-005
Checked By: R.L.P. | Date: AUGUST 2013

Revision No.	Date	By	Description
1	8/22/13	VMM	MOVED CENTER 50' SE
2	10/31/13	VMM	REVISED WELL NAME & COMPANY
3	11/17/15	JMW	REVISED WELL NAME & COMPANY, UPDATED PAD GRADES & QUANTITIES
4	3/3/16	JMW	Moved Well Location, Revised Pad Design
5	5/11/16	JMW	Revised Owner Heading

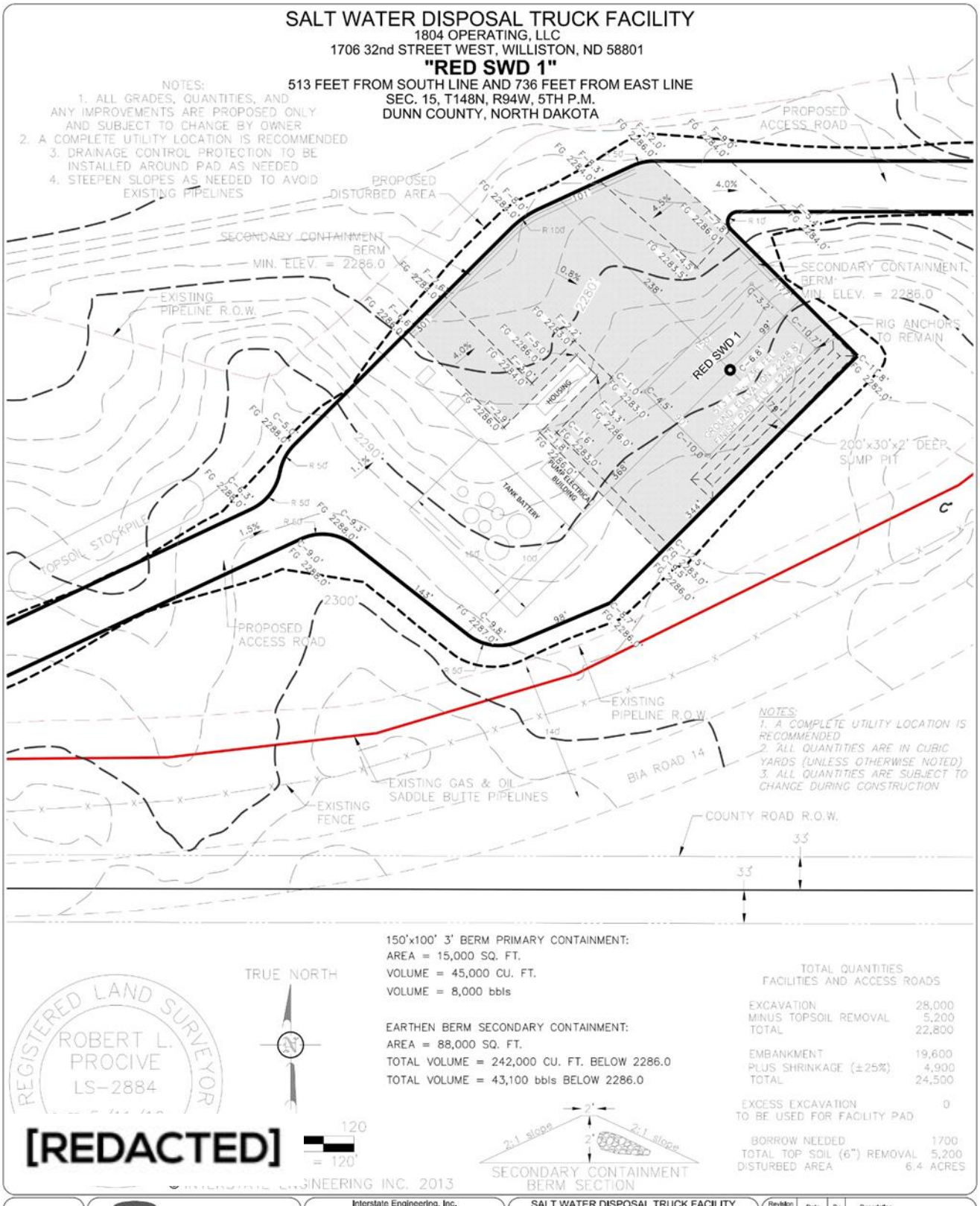
Copy of County Road Map – Attachment M1.3

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



Copy of Surface Facility Construction Schematic – Attachment M1.6

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

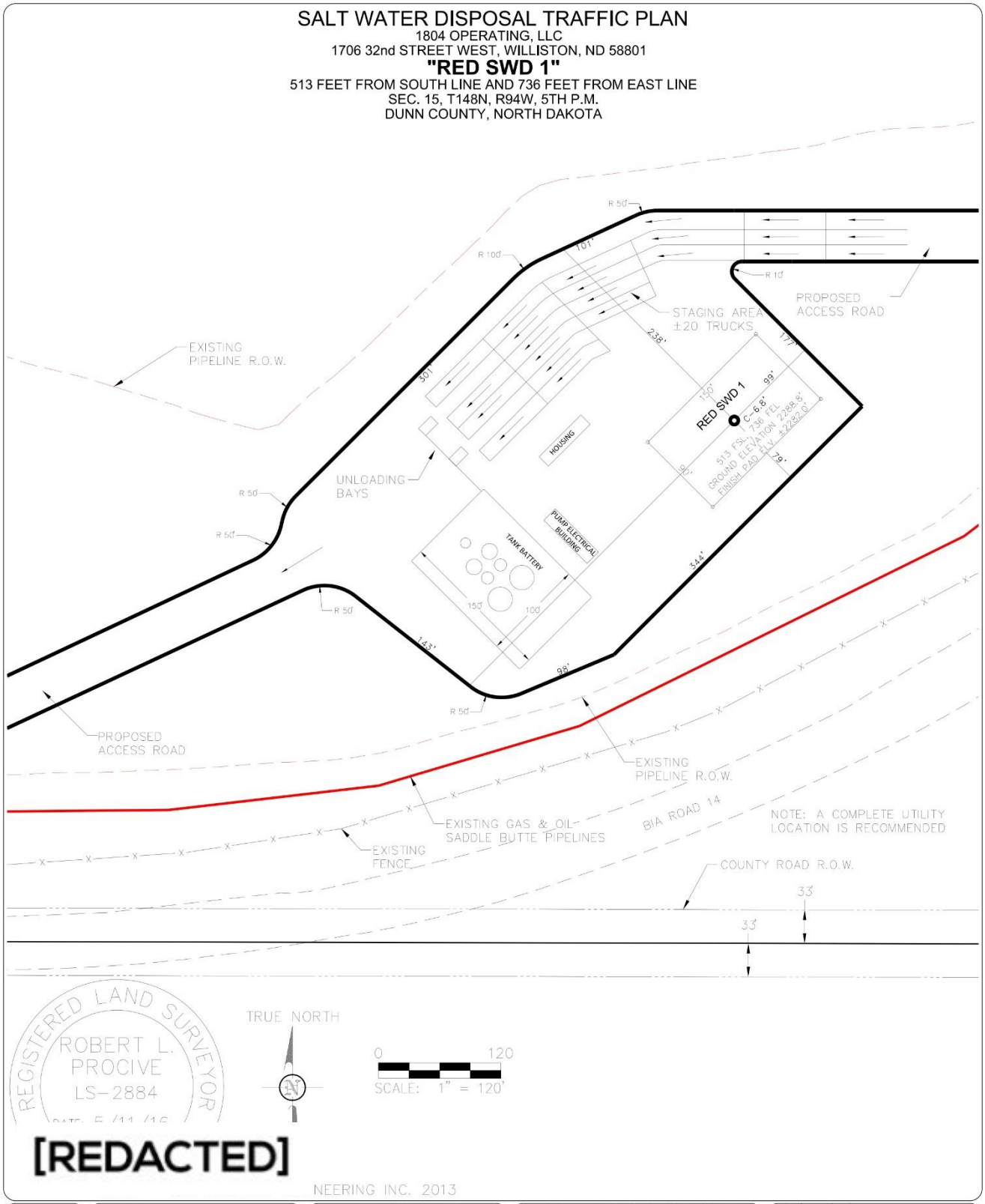


6 SHEET NO.	INTERSTATE ENGINEERING Professionals you need, people you trust	Interstate Engineering, Inc. P.O. Box 266 110 2nd Avenue Southwest Belfield, North Dakota 58622 Ph (701) 575-2247 Fax (701) 575-2251 www.ienginc.com Other offices in Minnesota, Montana and South Dakota	SALT WATER DISPOSAL TRUCK FACILITY 1804 OPERATING, LLC SEC. 15, T148N, R94W, 5TH P.M. DUNN COUNTY, NORTH DAKOTA Drawn By: V.M.M. Project No.: E16-17-005 Checked By: R.L.P. Date: AUGUST 2013	

Revision No.	Date	By	Description
2	10/31/13	VMM	REVISED WELL NAME & COMPANY
2	11/17/15	JMW	REVISED WELL NAME & COMPANY, ADDED SECONDARY CONTAINMENT
4	1/14/16	JMW	Corrected Pad Text
5	3/3/16	JMW	Moved Well Location, Revised Pad Design
6	5/11/16	JMW	Revised Owner Heading

Copy of Traffic Flow Diagram Schematic – Attachment M1.7

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



7 SHEET NO.	INTERSTATE ENGINEERING *Professionals you need, people you trust*	Interstate Engineering, Inc. P.O. Box 266 110 2nd Avenue Southwest Belfield, North Dakota 58622 Ph (701) 575-2247 Fax (701) 575-2251 www.iengi.com Other offices in Minnesota, Montana and South Dakota	SALT WATER DISPOSAL TRAFFIC PLAN 1804 OPERATING, LLC SEC. 15, T148N, R94W, 5TH P.M. DUNN COUNTY, NORTH DAKOTA Drawn By: V.M.M. Project No.: E16-17-005 Checked By: R.L.P. Date: AUGUST 2013	

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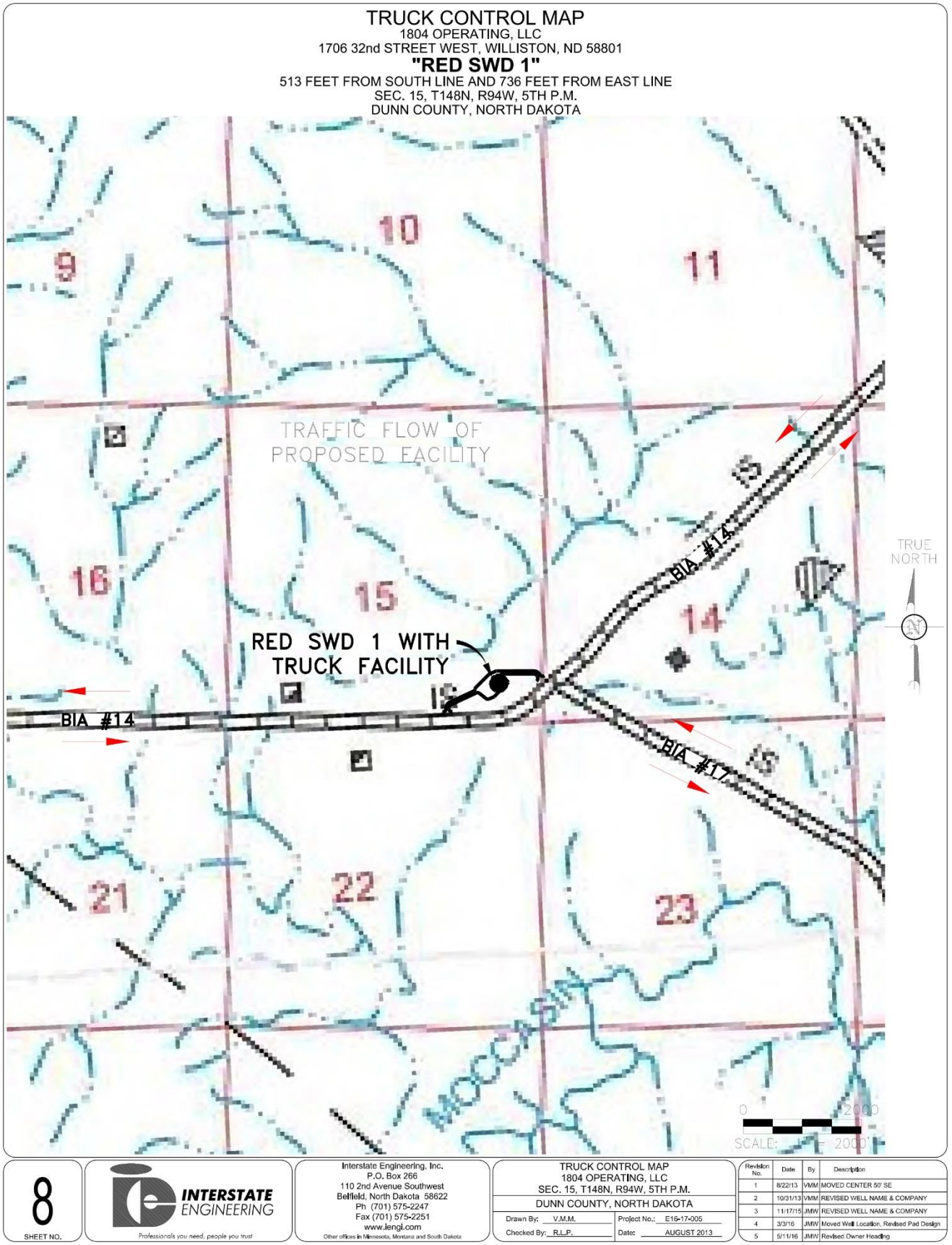
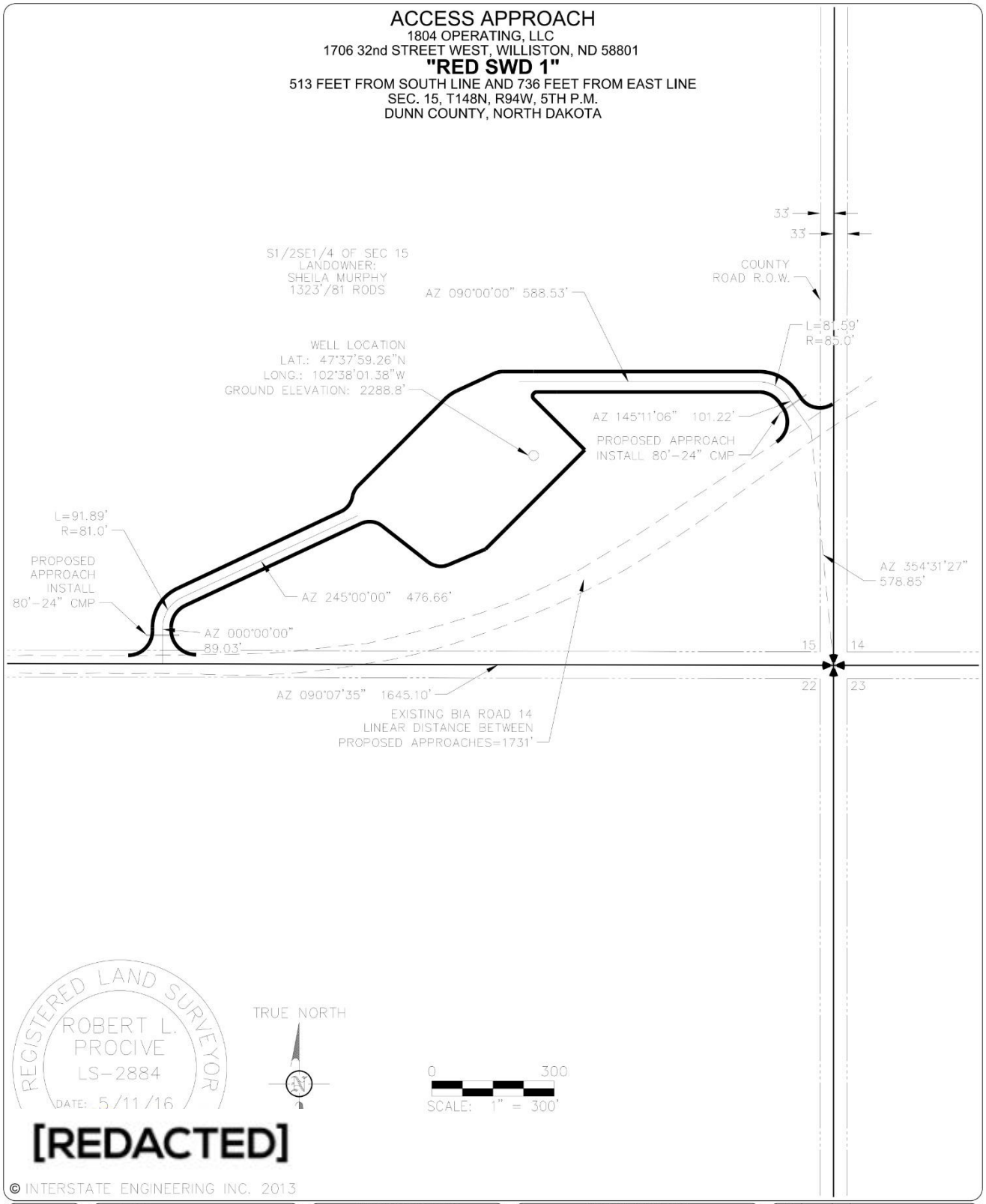
4	3/3/16	JMW	Moved Well Location, Revised Pad Design
5	5/11/16	JMW	Revised Owner Heading

Copy of Traffic Flow Diagram Schematic (Cont.) – Attachment M1.8



Copy of Access Approach Schematic – Attachment M1.9

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



9
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Other offices in Minnesota, Montana and South Dakota

ACCESS APPROACH
1804 OPERATING, LLC
SEC. 15, T148N, R94W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

Drawn By: V.M.M. | Project No.: E16-17-005
Checked By: R.L.P. | Date: AUGUST 2013

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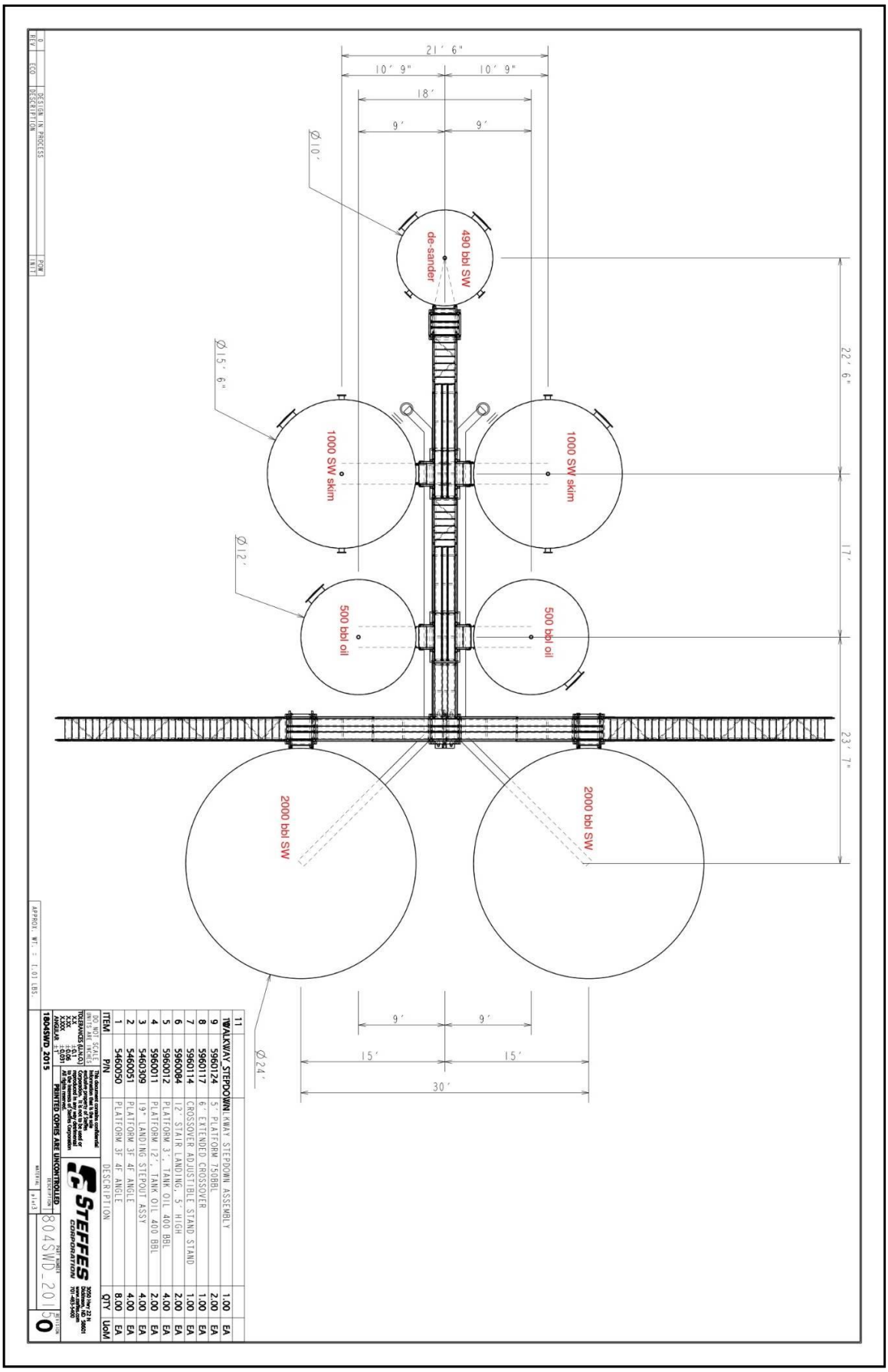
Schematic Detailing Tank Size and Purpose – Attachment M2.1

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



Liner Specification Sheet – Attachment M2.2

RED SWD 1 – 1804 Operating, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ArmorLiner™ 30

15.6 OZ GEOMEMBRANE

INTERTAPE POLYMER GROUP®

TECHNICAL DATA SHEET

DESCRIPTION

A heavyweight fabric incorporating a special weave pattern to enhance thickness, flatness, and tear properties. The coating recipe is designed to improve toughness and abrasion resistance.

FABRIC SPECIFICATIONS

Weave:	Woven black HDPE scrim
Coating:	LDPE, 5.5 mil average each side (130 g/m²/side)
Color:	White, black or other colored coatings available
Weight:	15.6 oz/yd² (528g/m²) +/- 5 %

ROLL SPECIFICATIONS

Cores:	4 inch I.D. or 5 inch I.D. available
Width:	Up to 144 in (-0, +2.5) as ordered
Length:	Minimum 250 yds/roll; up to 1000 yds/roll

These values are typical data and are not intended as limiting specifications.

PERFORMANCE PROPERTIES

The following data are typical values based on ASTM standard tests. This data should not be considered specification.

Thickness ASTM D1777	Nominal 30mil (0.75mm), ± 10%
Grab Tensile (N) ASTM D7004	MD 345 lb (1532) / TD 420 lb (1865)
Strip Tensile (N/5cm) ASTM D7003	MD 235 lb/in (2087) / TD 300 lb/in (2664)
Tongue Tear –large scale (N) ASTM D5884	MD 50 lb (222) / TD 55 lb (244)
Mullen Burst ASTM D751	700 psi 4823 kPa
MVTR ASTM E96 Proc. BW	0.17 g/m²·24hr (0.02 perms)
Hydraulic Conductivity (Permeability) Calculated from MVTR	1.07 x 10^{-12} cm/s
Hydrostatic Resistance ASTM D751	610 psi 4196 kPa
Puncture Resistance ASTM D4833	202 lb 900 N
Carbon Black Content ASTM D4218	7.5%
Carbon Black Dispersion ASTM D5596	Category 1
Dimensional Stability ASTM D1204	MD -2.8% / TD -1.5%
Low Temperature Flex ASTM D2136	MD&TD: Pass @ -65°C (-85°F)
Seam Strength (shear), min. ASTM D7747	Seam shear should be >80% of the strip tensile of the base fabric.
Seam Strength (peel), min. ASTM D413	4 lb/in / 35 N/5cm
Accelerated UV Weathering[1] ASTM G151 ASTM G154	>90 % strength retention after 2000 hrs exposure @ 0.77 W/m²/nm, or 1200 hrs exposure @ 1.35 W/m²/nm

[1] Q.U.V [A-340 Lamps]; 8 hrs UV @ 60°C; 4hrs condensation @ 50°C

ipg intertape polymer group®

100 Paramount Drive, Suite 300 | Sarasota, FL 34232 | USA
Customer Service: 800.IPG.8273 | 800.474.8273
Technical Service (Canada): 800.565.4533
Technical Service (US): 800.565.1450
www.itape.com | info@itape.com

EFFECTIVE: 2/14

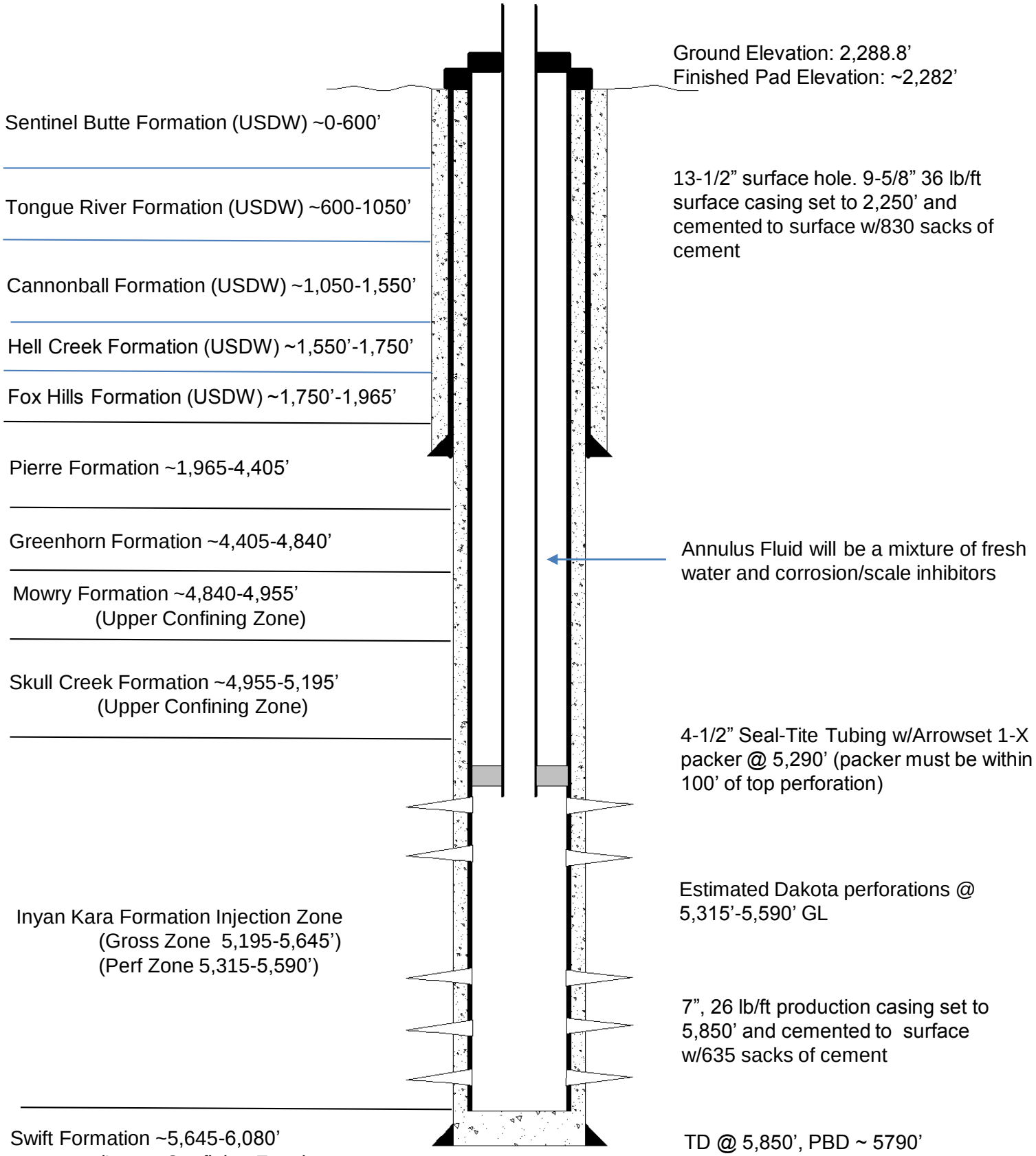
Contact your IPG representative for warranty details.

NovaThene AquaMaster

**** The RED SWD 1 primary tank containment will be lined with a 30mil geomembrane

Schematic of Proposed Wellbore – Attachment M3

RED SWD 1 - FBIR Water Systems, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



**** Not to Scale. All depth referenced from estimated 2,282' finished pad elevation

N. CHANGES IN INJECTED FLUID (N/A to Class II wells)

O. PLANS FOR WELL FAILURES

1804 Operating does not anticipate any well failures, but if a scheduled Mechanical Integrity Test (MIT) or our monitoring program reveals a loss of mechanical integrity, the well would immediately be shut in for repairs and the EPA and NDIC would be notified within 24 hours. 1804 would work diligently with the EPA and NDIC to diagnose and repair the well. Following the repairs, 1804 Operating would perform a subsequent MIT in the presence of a regulatory authority and results would be submitted to the EPA and the NDIC prior to returning to injection operations.

P. MONITORING PROGRAM

1804 Operating plans to install a SCADA system that would constantly monitor all aspects of the operation including injection rate, receipt rate, tank levels, pressures, spill detection, and other sensors that would prevent the receipt of additional fluids and shut the system in if any anomaly occurred. Additionally, 1804 Operating will physically monitor the system in accordance with the details of the final permit. This monitoring program will likely include the following:

OBSERVE WEEKLY AND RECORD AT LEAST ONCE EVERY THIRTY DAYS	
OBSERVE AND RECORD	Injection pressure (psig)
	Annulus pressure(s) (psig)
	Injection rate (bbl/day)
	Fluid volume injected since the well began injecting (bbls)

ANNUALLY	
ANALYZE	Injected fluid total dissolved solids (mg/l)
	Injected fluid specific gravity
	Injected fluid specific conductivity
	Injected fluid pH

ANNUALLY	
REPORT	Each month's maximum and averaged injection pressures (psig)
	Each month's maximum and minimum annulus pressures(s) (psig)
	Each month's injected volume (bbl)
	Fluid volume injected since the well began injecting (bbls)
	Written results of annual injeced fluid analysis
	Sources of all fluids injected during the year

Q. PLUGGING AND ABANDONMENT PLAN (Also note Attachments Q1-Q3)

Well Information as Proposed

Ground Elevation: 2,288.8'
Estimated Finished Pad Elevation: ~ 2,282'
Estimated KB: ~2,293'
Estimated PBTD: ~5,790'
Surface Casing: 9-5/8" 36ppf set to 2,250' and cemented to surface w/830 sacks of cement
Production Casing: 7" 26ppf set to 5,850' and cemented to surface w/635 sacks of cement
Tubing: 4-1/2" 12.75ppf Internally Plastic Coated set to 5,300'
Packer: Arrowset 1-X set at 5,290'

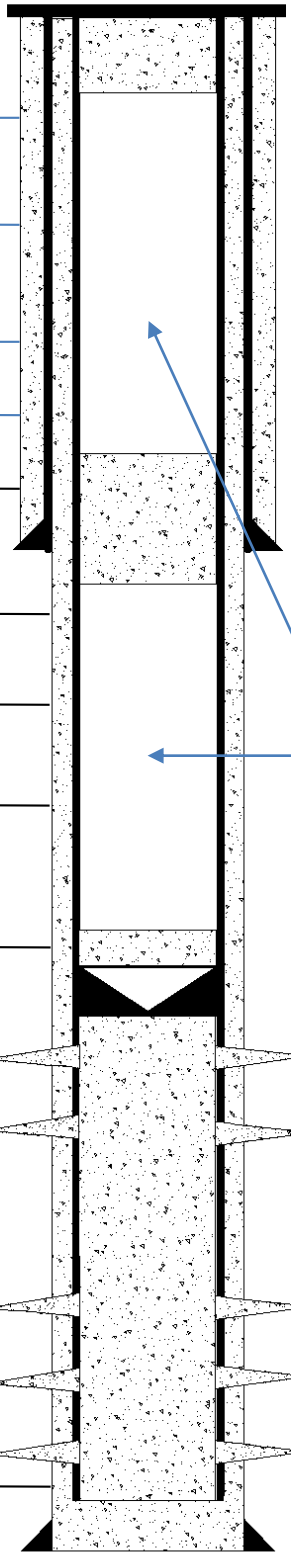
**** Note: A squeeze of the surface casing will NOT be required if surface/production casing annulus is isolated as proposed. All plugs will be placed in 7" 26ppf J-55 production casing. All depths referenced from the estimated finished pad elevation of 2,282'

Plug and Abandonment Procedure

1. Review CBL to ensure production string is adequately isolated to surface.
2. Notify EPA Director of proposed plugging at least 45 prior and submit changes to previously approved plugging and abandonment plan on new EPA Form 7520-14. Await approval.
3. Submit plugging and abandonment plan on sundry request to NDIC and await approval.
4. Notify NDIC field inspector, EPA, and BLM at least 48 hours prior to commencing with operations.
5. MIRU workover rig. Pressure test annulus to 500 psi for 15 minutes. LD surface equipment. ND injection wellhead, NU BOP.
6. Release 1-X packer and TOH w/injection string and packer, inspect, and lay down.
7. PU CICR, RIH and set at 5225' (~100' above top perforation). Pressure test tubing. Roll hole with clean 10 PPG brine. Establish injection rate into Dakota perforations.
8. Spot cement at end of tubing, sting into retainer and squeeze 100 sacks of Class G cement below CICR and into perforations.
    - If no pump pressure is observed during cement placement, the perforations will be cleared and a second attempt with an additional 100 sacks of Class G cement will be made to isolate the Dakota injection zone.
    - If the second attempt is unsuccessful, a 30 sack/150' Class G cement plug will be set on top of the retainer.
9. If pump pressure is observed during squeeze, sting out and spot 10 sacks of Class G cement on top of retainer. Estimated TOC at 5,175'.
10. Trip out of hole to 2,300' (50' below surface casing shoe). Spot 50 sack, 250' Class G plug in 7", 26ppf production casing to 2,050'.
11. Pull up and circulate tubing clean. Wait on cement. Tag plug and record.
12. Trip out of hole to 100'. Pump 20 sacks Class G plug to surface.
13. Wait on cement. Cut well head 4' below plow level and weld on marker plate.
14. Complete Form 7 Plug & Abandonment report and submit to NDIC.
15. Complete and submit EPA Form 7520-13 to Director within 60 days of plugging.
16. Notify NDIC Field Inspector, EPA, and BLM prior to restoring location.

Schematic of Proposed P&A'd Wellbore – Attachment Q1

RED SWD 1 - FBIR Water Systems, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND



Surface restored to approximate original 2,288.8' ground elevation

Casing(s) cut 4' below plow depth and steel plate with identification marker welded on top

20 sack 100' Class G cement plug in 7" production casing from surface to 100'

13-1/2" surface hole. 9-5/8" 36 PPF surface casing set to 2,250' and cemented to surface w/830 sacks of cement

50 sack 250' balanced Class G cement plug in 7" production casing from 2,050' to 2,300'

10 PPG clean brine plugging fluid

7" CICR @ 5,225' w/10 sacks of Class G cement on top

Inyan Kara perforations @ 5,315-5,590' squeezed with 100 sacks of Class G cement

7" 26 PPF J-55 production casing set to 5,850' and cemented to surface w/635 sacks of cement

TD @ 5,850', PBD ~ 5795'

Sentinel Butte Formation (USDW) ~0-600'

Tongue River Formation (USDW) ~600-1050'

Cannonball Formation (USDW) ~1,050-1,550'

Hell Creek Formation (USDW) ~1,550'-1,750'

Fox Hills Formation (USDW) ~1,750'-1,965'

Pierre Formation ~1,965-4,405'

Greenhorn Formation ~4,405-4,840'

Mowry Formation ~4,840-4,955'
(Upper Confining Zone)

Skull Creek Formation ~4,955-5,195'
(Upper Confining Zone)

Inyan Kara Formation Injection Zone
(Gross Zone 5,195-5,645')
(Perf Zone 5,315-5,590')

Swift Formation ~5,645-6,080'
(Lower Confining Zone)

**** Not to Scale. All depths referenced from estimated 2,282' finished pad elevation

Attachment Q2

OMB No. 2040-0042 Approval Expires 12/31/2018

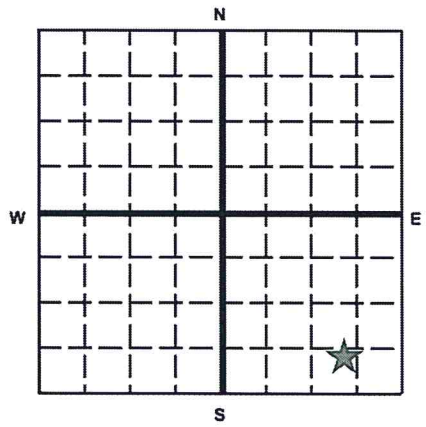
United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
RED SWD 1
9841 BIA ROUTE 14 MANDAREE ND 58757

Name and Address of Owner/Operator
1804 OPERATING, LLC 5910 N CENTRAL EXPRESSWAY
SUITE 630 DALLAS TX 75206

Locate Well and Outline Unit on Section Plat - 640 Acres



State NORTH DAKOTA
County DUNN
Permit Number

Surface Location Description
NE 1/4 of Sw 1/4 of SE 1/4 of SE 1/4 of Section 15 Township 148 Range 94

Locate well in two directions from nearest lines of quarter section and drilling unit
Surface
Location 513 ft. frm (N/S) S Line of quarter section
and 736 ft. from (E/W) E Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

WELL ACTIVITY
- [ ] CLASS I
- [x] CLASS II
  - [x] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Lease Name RED SWD
Well Number 1

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9-5/8"	36	2250	2250	13-1/2"
7"	26"	5850	5850	8-3/4"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [x] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [x] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche	7"	7"	7"				
Depth to Bottom of Tubing or Drill Pipe (ft	5225'	2300'	100'				
Sacks of Cement To Be Used (each plug)	110	50	20				
Slurry Volume To Be Pumped (cu. ft.)	126.5	57.5	23				
Calculated Top of Plug (ft.)	5175'	2050'	0'				
Measured Top of Plug (if tagged ft.)		TBD					
Slurry Wt. (Lb./Gal.)	15.8	15.8	15.8				
Type Cement or Other Material (Class III)	Class G	Class G	Class G				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
5315'	5590'		

Estimated Cost to Plug Wells
Three separate bids of $51,922.80, $91,259.92, and $48,573.43 were obtained. Estimated average cost to plug well is approximately $65,000.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possiblity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Patrick Walker, CEO	[REDACTED]	7/29/2016

EPA Form 7520-14 (Rev. 12-11)

Bids for Plugging the Proposed Wellbore - Attachment Q3

1804 Operating Red SWD P&A Bids

Bid #1

	Company	Amount	
Cement Bid	**Sanjel**	**$ 12,216.00**	
Workover Rig Bid	**Key Energy**	**$ 19,137.00**	
	Hourly Rate	$ 399.50	12 hrs/day
	Travel Time	$ 295.00	3 hrs/day
	Pump	$ 700.00	3 days
Tools Bid	**Graco Tools (BOP in cost)**	**$ 6,116.00**	
Consulting	**Welter Consulting**	**$ 5,800.00**	
		$ 1,450.00	4 days
General Contractor (20%)	**Welter Consulting**	**$ 8,653.80**	
Total P&A Bid for Cement/Rig/Tools		**$ 51,922.80**	

Bid #2

	Company	Amount	
Cement Bid	**Halliburton**	**$ 46,793.93**	
Workover Rig Bid	**Stride Well Service**	**$ 17,340.00**	
	Hourly Rate	$ 360.00	12 hrs/day
	Travel Time	$ 240.00	3 hrs/day
	Pump	$ 740.00	3 days
Tools Bid	**KLX (BOP in cost)**	**$ 6,116.00**	
Consulting	**Welter Consulting**	**$ 5,800.00**	
		$ 1,450.00	4 days
General Contractor (20%)	**Welter Consulting**	**$ 15,209.99**	
Total P&A Bid for Cement/Rig/Tools		**$ 91,259.92**	

Bid #3

	Company	Amount	
Cement Bid	**Consolidated Oil Well Services**	**$ 12,166.86**	
Workover Rig Bid	**Sun Well Service**	**$ 18,675.00**	
	Hourly Rate	$ 400.00	12 hrs/day
	Travel Time	$ 250.00	3 hrs/day
	Pump	$ 425.00	3 days
	BOP	$ 250.00	3 days
Tools Bid	**Weatherford Tools**	**$ 3,836.00**	
Consulting	**Welter Consulting**	**$ 5,800.00**	
		$ 1,450.00	4 days
General Contractor (20%)	**Welter Consulting**	**$ 8,095.57**	
Total P&A Bid for Cement/Rig/Tools		**$ 48,573.43**	

1804 Operating

Plug and Abandonment
RED SWD 1 – FBIR Water Systems, LLC.
Dunn County, North Dakota

Long String Cement Version 1 (04.08.16)

Prepared for:	Ren Gardner	Prepared by:	Kally Schmitt
Phone:		Phone:	406.245.0255
Mobile:		Mobile:	406.647.6212
Email:	Ren@WelterConsulting.com	Email:	Kschmitt01@sanjel.com

7" Casing

Well Information

Casing	7", 26 ppf
Depth:	5850' (MD)
Estimated Temp.	130^0 F.

Cement Blend

Squeeze @ 5225' :	0:1:0 'G' + 0.5% CFL-2 + 0.5% CFR + 0.25% LTR Load 100 sks
Contingency Squeeze @ 5225' :	*0:1:0 'G' + 0.5% CFL-2 + 0.5% CFR + 0.25% LTR* *Load 100 sks*
Contingency Plug @ 5225' :	*0:1:0 'G' + 0.5% CFR + 0.25% LTR* *Load 30 sks*
Contingency Plug @ 5225' :	*0:1:0 'G' + 0.5% CFR + 0.25% LTR* *Load 10 sks*
Plug @ 2300' :	0:1:0 'G' + 2.0% CaCl2 + 0.3% CFR-2 + 0.1% LTR Load 50 sks
Surface Plug :	0:1:0 'G' + 2.0% CaCl2 + 0.3% CFR-2 + 0.1% LTR Load 20 sks

Cement Data

Water Requirement:	gal/sk	5.00
Yield:	ft3/sk	1.15
Density:	lbs. /gal	15.8
Thickening Time:	Hrs. min	3:00
Temperature: °F	130^0 F (BHST)	

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

2011 PRICE BOOK
COST ESTIMATE: **F.O.B.** **WILLISTON, ND**

INTERMEDIATE CASING	**7**	**inch**				
SERVICES						
111380 Pumping Unit Travel			60	miles	$7.50 / mile	$450.00
111035 Pumping Unit Base Charge			5225	feet	$5,400.00 / 6 hours	$5,400.00
111480 Bulk Cement Blending			635	ft^3	$3.30 / ft^3	$2,095.50
111484 Bulk Cement Delivery			13.9	tons	$2.55 / ton*mile	$2,126.70
111497 SAM III - Data Acquisition			1	job	$1,015.00 / job	$1,015.00
Squeeze @ 5225'						
113000 0:1:0 'G' Cement			100	sacks	$38.40 / sack	$3,840.00
113131 CFL-2	0.50	%	47	lbs	$30.00 / lb	$1,410.00
113160 CFR	0.50	%	47	lbs	$14.10 / lb	$662.70
113110 LTR	0.25	%	24	lbs	$6.60 / lb	$158.40
Contingency Squeeze						
113000 0:1:0 'G' Cement			100	sacks	$38.40 / sack	$3,840.00
113131 CFL-2	0.50	%	47	lbs	$30.00 / lb	$1,410.00
113160 CFR	0.50	%	47	lbs	$14.10 / lb	$662.70
113110 LTR	0.25	%	24	lbs	$6.60 / lb	$158.40
Contingency Plug						
113000 0:1:0 'G' Cement			30	sacks	$38.40 / sack	$1,152.00
113131 CFL-2	0.50	%	15	lbs	$30.00 / lb	$450.00
113160 CFR	0.50	%	15	lbs	$14.10 / lb	$211.50
113110 LTR	0.25	%	8	lbs	$6.60 / lb	$52.80
Contingency Plug @5175'						
113000 0:1:0 'G' Cement			10	sacks	$38.40 / sack	$384.00
113131 CFL-2	0.50	%	5	lbs	$30.00 / lb	$150.00
113160 CFR	0.50	%	5	lbs	$14.10 / lb	$70.50
113110 LTR	0.25	%	3	lbs	$6.60 / lb	$19.80
Plug @ 2300'						
113000 0:1:0 'G' Cement			50	sacks	$38.40 / sack	$1,920.00
113110 LTR	0.10	%	5	lbs	$6.60 / lb	$33.00
113101 CaCl2	2.00	%	94	lbs	$1.80 / lb	$169.20
113161 CFR-2	0.30	%	15	lbs	$10.00 / lb	$150.00
Surface Plug						
113000 0:1:0 'G' Cement			20	sacks	$38.40 / sack	$768.00
113110 LTR	0.10	%	2	lbs	$6.60 / lb	$13.20
113101 CaCl2	2.00	%	38	lbs	$1.80 / lb	$3.60
113161 CFR-2	0.30	%	6	lbs	$10.00 / lb	$3.00
OTHER MATERIALS						
111492 Envirobag	1	bag			$78.00 / bag	$78.00
NON-DISCOUNTED ITEMS						
111493 Environmental Surcharge	1	job			$50.00 / job	$50.00
112340 Fuel Surcharge	3	trucks			$400.00 / truck	$1,200.00
NON-DISCOUNTED TOTAL						**$30,108.00**
					DISCOUNT: 62%	($17,891.96)
GRAND TOTAL						**$12,216.04**

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time..... $450/hr
Standby Time..... $285/hr

Bulk Cement Unit – per unit, per hour
Standby Time..... $285/hr

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
Travel charges are an estimate only. Invoice price will be based upon actual distance traveled. Equipment charges are for specified operating times. Hourly rates will be charged for operating times greater than specified. Federal and State taxes where applicable are additional. Quote is valid for 30 days from the date it is submitted.

Sanjel

GENERAL TERMS & CONDITIONS

Under these terms and conditions ("**T&C's**") Sanjel (USA) Inc. ("**Sanjel**") agrees to provide, and you agree to purchase, the goods and services in the attached proposal or work order ("**goods**," "**services**" or "**goods and services**"). You understand and agree that the T&Cs govern and control the provision of all goods or services Sanjel provides to you, including any goods or services Sanjel provides or performs under written or oral requests for goods or services. You accept the T&Cs by informing Sanjel or allowing Sanjel to provide goods and services, whichever is first. You cannot change the T&Cs, and Sanjel rejects any proposals on your forms or otherwise. When used in the T&Cs, "**we**," "**us**," and "**our**" refer to both you and Sanjel, collectively.

1. **Entire Agreement.** If we have signed an agreement applicable to the goods and services, that agreement will apply and the T&Cs do not. If no signed agreement exists between us, the T&Cs are our entire agreement for the goods and services, and no prior discussion, agreement, conduct, or industry practice will affect them. The T&Cs may not be changed, superseded or replaced by any other agreement (including any terms in a purchase order, service order, invoice or other similar document) unless specifically agreed by each of us in writing.

2. **Acknowledgment.** You understand that interpretations, research, analysis, advice or interpretational data furnished by Sanjel ("**Recommendations**") are opinions based on inferences from measurements, empirical relationships and assumptions and industry practice and that Recommendations are not infallible, and the opinions of professional geologists, engineers, drilling consultants and analysts may differ. Sanjel does not warrant the accuracy, correctness, or completeness of the Recommendations, or that your or any third party's reliance on the Recommendations will accomplish any particular results. You assume full responsibility for the use of and decisions based on the Recommendations, and you hereby agree to release, defend, indemnify and hold Sanjel harmless from Claims arising from the use of the Recommendations.

3. **Payment**. You will pay Sanjel for the goods and services at the rates in the applicable proposal or work order (which are good for 90 days) in US dollars within 30 days of receipt of performance or a correct invoice, whichever is later. Sanjel may charge interest at 18% per year on all overdue amounts, and you will bear all costs of collection of overdue accounts, including legal fees.

4. **Services**. You acknowledge and agree that the services Sanjel may perform are of such a nature that results cannot be guaranteed, and Sanjel makes no representations, warranties or guarantees with respect to the results of the services. Sanjel's only warranty with regard to the services is that they will conform to the material aspects of the applicable scope of work.

5. **Goods.** Sanjel may provide goods to you under the T&Cs or in connection with the services. Sanjel warrants that goods will (a) substantially conform to the applicable scope of work (b) be free of defects and of good quality and workmanship, and (c) not be subject to any liens, claims or encumbrances. There are no warranties, express or implied, of merchantability, use, and fitness that extend beyond those expressly stated herein.

6. **Warranty Remedies.** Sanjel will re-perform any non-conforming services if Sanjel is notified before leaving the work site, and will repair or replace any non-conforming or defective goods you notify Sanjel of within 30 days after Sanjel provided them to you free of charge. If Sanjel is unable to repair the non-conforming services, Sanjel will reimburse you for costs of a third party to repair such services, up to 10% of the original work order for such services. If fishing services are required to retrieve goods, Sanjel may specify the provider and be present during recovery. The remedies will not apply if damage is caused by: (i) your failure to properly store or maintain the goods, (ii) abnormal well conditions, abrasive materials, corrosion due to aggressive fluids or incorrect specifications, (iii) unauthorized alteration or repair of the goods, (iv) loss of goods while on your site due to your or any third party's negligence, vandalism or force majeure, (v) Sanjel's lack of or incorrect information regarding well conditions, or (vi) use or handling of the goods in a manner inconsistent with Sanjel's recommendations. Sanjel's warranty obligations will terminate if you fail to perform your obligations, including your failure to pay on time.

7. **Delay and Cancellation.** If Sanjel cannot provide goods or services to you due to circumstances beyond its control, Sanjel may charge you actual costs incurred, including but not limited to: mileage; blending; materials (including handling and hauling); return delivery and restocking charges; and all location time in excess of the location time allowance. Orders for goods or services that you cancel after Sanjel has procured the required materials may be subject to a 25% restocking fee. If Sanjel provides materials to your specifications and you cancel for any reason (including an uncontrollable event) you will be charged a cancellation fee plus actual costs incurred as a result of such cancellation.

8. **Taxes**. Prices are exclusive of any municipal, state, federal, special or use taxes or levies imposed on the sale of goods or services. You will be responsible for all taxes applicable to the provision of the goods or services.

9. **Additional Services Requests**. You will pay for services, equipment or materials not listed in a proposal but purchased or rented by Sanjel at your request at cost plus 25%. Sanjel has no liability to you for such services, equipment or materials.

10. **Proprietary Rights.** You acknowledge that any intellectual property Sanjel uses in connection with the T&Cs, or that is created or developed by Sanjel in the course of performing under the T&Cs, is the property of Sanjel at all times, and you understand that you are not entitled to any intellectual property rights in any of Sanjel's intellectual property, except as required to receive the benefit of the goods or services.

11. **Confidentiality.** Any non-public information that we learn about eachother in connection with the T&Cs, including our relationship, is confidential information of the disclosing party, and neither of us may disclose confidential information of the other to any third party without the prior written consent of the disclosing party. We may each use confidential information of the other to perform under the T&Cs, and may share it only on a need-to-know basis with employees.

12. **Indemnity. (A) Subject to Section 12(b) below, each of us ("Indemnitor") hereby agrees to release, defend, indemnify and hold the other, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier ("Indemnitee Group") harmless for all losses, claims, demands, causes of action, costs and expenses (including reasonable legal fees) (collectively, "Claims"), for personal injury, death and property damage to Indemnitor, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier arising out of or incident to the T&Cs or any goods or services provided hereunder, without regard to whether such Claim is caused, in whole or in part, by the negligence (whether sole, joint or concurrent, active or passive), contractual liability or other fault of any member of the Indemnitee Group or by any defect or pre-existing condition (whether known or unknown, patent or otherwise). (B) You hereby agree to release, defend, indemnify and hold Sanjel harmless for any Claims Sanjel may suffer or incur arising out of or incident to: well blowout or any uncontrolled well condition, fire, cratering, redrill or sidetracking, seepage or reservoir damage, loss or damage to the hole, pollution and contamination (except sudden and accidental pollution originating above the service of the earth and emanating from Sanjel's equipment while in Sanjel's care, custody and control), and loss or damage to Sanjel's (or its contractors') equipment while down the hole at new replacement value; even if caused in whole or in part by the sole, joint or concurrent negligence or other fault (active or passive) of Sanjel or any other person.**

13. **Consequential Damages Exclusion: Notwithstanding anything to the contrary, neither of us will be liable to the other for business interruptions, punitive, indirect or consequential damages relating to the goods or services (including but not limited to any loss of profit, loss of expected revenue, loss of hydrocarbons or loss of rig time).**

14. **Disposal of Chemicals.** You will arrange and be responsible for the disposal of any used chemicals and hazardous materials related to the goods or services.

15. **Insurance.** Each of us will maintain, at its own cost, commercial general liability insurance covering its indemnification obligations under the T&Cs with combined single limits of at least $5,000,000 per occurrence and in the aggregate. We will obtain insurance from carriers with AM Best ratings of at least A-VII (or equivalent), ensure the other party is named as an additional insured, and ensure that our carriers waive rights of subrogation against the other party.

16. **Uncontrollable Events.** Except for payment obligations, if either of us is unable to comply with the T&Cs because of events beyond our reasonable control, we will promptly notify the other in writing and will make reasonable efforts to restore our ability to perform as soon as possible. If the inability to perform continues for more than 10 days, the other party may cancel the applicable job immediately, by giving written notice to the affected party.

17. **Waiver.** Failure to enforce any or all of the T&Cs will not relieve either party of its rights or obligations or constitute a waiver or prevent further enforcement.

18. **Assignment.** You will not assign any of your rights or obligations under this PO without Sanjel's approval, which Sanjel may not unreasonably withhold. Any assignment in violation of this provision will be null and void.

19. **Governing Law.** We agree that the laws of the State of Colorado govern the T&Cs, without the application of choice of law rules. Each of us voluntarily submits to the jurisdiction and venue of the federal or state courts (as applicable) of the State of Colorado for the adjudication of all disputes under the T&Cs.

KEY ENERGY SERVICES

SERVICE PROPOSAL

1804 Operating
Rig Services

Presented to: Ren Gardner
Tuesday, April 05, 2016

Key Energy Services
1301 McKinney St, Suite 1800
Houston, TX 77010
713.651.4300

April 5, 2016

Ren Gardner
Welter Consulting
Petroleum Engineer
P: 406-853-5913
E: ren@welterconsulting.com

Dear Ren Gardner,

Thank you for considering Key Energy Services, LLC ("Key") for 1804 Operating's oilfield service needs in the Rocky Mountain Marketplace. Key is committed to developing both the newest technology and the highest standards of employee safety and training. Our experience on countless jobs gives us the know-how to perform in a way that offers clients the best value around.

Key is committed to offering our clients a comprehensive and advanced array of onshore energy production services that are backed by deep knowledge. Our offerings include:

1. Workover Rig services
2. Coiled Tubing services
3. Fluid & Logistics services
4. Fishing & Rental services
5. Drilling services
6. Frac Stack, Well Testing & Flowback
7. Plugging and Abandonment

When partnering with a company like 1804 Operating, our goal is to provide superior value through high performance integrated services. We are solutions driven company that strives to exceed customer expectations through our expertise and commitment to safety.

1804 Operating and Key currently have an established Master Services Agreement. This Master Service Agreement shall govern any scope of work subject to this proposal. (Ref No. MSA-13-0275) dated 06/26/2013. Any award of work resulting from this proposal may be set forth in a mutually agree written work order document subject of the parties' MSA.

We look forward to working with you and your team, and partnering with 1804 Operating to help achieve your goals for 2016 in a safe and cost effective environment.

Sincerely,

Shane Rose
Sales Representative
P: 701-339-2798
E: srose@keyenergy.com

HSE

Safety Management System

As the foundation of our Safety Management System, executive management has established a documented occupational health and safety policy as follows:

One of the Company's primary objectives is to provide a safe and secure working environment that is free of incidents, accidents and unsafe acts. In order to achieve and maintain this safe workplace, every employee must understand and adhere to the Company's health, safety and environmental policies and procedures as well as the laws, rules and regulations of the areas in which we conduct our business. Compliance with the governing policies, laws and regulations is the responsibility of every manager and employee and is a condition of employment. No deviations from such policies, laws and regulations are permitted without prior approval from the appropriate Company personnel or government regulatory agency.

Every employee must take responsibility for achieving a workplace that is incident-free. This responsibility includes exercising good judgment and common sense while performing job duties. It is management's responsibility to enforce the health, safety and environmental policies, laws and regulations.

Workplan

The planning process is in place to proactively plan our work to eliminate any potential hazards, behavior, or situations that may create an unsafe workplace. During the planning process we identify and prioritize activities such as specific tasks, review and use of Common Operating Guidelines (COGs) and the completion of a Work Plan/Job Safety Analysis in order to identify hazards, risks, management system deficiencies, and other opportunities for continuous improvement. Observation, feedback, coaching, and other programs that provide a systematic approach to risk recognition, assessment of risk, and mitigation of risk are included in the planning process.

We plan our work using an integrated approach called a Work Plan. The Work Plan incorporates five major planning tools: Common Operating Guidelines/Standard Operating Procedures, Critical Work Activity Review, Job Safety Analysis, and Stop Work Responsibility. Key requires that a Work Plan (WP) be completed by each work group for each task.

COG & Standard Operating Procedures

The Common Operating guidelines are to be used as the basic guide resource to improve operations performance with optimal safety awareness. Key strongly promotes standard procedures worldwide. COG's are visual adaptations of standard operating procedures used in the completion of specific steps within a larger process. They are made available to locations and should be used in conjunction with but not as a replacement for the Work Plan/Job Safety Analysis (WP/JSA).

Job Safety Analysis

An annual review of the Health and Safety Policy shall be performed by the Corporate HSE functional support group, which will recommend any policy changes to the Senior Executive Management Team. The policy is made available to all employees when newly hired and on an ongoing basis through the use of the Company's intranet, printed copies at all field locations, and communicated in a variety of other ways to all employees. Receipt of the Company's Safety Policy is established at time of hire and as changes are made to the policy, employees are required to date and sign.

STOP Working Responsibility

The Stop Work Responsibility should be used to address at-risk behavior. Should a risk be determined to be imminent and as part of an ongoing work process, all employees have the right and an obligation to invoke their stop work responsibility and initiate the stop work authority process.

Yellow means to stop the specific person and activity, coach, correct the problem, and reengage.

Orange means to stop the work of all, discuss actions, coach, correct the problem, and reengage.

Red means the issue either cannot be mitigated or anyone involved in the task continues to believe the process is not safe. In this situation the employee has the responsibility to invoke the Stop Work Authority Taken (SWAT). Once this is initiated and all employees are safe, a supervisor must be called, and work will not resume until the situation is resolved.

Continuous Improvement

Within Key Energy Services, continuous process improvement is an ongoing effort aimed at improving the current business process used to provide goods or services to customers. Continuous improvement is not just a managerial approach; it helps develop a culture of innovation and constant improvement within Key Energy Services. Continuous process improvement focuses on improving the bottom line by saving money through increasing efficiency and raising sales through enhancing quality.

Rig Services

Key Energy Services, LLC deploys Rigs that have been rebuilt to increase safety, reliability and reduce the chance of unplanned downtime. We specialize in well maintenance, workovers, completions, horizontal drilling re-entries, and new drills. Our rig fleet is the largest, most capable in the industry, with rigs rated from 150Hp to 1,000Hp for well work at any depth. Our fleet includes rigs with the patented KeyView® and Hydra-Walk® Pipe Handling systems.

Fleet Highlights

- Industry leader, 860+well services rigs worldwide
- "Build to Suit" Capability at the Key Technology Center (KTC) in Midland, TX
- Key's Fleet includes Rigs of diverse capacity
- Includes all ancillaries

Workover Rigs Fleet (250 HP, 550 HP & 750 HP)

- Improved Rig-up Efficiency
- Rig Floor Moves on X up to 8' and Y axis up to 30'
- Reduced Safety Risks with Proprietary Technologies
- Horsepower (HP) 250 Load limit 150,000 lbs, (HP) 550 Load limit 300,000 lbs, (HP) 1000 Load limit up to 300,000 lbs
- Customizable to Run Rods

Drilling Rigs

Typical package components include:

- 500 to 1,000-hp rig
- 112' to 120' double-mast rated at 250to 440K
- Top drive and/or Rotary table, or Power swivel
- Hydraulic Catwalk
- NOV ST-80 Iron Roughneck - 60,000ft lbs make up/80,000 ft lbs break out
- Air-operated pipe slips
- Triplex mud pumps, 500 to 1,300-hp
- 12' to 20' substructure rated to mast capacity, plus maximum racking capacity
- Mud system, 400 to 1,000 bbl capacity, with mixing and stirring capabilities
- Shale shakers (1 or 2)
- De-sander, de-silter and/or centrifuge as needed
- 2 generators sized as needed to meet package requirements, mounted in steel house with 2 air compressors

Well control (per specification):

- BOPs and accumulator
- Choke manifold (adjustable or automatic)

Other:

- Drill string, including pipe, drill collars and subs as specified
- Crew house and supervisor quarters as required

Pricing for

Williston Rigs

Manager: Jim Burau
Phone: 701-577-2527

Code	Description	UOM	Price
991080	Well Service Unit, Standard Class IV	HRS	$415.00
991020	Well Service Unit, Standard Class II	HRS	$399.50
991010	Swab Rig	HRS	$286.00
Additional Products / Services:			
991200	Crew Travel	HRS	$295.00
991180	Additional Crew Member	HRS	$82.00
991140	Enhanced Rig Supervision	HRS	$700.00
991500	Triplex Pump, 301Hp To 500Hp W/ Tank (Or Equivalent)	DAY	$700.00
991900	Standard Pipe Handling – Hydraulic Assist	DAY	$700.00
991740	Power Swivel, 85 Ton (2.5)	DAY	$700.00

Commercial Clarifications:

+ *The prices quoted will be in effect for thirty (30) days from the date shown and shall be subject to mutual agreement on terms and conditions in a Master Service Agreement or its equivalent. If additional terms and conditions are required, those will be set forth in writing and signed by an authorized representative of Key Energy and your company.*
+ *Upon mutual written agreement by the Parties, and amendment hereto this order for the scope of work subject hereto may be extended and/or renegotiated for an option term(s). Either Party may terminate this Order with thirty (30) days' prior written notice to the other Party.*
+ *Any products, materials, or services requested in the performance of work not addressed herein will be charged from our 2015 Rig Services National Price Book at a 50% discount.*
+ *Third-party rentals, products, or services provided at the request of an authorized customer representative will be subject to a 20% handling fee for EACH transaction.*

A DBA of Graco Fishing & Rental Tools, Inc.
GRACO OILFIELD SERVICES
Moving Forward, Honoring the Past

301 STATE STREET GLENDIVE, MONTANA 59330
PHONE: (406)365-5373 FAX (406)377-2119

1804 OPERATING BID

Prepared By: Mark Nicholson Date: 04/05/16

Prepared For: Ren Gardner

QTY	Description	1 day min	Add Day
1	7" Mechanical Cement Retainer	$2,346.00	
1	7" Mechanical Setting Tool	$200.00	
1	Squeeze manifold	$390.00	$110.00
1	Tubing Swivel	$225.00	$125.00
1	Supervisor	$1,100.00	$1,100.00
1	BOP, ACC, and TIW	$260.00	$260.00
	Mileage		
*	Deliver BOP RT mileage @ 2.50/mile	RT Mileage/2.50/mile	
*	Return BOP RT mileage @ 2.50/mile	RT Mileage/2.50/mile	
*	Supervisor 1st day RT mileage @ 2.00/mile	RT Mileage/2.00/mile	$200.00

Daily Min Rental Cost $4,521.00

Daily Add Day Rental Cost $1,595.00

ALL ITEMS FOR GLENDIVE, MT

1ST DAY CHARGE IS A ONE TIME CHARGE THEN PRICE IS STRICTLY ON A ADD DAY RATE

INSPECTION, REPAIRS, WASTE DISPOSAL WILL FOLLOW AS NEEDED

** MILEAGE COST NOT INCLUDED IN BID

TAX TO BE ADDED ON FINAL INVOICE

WELTER CONSULTING, INC.

P.O. Box 80232
Billings, MT 59108
406-259-4878

2015 RATE FRAC/WORKOVER CONSULTANT SCHEDULE

Consulting Services (Production/Completion/Workover)	**$1200.00 per day**
Second Rig	**Negotiable**
Hourly Rate	**$135.00 per hour**
Vehicle Mileage (4-wheel drive) **(Minimum of 50 miles per day)**	**$1.75 per mile**
Cellular Phone **(plus actual billed minutes)**	**$15.00 per day**
Fax Machine or Laptop Computer w/ printer	**$25.00 per day**
Meals	**$35.00 per day**
Other Expenses (motels, office supplies, etc.)	**At Cost**
HS & E FEE	**1 1/2% of Invoice**

HALLIBURTON

1804 Operating
1706 32nd Street West
Williston, NORTH DAKOTA, 58801
USA

Red SWD 1

WILLIAMS County, ND, US

Cement Recommendation

Proposal 207853-NC - Version 1.0
April 29, 2016

Submitted by:
Christopher Geddes
420 Halliburton Dr
Williston, ND - 58801
USA

HALLIBURTON

Contents

Halliburton appreciates the opportunity to present this cost estimate and looks forward to being of service to you.

1 Foreword

Enclosed is our cost estimate for cementing the casing strings in the referenced well. The information in this cost estimate includes well data, calculations, materials requirements, and cost estimates. This cost estimate is based on information from our field personnel and previous cementing services in the area.

The selection and use of non-Halliburton plugs and casing attachments often compromises the holistic approach and may jeopardize the overall objective for effective zonal isolation. Furthermore, Halliburton is not involved in the design, manufacture or use of plugs and casing attachments supplied by other manufacturers and assumes no liability for their installation and operation. For this reason we recommend Halliburton plugs and casing attachments be used when Halliburton performs any zonal isolation operation.

Halliburton Energy Services recognizes the importance of meeting society's needs for health, safety, and protection of the environment. It is our intention to proactively work with employees, customers, the public, governments, and others to use natural resources in an environmentally sound manner while protecting the health, safety, and environmental processes while supplying high quality products and services to our customers.

We appreciate the opportunity to present this cost estimate for your consideration and we look forward to being of service to you. Our Services for your well will be coordinated through the Service Center listed below. If you require any additional information or additional designs, please feel free to contact myself or our field representative listed below.

2 Service Center Contacts

SERVICE CENTER:	Williston, ND
SERVICE COORDINATOR:	Coordinator on Call
PHONE NUMBER:	701.774.7272

3 Squeeze

3.1 Volume Estimate Table Squeeze

Calculations are used for volume estimation. Well conditions will dictate final cement job design.
Stage 1

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	CEMENT	SqueezeCem	15.8		210 sack

NOTE: These slurries and spacers will require lab testing. The additives and concentrations are estimates based on field experience in the area and may need to be modified prior to the job. The proposed spacer is designed to be generally compatible with water base mud systems. Compatibility testing with field mud samples used may indicate changes in the additive package and the related costs.

3.2 Cost Estimate

Mtrl Nbr	Description	Qty	UOM	Unit Price	Gross Amt	Discount $	Net Amount
7528	**CMT PLUG TO ABANDON BOM**	1.00	JOB	0.00	0.00		0.00
2	MILEAGE FOR CEMENTING CREW Number of Units	120.00 1	MI	5.76	691.20		691.20
1	ZI-MILEAGE FROM NEAREST HES BASE,/UNIT Number of Units	120.00 1	MI	9.79	1,174.80		1,174.80
16094	PLUG BACK/SPOT CEMENT OR MUD,ZI FEET/METERS (FT/M) DEPTH	1.00 FT 5225	EA	9,856.00	9,856.00		9,856.00
100003685	CEM,CLASS G / PREMIUM, BULK *Premium Cement*	210.00	SK	44.26	9,294.60		9,294.60
101209204	CHEM, Halad-23, 50 lb *Halad(R)-23*	139.00	LB	30.35	4,218.65		4,218.65
100005050	CHEM, HR-5, 50 LB *HR-5*	20.00	LB	13.28	265.60		265.60
76400	MILEAGE,CMT MTLS DEL/RET MIN NUMBER OF TONS	60.00 9.949	MI	3.35	1,999.75		1,999.75
3965	HANDLE&DUMP SVC CHRG, CMT&ADDITIVES,ZI Unit of Measurement NUMBER OF EACH	217.00 EA 1	CF	5.49	1,191.33		1,191.33
	Total Gross Amount						**28,691.93**
	Total Item Discounts						**0.00**
	Total Net Amount	**USD**					**28,691.93**

Primary Plant:	Williston, ND, USA	**Price Book Ref:**	28 - ROCKIES
Secondary Plant:	Williston, ND, USA	**Price Date:**	4/29/2016

4 PTA

4.1 Volume Estimate Table PTA

Calculations are used for volume estimation. Well conditions will dictate final cement job design.

Stage 1

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	CEMENT	Plug 1	15.8		30 sack

Stage 2

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	CEMENT	Plug 2	15.8		50 sack

Stage 3

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	CEMENT	Plug 3	15.8		20 sack

NOTE: These slurries and spacers will require lab testing. The additives and concentrations are estimates based on field experience in the area and may need to be modified prior to the job. The proposed spacer is designed to be generally compatible with water base mud systems. Compatibility testing with field mud samples used may indicate changes in the additive package and the related costs.

4.2 Cost Estimate

Mtrl Nbr	Description	Qty	UOM	Unit Price	Gross Amt	Discount $	Net Amount
7528	**CMT PLUG TO ABANDON BOM**	1.00	JOB	0.00	0.00		0.00
2	MILEAGE FOR CEMENTING CREW Number of Units	120.00 1	MI	5.76	691.20		691.20
1	ZI-MILEAGE FROM NEAREST HES BASE,/UNIT Number of Units	120.00 1	MI	9.79	1,174.80		1,174.80
16094	PLUG BACK/SPOT CEMENT OR MUD,ZI FEET/METERS (FT/M) DEPTH	1.00 FT 5225	EA	9,856.00	9,856.00		9,856.00
100003685	CEM,CLASS G / PREMIUM, BULK *Premium Cement*	30.00	SK	44.26	1,327.80		1,327.80
100005050	CHEM, HR-5, 50 LB *HR-5*	6.00	LB	13.28	79.68		79.68
100003685	CEM,CLASS G / PREMIUM, BULK *Premium Cement*	50.00	SK	44.26	2,213.00		2,213.00
101509387	CALCIUM CHLORIDE-PELLET, 50 LB SK *Calcium Chloride, Pellet*	1.00	SK	180.30	180.30		180.30
100003685	CEM,CLASS G / PREMIUM, BULK *Premium Cement*	20.00	SK	44.26	885.20		885.20
101509387	CALCIUM CHLORIDE-PELLET, 50 LB SK *Calcium Chloride, Pellet*	1.00	SK	180.30	180.30		180.30
76400	MILEAGE,CMT MTLS DEL/RET MIN NUMBER OF TONS	60.00 4.745	MI	3.35	953.75		953.75
3965	HANDLE&DUMP SVC CHRG, CMT&ADDITIVES,ZI Unit of Measurement NUMBER OF EACH	102.00 EA 1	CF	5.49	559.98		559.98
	Total Gross Amount						**18,102.01**
	Total Item Discounts						**0.00**
	Total Net Amount	**USD**					**18,102.01**

Primary Plant:	Williston, ND, USA	**Price Book Ref:**	28 - ROCKIES
Secondary Plant:	Williston, ND, USA	**Price Date:**	4/29/2016

5 Conditions

The cost in this analysis is good for the materials and/or services outlined within and shall be valid for 30 days from the date of this proposal. In order to meet your needs under this proposal with a high quality of service and responsive timing, Halliburton will be allocating limited resources and committing valuable equipment and materials to your area of operations. Accordingly, the discounts reflected in this proposal are available only for materials and services awarded on a first-call basis. Alternate pricing may apply in the event that Halliburton is awarded work on any basis other than as a first-call provider.

The unit prices stated in the proposal are based on our current published prices. The projected equipment, personnel, and material needs are only estimates based on information about the work presently available to us. At the time the work is actually performed, conditions then existing may require an increase or decrease in the equipment, personnel, and/or material needs. Charges will be based upon unit prices in effect at the time the work is performed and the amount of equipment, personnel, and/or material actually utilized in the work. Taxes, if any, are not included. Applicable taxes, if any, will be added to the actual invoice.

It is understood and agreed between the parties that with the exception of the subject discounts, all services performed and equipment and materials sold are provided subject to Halliburton's General Terms and Conditions contained in our current price list, (which include LIMITATION OF LIABILITY and WARRANTY provisions), and pursuant to the applicable Halliburton Work Order Contract (whether or not executed by you), unless a Master Service and/or Sales Contract applicable to the services, equipment, or materials supplied exists between your company and Halliburton, in which case the negotiated Master Contract shall govern the relationship between the parties. A copy of the latest version of our General Terms and Conditions is available from your Halliburton representative or at: http://www.halliburton.com/terms for your convenient review, and we would appreciate receiving any questions you may have about them. Should your company be interested in negotiating a Master Contract with Halliburton, our Law Department would be pleased to work with you to finalize a mutually agreeable contract. In this connection, it is also understood and agreed that Customer will continue to execute Halliburton usual field work orders and/or tickets customarily required by Halliburton in connection with the furnishing of said services, equipment, and materials.

Any terms and conditions contained in purchase orders or other documents issued by the customer shall be of no effect except to confirm the type and quantity of services, equipment, and materials to be supplied to the customer.

If customer does not have an approved open account with Halliburton or a mutually executed written contract with Halliburton, which dictates payment terms different than those set forth in this clause, all sums due are payable in cash at the time of performance of services or delivery of equipment, products, or materials. If customer has an approved open account, invoices are payable on the twentieth day after date of invoice.

Customer agrees to pay interest on any unpaid balance from the date payable until paid at the highest lawful contract rate applicable, but never to exceed 18% per annum. In the event Halliburton employs an attorney for collection of any account, customer agrees to pay attorney fees of 20% of the unpaid account, plus all collection and court costs.

1804 Operating

KLX Energy Services
Down Hole Production Systems
518 17th Street Ste 1050
Denver, CO 80202

Date: 3/24/2016
Contact Name: Ren Gardner
Operating Co:
Area/Field:
Cell Phone: 406-853-5913
e-mail: ren@welterconsulting.com

KLX Sales Rep: Chris Kerschion
e-mail: ristopher.kerschion@klx.cc
Cell: 701-641-7094
Office: 701-264-8935

QTY	ITEM DESCRIPTION	LIST	%	Total
1	7" Cast Iron Cement Retainer With Mechanical Slips	$1,967.00	35%	*1278.55*
1	Rental of 7" Mechanical Setting Tool	899.00	50%	*449.50*
1	Rental of 15,000 PSI Cement Manifold w/ Guages	650.00	35%	*422.50*
1	Rental of Tubing Swivel w/ 1502 Thread Half Connection	310.00	35%	*201.50*
1	Tool Operator Service Charge (If Required)	1200.00		*1200.00*
1	Round Trip Mileage @ $3.00 per mile	3.00	50%	*1.50*
		USD Total Discounted:		***$3,553.55***

Terms and Conditions: *The total cost in this quotation is good for the items (materials & services) outlined within and will remain valid for 30 days from the date listed on the quotation. List prices are based on current published price book. The projected equipment, personnel and material needs are only estimated based on the information supplied by the customer. Conditions at the time of job may require a change in equipment, personnel, and/or materials. Should equipment and personnel needs change due to customers well design or requirements, prices stated above are no longer valid and updated quotation will be provided at that time. This estimate does not include tax fees and will be added at invoice. Absent a separately executed master services or similar agreement between the parties, KLX Energy Services' Oilfield Services Terms apply to the services and equipment provided to the customer. KLX Energy Services' Oilfield Services Terms are available at http://www.klxenergy.com/KLX_Energy_Services_Oilfield_Terms_June_2015.pdf

KLX Energy Services

QUOTE: #	
DATE:	3/25/2016
DISTRICT:	
North Dakota	
Phone #	

BOP Package Pricing

COMPANY:	1804 Opperating	SALES REP:	
CUSTOMER:	Mr. Ren Gardner		
CONTACT #:			

ITEM	QTY	DESCRIPTION	DAILY EA.	TOTAL
1	1	Accumulators/Closing Units Self Contained with Motor and Backup System 4-6 Valve 80 Gal. - Skid	$ 375.00	$ 375.00
2	1	Hydraulic Ram Type Blow Out Preventers 7-1/16" 5M Triple Gate	$ 700.00	$ 700.00
3	1	Safety Valve "TIW" Type, Ball Valve 2 7/8" Connection and Smaller 5m Working Pressure	$ 50.00	$ 50.00
4	1	Spool Adaptor 7 1/16" 5,000# (X) 7 1/16" 10,000#	$ 30.00	$ 30.00
5	1	All Necessary BOP Rubber Redress Products 7-1/16" 5M Triple Gate	$ 1,000.00	$ 1,000.00
6	1	TIW Valve Redress 2 7/8" Connection and Smaller 5m Working Pressure	$ 295.00	$ 295.00

INCLUDES: All nuts & bolts needed to nipple up equipment.

Total	$2,450.00
2016 All in Daily BOP Rental	$350.00

Sales items:

Ring Gaskets, Trucking and Bop Repairs beyond normal where and tear.

R-46 ring Gasket = $38

Trucking = $110 per hour

From: Battest, Michael
To: ren@welterconsulting.com
Subject: Re: RE:
Date: Monday, May 16, 2016 2:34:52 PM

Rig 360.00hour
Travel 240.00 hour
Travel from Dickinson to location
Pump 185.00 hour
No standby
No minimum

Sent from my iPhone

On May 16, 2016, at 9:03 AM, Ren Gardner <ren@welterconsulting.com> wrote:

> Mike,
>
> The .pdf file you sent me was corrupted so my computer couldn't open it. Can you please resend another a different name? Thanks.
>
> Ren Gardner
> Petroleum Engineer
> **Welter Consulting**
> 406-853-5913
> ren@welterconsulting.com
>
> ---
>
> **From:** Battest, Michael [mailto:MBattest@StrideWellService.com]
> **Sent:** Wednesday, May 11, 2016 5:35 PM
> **To:** ren@Welterconsulting.com
> **Subject:** Fwd:
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** "8520Cscanner@stridewellservice.com" <8520Cscanner@stridewellservice.com>
> > **To:** "Battest, Michael" <MBattest@StrideWellService.com>
> >
> > ----------
> > FS-C8520MFP
> > [00:c0:ee:b2:63:fc]
> > ----------

CONSOLIDATED
OIL WELL SERVICES, LLC

Cement Cost Estimate:

Red SWD 1
Section 15, Township 148, Range 94
Dunn County, ND
API#

Prepared For:

Mr. Ren Gardner
(406) 853-5913
ren@welterconsulting.com
Welter Consulting

Prepared By:

Joe Nowacki
(307) 299-0506

Report Date: May 12, 2016

Contact Information:

Operations

Consolidated Oil Well Services, LLC
Service Location
2602 E 2nd Street, Gillette, WY 82718
307-686-4914

Rick Boyce
District Manager
307-388-4331

Joe Nowacki
District Cement Manager/Sales
307-299-0506

Eric Price
Frac Manager
641-295-5361

www.ConsolidatedOWS.com

P&A Cement Job Information

1st Squeeze/Plug 5225'

Primary Cement:	**Class G**
Density:	15.8 ppg
Yield:	1.16 cu ft/sk
Water Requirement:	4.98 gal/sk
Volume Required:	100 sks

2nd Plug ±2300'

Primary Cement:	**Class G + 2% CC**
Density:	15.8 ppg
Yield:	1.15 cu ft/sk
Water Requirement:	5.00 gal/sk
Volume Required:	50 sks

Surface Plug

Primary Cement:	**Class G Cement**
Density:	15.8 ppg
Yield:	1.15 cu ft/sk
Water Requirement:	5.00 gal/sk
Volume Required:	30 sks

Excess Cement

Primary Cement:	**Class G Cement**
Density:	15.8 ppg
Yield:	1.15 cu ft/sk
Water Requirement:	5.00 gal/sk
Volume Required:	150 sks

Customer to supply mix water and displacement fluid.

Equipment Required

Cement Pump Unit	1 Each
Bulk Cement Truck	1 Each
Cement Monitoring and Control	1 Each

Materials Required

330sks	Class G
94lbs	Calcium Chloride

P&A Cement Price Ticket

Job Type	Cement

Customer	Welter Consulting/FBIR Water Systems, LLC
Well Name	Red SWD 1
Job Type	P&A
Casing Size	7"

Code	Equipment Charges	Quantity	Unit	Price Per Unit	
CE0454	Cement Pump Charge (5001-6000')	1	EACH	$ 3,900.00	$ 3,900.00
CE0002	Cement Pump Truck Mileage, One Way	315	PER MILE	$ 7.15	$ 2,252.25
CS2212	Cement Crew Charge	1	PER JOB	$ 895.00	$ 895.00
CE2027	Standby Time, per hour (After 8 hours)	0	PER HOUR	$ 1,500.00	$ -
				EQUIPMENT TOTAL	$ 7,047.25
Code	**Chemical Charges**	**Quantity**	**Unit**	**Price Per Unit**	
CC5803	Class G Cement	330	PER SK	$ 17.60	$ 5,808.00
CC5325	Calcium Chloride	100	PER POUND	$ 1.00	$ 100.00
CE0525	Blending Charge	330	PER SK	$ 1.80	$ 991.98
CE0710	Ton Mileage	330	PER UNIT	$ 1.75	$ 4,771.02
				CHEMICAL TOTAL	$ 11,671.00
			SUB TOTAL		18,718.25
		35%	- DISCOUNT		6,551.39
		0%	+ SALES TAX		0.00
			DISCOUNTED TOTAL		**$12,166.86**

Consolidated Oil Well Services, LLC

GENERAL:

Consolidated Oil Well Services LLC is committed to providing our customers with the best possible services and products that we can. To that goal we have outlined some guidelines that we will follow.

1. All applicable Federal and State guidelines will be followed while this well is being worked on.

2. Correspondence may be conducted through any of our field supervisors or any location or through the office located in Gillette, WY. The address is 2602 E 2nd Street and the phone number is 307-686-4914. Fax # is 307-686-4917 or you can E-mail: rboyce@cows.bz

3. All work will be performed with the approval of the customer or a designated representative and cost estimates will be furnished on request.

4. No fresh water shall be used from ponds, stock tanks, existing water wells, or natural waters (streams & rivers) except as instructed by the customer with the permission of the landowner and surface lessee(s).

5. Every effort will be made to keep trash cleaned up, traffic and road damage to a minimum and to run a clean operation.

6. Livestock on the property are to be protected at all times.

7. Drugs and alcohol are strictly prohibited.

8. Smoking is not allowed on location except in designated areas.

9. All well information is to be kept confidential.

10. Material Safety Data Sheets (MSDS) for all chemicals are maintained in our office and are available on request.

11. Any speed limits or road restrictions will be strictly adhered to.

TERMS

In consideration of the prices to be charged for Consolidated Oil Well Services, LLC (COWS) services, equipment and products and for the performance of services and supplying of materials, Customer agrees to the following terms and conditions.

Terms. Cash in advance unless satisfactory credit is established. On credit sales, invoices are payable within 30 days of the invoice date. On all invoices not paid within 30 days, Customer agrees to pay COWS interest at the rate of 18% per annum or the maximum rate allowed by law, whichever is higher. In the event COWS retains an attorney to pursue collection of any account, Customer agrees to pay all collection costs and attorney's fees incurred by COWS.

Any applicable federal, state or local sales, use, occupation, consumer's or emergency taxes shall be added to the quoted price. A sales tax reimbursement of 2% is applied to chemical and product charges for all services performed on oil and gas wells in the State of Texas. All process license fees required to be paid to others will be added to the scheduled prices.

All COWS' prices are subject to change without notice.

SERVICE CONDITIONS

Customer warrants that the well is in proper condition to receive the services, equipment, products and materials to be supplied by COWS. The Customer shall at all time have complete care, custody, and control of the well, the drilling and production equipment at the well, and the premises about the well. A responsible representative of the Customer shall be present to specify depths, pressures, or materials used for any service which is to be performed.

(a) COWS shall not be responsible for any claim, cause of action or demand (hereinafter referred to as a 'claim') for damage to property, or injury to or death of employees and representatives, of Customer or the well owner (if different from Customer), unless such damage, injury or death is caused by the willful misconduct or gross negligence of COWS, including but not limited to sub-surface damage and surface damage arising from sub-surface damage.

(b) Unless a claim is the result of the sole willful misconduct or gross negligence of COWS, Customer shall be responsible for and indemnify and hold COWS harmless from any claim for: (1) reservoir loss or damage, or property damage resulting from sub-surface pressure, losing control of the well and/or a well blowout; (2) damages as a result of a subsurface trespass, or an action in the nature thereof, arising from a service operation performed by COWS; (3) injury to or death of persons, other than employees of COWS, or damage to property (including, but not limited to, injury to the well), or any damages whatsoever, irrespective of cause, growing out of or in any way connected with the use of radioactive material in the well hole; and (4) well damage or reservoir damage caused by (i) loss of circulation, cement invasion, cement misplacement, pumping cement or cement plugs on wells with loss of circulation, including the failure to displace plug to proper depth, (ii) sub-surface pressure and resulting failure to complete pumping of cement or cement plug, including dehydration of cement slurry or flashing, plugged float shoe, annulus bridging or plugging, or (iii) down hole tools being lost or left in the well, or becoming stuck in the well for any reason and by any cause. COWS may furnish down hole tools and may supply supervision for the running and placement of such tools but will not be liable for any damage, loss or result caused by the use of such tools. Furthermore, Customer will be responsible for the cost to replace such tools if they are lost or left in the well.

(c) COWS makes no guarantee of the effectiveness of any COWS' products, supplies or materials, or the results of any COWS' treatment or services.

(d) Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, COWS is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by COWS. COWS' personnel will use their best efforts in gathering such information and their best judgment in interpreting it, but Customer agrees that COWS shall not be responsible for any damage arising from the use of such information except where due to COWS' gross negligence or willful misconduct in the preparation or furnishing of it.

(e) COWS may buy and re-sell to Customer down hole equipment, including but not limited to float equipment, DV tools, port collars, type A & B packers, and Customer agrees that COWS is not an agent or dealer for the companies who manufacture such items, and further agrees that Customer shall be solely responsible for and indemnify COWS against any claim with regard to the effectiveness, malfunction of, or functionality of such items.

WARRANTIES - LIMITATION OF LIABILITY

COWS warrants title to the products, supplies and materials, and that the same are free from defects in workmanship and materials. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, NOR ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. COWS's liability and Customer's exclusive remedy in any claim (whether in contract, tort, breach of warranty or otherwise,) arising out of the sale or use of any COWS' products, supplies, materials or services is expressly limited to the replacement of such products, supplies, materials or services or their return to COWS or, at COWS' option, an allowance to Customer of credit for the cost of such items.

Customer waives and releases all claims against COWS for any special, incidental, indirect, consequential or punitive damages.

Weatherford®
Completion Systems

1804 Operating

P&A Bid

Date: **April 4th, 2015**

Well Name or Project Area: **Rocky Mountain Region**

Service Center Location: **Williston, ND;**

Quoted By: **Pelima Ingka, Sales Manager, Denver, CO**

Weatherford

1804 Operating P&A Bid

Prepared For:		Prepared By:			
Contact		Contact	Pelima Ingka	Reference	
Company	Welter Consulting	Division	Weatherford Completions	Date	4.4.16
Phone		Phone	720.946.2541	Location	
		Cell	303.653.6369	Well Name	
Email		Email	pelima.ingka@weatherford.com	Service Center	Williston

NOTES

This quote is based on data provided by the customer. Should dimensions, wellbore conditions, market, or treatment parameters change, equipment and bid modifications may be required.

TUBULAR

	Size	Weight	Grade	Thread	Depth	Other
Casing	7.00	26#	J55			

ITEM	Part Number	DESCRIPTION	SIZE	QTY	PRICE	EXTENDED PRICE
PURCHASED EQUIPMENT						
1	**154360**	**Sale of 7" Cement Retainer**	7"	1	$676	$676
					EQUIPMENT SUBTOTAL	**$676.00**
RENTAL EQUIPMENT						
1		Rental of Mechanical Setting Tool for CICR	7"	1	included	included
2	R013-01	Cement Manifold		1	$495	$495
3		2-7/8" Tubing Swivel (Per Month)	2-7/8"	1	$50	$50
					RENTAL EQUIPMENT SUBTOTAL	**$545**
SERVICES						
1	1	Tool operator service charge: daylight rig			$800	$800
2		Service Vehicle To and From Location (per mile)			$1.50	$1.50
3		4 gas monitor			$10.00	$10

TERMS: NET 30 DAYS

Prices listed are in USD $. Valid for 90 days from date of quote. Taxes, duties, tariffs and other incidental charges are not included in pricing.
Part and product numbers may change without notice. Subject to Weatherford's Terms and Conditions a copy can be found at www.weatherford.com/t&c.

Quotation

Date created:
Quote expires:

ACCEPTANCE OF QUOTATION

THE TERMS AND CONDITIONS REFERENCED BELOW INCLUDE DISCLAIMERS OF WARRANTIES AND LIMITATIONS ON REMEDIES AND CONTAIN RELEASE AND INDEMNITY PROVISIONS WHICH ABSOLVE WEATHERFORD FROM THE CONSEQUENCES OF ITS OWN FAULT OR NEGLIGENCE, INCLUDING, IN SOME CIRCUMSTANCES, ITS OWN GROSS NEGLIGENCE. PLEASE READ THEM CAREFULLY.

The goods, services, and/or rental equipment (collectively "Work") specified in this Quotation will be sold and provided to Customer by the Weatherford company or affiliate described above ("Weatherford") subject to and in accordance with the terms and conditions of the most current applicable master services, supply, rental or other agreement between Weatherford and Customer ("Master Agreement") covering the Work, if any. If no Master Agreement exists or applies to the Work, the Work will be sold and provided subject to and in accordance with Weatherford's standard Terms and Conditions of Sale, Service and Rental, a copy of which is available at **WWW.WEATHERFORD.COM/T&C** ("Terms and Conditions"). Those Terms and Conditions are incorporated in this Quotation by reference for any and all purposes as fully as though set forth *verbatim*. No other, additional or different terms and conditions in any written or oral communication with respect to the Work covered by this Quotation (including, but not limited to, the terms and conditions in any Customer request for proposal request for quote, request for bid, purchase order or similar document) shall vary or amend the Terms and Conditions (and to the extent of their inconsistency with the Terms and Conditions, Weatherford hereby objects thereto). Customer acknowledges that (a) Weatherford may revise and post updates to the Terms and Conditions from time-to-time, and (b) any future Quotations and Acceptance of Quotations will be subject to the most recently posted version of the Terms and Conditions.

This Quotation is not valid for and Weatherford will not engage in shipments, sales, re-sales or rental of Weatherford products to Cuba, Iran, North Korea, Sudan, or Syria, or to any denied or restricted party, or for any prohibited end-use. Upon request, Customer will disclose to Weatherford the ultimate end-user(s), end-destination and end-use of any requested product. For additional requirements, please refer to the Laws and Regulations section of the Terms and Conditions.

BY SIGNING BELOW, CUSTOMER ACCEPTS THE PRICING AND OTHER PROVISIONS OF THIS QUOTATION AND ALL OF THE TERMS AND CONDITIONS. THE PERSON SIGNING THIS ACCEPTANCE OF QUOTATION REPRESENTS THAT HE OR SHE HAS THE AUTHORITY TO BIND CUSTOMER. BY ACCEPTING GOODS, SERVICES AND/OR RENTAL EQUIPMENT FROM WEATHERFORD, CUSTOMER VOLUNTARILY ELECTS TO BE BOUND BY ALL OF THE TERMS AND CONDITIONS.

ACCEPTANCE OF QUOTATION:

By: _____

Printed name: _____

Title: _____

Date signed: _____

DAYLIGHT RIG RATE FOR WELTERS CONSULTING

EFFECTIVE APRIL 1st, 2016

TERMS – NET 30 DAYS

Contractor Name: Sun Well Service, Inc.

Contractor Agreement Number: SWS Rigs

Contractor Physical Address: 118 84th Street West
Williston, ND 58801

Contractor Remittance Address: Sun Well Service, Inc.
PO Box 847729
Dallas, TX 75284-7729

Point of Contact: Dean Arnson, Sales Manager
Phone: 701-774-3001
Cell: 701-770-6527
Fax: 701-774-0774
Email: dean@sunwellservice.com

RIG LOCATIONS

Williston, ND
Sidney, MT
Dickinson, ND
Kenmare, ND

Approval Signature: _____ Date: _____

Title:_____

Approval Signature: _____ Date: _____

Title:_____

RIGS

Rig rates include a four (4) man crew. Tubing and rod tongs as well as normal equipment to handle swabbing and rod fishing operations are included.

Sun Well Service currently has in its fleet 36 rigs:

- 300, 400, 500, 600 Series rigs
- Powered by 475-550 HP Engines
- Derrick capacities of 200,000# to 300,000#
- Double drum draw works w/Disc assist
- Equipped to handle ¾" – 1" rods
- Fishing tools for all rod sizes
- Tubing equipment for 2 3/8" and 2 7/8" with square shoulder elevators

Support Equipment includes the following:

- Mud pumps and tanks
- Swivels
- Pipe Wranglers
- Light Towers
- Loaders
- Heaters

RIGS	Unit of Measure	Price		
Rig Rate (Daylights) – WITH 4 MAN CREW INCLUDED	Per Hour	$400.00		
Crew Travel-WITH 4 MAN CREW INCLUDED	Per Hour	$250.00		
Flow testing rate ***2 man crew minimum*	Per Hour	$280.00		
Rig Standby		At current rate		
6 Hr. minimum per day per crew	Per HR/Per Crew	$400.00		
Extreme cold weather start up when requested		At current rate		
Rig and pump engine running over night	Per Night	$300.00		
Special operation		Call for quotes and rates		
Cleaning well bore fluids from rigs, and equipment: labor plus 3rd party wash cost.				

All Auxiliary Equipment has been discounted 50% off of the Standard published rates				
AUXILIARY EQUIPMENT				
Power Swivels:				
Power Swivel 1.5	Per Day/12 HR	$225.00		
Standby Rate	Per Day/12HR	$125.00		
Bowen S-2.5 85 ton – trailer mounted *When used with the rig plus fuel charges*	Per Day/12 HR	$425.00		
When rented separately from rig *(Excluding Operator and fuel)**	Per Day/12 HR	$800.00		
Standby rate	Per Day/12 HR	$300.00		
Bowen 3.5 Ton – trailer mounted				
When used with the rig plus fuel	Per day/12 HR	$425.00		
When rented separately from rig * (Excluding Operator and fuel)**	Per Day/12 HR	$800.00		
Standby rate	Per Day/12 HR	$300.00		
Customers will be billed for excessive use and repairs caused from dry drilling with swivels				
Blow Out Preventers	Per Day	$250.00		
5,000# Double Ram with hydraulic closing unit & TIW valve	3 day minimum	$750.00		
5,000 # Single Ram with hydraulic closing unit	3 day minimum	$125.00		
Customer will be charged for stump testing and necessary repairs to BOP's and Accumulators.				
Pumps and Tanks :				
Skid Mounted TEE – 165 Triplex Pump with 100 barrel Mud tank with steel hard line plus fuel charge				
**** When rented with the rig**	Per Day/12HR	$425.00		
When rented separately from rig excluding Operator and fuel.	Per Day/12 HR	$800.00		
Skid Mounted 340 HP National Triplex & KT 250 Triplex (With 100 barrel mud tank with steel hard line plus fuel charge)				
***When rented with the rig**	Per Day/12 HR	$425.00		
When rented separately from rig excluding Operator and fuel.	Per Day/12 HR	$800.00		
Pump & Tank standby rate	Per Day / 12 HR	$250.00		
Pump & Tank - 5x8 Triplex	Per Day /12 HR	$425.00		
When rented separately from rig	Per Day /12 HR	$800.00		
Standby Rate	Per Day /12 HR	$250.00		

Pump & Tank - 7 x 8.5 800 Hp Triplex	Per Day /12 HR	$425.00		
When rented separately from rig	Per Day /12 HR	$800.00		
Standby Rate		$250.00		
Customers will be billed for expendables and excessive use repairs to mud pump.				
Mud Tanks				
200 BBL Capacity w/ Shaker	Per Day /12HR	$200.00		
300 BBL Capacity w/ Shaker	Per Day /12HR	$225.00		
Trucking for Pump and Tank		At Cost		
Catch Tank	Per Day /12HR	$50.00		
Shaker Screens	Each	Cost + 10%		
Cleaning and disposal of well bore fluids				
All fluids and solids will be removed from tanks on location		Cost**		
Pipe Wranglers:	Per Day	$425.00		
When rented separately from rig	Per Day	$800.00		
Standby Rate	Per Day	$250.00		
Light Plants & Generators				
Derrick Lights (when used)	Per Day	$55.00		
250KW-475KW Generator **(Less Fuel)	Per Day	$150.00		
Standby	Per Day	$75.00		
8KW Generator **(Less Fuel)	Per Day	$50.00		
Light Tower **(Less Fuel)	Per Day	$60.00		
Flame Less Heaters *(less fuel)** ***w/ 8ft or 16ft Hoses***	Per Day/24HR	$450.00		
Diesel Fuel for all Sun Well auxiliary equipment & third-party equipment will be invoiced to the customer (fuel market pricing is obtained from government website using previous monthly data: www.eia.gov/petroleum/gasdiesel	**Per Gallon**	**Market Price + $ .75**		
RIG PERSONNEL				
Additional crewman (when requested)	Per Hr	$55.00		
(4th man is included in Rig Rate)				
Tool Pusher / 2 HR Per Day / Per Rig	Per Hr	$70.00		
Tool Pusher / "Full time"/ Per Rig	Per Day	$425.00		
Tour Tool Pusher (24hour)	Per Day	$700.00		

Subsistence Pay/Per Man	Per Day/Man	$100.00		
Rotational Charges (Per Man – Per Day)	Per Day/Man	$100.00		
Wet Pay/Per Man, paid to those who get wet	Per Day/Man	$50.00		
Sunday / holiday / Per Man	Per Hour/Man	$50.00		
Tero Labor, in addition to 4th man	Per Day	$80.00		
OTHER				
Sand line charge	Per Day	$175.00		
4 ½" Swab Mandrel	Per Day	$100.00		
100ft – 2" high psi swab line w/4 swings	Per Day	$50.00		
80 ft. High PSI Kelly Hose	Per Day	$175.00		
Corrosive swabbing, sand line drilling	Per Day	$210.00		
Sale of cut sand line* **	Per Foot	At cost		
Sale of sand line chemical	Gallon	$35.00		
Sand line depth-o-meter	Per Day	$50.00		
Frac ball catcher	Per Day	$40.00		
Paraffin knife	Per Day	$25.00		
Swaging/Jarring	Per Hour	$45.00		
Rod fishing tools (O'Bannon)	Per Trip	$60.00		
Pipe Dope	Per ½ Bucket	$60.00		
Rod back off tool	Per Job	$50.00		
Plus Repairs	When Used	At Cost		
1-1/8" – fiber flex rod equipment	Per Day	$125.00		
Tong dies	Per round trip	$25.00		
Rod tong dies	Per round trip	$25.00		
Slip dies	Per round trip	$25.00		
Hot shot charges	Per Hour	$140.00		
Fifth wheel trailer	Per Day	$75.00		
Containment Trailer w/ Drip pans	Per Day	$75.00		
Catwalk	5 day min	$300.00		
	Per Day after	$50.00		
Pipe Racks (Per Set)	Per Day	$25.00		
H2S monitors, 1-30 minute rescue pack with rig	Per Day	$30.00		
Larkin flange	Per Day	$25.00		
Rubber goods	Each	List Price		
Damages beyond normal wear	Each	List +10%		
Permits	Each	Cost +10%		
New fees or charges for TERO permits may be charged as needed	Each	At Cost		
Base beam	Per Day	$50.00		
Guided Base Beam	Per Day	$150.00		
3 ½" - 4 ½" tubing elevators	Per Day	$125.00		
3 ½" - 4 ½" slip and tong dies	Per Day	$75.00		
Slip Type Elevators (if available)				
LYT	Per Day	$200.00		
MYT	Per Day	$200.00		

YT	Per Day	$150.00		
YC	Per Day	$200.00		
Bottle Neck Elevators				
2 -7/8”	Per Day	$125.00		
3-1/2”	Per Day	$175.00		
Washington stripper head	5 Day Min.	$125.00		
	Per Day After	$25.00		
Washington stripper rubber	Each	$495.00		
Casing tongs 4 ½” - 5 ½ “	Trip in	$1250.00		
	Trip out	$1250.00		
Wheel Loader	Per Day	$100.00		
Crew Quarters w/ 85 Kw Generator	Per Day	$100.00		

General Terms and Conditions

An additional charge of $80.00 per hour per employee will be charged for all work performed on the following days: New Year's Day, Memorial Day, July 4th, Easter, Labor Day, Thanksgiving Holiday, Christmas Holiday (2 days, Christmas Eve and Christmas Day) and Sundays. **(Applies to Daylight Rigs only- with the exception if the daylight rig is operating on a 7 day a week schedule- if so, the aforementioned would not apply.)**

Charges for other special equipment provided upon your request.

Standby of 6Hr min will be charged 6hr of rig rate

Sun Well Service will not be liable for damages caused by 3rd parties, even if the use of Sun Well Services equipment or personnel is involved.

Customer will be responsible for the lease roads and the location to ensure safe driving conditions and proper rig-up procedures and adequate equipment (i.e. Anchors, appropriate rig pad) installed properly, prior to spotting the rig and rigging up to support the rig to perform work for the Customer.

With proper operation procedures customer will be held responsible for damages to Sun Well Service equipment exclusive of normal wear and tear (i.e. abrasive sand resulting in valve damage and swedge damage). Customer will be held responsible for the first hour of maintenance and repairs.

Cleaning oil spillage from the rig equipment following job will be charged to the customer, if required. Cleaning of the rig after stripping well or swabbing or flowing well etc. will be charged at regular rate plus a disposal fee.

Customer will be held responsible for all tools or line left in the well due to conditions beyond Sun Well Service control.
Sun Well Service shall not be held responsible for surface equipment and well bore damage (ex. Rods, tubing, and casing and loss of sand line.)

The customer will provide or reimburse the cost of any specialized safety/health equipment as required by Customers Company.

**Cost to clean tanks and equipment not cleaned on location will be billed back to customer with labor to dispose fluids and solids properly.

***Loss of sand line in the hole due to all well bore conditions will be billed to customer.

For the safety of Sun Well Service and 3rd party employees and equipment, rods will be laid down prior to swaging or jarring.

Sun Well Service Inc. strives to provide a safe working environment and quality job performance. All SWS employees are provided with personal protective equipment (PPE) to enhance their job performance and safety.

R. NECESSARY RESOURCES

1804 Operating will submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug and abandon the well are available in the final draft of the application.

S. AQUIFER EXEMPTIONS

1804 Operating has identified an Inyan Kara source well named the BEAR CREEK UNIT WATERFLOOD SWS 1 approximately twelve miles from the proposed RED SWD 1 disposal well site. A review of the well file revealed an analysis that was reportedly run on a water sample taken from the well on or near the date of 10/12/1992. The analysis is included with this application as Attachment S1 and details Total Dissolved Solids (TDS) of 7,231 ppm.

1804 Operating believes an aquifer exemption may be required for this location but the measured distance to the source of this water analysis does not support nor dismiss the need for this requirement. Therefore, 1804 Operating wishes to proceed with the permit application contingent on the need to sample and analyze the water from the well and receiving full EPA authorization prior to proceeding with an injection or a stimulation program.

Analysis of Nearest Inyan Kara Source Well – Attachment S1

RED SWD 1 - FBIR Water Systems, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM SERVICE LABORATORY

4102 2nd Ave. West
Williston, North Dakota 58801
P. O. Box 972
Phone 701-572-7356

NOV 1992

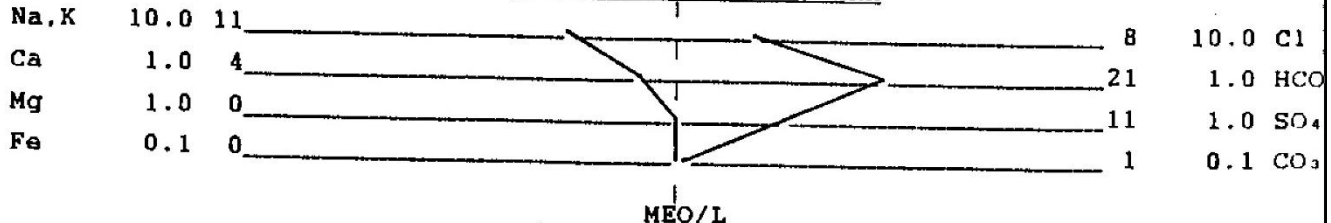
WATER ANALYSIS REPORT

SAMPLE NUMBER W-92-3438 DATE OF ANALYSIS 10-14-92
COMPANY Mesa Limited Partnership
CITY Killdeer STATE ND
WELL NAME AND/OR NUMBER
DATE RECEIVED 10-12-92 DST NUMBER
SAMPLE SOURCE Last Run
LOCATION OF SEC. TWN. RANGE COUNTY
FORMATION Dakota DEPTH
DISTRIBUTION Wally & Fred - Killdeer, ND
W.R. McElya-Amarillo / R. Nutt-Irving

RESISTIVITY @ 77°F = 0.875 Ohm-Meters pH = 8.33
SPECIFIC GRAVITY @ 77°F = 1.000 H_2S = Neg
TOTAL DISSOLVED SOLIDS (CALCULATED) = 7231 mg/L (7231 ppm)
SODIUM CHLORIDE (CALCULATED) = 4688 mg/L (4688 ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	4.4	87	CHLORIDE	80.2	2843
MAGNESIUM	0.4	4	CARBONATE	0.1	3
SODIUM	105.7	2430	BICARBONATE	20.6	1257
IRON	0.0	0.4	SULFATE	11.3	542
CHROMIUM	0.0	0.0	NITRATE	0.1	4
BARIUM	0.0	0.0			
POTASSIUM	1.5	60			

WATER ANALYSIS PATTERN



REMARKS Date Sampled 10-8-92 @ 6:30 PM

Analysis of Nearest Inyan Kara Source Well – Attachment S1 (Cont.)

RED SWD 1 - FBIR Water Systems, LLC
SESE Section 15-148-94
McGregory Buttes Field - Dunn County, ND

ASTRO-CHEM SERVICE LABORATORY

4102 2nd Ave. West — Williston, North Dakota 58801 — Phone 701-572-7355

P. O. Box 972

	KSP	Sat. Index	mg/L PPT
BaSO4	0.0000000018	1.024	0.00
SrSO4	0.0000036623	0.912	0.00
CaSO4	0.0004575811	1.508	0.00
CaCO3	0.0000000387	1.352	217.05

Ionic Strength = 0.120 (Molal) 0.120 (Molar)
Index Calculated at 70.0 degrees F and 50.0 PSI

10-8-92 @ 6:30 PM (New F/W Well)
W-92-3438

	KSP	Sat. Index	mg/L PPT
BaSO4	0.0000000018	1.024	0.00
SrSO4	0.0000015104	0.528	0.00
CaSO4	0.0004575811	1.508	0.00
CaCO3	0.0000000010	2.921	217.25

Ionic Strength = 0.120 (Molal) 0.120 (Molar)
Index Calculated at 250.0 degrees F and 5000.0 PSI

10-8-92 @ 6:30 PM (New F/W Well)
W-92-3438

T. EXISTING EPA PERMITS (also note Biological & Cultural Resource Attachments T1and T2)

Under 40 C.F.R. Section 124.3(a)(2), which incorporates by reference the application requirements of 40 CFR Section 144.31, this application is required to provide:

A listing of all permits or construction approvals received or applied for under any of the following programs:

- **(i)**§ 144.31(e)(6)(i) Hazardous Waste Management program under RCRA.
- **(ii)**§ 144.31(e)(6)(ii) UIC program under SDWA.
- **(iii)**§ 144.31(e)(6)(iii) NPDES program under CWA.
- **(iv)**§ 144.31(e)(6)(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act.
- **(v)**§ 144.31(e)(6)(v) Nonattainment program under the Clean Air Act.
- **(vi)**§ 144.31(e)(6)(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.
- **(vii)**§ 144.31(e)(6)(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.
- **(viii)**§ 144.31(e)(6)(viii) Dredge and fill permits under section 404 of CWA.
- **(ix)**§ 144.31(e)(6)(ix) Other relevant environmental permits, including State permits.

Hazardous Waste Management: As a Class II Disposal well for brine and produced water, the proposed disposal well is NOT a treatment, storage or disposal facility (TSDF) for hazardous waste within the meaning of RCRA, and so does not need to apply for a TSDF permit. Solid waste (including filter socks or oily waste from tank bottoms or filters) is to be disposed of by contractors, currently including Clean Harbors and OWL.

UIC Permit: This is an application under the UIC program for a brine disposal well. A permit application under the North Dakota UIC program has been submitted for Case No. 21565 of the North Dakota Industrial Commission (NDIC) hearings held on December 19, 2013.

NPDES Permit Program: The installation will not have a process wastewater discharge to surface waters. Given the expected timing of development, and the fact that more than one acre will be disturbed during construction, the stormwater at the installation will be managed in accordance with EPA's 2017 Construction and Development General Permit, since that permit applies to construction in Indian country such as the Fort Berthold Indian Reservation. https://www.epa.gov/npdes/authorization-status-epas-construction-and-industrial-stormwater-programs#undefined

Stormwater discharges during the operation of the installation will be managed in accord with EPA's multi-sector general permit. *Id.* An appropriate Stormwater Pollution Prevention Plan (SWP3) will be developed in accord with that permit.

Clean Air Act Permits: North Dakota is in attainment for criteria pollutants. https://www3.epa.gov/airquality/greenbook/multipol.html

With respect to PSD and NESHAPS programs, the proposed installation, even operating at maximum capacity is believed to emit far less than the annual emissions required to trigger the application of these programs. Its equipment is powered electrically, so it does not have boiler or generator emissions.

Ocean Dumping Permits: Not applicable.

Dredge-fill permits: The proposed facility does not include jurisdictional wetlands and so does not trigger the application of section 404 of the Clean Water Act.

Attachment T1

Red SWD 1 Salt Water Disposal Well Location
Well Pad and Access Roads
BIOLOGICAL ASSESSMENT

T148N, R94W, S15 SE

Dunn County, North Dakota
July 20, 2016

Prepared for:
1804 Operating, LLC
Williston, ND

By:
David Schmoller, Yellowfield Biological Surveys, LLC

TABLE OF CONTENTS

ABSTRACT

Yellowfield Biological Surveys, LLC, investigated the natural resources of the Red SWD 1 Salt Water Disposal Truck Facility, a 6.4-acre salt water disposal well pad and access roads by 1804 Operating, LLC in Dunn County, North Dakota. The project is located in T148N-R94W-S15 SE. Existing conditions were documented and recommendations were provided to assist the Environmental Protection Agency and US Fish and Wildlife Service (FWS) to determine if the proposed activities adhered to federal management direction and the management intent of the FWS. The well pad and access roads would be constructed in upland grassland dominated by native vegetation with small thickets of shrubs and trees. The project will not intersect any wetlands or woods. It would be constructed between two recently constructed pipeline corridors. Existing development in the project vicinity includes oil/gas/saltwater wells, gas, oil, and water lines, power lines, roads, highways, and stock dams. No listed species were observed. No historic sightings of listed species are within the project or analysis area. The proposed project may have effects upon one Endangered Species, no Threatened Species, two Candidate Species, and no Designated Critical Habitat. It will not have effects upon Bald or Golden Eagles or their habitat. It will not have effects upon North Dakota Species of Concern. Using applicable design criteria, the project may affect but would not likely adversely affect individuals, and it is not expected to contribute to a trend toward elevated federal listing or loss of viability to individuals, the population, or species.

INTRODUCTION

PROPOSED ACTION

1804 Operating, LLC is proposing the Red SWD 1 Salt Water Disposal Truck Facility, a 6.4-acre salt water disposal well pad and access roads Dunn County, North Dakota. Site maps are contained in ***Appendix A.***

CURRENT MANAGEMENT DIRECTION

This biological assessment is prepared in accordance with legal requirements set forth under the Endangered Species Act, Sections 4(b)(2) (16 USC 1533) and 7 (16 USC 1536 (c)), and follows the standards established in 50 CFR Part 402-Interagency Cooperation-Endangered Species Act of 1973, as amended. Other legislation that has a bearing on this assessment include: the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.), the Bald and Golden Eagle Protection Act (16 U.S.C. 2342352352), the National Environmental Policy Act (42 U.S.C. 4321 et seq.), Executive Order 11990 "Protection of Wetlands" and Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds." Project details are contained in ***Table 1.***

The purpose of this biological assessment is to review the proposed improvements in sufficient detail to determine to what extent the improvements and the construction activities may affect threatened, endangered or candidate species or their designated critical habitat.

The entire project would occur on private surface.

THREATENED, ENDANGERED, CANDIDATE SPECIES and DESIGNATED CRITICAL HABIT ENDANGERED

ENDANGERED
Gray wolf *(Canis lupus)*
Black-footed ferret *(Mustela nigripes)*
Whooping Crane *(Grus Americana)*
Interior least tern *(Sterna antillarum)*
Pallid sturgeon *(Scaphirhynchus albus)*
THREATENED
Piping Plover *(Charadrius melodus)*
Red Knot *(Calidris canutus rufa)*
Northern Long-eared Bat *(Myotis septentrionalis)*
Dakota Skipper *(Hesperia dacotae)*
Western prairie fringed orchid *(Platanthera praeclara)*

CANDIDATE
Sprague's Pipit *(Anthus spragueii)*
DESIGNATED CRITICAL HABITAT
Piping Plover *(Charadrius melodus) – Missouri River*
NORTH DAKOTA SPECIES OF CONCERN
Flathead Chub *(Platygobio gracilis)*
Sturgeon Chub *(Macrhybopsis galida)*
Paddlefish *(Polyodon spathula)*
OTHER SPECIES
Bald Eagle *(Haliaeetus leucocephalus)*
Golden Eagle *(Aquila chrysaetos)*

PROJECT SUMMARY

Company	1804 Operating, LLC
Company contact	Tom Schumacher
Project name	Red SWD 1
Project type	Well Pad and Access Road
Legal description (with number of sections)	T148N-R94W-S15 SE
County	Dunn
USGS quadrangles	Mandaree 47102-F6-TF-024
National Wetland Inventory Maps	Mandaree 47102-F6-TF-024
Date of survey	June 23-30, 2014
Project footprint	6.4 acres
Start and end times	June 2017
Construction access	Off BIA Road 14
Staging laydown areas	Everything will be confined to the well pad
Construction equipment and techniques	Standard oil and gas well construction equipment
Permanent versus temporary impacts	Well pad and access roads are permanent; truck traffic, construction action, some disturbance effects are temporary
If temporary how long	The construction period
Is the project is growth inducing	A result of other oil and gas projects, not growth inducing
Is the project is part of a larger plan or project	Isolated service industry project
Are other projects are interrelated or interdependent	No

METHODS

RESEARCH AND CONSULTATION

These references were reviewed: **(1)** US Fish and Wildlife Service (FWS) list of threatened and endangered species that could occur in North Dakota (FWS 2008). **(2)** FWS list of threatened and endangered species and designated critical habitat that could occur within the project area. The FWS Information, Planning, and Conservation System (IPAC) Species List is presented in ***Appendix D***. **(3)** The North Dakota Parks and Recreation Department (NDPR) was consulted requesting historic and potential occurrences of listed species in the analysis area, including raptor nests and raptor species. The NDPR did not reply by the time this report was composed. Information is normally displayed in ***Appendix C***. **(4)** Recovery plans, status surveys, and species descriptions for the listed species.

Other information was obtained from scientific journals, natural resource management organization websites, FWS National Wetlands Inventory (NWI) Data, US Geological Survey topographic maps, and aerial photographs. Personal knowledge of the region was considered.

Prior to the field work, wildlife characteristics and their habitats were studied to aid in field recognition.

AREA SURVEYED

The *analysis area* includes the 6.4-acre well pad and access roads and territory within a one-mile radius of the waterline corridor. Total area included in the analysis area amounted to 2,365 acres. The most intensive surveys occurred within the project area and the adjacent wetland and prairie dog town. The area was field surveyed on July 11, 2016 by David Schmoller and James Nauertz.

FIELD INSPECTION

Field surveys were conducted in the analysis area to determine the presence or absence of listed species and habitat and to evaluate habitat suitability. Surveys were conducted on foot. Survey stations, or *observation points*, were located at accessible points along the proposed waterline and at locations with habitat that indicated a higher probability of containing listed birds, mammals, or fish. Survey intensity was intuitive meander. Observations were aided by binocular, spotting scope, and 60-power digital camera. Aerial photographs and historical records were used to guide the survey track. Audio recordings of bird sounds were recorded on a Tascam DR40.

Other features were assessed within the project area, such as transportation, utility, oilfield, and agricultural developments. These observations were aided by aerial photographs.

Global Positioning System equipment (Garmin 60CSx) was used to record site and feature locations. A photographic record of the site was created.

DETERMINATIONS

A Biological Assessment was conducted on the analysis area. By research and field inspection, this: **(1)** evaluates the potential direct and cumulative effects of the action on: (a) endangered species, (b) threatened species, (c) candidate threatened or endangered species, and (d) designated and proposed critical habitat; **(2)** determines whether any such species or habitat are likely to be adversely affected by the action; **(3)** is used in determining whether formal consultation or conference with the FWS is necessary.

There are three potential categories of effects for a project:

1. **No effect:** There are absolutely no effects from the proposed action, positive or negative, to listed species. A "no effect" determination does not include effects that are *insignificant* (small in size), *discountable* (extremely unlikely to occur), or *beneficial*.
2. **May affect, not likely to adversely affect:** Where all effects are beneficial, insignificant or discountable. *Beneficial* effects have contemporaneous positive effects without any adverse effects to the species or habitat (i.e., there cannot be a "balancing," where the benefits of the proposed action would be expected to outweigh the adverse effects). *Insignificant* effects relate to the size of the effects and should not reach the scale where take occurs. *Discountable* effects are those that are extremely unlikely to occur. This conclusion is usually reached through the informal consultation process, and written concurrence from the Service exempts the proposed action from formal consultation.
3. **May affect, is likely to adversely affect:** All adverse effects cannot be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect" even if the net effect is neutral or positive. Section 7 of the Endangered Species Act requires that the federal action agency request initiation of formal consultation with the Service when a "may affect, likely to adversely affect" determination is made.

A summary of determinations is found in ***Table 5***.

A revised Biological Assessment would be necessary should the following conditions develop subsequent to the filing of this Biological Assessment:

1. Additional information reveals action that may affect threatened, endangered, or candidate species or designated critical habitat.
2. The proposed project is modified and the modifications may affect threatened, endangered, or candidate species or designated critical habitat.
3. The FWS lists a new species or habitat that may be affected by the proposed project.

ACTION AREA

WELL PAD AND ACCESS ROADS

The proposed well pad and two access roads would occupy a total of 6.4 acres. The access road exits the north side of BIA Road 14, heads to the west and continues 685 feet to the well pad. The well pad itself would occupy 4.6 acres. The access road exits the well pad and continues to the west for 635 feet, rejoining BIA Road 14. Details are contained in ***Appendix A***.

GEOGRAPHY AND GEOLOGY

The survey area is within the Missouri Slope Uplands. Surface geology in the project area is the Glaciated Missouri Plateau Section of the Great Plains Province. Along waterways in floodplains and terraces is the more recent Holocene erosional debris belonging to the *Oahe Formation*. The eastern two-thirds of Dunn County is characterized by glacial drift of the Pliestocene *Coleharbor Group*; a generally thin veneer of igneous and metamorphic Precambrian to Paleozoic glacial erratics, deposited during the Pleistocene *Wisconsinan glacial event*. Most of the glacial till has been removed by erosion. Where the glacial drift is absent, Paleocene deposits are exposed. These include the kaolnitic sandstone, siltstone, mudstone, and claystone of the *Golden Valley* formation. Where this has been eroded, the interbedded sand, silt, mudstone, carbonaceous shale, and lignite of the *Sentinel Butte* formation is exposed. This formation is at the surface in about 75% of Dunn County. Several thick lignite beds are in this formation. The caprock of the Killdeer Mountains is the Miocene and Oligocene *Arikaree Formation*. Where this formation is absent, there are occasional exposures of Eocene *Chadron Formation*.

The survey area occurs within the Moccasin Creek watershed. It is 4.5 miles to the north of the Little Missouri River. In the breaks, the geomorphology has an undulating, rugged aspect with buttes, steep-sided canyons, and badland outcrops. Landslides, slumps, and mass wasting are common. Upslope from the breaks the landscape levels off, is less severe in aspect, and has a thicker mantle of glacial veneer. Much of the county is dominated by proglacial meltwater channels. Other geologic features include clinker, or porcelainite, beds, lignite veins, Knife River flint, fossils, petrified wood, and sandstone concretions, relicts of ancient river channels.

VEGETATION

The analysis area lies within two Ecoregions: The Missouri River Breaks and the Missouri Plateau. This project is located within the mixed-grass prairie province. Prior to settlement, the analysis area was dominated by native mixed-grass prairie in the uplands, wooded draws in the breaks along the Little Missouri River and smaller waterways, and floodplain forest and willow thickets on the flats along the Little Missouri River.

The current landscape condition is similar to the historical landscape condition. Within the project area, the terrain is largely native upland grassland with some patches of shrubs and small trees. There are disturbances on the edges of the project area, within recently constructed pipeline corridor and the right-of-way along BIA Road 14. Within the analysis area, the terrain is largely native, with the exception of the BIA roads and the numerous gas and oil developments.

DISTURBED SITES: The disturbances within the analysis and project areas are road corridors, pipeline corridors, and well pads. These areas are dominated by reclamation species such as crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and yellow sweetclover (*Melilotus officinale*). Invasives such as Canada thistle (*Cirsium arvense*), foxtail barley (*Hordeum jubatum*), and sow thistle (*Sonchus arvensis*) have become established ***(Figure 1)***. Within the analysis area, there are 9 well pads measuring a total of 45.53 acres with 1.8 miles of access road. There are 4.5 miles of ranch road and 3.3 miles of BIA Road. There are 8.4 miles of pipeline, 6.0 miles of utility line, and one electrical substation measuring 1.7 acres. There are two farmsteads measuring 6.4 acres. Of the 2,365-acre analysis area, 217.8 acres, or 9%, were disturbed.

NATIVE VEGETATION: These six native plant community types were in the analysis area (Faber-Langendoen, 2001):

1. ***Stipa comata - Bouteloua gracilis - Carex filifolia*** **Herbaceous Vegetation.** This is the dominant habitat type within the analysis and project areas. It occupies table land and well-drained uplands. It is dominated by green needlegrass (*Stipa viridula*), needle-and-thread (*Stipa comata*), and western snowberry (*Symphoricarpos occidentalis*) ***(Figure 2)***.
2. ***Schizachyrium scoparium - Bouteloua curtipendula - Hesperostipa spartea*** **- (*Pascopyrum smithii*) Herbaceous Vegetation.** These occur on steeper gradients below crests and plains. It is dominated by little bluestem (*Andropogon scoparius*), creeping juniper (*Juniperus horizontalis*), and prairie sandreed (*Calamovilfa longifolia*). There was a small, 580 ft² patch of this habitat within the project area ***(Figure 3)***. More of this habitat was located in the hills to the north of the prairie dog town,
3. **Great Plains Badlands Sparse Vegetation Complex.** This was limited to a small badland outcrop on the northern border of the analysis area ***(Figure 4)***. This was an outcrop of the *Bear Den Member* of the *Golden Valley Formation* and underlying *Sentinel Butte Formation.*
4. ***Fraxinus pennsylvanica - Ulmus americana / Prunus virginiana*** **Woodland.** Often called "wooded draws," these are dominated by green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*) with Kentucky bluegrass bottoms (*Poa pratensis*) and Sprengel's sedge (*Carex sprengelii*). Almost all of this habitat was located in the northern quarter of the analysis area, generally over 0.5 mile from the project area ***(Figure 5)***.
5. ***Shepherdia argentea Shrubland.*** There were small patches of shrubs and trees within the project area that correspond to this habitat type ***(Figure 6)***. These were dominated by choke cherry (*Prunus virginiana*) and buffaloberry (*Shepherdia argentea*).
6. **Prairie Wetlands.** Wet swales, intermittent creek bottoms, seasonal ponds, or stock dams containing hydrophytic species. This habitat occurred within the wetland complex to the northeast of the project area ***(Figure 7)***. There are 40 NWI wetlands within the analysis area. Wetlands were not identified by a formal wetland determination.
7. **Blacktailed Prairie Dog Town Grassland Complex.** This is the dominant habitat in the prairie dog town to the northwest of the project area ***(Figure 8)***.

WILDLIFE

Birds were the primary wildlife encountered during the surveys. These included: Upland Sandpiper, Western Meadowlark, Brewer's Blackbird, Rock Dove, Killdeer, Wilson's Phalarope, and Swainson's Hawk. Mammals included jackrabbit and prairie dog. A herd of horses was in the analysis area. See ***Figure 9***.

Figure 1. Invasives within pipeline corridor between project area and BIA Road 14. Foxtail barley dominates this view. View is to NW.

Figure 2. *Stipa comata - Bouteloua gracilis - Carex filifolia* Herbaceous Vegetation. These needlegrass uplands dominate the project area. View is from western edge of proposed well pad, looking NW. Pink stake marks project disturbance boundary.

Figure 3. *Schizachyrium scoparium - Bouteloua curtipendula - Hesperostipa spartea* - (*Pascopyrum smithii*) Herbaceous Vegetation. The only representative of this habitat within the project are is this small 580 ft² patch.

Figure 4. Small outcrop of Great Plains Badlands Sparse Vegetation Complex on northern border of analysis area. The orange layer is the *Bear Den Member* of the *Golden Valley Formation*, the underlying grey strata is the *Sentinel Butte Formation*.

Figure 5. *Fraxinus pennsylvanica - Ulmus americana / Prunus virginiana* Woodland. Some patches of shrubs are in foreground, mostly buffaloberry and choke cherry. View is to NW. Most of the wooded draws are scattered across the hills to the north of the project area.

Figure 6. *Shepherdia argentea* Shrubland. Patches of shrubs and trees within the project area that contain buffaloberry and chokecherry. View is from proposed well pad, to the SE.

***Figure 7*.** Prairie wetland. This is the wetland between the project area and the prairie dog town. The western end of this wetland, where this photograph was taken, is a NWI wetland. It is classed as a Freshwater Emergent Wetland, PEMC, 0.45 acres in size. View is to the N. Prairie dog town is visible in background.

Figure 8. Blacktailed Prairie Dog Town Grassland Complex. This town is 81.2 acres. View is from proposed well pad, to the N.

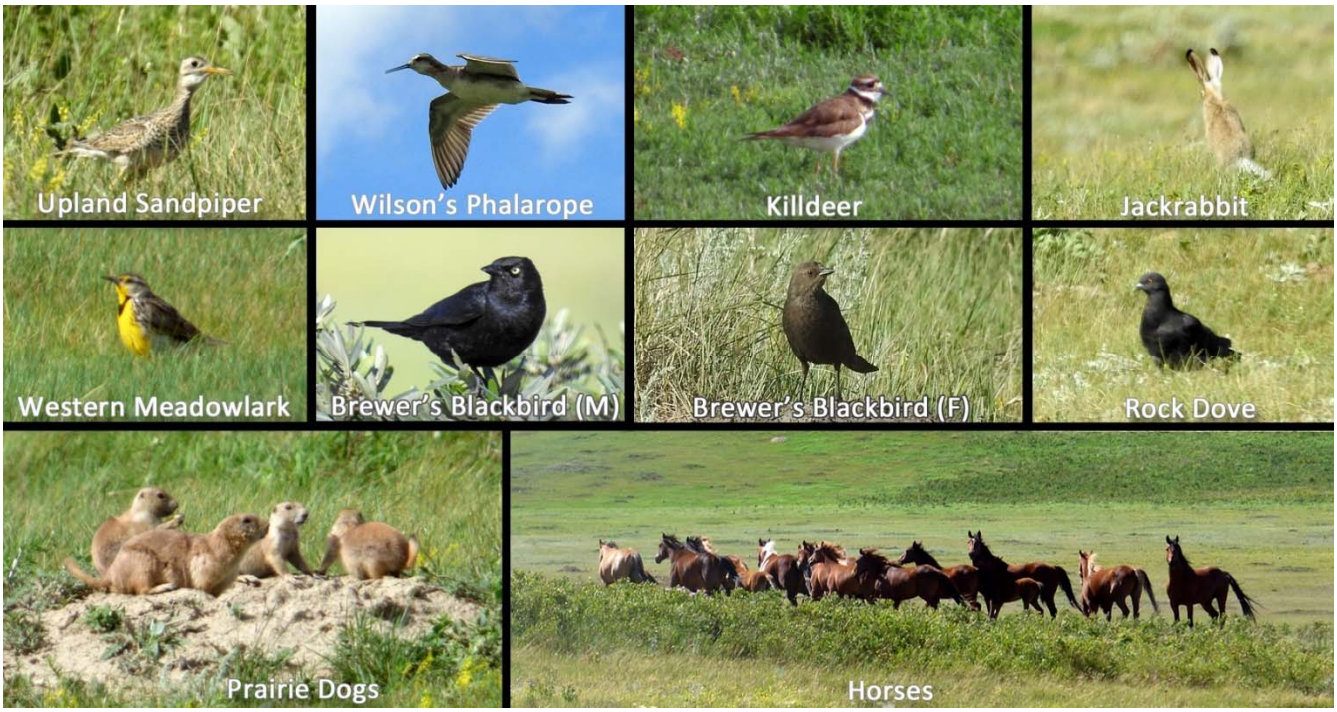


Figure 9. Some wildlife seen during the survey.

FEATURES

Within the analysis area, there are 9 well pads measuring a total of 45.53 acres with 1.8 miles of access road. There are 4.5 miles of ranch road and 3.3 miles of BIA Road. There are 8.4 miles of pipeline, 6.0 miles of utility line, and one electrical substation measuring 1.7 acres. There are approximately 12 miles of fence line. There are two farmsteads measuring 6.4 acres. Livestock grazing is common.

SPECIES ACCOUNTS

The following evaluation is being made to facilitate the FWS decision making process. The existing conditions documented below may assist FWS personnel to determine if the proposed activities appropriately adhere to the overall management intent of the FWS. A summary of the evaluation is found in ***Table 3.***

GENERAL

Where potential adverse effects are seen, design criteria are provided to avoid potential future effects. Where no potential adverse effects are seen, a "no effect" determination, no avoidance measures are necessary.

ENDANGERED SPECIES

Gray Wolf (Canis lupus)

Historical records show that wolf sightings are very rare within North Dakota. From 1981 to 1992, 10 wolves were killed in the Dakotas, five of them in 1991-92 (Licht 1992). One was shot in Dunn County in 1992, a den was discovered in the Turtle Mountains in 1994, and another was shot in Traill County in 2011. Additional sightings have been reported in the Killdeer Mountains in Dunn County (Johnson 1999). The Killdeer Mountains are about 14 miles to the southwest of the project area. Most wolves in North Dakota are likely dispersed animals that originated in northern Minnesota, Riding National Park or Spruce Woods Reserve, Manitoba. Currently, wolves are not known to inhabit the project area. The proposed project will have **no effect** on the gray wolf.

Black-footed Ferret (Mustela nigripes)

Black-footed ferrets were historically found in North Dakota, mostly in the southwest portion of the state. They have been extirpated from the state. The Black-footed Ferret Recovery Plan lists the need to reintroduce ferrets into suitable habitat. Since they rely almost exclusively on prairie dogs for food and den sites, suitable Black-footed Ferret habitat is large prairie dog towns or complexes of towns in close proximity to each other.

There is an active prairie dog town in the analysis area, 365 feet to the north of the project area ***(Figure 8)***. The nearest black-footed ferret population is about 182 miles to the southeast on the Cheyenne River Indian Reservation in Dewey County, SD. There are no known ferrets outside of the reintroduction areas and captive breeding locations and their existence outside of these locations is extremely unlikely. The proposed project will have **no effect** on the black-footed ferret.

Whooping Crane (Grus americana)

Locations: According to the Canadian Wildlife Service (CWS) and the FWS recovery plan, "areas characterized by wetland mosaics appear to provide the most suitable stopover habitat." Migration patterns show that the "cranes primarily used shallow, seasonally and semipermanently flooded palustrine wetlands for roosting, and various cropland and emergent wetlands for feeding." The large reservoir margins in the Dakotas were included in this category. Riverine habitats are also used by the cranes during migration, roosting on "submerged sandbars in wide, unobstructed channels that are isolated from human disturbance" (CWS FWS 2007; page 18) ***(Figure 9)***. There are records of Whooping Crane stopovers in northern Dunn County in the vicinity of the project area (Austin 2001). There have been numerous sightings at Lake Ilo National Wildlife Refuge, 19 miles to the south of the project area.

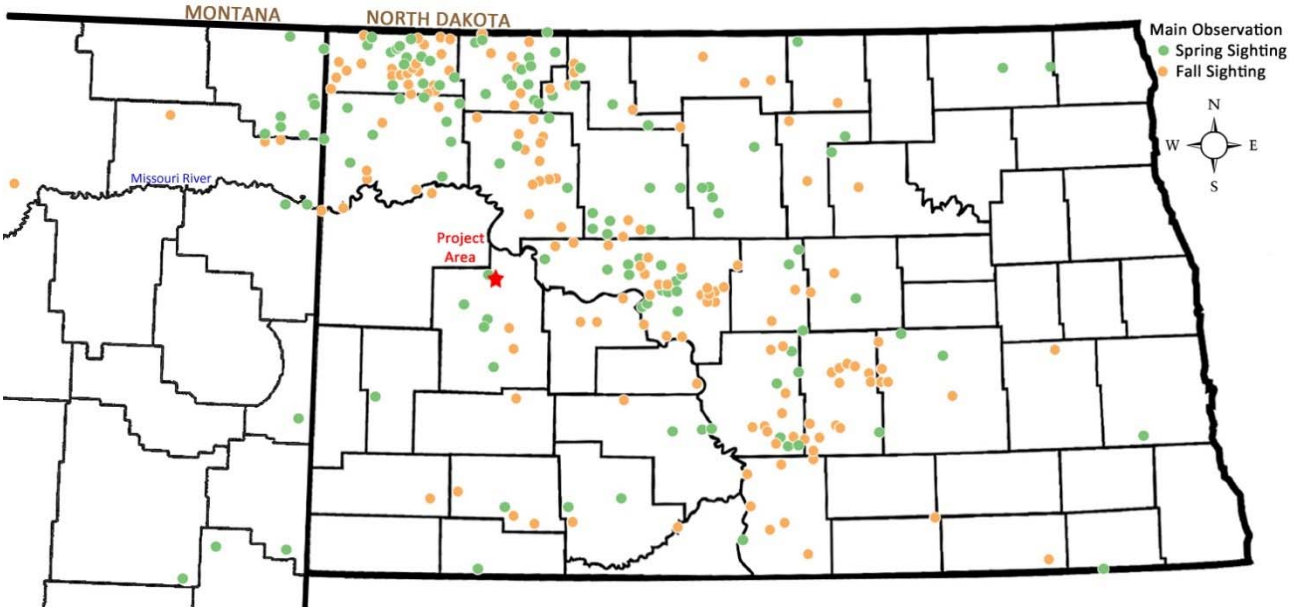


Figure 9. Whooping Crane observations 1943-1999 in North Dakota and Montana (adapted from Austin 2001).

Migration: According to the FWS recovery plan, the Aransas-Wood Buffalo Whooping Crane population (AWBP) migrates "southeasterly through Alberta, Saskatchewan, and eastern Manitoba, stopping in southern Saskatchewan for several weeks in fall migration before continuing migration into the United States. They migrate through the Great Plains states of eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. Their spring migration is more rapid and they simply reverse the route followed in fall." They spend three months of the year in migration (CWS FWS 2007; page 13).

On average, the AWBP depart from Aransas National Wildlife Refuge (ANWR) in Texas between March 25 and April 15. The northward migration is normally completed in 2-4 weeks. Typically, nesting pairs arrive in Wood Buffalo National Park (WBNP) in late April, lay eggs from late April to mid-May, and hatching occurs in late May to mid-June. The cranes remain in WBNP for the remainder of the summer. Normally, the autumn migration of AWBP from WBNP in Alberta begins in mid-September. Birds linger in northern Saskatchewan for 2-4 weeks then make a rapid migration to their wintering grounds at the ANWR, usually covering the distance in a week. Cranes have lingered in North Dakota into November. Winter storms play a role in migration timing.

Threats: Threats to Whooping Cranes in North Dakota include: **(1)** Damage to migration habitat as a result of drought, cattle grazing, contaminated runoff, widespread draining of prairie pothole wetlands and diversions of major river systems, **(2)** low genetic diversity, **(3)** power line collisions, **(4)** predation, and **(5)** illegal shooting. Whooping Cranes have shown an aversion to human activity. They will respond negatively to aircraft and humans on foot. This aversion may limit their ability to obtain food resources and weaken individuals and social structure.

Project: Of the dozens of wetlands in the analysis area, forty are NWI wetlands. Two of these are PABFh wetlands; a stock dam and a dugout. They total 7.23 acres. Sixteen are PEMA wetlands that total 2.93 acres. Most of these are less than 0.10 acre. Nineteen are PEMC wetlands. They total 8.6 acres. There are dozens of other wetlands in the analysis area. These include creeks, oxbow wetlands, dugouts, and springs ***(Figure 10)***. Many of these could be used by cranes during migration. Coarse-scale maps indicate that one of these wetlands may have been the location of a crane sighting decades ago.

The proposed well and access roads would not be constructed within any wetlands. It would, however, be within 980 feet of an NWI wetland to the northwest. That wetland extends beyond the NWI boundaries. It comes within 700 feet of the proposed well pad. This wetland has shallow, standing water, enough to provide nesting habitat for Wilson's Phalarope, which were seen defending their nests and young during the survey. Indirect contact with this wetland could occur through chemical spill, such as fuel or hydraulic fluid for equipment used in construction, and excess erosion; debris and/or chemicals may work their way downslope into the wetlands, impacting crane habitat. Human activity during construction or saltwater disposal may disturb cranes. None were seen in the survey.

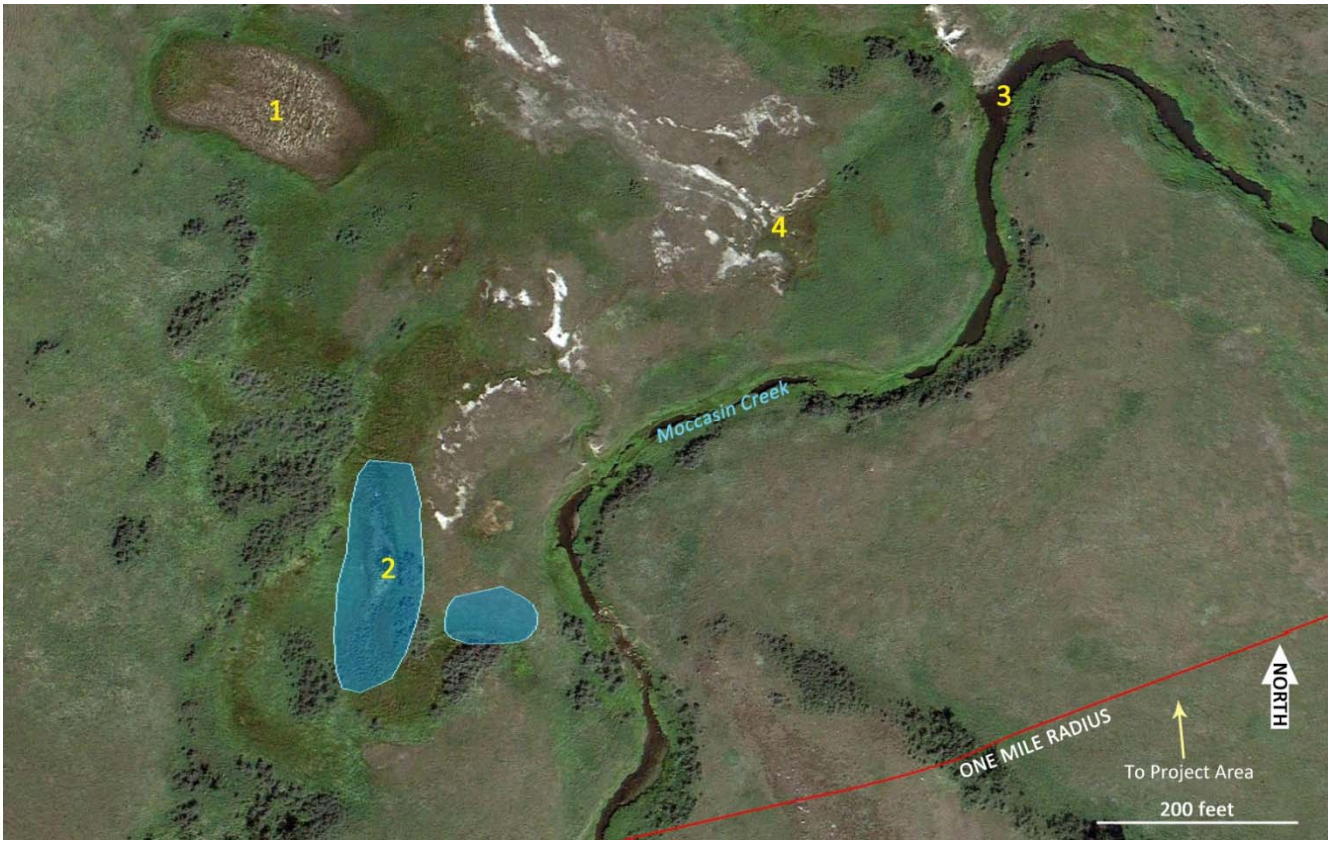


Figure 10. Sample of wetland variety within analysis area, some of which may be suitable for Whooping Cranes. Red line shows boundary of analysis area. Project area is to N of this view. Number 1 shows closed depression, #2 shows NWI wetlands in old oxbow of Moccasin Creek, #3 shows Moccasin Creek channel holding water at time of photograph, #4 shows spring seep at base of hill. White surface is alkali.

Design Criteria to avoid potential future impacts: Best management practices should be used during activities to minimize disturbances and reduce effects as much as possible. The FWS makes a general recommendation for all listed migratory birds that occur in the project area to limit construction activities to late summer or fall/early winter (FWS 2011 letter). The ideal construction window for Whooping Crane is when they have vacated the region after fall or spring migration and feeding in the region. Migration and feeding occurs in the region in the period between mid-April and mid- May and mid-October and mid-November. Thus, it is recommended that construction activities occur from mid-May to mid-October or mid-November to mid-May. Project design should include measures to prevent, contain, or collect chemical spills. More details are provided under ***Discussion - Management Practices***.

Determination: In view of the historic observations of Whooping Crane in the county and the presence of a variety of wetlands in the analysis area, the proposed project may impact individuals or habitat. However, the proposed project area does not intersect any wetlands; the project would occur on uplands between road right-of-way and recently constructed pipeline corridor. Combining these facts with the design criteria described above, project **may affect but would not likely adversely affect** individuals, and it is not expected to contribute to a trend toward elevated federal listing or loss of viability to individuals, the population, or species. The effects are expected to be *Insignificant*.

Interior Least Tern (Sterna antillarum)

Locations: According to the FWS recovery plan, "Interior least terns breed in the Mississippi and Rio Grande River Basins from Montana to Texas and from eastern New Mexico and Colorado to Indiana and Louisiana. From late April to August they occur primarily on barren to sparsely vegetated riverine sandbars, dike field sandbar islands, sand and gravel pits, and lake and reservoir shorelines" (FWS 1990; page ii). Essential breeding habitat in North Dakota for Interior Least Tern is found along "about 192 km [119 miles] of the Missouri River from Garrison Dam to the mouth of the Cannonball River south of Bismarck, and about 29 km [18 miles] of the Yellowstone River in North Dakota from the Montana border to the river's confluence with the Missouri River. A few Interior Least Terns nest on islands, shorelines and sandbars along the reservoir, Lake Oahe, an impoundment on the Missouri River in North and South Dakota. In Montana, breeding Interior Least Terns recently have been recorded on the Yellowstone River, and on the Missouri River between Fort Peck Reservoir and North Dakota" (FWS 1990; page 3). Suitable riverine breeding habitat is "sparsely vegetated sand and gravel bars within a wide unobstructed river channel, or salt flats along lake shorelines. Nesting locations usually are at the higher elevations and away from the water's edge" (FWS 1990; page 20) and occur during periods of normal to low flows.

Habits: Interior Least Terns nest for 4 to 5 months, arriving in late April to early June and departing by early September. They show strong breeding site fidelity and a small home range. Human presence has been shown to reduce reproductive success. While Interior Least Terns subsist on a diet that includes numerous species of small fish, they also feed on crustaceans, insects, mollusks and annelids.

Threats: The conversion of the Missouri River from a braided river with numerous channels, sandbars, oxbows, and pools to a single, narrow, relatively uniform navigation channel has eliminated much of the tern's habitat. In addition, reservoirs have submerged hundreds of miles of habitat, captured clay, silt and sand that build sandbars downstream, and produced discharges that fail to mimic those that occurred naturally. Other threats include surface or water contaminants, as by chemical spills, and vehicular and human traffic on beach habitat.

Project: Suitable riverine habitat is not within the project or analysis area. No Interior Least Terns were seen in the survey. The proposed project will have **no effect** on Least Terns.

Pallid Sturgeon (Scaphirhynchus albus)

Locations: The pallid sturgeon is known only to occur in the Missouri and Yellowstone Rivers. It requires large rivers with swift and free-flowing, turbid, warmwater habitat with diverse and fluctuating structure. This diverse structure includes braiding, floodplains, oxbows, backwaters, sloughs, chutes, side channels, islands, sandbars snags, cutbanks, and organic debris. Most recent records show the pallid sturgeon in or near North Dakota in the following locations:

> From the Missouri River between the Marias River and Ft. Peck Reservoir in Montana; between Ft. Peck Dam and Lake Sakakawea (near Williston, North Dakota); within the lower 113 km (70 mi) of the Yellowstone River to downstream of Fallon, Montana. (FWS 1993; page 5)

Habits: Historically, spawning migrations occurred during the two periods of spring floodflows: April, when snowmelt from the Great Plains entered the river system, and late May and June when snowmelt from the Rocky Mountains entered the river system. The sturgeon spawns from June to August. It is surmised that the sturgeon spawns over rough rock or gravel substrate found in the relatively swift waters in the main channel of the Missouri River. Suspended sediment provides essential cover for hatchlings and small sturgeon and maintains food sources adapted to turbid waters. Diet includes immature aquatic invertebrates and fish, primarily cyprinids.

Threats: Reservoirs along the Missouri River have been the primary threat to pallid sturgeon. This has: **(1)** altered the river dimensions **(2)** altered patterns of water velocity, discharge, depth, and temperature, **(3)** blocked fish movement, **(4)** reduced turbidity and organic debris, **(5)** reduced bed roughness, and **(6)** inundated spawning and nursing areas. Approximately 36% of riverine habitat on the mainstem of the Missouri River has been lost due to the construction of six reservoirs and another 40% has been lost to channelization. As a result, most suitable spawning and foraging habitat has been lost. In turn, reproduction of the pallid sturgeon in the Missouri or Yellowstone Rivers had not been documented for decades. In recent years, some reproduction has been observed, a result of habitat restoration (Krentz 1997, FWS 2000, USGS 2007).

Project: Suitable riverine habitat is not within the project or analysis area. No pallid sturgeons were observed in the survey. Thus, the proposed project will have **no effect** on pallid sturgeon or its habitat.

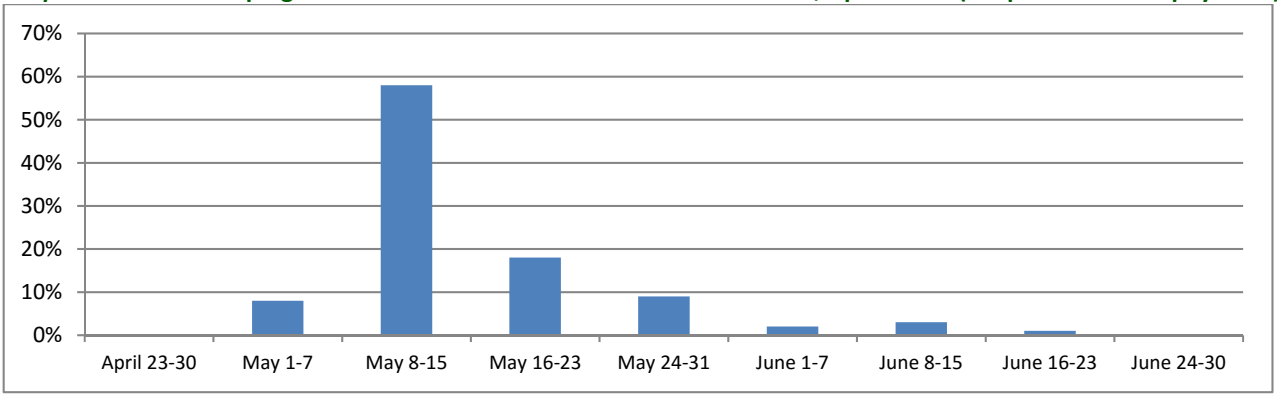
THREATENED SPECIES

Piping Plover (Charadrius melodus)

Locations: Piping Plovers spend spring and summer months in North Dakota, breeding and raising young. Breeding, nesting, and foraging habitat occur in North Dakota on open, sandy to gravelly, sparsely vegetated beaches and bars along the Missouri and Yellowstone Rivers. About 15% of the Plovers in North Dakota are found along the Missouri River from Garrison Dam south to the mouth of the Cannonball River and along the Yellowstone River in McKenzie County. The remaining 85% of Plovers in North Dakota can be found on alkali wetlands on the Missouri Plateau. In Dunn County, Piping Plover have nested on Lake Ilo since 1989 (USFWS 2001).

Habits: Piping Plovers spend 3-4 months in North Dakota, arriving from the third week in April to the second week in May. Nesting occurs from late April through June ***(Graph 1)***. Hatching begins in late May and continues into June. The adult birds begin to abandon nests as early as mid-July and normally, all Piping Plovers have left by early August. Some have stayed at the breeding grounds into September. Juveniles depart a few weeks later and it is the norm for all to leave by late August. Similar observations have been made for the Great Lakes population. Breeding site fidelity is variable from region to region, based on the shifting quality of nest sites as water levels, shoreline exposure, and gravel component vary from year to year. They feed on small invertebrates including worms, fly larvae, beetles, crustaceans, mollusks.

Graph 1. **Percent of Piping Plover Nest Initiations in Central North Dakota, April - June (adapted from Murphy 1999)**



Threats: As with Interior Least Terns, the conversion of the Missouri River from a braided river with numerous channels, sandbars, oxbows, and pools to a single, narrow, relatively uniform navigation channel has eliminated much of the Plover's habitat. Reservoirs have submerged hundreds of miles of habitat, captured clay, silt and sand that build sandbars downstream, and produced discharges that fail to mimic those that occurred naturally. Other threats to Piping Plovers include surface or water contaminants, as by chemical spills, vehicular and human traffic on beach habitat, and vegetation encroachment which provides cover for predators. On alkaline wetlands, Plover are threatened by cattle trampling, wetland drainage, and chemical contaminants.

Potential threats to Plover populations and individuals include the following (FWS 2013):

- Dredging and dredge spoil placement
- Seismic exploration
- Construction and installation of facilities, waterlines, and roads associated with oil and gas development
- Oil spills and oil spill clean-up
- Construction of dwellings, roads, marinas, and other structures
- Associated construction impacts such as staging of equipment and materials
- Beach nourishment, stabilizations and cleaning
- Certain types and levels of recreational activities such as all-terrain vehicular activity
- Stormwater and wastewater discharge from communities
- Sale, exchange, or lease of Federal land with suitable habitat that is likely to result in habitat degradation
- Marsh restoration
- Military maneuvers

Project: Although small populations of Piping Plover have been observed in Dunn County, suitable lake or riverine habitat is not within the project or analysis area. No Piping Plovers were seen in the survey. Thus, the proposed project will have **no effect** on Piping Plover or its habitat.

Red Knot (Calidris canutus rufa)

Basis: In 2012, the Federal Register stated that "listing this species is warranted" and that the FWS was preparing proposed listing determinations (FWS 2012; pages 70008, 700013). On December 11, 2014, the FWS listed this species as *Threatened* (FWS 2014d; page 73706).

Location: Red Knots migrate from southern South America to breeding grounds in the Canadian Arctic, a distance of over 18,000 miles. The primary summer breeding grounds are in the Canadian Nunavut Territory. In the US, populations ordinarily winter from December to February along the Gulf of Mexico from Texas to Louisiana and the southeastern US from Florida to North Carolina. Some arrive as early as September and leave as late as May. There are other smaller overwintering populations along the gulf coast from the Florida panhandle, through Alabama and Mississippi, to eastern Louisiana and along the Atlantic coast in Virginia, Maryland, New Jersey, New York, Massachusetts, and Nova Scotia.

Spring and fall migrating Red Knots pass through shoreline habitats all along the Gulf and Atlantic coasts. Their prime stopover is Delaware Bay, where an estimated 50 to 80 percent of all red knots stop during the spring. Other stopovers include James Bay, the northern Bay of Fundy, the north shore of the St. Lawrence Gulf, Cape Cod Bay, Chesapeake Bay, and Delaware Bay. There is evidence of inland migration routes, individual birds passing over Kentucky, the Great Lakes, and the Northern Great Plains ***(Figure 11)***. The FWS observes:

> In the United States, data sets contain roughly 1,900 records of knots more than 25 miles from any ocean coast. Most records in the interior states show small numbers (fewer than 10) of knots, but there are multiple records in nearly every inland state...Use of an interior route through the United States and Canada has also been documented by resightings in Manitoba and Alberta, Canada of birds that had been marked in Florida. (FWS 2014c; page 2)

Another FWS report adds:

> Geolocator results from seven red knots (one with 2 years of data) wintering in Texas showed that all these birds used a central, overland flyway across the midcontinental United States. Birds flew 1,600 to 2,000 mi (2,600 to 3,300 km) to the first stopover. A Northern Great Plains stopover (Saskatchewan, Canada, and, for one bird, North Dakota, United States) was used by five of six birds in 2010, while southern Hudson Bay in Manitoba, Canada (the Nelson River delta and James Bay), was used by one bird in 2010 and all three birds in 2011. These findings support earlier reports of large numbers (1,000 to 2,500) of red knots in Saskatchewan and Alberta, Canada, between January and June. Following publication of the Newstead *et al.* study results, additional geolocator data became available showing six additional red knots stopping on the U.S. side of the Northern Plains—three in North Dakota, two in Montana, and one possibly in Nebraska…Geolocators on seven birds wintering in Texas showed they all used a similar and direct interior flyway across the midcontinental United States during the southbound migration. (FWS 2014b; pages 57-8)

Chronology: The median Arctic arrival date is June 10 and the departure date is July 22; nonbreeding Knots have been reported during June along coastal, Great Lakes, and Northern Plains US and Canada. Knots migrating in the fall on the mid-Atlantic coast have been observed from July to late September. Knots on the spring interior migration route departed from Texas in mid-May, taking 2-3 days to reach Hudson Bay. Knots on the fall interior migration route arrived in Hudson Bay from mid to late July. They lingered for about 2 weeks before departing on a 2 to 3-day flight, arriving in Texas in August. (FWS 2014b) Thus, stopovers in North Dakota could be expected around mid-May and early August. Some individual knots use the Northern Plains in the spring and switch to the Great Lakes or Atlantic Coast in the fall.

Habitat: Within the US, during migration or overwintering, Red Knots live along the Gulf of Mexico and Atlantic coasts in mangrove swamps, sandy beaches, tidal mudflats, oyster reefs, brackish lagoons, exposed bay bottoms, and salt marshes. On interior migration routes, the FWS observes:

> Available information suggests that red knots use inland saline lakes as stopover habitat in the Northern Great Plains. For example, Skagen *et al.* reported peak counts of over 1,000 red knots between January and June over the period 1980 to 1996 at several saline lakes in the northern Plains of southern Canada. In May 2005, 25 red knots were observed at North Dakota's Long Lake NWR…Long Lake is a natural saline lake, suggesting that this may be a habitat type used by inland-migrating knots. Geolocator data show red knots stopping in the Northern Great Plains in spring. Although the Northern Plains encompass a large area, most of the concentrations of red knots recorded in recent years have been at Chaplin, Reed, and Quill Lakes in Saskatchewan, Canada, all saline lakes. Further, geolocator data from one bird that stopped in North Dakota indicate this bird utilized a salty environment (e.g., natural alkaline lake or wetland). (FWS 2014b; page 68)

About 85% of the salt lakes in this region are playa lakes, drying up in late summer. It is theorized that Red Knots may also use freshwater lakes in the interior migration. There have been clusters of sightings of Red Knot along the Mississippi River and its tributaries on wetlands and sandbars and they have been regularly observed along a portion of the Missouri River in North Dakota since 2005. Elsewhere, they have been observed using manmade lakes. They have been seen on sewage lagoons in North Dakota, Minnesota, and Oklahoma. They have been seen on reservoirs in Colorado, Oklahoma, Iowa, Illinois, and Arkansas. They have been observed on fish hatchery ponds, river flood plains, and managed wetland complexes in Oklahoma. (FWS 2014b)

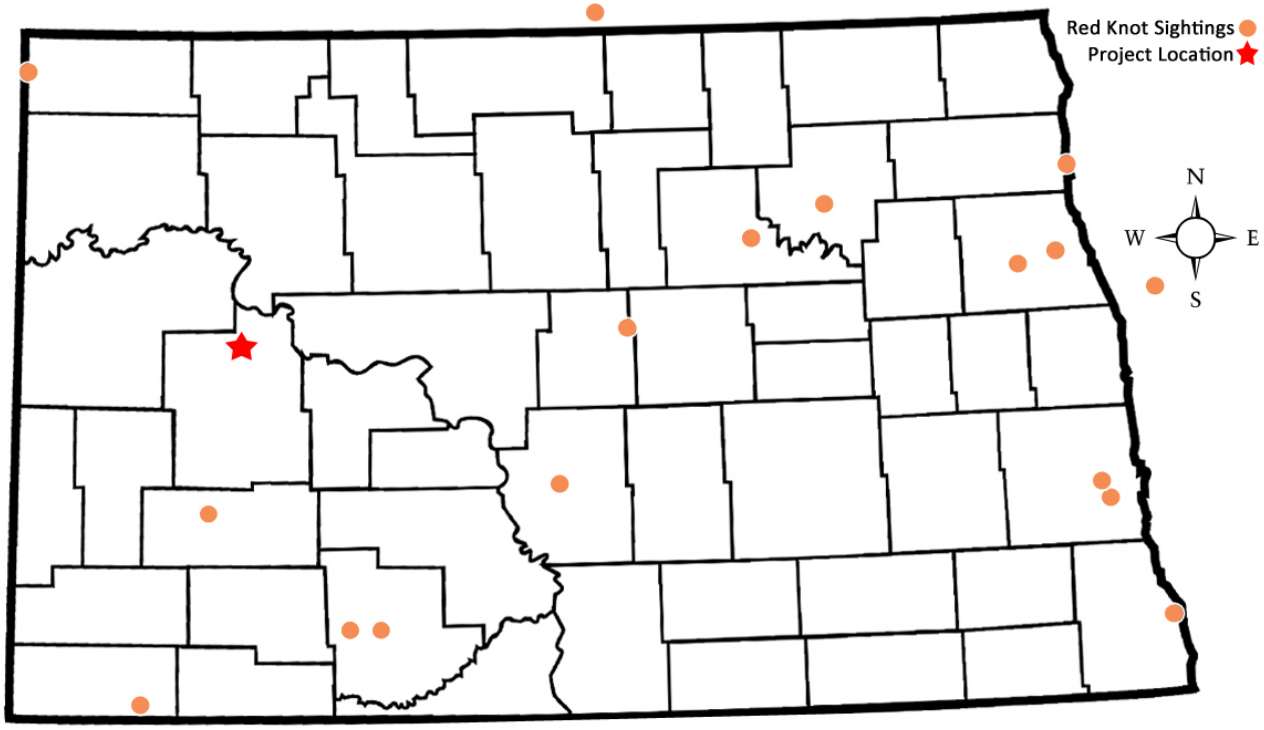


Figure 11. Distribution of Rufa Red Knot in North Dakota (Derived from ebird.org and FWS 2014).

Threats: The primary threat to Red Knots has been the decline of available horseshoe crab eggs in Delaware Bay. This has been the result of horseshoe crab harvests for fish bait and the biomedical industry. Lesser threats excessive beach erosion due to major weather events, shoreline stabilization, protection and development, wind turbines, harmful algal blooms, and oil pollution. High water levels in inland lakes may be a deterrent to Red Knot stopovers. The FWS adds:

> We have determined that the rufa red knot is threatened due to loss of both breeding and nonbreeding habitat; potential for disruption of natural predator cycles on the breeding grounds; reduced prey availability throughout the nonbreeding range; and increasing frequency and severity of asynchronies (''mismatches'') in the timing of the birds' annual migratory cycle relative to favorable food and weather conditions. (FWS 2014a; page 27549).

Project: None of the wetlands within the analysis area give evidence of saline conditions. There are four open water bodies in the analysis area. Three are dugouts, one is a stock dam. The dugouts are between 0.14 and 0.17 acre in size; the stock dam is 7.09 acres. Moccasin Creek has numerous small pools along its length within the analysis area ***(Figure 10)***. The nearest waterbody, a 0.14-acre dugout, is 1,900 feet from the project boundary. Thus, potential stopovers for Red Knot are few and small and distant within the analysis area.

No wetlands would be intersected by the project. Indirect contact could occur through chemical spill, such as fuel or hydraulic fluid for equipment used in construction, and excess erosion; debris and/or chemicals may work their way downslope into the wetlands, impacting knot habitat. Human activity may disturb knots. No Red Knots were observed in the survey.

Determination: In view of the absence of historic observations of Red Knots in Dunn County, the project limitations, and the long distance to the marginally suitable habitat in the analysis area, the proposed project will have **no effect** on Red Knot or its habitat.

Northern Long-eared Bat (Myotis septentrionalis)

Basis: In 2013, the FWS proposed to list the northern long-eared bat as an endangered species throughout its range (FWS 2013d; page 61046). It was listed as a threatened species on April 2, 2015.

Distribution: Northern long-eared bat occurs across temperate western North America, from southwestern Saskatchewan to southern Alberta and British Columbia, south to Baja California, east to western New Mexico, and north to the western Dakotas. Hence, North Dakota lies at the eastern edge of its range. There have been at least 37 observations of the species in North Dakota, but only one is from Dunn County ***(Figure 12)***. The nearest historic sightings are at the Medicine Hole cave, 17.5 miles to the southwest. Seven historic populations are along the Little Missouri River, 29 miles to the west and beyond.

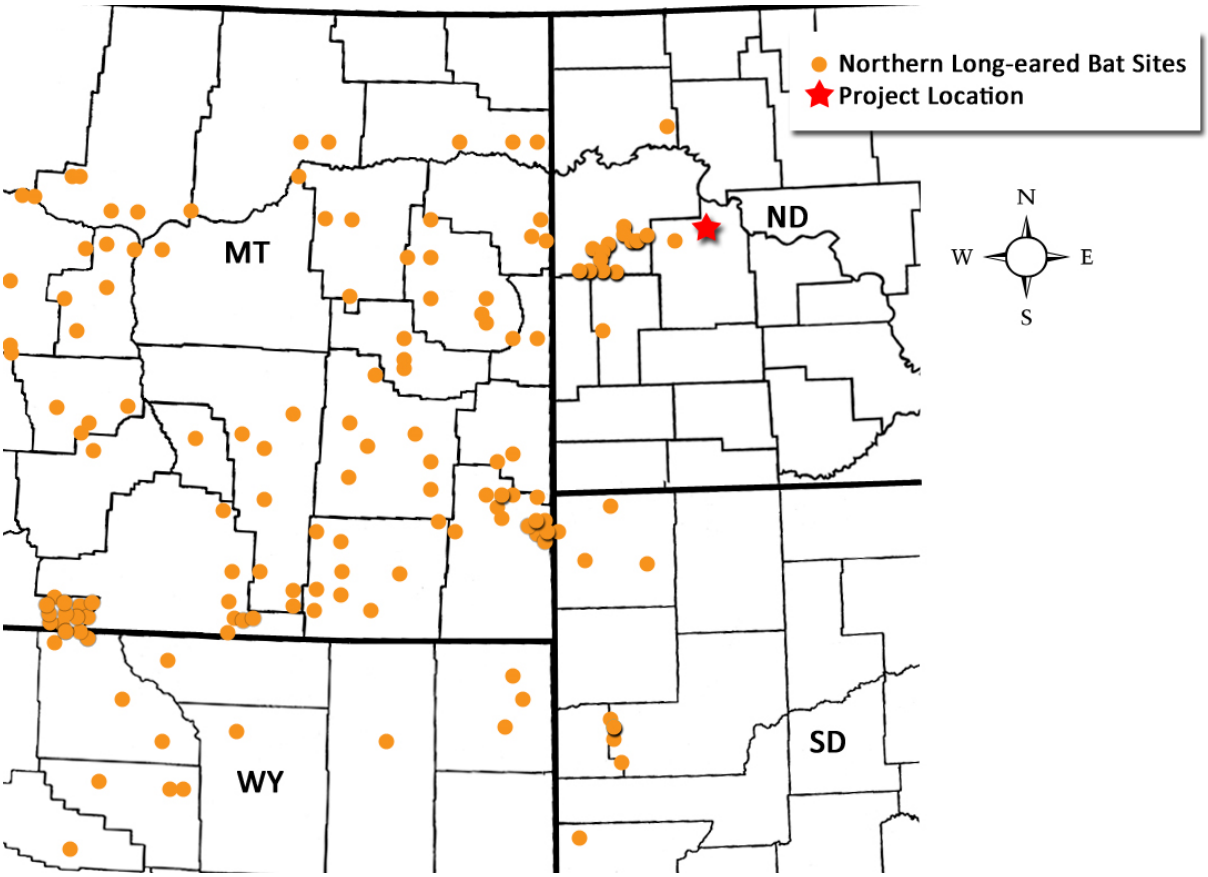


Figure 12. Populations of northern long-eared bat in the Northern Great Plains (Compiled from Jones and Choate 1978, Lausen 2009, Lampe et al. 1974, Jones et al. 1973, Tigner and Stukel 2003, Lenard et al. 2009).

Habitat: Throughout its range, northern long-eared bats have been associated with coniferous montane forests. It uses caves or abandoned mines for hibernation in the winter. In the summer, it has been observed roosting in fissures of cliffs, sinkholes, railroad trestles, deserted buildings, hollow trees, clear-cut stumps, and the loose bark of ponderosa pine, lodgepole pine, juniper, and green ash. It typically forages over water such as creeks, rivers, and reservoirs. Night, nursery, and maternity roosts must be in close proximity to foraging areas. Long flights to foraging sites consume large amounts of energy. A New Hampshire study showed the mean distances between roost trees and foraging area varied from 197 to 5,640 feet with a mean distance of 1,975 feet; a Prince Edward Island study showed the average distance between roost trees and foraging sites of 3,609 feet (FWS 2015). In McKenzie County, ND, seven observations of northern long-eared bats in 2009 were an average of 677 feet from open water. Five were near the Little Missouri River. Two were near creeks. Home ranges may extend to three miles. It has been observed at altitudes from sea level to over 8,000 feet.

Threats: The greatest threat to northern long-eared bats is White-nose Syndrome, a disease caused by a non-native fungus. Bat numbers have declined 99% in the Northeastern US since the fungus appeared. As of January 2016, the fungus has not appeared in ND (FWS 2016). Other threats include roost disturbance, usually by recreational activities, silviculture practices that lead to monotypic stands and remove mature, den, and dead trees, wetland destruction, pesticide use, and wind energy turbines.

Project: No wetlands would be intersected by the proposed project. There are four open water bodies in the analysis area. Three are dugouts, one is a stock dam. The dugouts are between 0.14 and 0.17 acre in size; the stock dam is 7.09 acres. Moccasin Creek has numerous small pools along its length within the analysis area ***(Figure 10)***. The nearest waterbody, a 0.14-acre dugout, is 1,900 feet from the project boundary. No trees of stature are within the project area. Within the analysis area, suitable trees such as mature green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*) are 3,500 feet to the north and 1,300 feet to the east. Thus, potential roost habitat is absent within the project area and rare within the analysis area. There are dozens of oil service and farm buildings within the analysis area.

Determination: In view of the scarcity of bodies of open water and roost trees in proximity to the open waters, and their distance to the project area, the proposed project will have **no effect** on northern long-eared bat or its habitat.

Dakota Skipper (Hesperia dacotae)

Habitat: The Dakota skipper can survive only on high quality, native, undisturbed tall grass and mid-grass prairie. In North Dakota, these sites include ungrazed, native prairie with little bluestem, needle-and-thread and purple coneflower and dry, upland prairie dominated by little and big bluestems, needlegrass, purple coneflower (*Echinacea purpurea*), pale purple coneflower (*Echinacea pallida*), prairie coneflowers (*Ratibida colmnifera*), and blanketflower (*Gaillardia aristata*). It is also found in association with harebell (*Campanula rotundifolia*), white prairie clover (*Dalea candida*), fleabanes (*Erigeron*), black-eyed Susans (*Rudbeckia hirta*), and evening primrose (*Oenothera serrulata*). It appears to prefer purple coneflower and, to a lesser extent, harebell as nectar sources. They are not found on habitats dominated by exotic plant species. They are "almost universally absent from grazed prairies in North Dakota" (Royer 2002; page 7). The FWS states:

> Dakota skipper populations have declined historically due to widespread conversion of native prairie for agriculture and other uses. This has left remaining Dakota skipper populations isolated from one another in relatively small areas of remnant native prairie. States and Canadian provinces in the original range of Dakota skipper have each lost 85%-99% of their historical tallgrass prairie and 72%-99.9% of their historical mixed-grass prairie. This has left isolated fragments of native prairie, only some of which are suitable for Dakota skippers. Dakota skippers are sensitive to several types of artificial and natural disturbances and are almost always absent from remnant prairies that are overgrazed or otherwise degraded. Because of this sensitivity, the historical persistence of Dakota skippers may have depended on the vastness of the prairie and the availability of immigrants to repopulate areas in which the species had been eliminated by disturbances, such as fire or intensive bison grazing. (FWS 2007; page 1)

Royer observes that "a reliable indicator of possible presence in the more xeric west is a combination of Needle and Thread (*Stipa comata*) and Narrow-leaved Purple Coneflower (*Echinacea angustifolia*) in rolling upland pastures." (Royer 2003; page 36) The upper reaches of woody ash-oak draws with wide margins and that contain *Viola, Aster, Apocynum, Asclepias*, and *Monarda* provide excellent habitat for this species. Also, south-facing prairie hilltops adjacent to these woody draws that contain *Andropogon*/*Stipa* associations and large populations of *Echinacea angustifolia* provide excellent habitat. A reliable indicator of possible Dakota skipper populations in western North Dakota is rolling upland prairie with both Needle-and-Thread and Purple Coneflower (Royer 2003).

The FWS (2015) describes the most suitable habitat for Dakota skipper on the western edge of its range as a variant of the "Type B" habitat. This contains an association of little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), and needlegrasses (*Hesperostipa (Stipa) comata, Nassella viridula*) that is often invaded by Kentucky bluegrass (*Poa pratensis*). Other indicators of suitable Type B habitat included prairie lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), purple prairie coneflower (*Echinacea angustifolia)*, other asters and mountain deathcamas (*Zygadenus elegans*).

The USFS describes preferred Dakota skipper habitat as a landscape with slopes from 0-35%, aspects from 90-315 degrees, grasslands with low/moderate to high biomass dominance, and being at least 2,640 feet from existing range livestock water, 660 feet from water bodies and pools along streams, and 660 feet from streams and rivers.

Locations: Royer recorded three sightings of the butterfly in McKenzie County. **(1)** One population in northern McKenzie County, 35 miles northwest of the project area. **(2)** One population in northern McKenzie County 32 miles northwest of the project area. A total of three butterflies were seen in these two populations. **(3)** One population in southern McKenzie County near Eagle Nest Butte, 5.8 miles northwest of the project area. This population is small and vulnerable, covering 10 acres of prairie. These sightings constitute the westernmost known populations of the species in the US. (Royer 2005) The majority of the populations occur in McHenry, Ransom, Eddy and Richland counties, at their closest, 100 miles to the east ***(Figure 13)***. Royer (2006; page 10) states that "it is very unlikely to reproduce as far west as the Yellowstone River drainage within the McKenzie District."

Habits: Pupation takes about 10 days and occurs in mid-June to early July. Males emerge as adults about five days before females. They mate during this flight period, which lasts a maximum of about three weeks (USFWS 2002).

Project: High quality, native, undisturbed tall grass or mid-grass prairie is common in the analysis and project areas. However, ideal Type B prairie habitat with little bluestem and at the head of wooded draws is rare within the project area. There is one small, 580 ft² patch within the project area. There are range livestock waters and water bodies or pools along streams in the analysis area. Three are dugouts, one is a stock dam. The dugouts are between 0.14 and 0.17 acre in size; the stock dam is 7.09 acres. Moccasin Creek has numerous small pools along its length within the analysis area ***(Figure 10)***. The nearest waterbody, a 0.14-acre dugout, is 1,900 feet from the project boundary. The remainder of the project area is mostly *Stipa comata - Bouteloua gracilis - Carex filifolia* upland grassland. Within the analysis area, Type B habitat is more common in the hills found in the northwestern third of the analysis area. This is to the north of the wetland and prairie dog town, about 2000 feet away from the project area. Other patches of Type B habitat are found in the southern third of the analysis area, on the other side of BIA Road 14. No Dakota skippers were observed in this survey.

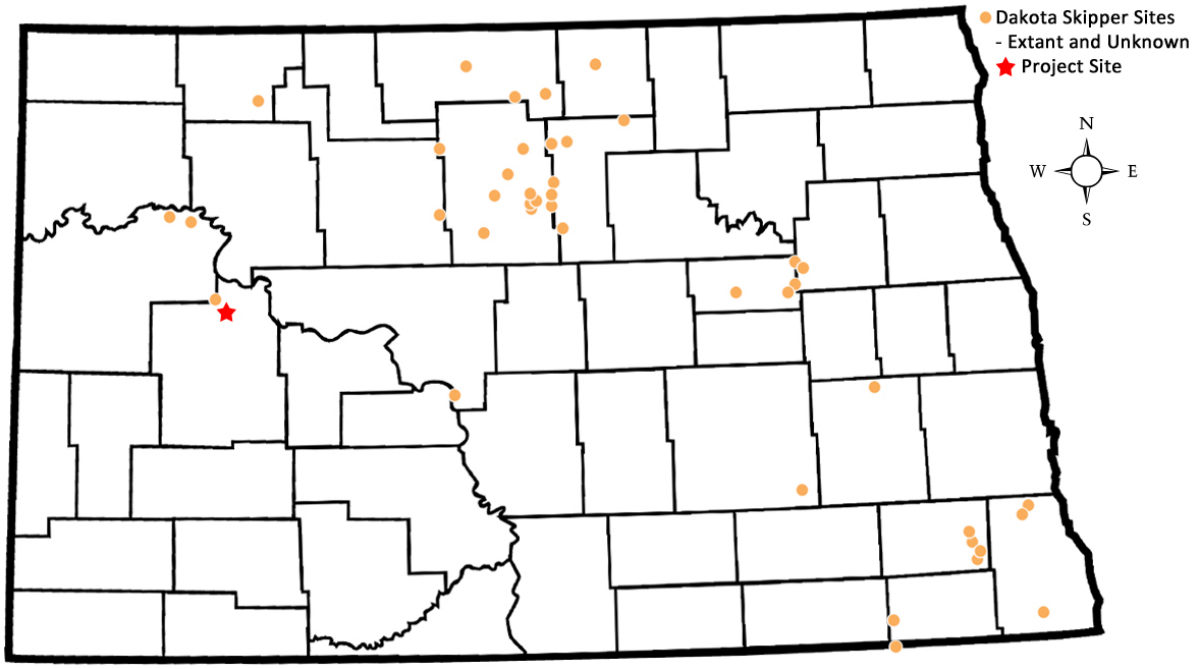


Figure 13. Atlas of Dakota skipper sightings in North Dakota (adapted from Cochrane 2002 and Royer 2002).

Design Criteria to avoid potential future impacts: Since butterflies are dependent upon specific habitat and locations during most of their life cycle, endemism must be considered in butterfly conservation and management. This requires management on a small-scale. Since most any degree of cattle grazing has a strong negative effect on this species, any ground disturbing activities such as road construction that would cross such specific habitat zones should be avoided. Alternative routes should be considered. More details are provided in the section "***Recommended Design Criteria***".

Determination: In view of the historic observations of Dakota skipper and the presence of good habitat in the analysis area, the proposed project **may impact** individuals or habitat. However, avoiding construction during critical time periods, and applying appropriate design criteria during construction would reduce adverse effects. Under these conditions, the project **may affect but would not likely adversely affect** individuals, and it is not expected to contribute to a trend toward elevated federal listing or loss of viability to individuals, the population, or species. The effects are expected to be *insignificant*.

Western Prairie Fringed Orchid (Platanthera praeclara)

The distribution of the western prairie fringed orchid in North Dakota is limited to the Sheyenne National Grassland in southeastern North Dakota, 260 miles to the southeast. The proposed project will have **no effect** on the western-fringed prairie orchid or its habitat.

CANDIDATE SPECIES

Sprague's Pipit (Anthus spragueii)

Basis: A 2010 status review found that "listing Sprague's Pipit as threatened or endangered is warranted, but that listing the species at this time is precluded by the need to complete other listing actions of a higher priority" (FWS 2010; page 56,028).

Locations: Sprague's Pipit is fairly common locally on the Northwestern Drift Plain, Missouri Coteau, Coteau Slope, and Little Missouri Slope. It is uncommon and local on the Northeastern Drift Plain, Southern Drift Plain, and Missouri Slope. Six sightings of territorial males or pairs were recorded up to 1972 in Dunn County. The USFS reports that "there have been various observations of Sprague's Pipit throughout the general area" (USFS 2010) ***(Figure 14)***. They are solitary and secretive birds, difficult to observe. Territorial and mating calls occur during flight. Identification is more likely by sound than sight.

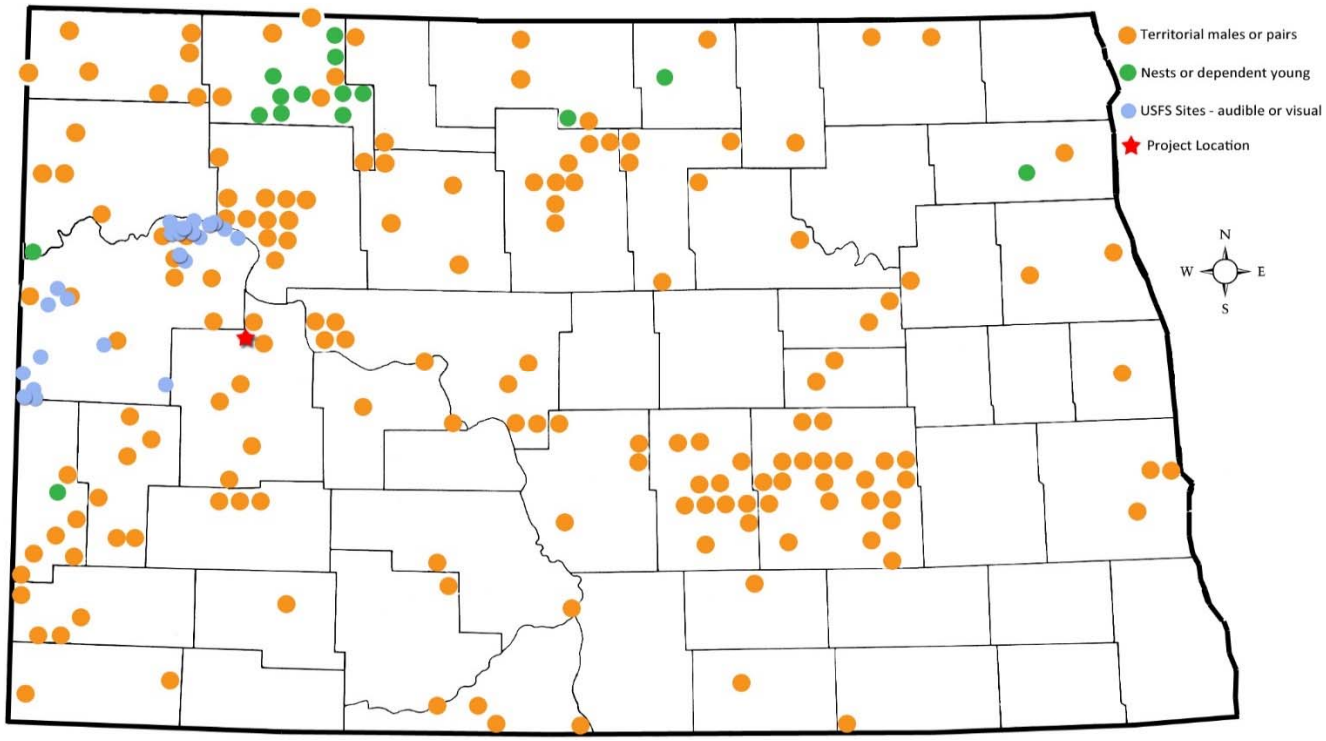


Figure 14. Sprague's Pipit locations in North Dakota (adapted from Stewart 1975).

Habits: Migration occurs between April and October. In Montana, fall migration normally begins at the end of August. Breeding activity is from late April to early September, peaking from early May to August. Some speculate that the species rears two broods each year. Nestlings have been recorded as late as August 2 in North Dakota. The latest recorded singing male in North Dakota was on September 6. The latest recorded migratory Sprague's Pipit in Montana was in October.

Their breeding range is from north-central Montana through North Dakota, south to north-central South Dakota. Breeding occurs in April and May. Breeding territory serves for nesting and feeding. Their diet consists primarily of arthropods. In North Dakota it has been observed to be in short grasses on elevated sites. In Montana, nest sites tended to be in medium height native grasses with fewer forbs, clubmosses, or shrubs. Site fidelity is low.

In southern Saskatchewan, where edge-to-area ratios tend to be low, the birds had a 50% probability of occurring on patches greater than 360 acres, and were not seen on patches smaller than 70 acres (Environment Canada 2008; page 6). Regarding general habitat requirements, Deschant makes these comments:

> Sprague's Pipits use grasslands of intermediate height and sparse to intermediate vegetation density. Although they will use exotic vegetation, they are significantly more abundant in, and prefer, native prairie. Other habitat features required include low visual obstruction, moderate litter cover, and little or no woody. Vegetation in dry lake bottoms and alkali lake borders can also be suitable for Sprague's Pipits. In Alberta native grassland, Sprague's Pipits preferred areas with moderate cover diversity, moderate grass height and height variation, and moderate to high grass to forb ratio. Within grazed mixed-grass areas in North Dakota, abundance of Sprague's Pipits was positively associated with percent clubmoss (*Selaginella densa*) cover and

plant communities dominated by native grass (*Stipa, Bouteloua, Koeleria*, and *Schizachyrium*). Abundance was negatively associated with percent grass cover, litter depth, density of low-growing shrubs, vegetation density, and with plant communities dominated by Kentucky bluegrass (*Poa pratensis*) and native grass. In areas not occupied by Sprague's Pipits, percent grass cover, litter depth, and vegetation density were greater than in areas where Sprague's Pipits were present. Strongest vegetational predictors of the presence of Sprague's Pipit were decreasing bare ground and decreasing litter depth. (Deschant 2001; page 1)

The FWS makes the following statement regarding habitat requirements:

> Sprague's Pipits have a strong negative response to exotic grasses. Consequently, the introduction of Eurasian plant species has had a negative effect on Sprague's Pipit populations. In Manitoba, Sprague's Pipits were significantly more abundant in native prairie than in introduced vegetation. Singing males were two to three times more abundant in native grass than in crested wheatgrass (*Agropyron cristatum*) and four to 25 times more abundant in native grass than in brome-dominated grassland in south-central. They were more than twice as abundant in native grass than crested wheatgrass or absent from crested wheatgrass in southern Alberta sites. Greater Sprague's Pipit densities were significantly correlated with native grasses at Lostwood NWR in North Dakota. Exotic plant species planted for the Conservation Reserve Program and for nesting cover for waterfowl are generally not used by Sprague's Pipits. (FWS 2010; page 19)

Threats: Pipits are threatened by degradation or loss of native prairie habitat by cropland conversion, high-intensity grazing, tree planting, shrub encroachment, and fragmentation. Loss of suitable vegetation structure has been shown to reduce Pipit density. Non-native reclaimed grasslands with suitable vegetation structure will be used, but their numbers are lower than those found in native grasslands. Energy development has a negative correlation with Pipit abundance; it has been shown to decrease within 300 meters of oil wells. Predation is a prime threat to breeding success of Pipits.

Project: Extensive tracts of native mixed-grass prairie dominate the analysis area. The project area is dominated by native mixed grass prairie. However, the project area, while native, is bounded by disturbance corridors on all sides, a well pad and pipeline scars of recent origin. The entire patch of native grassland in which the project area resides is only 18 acres. No Pipits were seen or heard during the survey.

Design Criteria to avoid potential future impacts: Best management practices should be used during activities to minimize disturbances and reduce effects as much as possible. The recommended construction window is when Sprague's Pipits are not breeding or nesting in the region; the period between mid-September and late April. Reclamation of disturbed ground with native species is recommended to avoid invasive vegetation. This is described in the section "***Recommended Design Criteria***".

Determination: In view of the historic observations of Sprague's Pipit in the county and the presence of good habitat in the analysis and project area, the proposed project **may impact** individuals or habitat. However, the size of the patch of native grassland, the abundance of habitat in the region, and the application of the recommended design criteria above, especially native vegetation reclamation, lead to the conclusion that the project **may affect but would not likely adversely affect** individuals, and it is not expected to contribute to a trend toward elevated federal listing or loss of viability to individuals, the population, or species. The effects are expected to be *insignificant*.

DESIGNATED CRITICAL HABITAT

Piping Plover (Charadrius melodus)

Habitat: According to the FWS recovery plan, critical habitat for the Piping Plover must contain the ecological processes that create and maintain Piping Plover habitat. In North Dakota the elements of these habitats are:

- On prairie alkali lakes and wetlands, the physical primary constituent elements include—**(1)** shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; **(2)** springs and fens along edges of alkali lakes and wetlands; and **(3)** adjacent uplands 200 ft (61 m) above the high water mark of the alkali lake or wetland.
- On rivers the physical primary constituent elements include—sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river.
- On reservoirs the physical primary constituent elements include—sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies. (FWS 2002; page 57,643)

The recovery plan details critical habitat on the Missouri River:

> [Plovers] use reservoir shorelines and large dry, barren sandbars in wide, open channel beds. Along these rivers, plovers often nest near endangered interior least terns (*Sterna antillarum*). Vegetative cover on nesting islands is usually less than 25 percent…Average vegetation height ranged from 2 to 11 in (6 to 29 cm) and the majority of the plovers (63 percent) nested in areas where vegetation was less than 4 in (10 cm)…[Plovers] select a higher nest site, away from the water's edge, when available. For nesting, piping plovers evidently seek habitats with wide horizontal visibility, protection from terrestrial predators, isolation from human disturbance, low likelihood of inundation, and nearby feeding habitat…Open, wet, sandy areas provide feeding habitat for plovers on river systems and throughout most of the species' nesting range. (FWS 2002; page 57,640)

In the Montana Piping Plover Management Plan, Atkinson states:

> Permanent, to seasonally flooded, alkaline sloughs (or potholes) embedded within the Prairie Pothole Region are utilized by breeding birds. These wetland habitats are typically closed basin depressions that receive water through surface precipitation, basin runoff, and seepage inflow of ground water. While the surrounding habitat may include pasture or rangeland composed of short grass prairie, nest sites are typically placed on dry salt flats or gravel beaches…In addition to vegetation cover and substrate type, along the shorelines of inland lakes and saline wetlands plovers appear to prefer wide beaches for nesting. At Chain-of-Lakes in North Dakota…piping plovers established territories on beaches >25 m wide. Mean beach width was also greater at occupied sites and the authors speculate that below a threshold beach width (>20 m) the probability of nest detection by predators may increase abruptly (pages 10-11)…[Plovers] prefer nesting on gravel beaches than those with lower gravel content…During drier climatic periods, substantial quantities of sparsely vegetated lower elevation beach habitat are available for breeding plovers. During wet periods, however, basin levels tend to be relatively high and only the highest elevation beach habitat is available. Thus, due in large part to the dynamic nature of these wetlands, birds tend to be opportunistic and dispersed across the landscape. (Atkinson 2006; page 10-11)

The FWS Great Lakes recovery plan describes ground cover in critical habitat:

> In North Dakota, Prindiville (1986) found that piping plover territories had significantly more cobble that was more uniformly distributed than unoccupied sites. Vegetation on the beach may function as additional escape cover from predators for piping plovers and may help conceal the location of nests. Prindiville, Gaines, and Ryan (1988) found that vegetation was more clumped within piping plover territories than in unoccupied areas. (FWS 2003; page 13)

Project: Although small populations of Piping Plover have been observed in Dunn County, suitable lake or riverine habitat is not within the project or analysis area. The project location is well outside of suitable Piping Plover habitat. No Piping Plovers were seen in the survey. Thus, the proposed project will have **no effect** on the species or critical habitat.

NORTH DAKOTA SPECIES OF CONCERN

Flathead Chub (Platygobio gracilis)

This species is usually found in swift flowing, turbid large creeks and rivers and their tributaries with sand to fine gravel bottoms. Although it is usually found in the main channel and in lower reaches of tributaries to plains rivers, rarely it has been found in side channels and backwaters or relatively clear, still pools of water with gravel to bedrock bottoms. The diet includes small insects, invertebrates, and plant material. It congregates near the bottom of pools amidst tree roots, macrophytes and woody debris. It is believed that it spawns between May and August. It is suspected that it migrates into smaller streams to spawn, but this is not a certainty. It is believed that it spawns in response to floods (USFS 2004).

The primary threat to flathead chub is the extensive modification of rivers by reservoirs. On the Missouri River alone, approximately one-third of the flowing water habitat required by flathead chubs has been lost to impoundments. Dams also decrease turbidity, which serves to protect flathead chub from predators. Also, impoundments reduce the length of free flowing rivers needed to suspend the non-adhesive, semi-buoyant flathead chub eggs long enough to hatch and fry long enough to develop the ability to swim. Dams also prevent populations from accessing the remainder of the watershed. Other threats include pollution by animal wastes, groundwater removal for agriculture and industry – which may change a

permanent stream to an intermittent stream - and coalbed methane production – which injects water into the waterway, changing an intermittent stream into a permanent stream, often changing the temperature and chemistry in the process.

Project: Of the dozens of wetlands in the analysis area, forty are NWI wetlands. Two of these are PABFh wetlands; a stock dam and a dugout. They total 7.23 acres. Sixteen are PEMA wetlands that total 2.93 acres. Most of these are less than 0.10 acre. Nineteen are PEMC wetlands. They total 8.6 acres. There are dozens of other wetlands in the analysis area. These include creeks, oxbow wetlands, dugouts, and springs. Moccasin Creek has numerous pools along its course ***(Figure 10)***.

Determination: Suitable swift flowing, turbid, large creek and river habitat is not within the project or analysis area. No flathead chubs were observed in the survey. Thus, the proposed project will have **no effect** on flathead chub or its habitat.

Sturgeon Chub (Macrhybopsis galida)

The sturgeon chub is a lithophile, an obligate of living in turbid, swift-flowing, sandy rivers over substrate of small gravel and coarse sand, especially at heads of islands or exposed sandbars. It is endemic to the mainstream and large tributaries to the Missouri River and the large tributaries of the Mississippi River south of St. Louis. Its historical range included the Missouri, Little Missouri, and Yellowstone Rivers. Its current range in ND is the Yellowstone River, Little Missouri River, and the Missouri River upstream from Lake Sakakawea and the Yellowstone River. The FWS reports that it "has been extirpated from approximately 800 miles of the Missouri River that has been converted to reservoir habitat" (FWS 2001; page 2). However, recent collections have shown that the sturgeon chub is more widespread and abundant than believed. In one study, almost a third of the catch at the confluence of the Yellowstone and Missouri Rivers in North Dakota were sturgeon chub (Welker 2001). As a result, it was removed from the FWS Candidate Species list in 2001, where it had been since 1995.

Little is known about the biology of the sturgeon chub. It is believed that they reproduce in June and July. They are highly adapted to life in turbid waters (USFS 2004).

Threats include reservoir operation and channelization of the Missouri River. Structures such as dike fields, bendway weirs have altered sturgeon chub habitat. As a result, the chub occupies only 55 percent of its historical range on the Missouri River, having been extirpated from 1,000 miles of its original habitat (FWS 2001).

Project The analysis area does not contain the mainstream and large tributaries to the Missouri River. Although Moccasin Creek is in the analysis area, it is on the opposite side of BIA Road 14, no closer than 3400 feet. Moccasin Creek does empty into the Lake Sakakawea 7 miles to the southeast, but Moccasin Creek is a smaller, flashy creek, becoming turbid and milky during and immediately following episodes of high rainfall or runoff. Within a few days of the episode, the flows will reduce to a narrow, clear channel, often reducing to a mere trickle in dry summers. Pools of clear, still water will remain in oxbows, outer bends of meanders, and behind beaver dams ***(Figure 10)***. These do not provide suitable habitat for sturgeon chub. No sturgeon chubs were observed in the survey.

Determination: These site conditions lead to the conclusion that the proposed project will have **no effect** on sturgeon chub.

Paddlefish (Polyodon spathula)

Habitat: Approximately 30-35,000 paddlefish exist today, mostly in two populations, the Fort Peck Stock and the Yellowstone/Sakakawea Stock. They prefer turbid, free flowing, naturally fluctuating rivers rich in zooplankton, but will occupy impoundments with access to spawning sites. Paddlefish spawn in rivers over bars of gravel to sand during periods of high-water, typically in May and June. They feed by filtering zooplankton. Commonly, they are found in slow-moving waters of side channels and river-lakes.

Threats: Dam and reservoir construction, dredging and channelization of rivers, and drawdowns for irrigation and industry. These may reduce turbidity, flow rates, and springtime flooding, essential for spawning.

Project: The development is some 7 miles to the northwest of an arm of Lake Sakakawea and 64 miles east of the Yellowstone River. The proposed project will have **no effect** upon paddlefish or its habitat.

OTHER SPECIES

Bald Eagle (Haliaeetus leucocephalus)

Bald Eagles prefer large, supercanopy trees with sturdy horizontal branches for nesting and winter roosting and a clear flight path to water. Most often these are cottonwoods found along larger rivers. Suitable Bald Eagle habitat is uncommon in the analysis area. There are only a few isolated badland buttes within a mile of the project area, on the northern edge of the analysis area. Wooded draws are small and uncommon as well, and limited to mid-sized elm, ash, and chokecherry. No suitable habitat is in the project area. No Bald Eagles or their nests were observed during the survey.

Determination: The scarcity of suitable Bald Eagle habitat within the analysis area, particularly large, supercanopy trees, indicates that the proposed project will have **no effect** on Bald Eagles or their habitat.

Golden Eagle (Aquila chrysaetos)

Golden Eagle habitat includes isolated buttes, badland outcrops, bluffs, wooded acreage, and large trees. These are rare in the analysis area. There are only a few isolated badland buttes within a mile of the project area, on the northern edge of the analysis area. Wooded draws are small and uncommon as well, and limited to mid-sized elm, ash, and chokecherry. No suitable habitat is in the project area. No Golden Eagles or their nests were observed during the survey.

Determination: The scarcity of suitable Bald Eagle habitat within the analysis area, particularly large, supercanopy trees, indicates that the proposed project will have **no effect** on Golden Eagles or their habitat.

CONDITIONS

Since the settlement of the northern Great Plains, urbanization, agriculture and industry have altered the nature of much of the landscape. The original, integrated ecosystem has been fragmented and disturbed, often redesigned or destroyed. This has resulted in relatively small, contiguous ecological units that are small and often unsuited to interior species. Whether in native vegetation or commercial, residential, or industrial development, land use is often in conflict.

The proposed well pad and access road would occupy a total of 6.4 acres. The access road exits the north side of BIA Road 14, heads to the west and continues 685 feet to the well pad. The well pad would occupy 4.6 acres. The access road exits the well pad and continues to the west for 635 feet, rejoining BIA Road 14. The project would occur within an 18-acre patch of relatively native upland grassland that lies between recently constructed well pad and pipelines. Elsewhere in the analysis area, relatively native habitats maintain dominance.

Of the dozens of wetlands in the analysis area, forty are NWI wetlands. Two of these are PABFh wetlands. One is a 7.09-acre stock dam and the other is a 0.14-acre dugout. Sixteen are PEMA wetlands that total 2.93 acres. Most of these are less than 0.10 acre. Nineteen are PEMC wetlands. They total 8.6 acres. There are dozens of other wetlands in the analysis area. These include oxbow wetlands, two other dugouts, springs, and Moccasin Creek, an intermittent prairie creek.

The pipeline corridors are dominated by non-native species such as foxtail barley, smooth brome, yellow sweetclover, sow thistle, and Kentucky bluegrass. Elsewhere, there are three dugouts and one stock dam.

Within the analysis area, there are 9 well pads measuring a total of 45.53 acres with 1.8 miles of access road. There are 4.5 miles of ranch road and 3.3 miles of BIA Road. There are 8.4 miles of pipeline, 6.0 miles of utility line, and one electrical substation measuring 1.7 acres. There are two farmsteads measuring 6.4 acres. Of the 2,365-acre analysis area, 217.8 acres, or 9%, were disturbed. Livestock grazing is common.

EFFECTS

Species: The project may have effects upon one Endangered Species, no Threatened Species, two Candidate Species, and no Designated Critical Habitat. It will not have effects upon Bald Eagles or their habitat. It will not have effects upon one North Dakota Species of Concern ***(Table 1)***. The project may affect but would not likely adversely affect individuals, and it is not expected to contribute to a trend toward elevated federal listing or loss of viability to individuals, the population, or species. The effects are expected to be *insignificant*.

Intensity: The addition of the proposed well pad and access roads would result in a net increase in disturbances of about 6.4 acres. This would disturb about 0.3% of the total analysis area. This would occur within relatively native habitat, but in a small patch of native habitat bounded by disturbed sites, including a well pad, access road, and two pipeline corridors.

The majority of the project would experience *temporary* effects from construction activities – earth moving, dust, blowing litter, and noise - taking several months to complete. Also, until sufficient revegetation occurs, the edges of the access road and well pad scar would provide corridors through which invasive plant species will enter the analysis area.

The most likely *long-term* effect may be from the access roads and well pad scar. Upon completion of the project, it can be expected that some revegetation of the well pad and access road edges would occur within the first growing season and that weedy species and annual grasses would be the first to colonize bare ground. This would be followed by bunchgrasses, and eventually a climax prairie. But the development of climax or original conditions may take decades (Tomanek 1955). Waterline scars in western North Dakota can be visible for decades ***(Figure 15).*** Hence, a long-term effect would be the persistence of early seral stage or invasive vegetation communities within the well pad and access roads perimeter. The persistence of this would depend, in part, on the local seed bank, adjacent plant communities, and success of revegetation efforts and alien invasive weed control.

Table 1. **Effects Summary**

SPECIES	EFFECT		
	NONE[1]	MAY, UNLIKELY[2]	MAY, LIKELY[3]
ENDANGERED			
Gray wolf *(Canis lupus)*	X		
Black-footed ferret *(Mustela nigripes)*	X		
Whooping Crane *(Grus americana)*		X	
Interior Least Tern *(Sterna antillarum)*	X		
Pallid sturgeon *(Scaphirhynchus albus)*	X		
THREATENED			
Piping Plover *(Charadrius melodus)*	X		
Red Knot (*Calidris canutus rufa*)	X		
Northern long-eared Bat (*Myotis septentrionalis*)	X		
Dakota Skipper (*Hesperia dacotae*)		X	
Western prairie fringed orchid *(Platanthera praeclara)*	X		
CANDIDATE			
Sprague's Pipit *(Anthus spragueii)*		X	
DESIGNATED CRITICAL HABITAT			
Piping Plover habitat	X		
NORTH DAKOTA SPECIES OF CONCERN			
Flathead Chub (*Platygobio gracilis*)	X		
Sturgeon Chub (*Macrhybopsis galida*)	X		
Paddlefish (*Polyodon spathula*)	X		
OTHER SPECIES			
Bald Eagle (*Haliaeetus leucocephalus*)	X		
Golden Eagle (*Aquila chrysaetos*)	X		

[1] No effect. There are absolutely no effects from the proposed action, positive or negative, to listed species.

[2] May, Unlikely. May affect, not likely to adversely affect: Where all effects are beneficial, insignificant or discountable. It is not likely to adversely affect or contribute to a trend toward elevated federal listing or cause a loss of viability to the population or species.

[3] May, Likely. May affect, is likely to adversely affect: All adverse effects cannot be avoided. Will affect individuals or habitat and is likely to adversely affect, with a consequence that the action may contribute to a trend toward elevated federal listing or cause a loss of viability to the population or species.

Figure 15. Aerial view showing road, pipeline, and well pad scars at varying stages of reclamation. This view is from Charlson, ND.

Some effects may result from the maintenance of bare ground conditions on the access roads and well pad. These may provide opportunities for alien and invasive plant species to colonize and spread into the analysis area. Maintenance vehicles and traffic may be vectors through which invasive plant species enter the analysis area. Animal species may be disturbed by maintenance and repair activities.

While the proposed well pad and access roads would produce a total of 6.4 acres of disturbance, repeated disturbances and an accumulation of individual impacts could eventually result in an adverse *cumulative* impact on the habitat and/or populations of rare species. Individual impacts may include the introduction of non-native plant species, habitat fragmentation, loss of corridors, decreased vegetative structure, decreased floristic diversity, reduction of gene flow, reduction of populations or habitat below critical threshold levels, extirpation of populations or habitat, sedimentation and degradation of surface water, erosion and siltation. Individually, each of these has the potential result in the loss of viability of a population or species. Cumulatively, these impacts may result in the loss of viability of a population or species. In turn, some of these cumulative effects could accelerate other adverse conditions.

Mitigations: In an effort to further reduce potential effects upon listed species, best management practices, or recommended design criteria should be considered. These criteria are described below.

RECOMMENDED DESIGN CRITERIA

Yellowfield Biological Surveys, LLC, recommends the approval of this project with incorporation of the applicable design criteria below. Generally, best management practices should be conducted in a manner to avoid or minimize cumulative effects to natural plant and animal populations; the best management practice is to limit disturbances as much as possible. This can produce major improvements in the ecological outcomes: reducing habitat fragmentation, and noxious weed opportunities, and maintaining suitable habitat, vegetative structure and floristic diversity.

These recommendations are based on FWS standards, general recommendations for high-level project planning purposes that, if followed, should yield some beneficial proactive planning that would avoid or minimize the risk for take under federal environmental laws (FWS 2011; FWS 2012; FWS 2013a).

Table 2. Listed Species and Habitat Sensitivity Periods

SPECIES	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ENDANGERED												
Gray wolf *(Canis lupus)*												
Black-footed ferret *(Mustela nigripes)*												
Whooping Crane *(Grus Americana)*												
Interior Least Tern *(Sterna antillarum)*												
Pallid sturgeon *(Scaphirhynchus albus)*												
THREATENED												
Piping Plover *(Charadrius melodus)*												
Red Knot *(Calidris canutus rufa)*												
Northern long-eared bat *(Myotis septentrionalis)*												
Dakota skipper *(Hesperia dacotae)*												
Western prairie fringed orchid *(Platanthera praeclara)*												
CANDIDATE												
Sprague's Pipit *(Anthus spragueii)*												
DESIGNATED CRITICAL HABITAT												
Piping Plover *(Charadrius melodus) – Missouri River*												
NORTH DAKOTA SPECIES OF CONCERN												
Flathead Chub *(Platygobio gracilis)* [1]												
Sturgeon Chub *(Macrhybopsis galida)* [2]												
Paddlefish *(Polyodon spathula)* [3]												
OTHER SPECIES												
Bald Eagle *(Haliaeetus leucocephalus)*												
Golden Eagle *(Aquila chrysaetos)*												

1) Avoid critical reproductive or migratory activities. When listed species may be affected, construction activities should avoid periods of critical reproductive or migratory activities of these listed species. ***Table 2, Listed Species and Habitat Sensitivity Periods*** describes potential construction windows. Should this not be possible, alternative dates *may be acceptable* under certain conditions. Regarding listed migratory birds, the FWS recommends:

> To the extent practicable, schedule construction for late summer or fall/early winter so as not to disrupt migratory birds during the breeding season (February 1 to July 15 generally, for least terns and piping plovers the breeding season extends through August 31). (FWS 2011; page 3)

In the event the schedule cannot be followed:

> If work is proposed to take place during the breeding season, there may be take of migratory birds, their eggs, or active nests. If project construction cannot avoid the nesting season, the Service suggests that the vegetation within the proposed project area be mowed/cleared outside of the nesting season, in advance of the project initiation to remove potential breeding habitat for nesting migratory birds in the project area. Once cleared the project area should be maintained in a state that is unsuitable for nesting until the end of the breeding season or until construction is complete. Alternatively, a qualified biologist could be hired to conduct bird/nest surveys within 5 days prior to the initiation of construction. If active nests are identified, the project proponent should cease construction, maintain a sufficient buffer around active nests to avoid disturbing breeding activities and contact the Service immediately. The Service recommends that the project proponent implement all practicable measures to avoid all take, such as suspending construction where necessary, and/or maintaining adequate buffers to protect the birds until the young have fledged. The Service further recommends that if you choose to conduct field surveys for nesting; birds with the intent of avoiding take, that you maintain any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the survey(s), and any avoidance measures implemented at the project site. Should surveys or other available information indicate a potential for take of migratory birds, their eggs, or active nests, the Service requests that you contact this office for further coordination on the extent of the impact and the long-term implications of the intended use of the project on migratory bird populations. (FWS 2012; page 3)

Regarding Sprague's Pipit, the FWS guidelines allow a late summer start-up. Pipits normally depart in late August.

2) Clean equipment. While noxious weeds are likely to remain a threat in the grasslands on private and public lands, care can be taken to control further spread of invasive species into the area by cleaning equipment. This is important in this project because the proposed waterline would travel through so much disturbed habitat, creating a greater potential for distribution of non-native species during construction.

3) Weed spraying. Isolated weed patches should be treated with herbicide prior to disturbances.

4) Weed monitoring. Because of the threat of noxious weeds, periodic monitoring of weed populations should be made to determine the need for biological or chemical control measures.

5) Avoid wooded draws, wetlands, and riparian areas. Effects on vegetative structure can be reduced by avoiding these areas. The FWS adds these details:

- Make *no stream channel alterations* or changes in drainage patterns.
- Locate construction to *avoid placement of fill in wetlands* along the route.
- *Replace unavoidable loss of wetland habitat* by restoring an equal acreage of functionally restoring equivalent wetland habitat (FWS 2011; pages 3-4).

6) Reclamation. Floristic diversity can be aided by reclamation practices such as the restoration of topographical diversity, uneven distribution of topsoil, and avoidance of planting aggressive cultivars. Reclamation of the site should follow specifications set forth by federal and state authorities. The FWS letter adds these details:

- *Reseed disturbed upland areas* with native plant species immediately after construction to reduce erosion.
- *Avoid construction in native prairie*, if possible.
- *Reseed disturbed native prairie* with a comparable native grass and forb seed mixture.
- *Plant a diverse mixture of native cool and warm season grasses* and forbs. Recent research has suggested that a more diverse mix, including numerous forb species, is not only ecologically beneficial but is also more weed resistant, allowing for less intensive management and chemical use. In essence, the more species included in a mixture, the higher the probability of providing competition to resist invasion by nonnative plants. The *seed source should be as local as possible,* preferably collected from the nearby native prairie. Obtain seed stock from nurseries within 250 miles of the project area to ensure the particular cultivars are well-adapted to the local climate. The Natural Resources Conservation Service (NRCS) compiles a list of vendors in North Dakota that supply conservation seed and plants. Additional information on native grasses and forbs may be found at the NRCS Bismarck Plant Materials Center. (FWS 2011; pages 3-4)

7) HDD Technique. Where possible, use HDD rather than open trench construction when crossing wetlands. The HDD waterbody crossing technique is a low impact crossing technique that is preferred by the Army Corps of Engineers and the North Dakota Department of Health. This drilling method minimizes potential impacts to the resources and downstream water quality. Based upon aerial photography the HDD equipment and materials should be staged and operating from a point that will maintain the minimum 0.5 buffer from potential nesting habitat.

8) Erosion control. Install and maintain appropriate erosion control measures to reduce sedimentation and water quality degradation of wetlands and streams near the project area. Silt fencing between wetland or aquatic communities or drainageways and the construction zone can provide some protection.

9) Chemical spill prevention and containment. The developer will need to implement a Spill Prevention, and Containment and Countermeasure Plan for this project. Project personnel should be trained to the procedures for addressing a potential release event. Typical equipment used for construction is drill rigs, trucks and excavator equipment. Fuels used for this equipment are diesel, kerosene, military aviation kerosene and gasoline, coolants and lubricants. Each machine has a capacity between 6,000 to 12,000 gallons. Spill response kits should be on site of the appropriate type to manage a potential release. Project personnel should be oriented to the location and contents of kits and should be trained to appropriate response measures.

For added protection, a field biologist could be onsite during the construction to monitor for listed species. Any future sightings of listed in the project area should be reported to the FWS.

LIMITATIONS

Despite the survey and research efforts, findings and determinations have limits. Absence of evidence does not constitute evidence of absence. At times, field surveys do not necessarily coincide with prime survey windows, such as best plant phenology, bird breeding season, or adult flight of butterflies. Mobile species might not be in the analysis area or in open view at the time of the survey. Objects or weather conditions may obscure the species or impair visibility. In many cases, a given species may have a wide tolerance for habitats, while in other cases the habitat required by a species has not been closely studied and therefore has been vaguely identified. This makes it difficult to anticipate whether a species will occur on an area or not. Evidence may be limited by the conditions under which it is gathered and determinations are as limited as the evidence upon which they are based.

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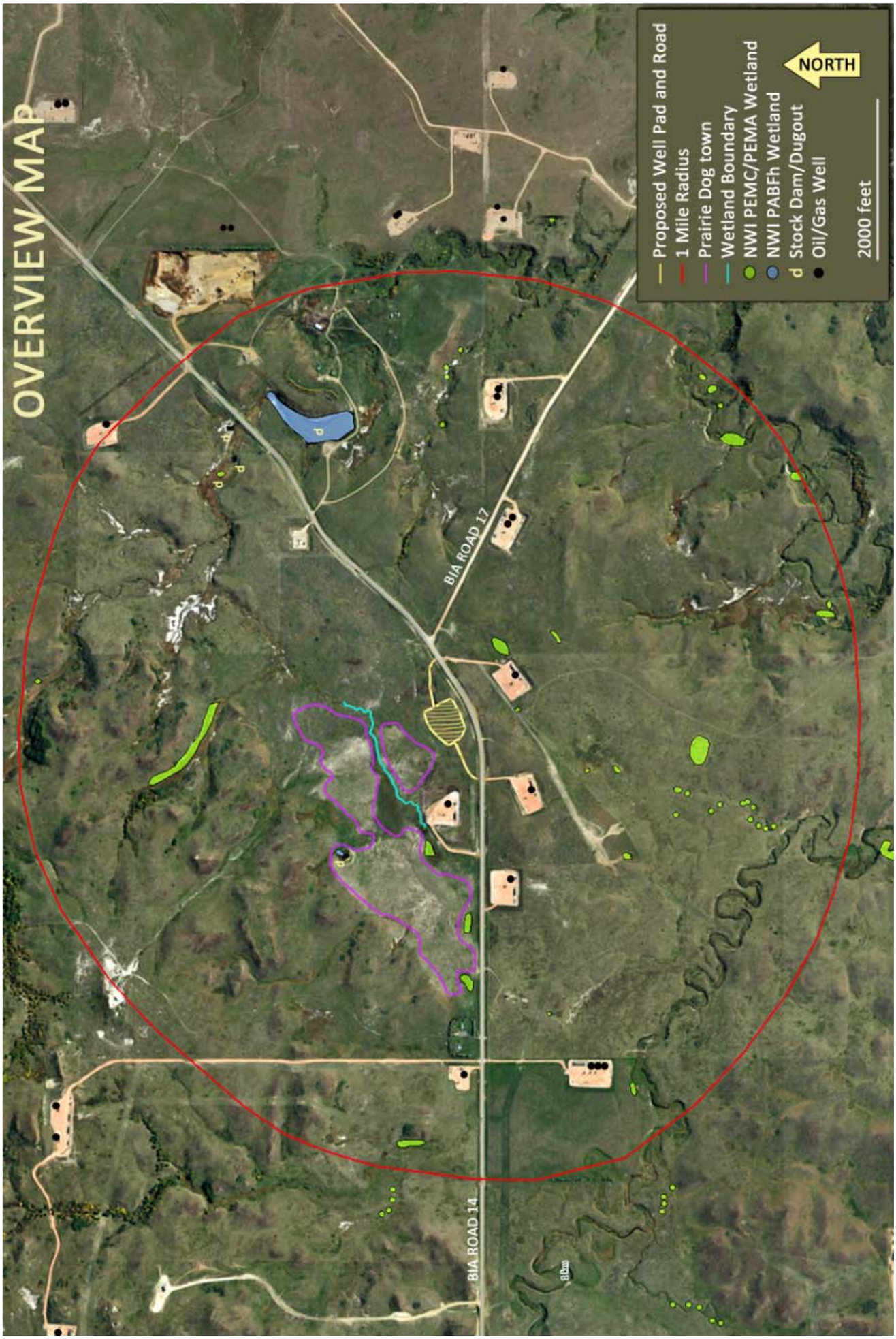
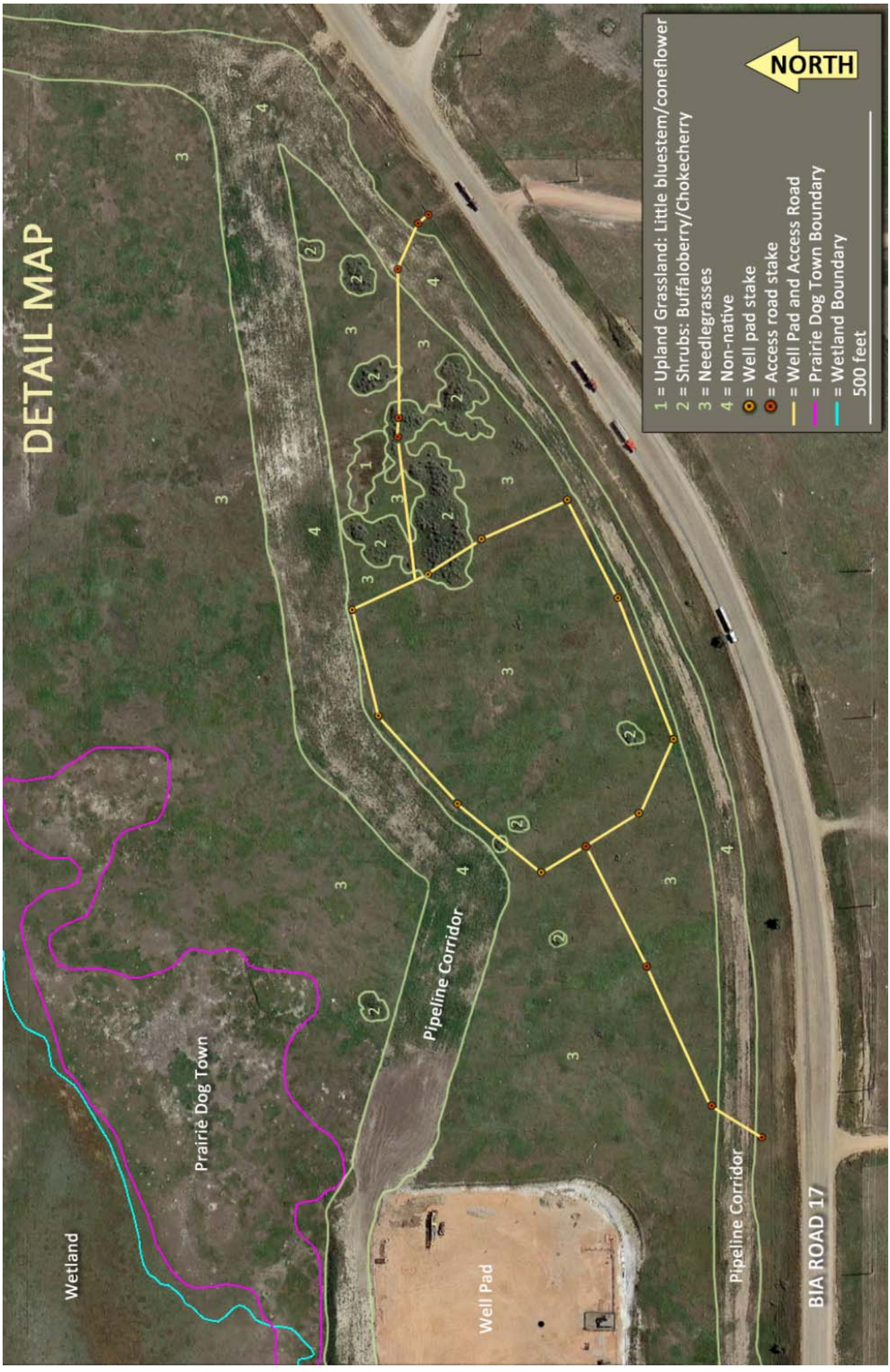
APPENDIX A. OVERVIEW MAP



APPENDIX B. DETAIL MAP



APPENDIX C. NDPR RARE SPECIES LOCATIONS

APPENDIX D. IPAC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Dakota Ecological Services Field Office
3425 MIRIAM AVENUE
BISMARCK, ND 58501
PHONE: (701)250-4481 FAX: (701)355-8513
URL:
www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Consultation Code: 06E15000-2016-SLI-0427 July 25, 2016
Event Code: 06E15000-2016-E-00900
Project Name: RED SWD 1

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: RED SWD 1

Official Species List

Provided by:

North Dakota Ecological Services Field Office
3425 MIRIAM AVENUE
BISMARCK, ND 58501
(701) 250-4481
http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

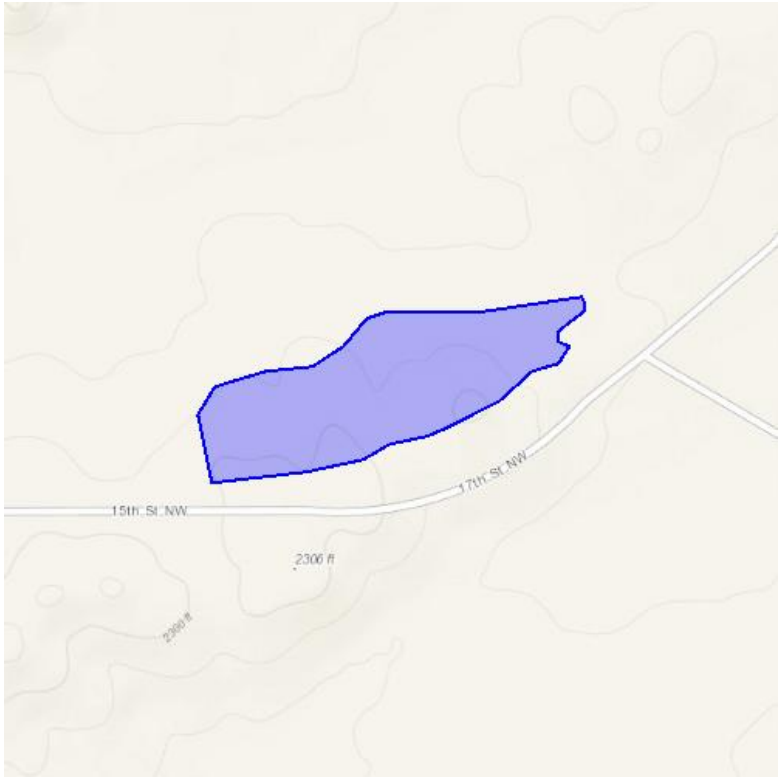
Consultation Code: 06E15000-2016-SLI-0427
Event Code: 06E15000-2016-E-00900

Project Type: OIL OR GAS

Project Name: RED SWD 1
Project Description: Saltwater disposal system. 6.4 acre project. T148N, R94W, S15 SE. Build 2016

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-102.63092994689941 47.6340340152513, -102.63092994689941 47.63394002812653, -102.63136982917786 47.63370144466599, -102.63138055801392 47.63357853760968, -102.63118743896484 47.633527928737756, -102.63136982917786 47.633332722629845, -102.63184189796446 47.63323150436088, -102.63241052627563 47.6328989286682, -102.63327956199646 47.63258804078058, -102.63367652893066 47.63247236109447, -102.63430953025818 47.632385601161836, -102.63476014137267 47.63220485083955, -102.63575792312622 47.6320530200857, -102.63739943504332 47.63193733921528, -102.6376461982727 47.63273264002814, -102.63733506202698 47.633050756964394, -102.63644456863403 47.633245964125585, -102.63566136360168 47.63328934339573, -102.63511419296265 47.633527928737756, -102.63470649719238 47.63384604083273, -102.63439536094666 47.633932798340716, -102.6327645778656 47.63391833876606, -102.63097286224365 47.63411354268641, -102.63092994689941 47.6340340152513)))

Project Counties: Dunn, ND

Endangered Species Act Species List

There are a total of 8 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Least tern *(Sterna antillarum)* Population: interior pop.	Endangered		
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened	Final designated	
Red Knot *(Calidris canutus rufa)*	Threatened		
Whooping crane *(Grus americana)* Population: except where EXPN	Endangered	Final designated	
Fishes			
Pallid sturgeon *(Scaphirhynchus albus)* Population: Entire	Endangered		
Insects			
Dakota Skipper *(Hesperia dacotae)*	Threatened	Final designated	
Mammals			
Gray wolf *(Canis lupus)* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA,	Endangered		

MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico.			
Northern long-eared Bat *(Myotis septentrionalis)*	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Attachment T2

JUNIPER
ENVIRONMENTAL CONSULTING

RED 1 SWD WELL LOCATION:
CLASS III CULTURAL RESOURCE INVENTORY, DUNN COUNTY, NORTH DAKOTA

Prepared For:
1804 Operating, LLC
Williston, North Dakota

Principal Investigator:
John G. Morrison

Prepared By:
John G. Morrison
Juniper, LLC
Bismarck, North Dakota

Report of Investigation: 364 **July 2016**

315 E. Broadway Ave., Bismarck, ND 58501 | O: (701) 223-6306 | C: (701) 400-3575 | Juniper, LLC

MANUSCRIPT DATA RECORD FORM

1. Manuscript Number:
2. SHPO Reference #:
3. Author(s): John G. Morrison
4. Title: RED 1 SWD Well Location: A Class III Cultural Resource Inventory, Dunn County, North Dakota
5. Report Date: July 2016
6. Number of Pages: 14
7. Type I, T, E, O: I
8. Acres: 28
9. Legal Location(s) with Historic Context Study Unit(s):

COUNTY	TWP	R	SEC	SU
DU	148	94	15	LM

Small Survey Report
Submitted by Juniper, LLC
315 E. Broadway Ave., Bismarck, ND 58501
Phone: (701) 400-3575, Email: j.morrison@juniperenvironmental.com

Report Title: RED 1 SWD Well Location: A Class III Cultural Resource Inventory, Dunn County, North Dakota

Author: John G. Morrison

Report Date: July 2016

Acreage: 28 acres

Survey Date: July 13, 2016

Project Sponsor: 1804 Operating, Williston, North Dakota

Historic Context: Little Missouri River Study Unit (#1)

Legal Description/Location of Project Area: The current inventory area is located in the SE¼ of Section 15, T. 148 N., R. 94 W., approximately 14.5 miles south-southeast of Mandaree, North Dakota. The well head is proposed to be placed at 513' FSL and 736' FEL within Section 15, T. 148 N., R. 94 W., in Dunn County, with a total proposed disturbance of less than 7 acres.

Description of Proposed Project: The proposed project consists of the development of a disposal well location and an access road off of BIA 14. The proposed disturbance is 6.4 acres based on plat drawings, with access provided by two access roads, one approximately 650' long entering the western side of the location and the other 740' long entering the eastern side of the location. Both of the access roads tie the location into BIA Road 14 which runs along the southern edge of the inventory block (Figure 1 - Figure 3). An irregularly shaped 28 acre area was inventoried to Class III standards as defined in the State Historic Society of North Dakota (SHSND) guidelines (SHSND 2015). The irregular shape of the inventory area results from the perceived barriers to additional ground disturbance surrounding the proposed well location. The area to the north of the well location is bounded by the existing Arrow pipeline, to the south lies the Targa pipeline and BIA Road 14. To the west is an existing well location and to the east is the section line. The project area is located within the Little Missouri River Study Unit (#1) as described in SHSND (2008:1.1-1.41).

Results of Literature Review: A literature review of the SHSND site and manuscript files was conducted by Solli Frank on July 6, 2016, for a one mile radius study area around the proposed well location. The file search noted 31 previously recorded cultural resources and 36 previous inventories within a one mile radius. Approximately seven (possibly as many as nine) of the previous inventories overlap the proposed well location. The current inventory covers the entirety of the project area and fills in any gaps in the previous coverage. The results of the file search are tabulated below (Table 1- Table 2, Figure 4).

Field Personnel: John G. Morrison (Principal Investigator). The Mandan, Hidatsa, and Arikara Nation Tribal Historic Preservation Office (MHATHPO) was contacted and informed of the inventory; the MHATHPO did not, however, express concerns and declined to participate with this field effort. The MHATHPO did ask that if cultural resources were found that Juniper should notify the MHATHPO regarding the cultural resources.

Small Survey Report
Submitted by Juniper, LLC
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Phone: (701) 400-3575, Email: j.morrison@juniperenvironmental.com

Table 1: Results of the Site, Site Lead, and Isolated Find Files Search					
Sec-Twp/Rng	**SITS#**	**Type**	**Recorder Date**	**NRHP Status**	**MS #**
9-148/94	32DU1843	Archaeological - Cairn, SC, Other Rock Features	Leroy 2012	UN	12336, 12502, 13169, 13819, 14949, 15033, 16486
10-148/94	32DU1837	Architectural/Historic - Log Cabin; CMS, Metal, Rubble, Wood, Other	Macy 2012	UN	
11-148/94	32DU1410	Archaeological - Cairn	Brooks 2013; Hiemstra 2008	UN	6463, 10823, 12614, 12972, 13037, 13043, 13079
	32DU1548	Archaeological - Stone Alignment	Kohler/Hutchinson 2010	UN	
14-148/94	32DU1407	Archaeological - CMS, Chipped Stone	Cox/Picka 2013; Hiemstra 2008	UN	10823, 12633, 12614, 12718, 12910, 13034, 13079, 13131, 13148, 13383, 14306, 16485
	32DU1409	Archaeological - CMS, Chipped Stone	Hiemstra 2008	UN	
	32DU1666	Archaeological - Stone Alignment	Schleicher/Riordan 2011	UN	
	32DU1702	Archaeological - Cairn	Leroy/Lantz/Yost 2011	UN	
	32DU1893	Historic - Depression	Brooks 2013	NE	
	32DU1896	Architectural - Culverts	Brooks 2013	NE	
	32DU848	Archaeological - SCs	Banks 1987	UN	
	32DUx739	Isolated Find - Chipped Stone	Hiemstra 2008	NE	
15-148/94	32DU1406	Archaeological - CMS, Chipped Stone	Hiemstra 2008	UN	10823, 12633, 12718, 12910, 13148, 13151, 14306, 15799
	32DUx67	Site Lead - Goodall's Horse Camp	Benson 1980	UN	
	32DUx727	Isolated Find - Chipped Stone	Hiemstra 2008	NE	
	32DUx728	Isolated Find - Chipped Stone	Hiemstra 2008	NE	
16-148/94	32DU1859	Architectural/Historic - Homestead, CMS, Depression	Gordon 2012	UN	10406, 12501, 12502, 13151, 13169, 14949, 16486
	32DU1860	Historic - CMS, Ceramics, Glass, Metal, Wood	Robinson 2012	NE	
	32DU1895	Architectural - Culvert	Brooks 2013	NE	
	32DUx68	Site Lead - Round-Up Corral	Benson 1980	UN	
21-148/94	32DU1671	Archaeological - SC, CMS, Chipped Stone	Smith/Schleicher 2010	UN	2709, 12501, 12502, 12633, 12848, 12938, 13151, 13170
	32DU1895	Architectural - Culvert	Brooks 2013	NE	
	32DUx68	Site Lead - Round-Up Corral	Benson 1980	UN	
22-148/94	32DU1450	Archaeological - SCs	Tatman/Lechert 2009	UN	10823, 12323, 12501, 12938, 13370, 12540, 12633, 13148, 13151, 14306, 15799
	32DU1451	Archaeological - SC	Tatman 2009	UN	
	32DU1892	Archaeological - SC	Brooks 2013	UN	
	32DUx726	Isolated Find - Chipped Stone	Hiemstra 2008	NE	
23-148/94	32DU1375	Archaeological - CMS, SC, Chipped Stone	Harty 2008	UN	12633, 13041, 13042, 13148
	32DU1545	Archaeological - SC, Stone Arc	Kohler/Hutchinson 2010	UN	

Small Survey Report
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Table 1: Results of the Site, Site Lead, and Isolated Find Files Search					
Sec-Twp/Rng	**SITS#**	**Type**	**Recorder Date**	**NRHP Status**	**MS #**
	32DU1546	Archaeological - Cairn, Stone Alignment	Kohler/Hutchinson 2010	UN	12633, 13041, 13042, 13148
	32DU1547	Archaeological - Stone Concentration	Kohler/Hutchinson 2010	UN	
	32DU1561	Archaeological - Stone Alignment	Smith/Schleicher 2010	UN	

NRHP=National Register of Historic Places, CMS=Cultural Material Scatter, SC=Stone Circle, NE=Not Eligible, UN=Unevaluated.

Table 2: Results of the Manuscript Review	
Manuscript #	**Reference**
2709	Montgomery, S., R. Birnie, and D. Hungerford 1982 *A Class III Intensive Inventory for the Proposed Amerex Allotted Well #1 and Access Road in Dunn County, North Dakota.*
6463	Klinner, D. 1995 *TEK Industries' Proposed Gravel Pit Expansion on the Fort Berthold Indian Reservation: Results of the Class III Cultural Resources Inventory, Dunn County, North Dakota UW#1788.*
10406	Harty, J. 2008 *Burr 16-44 Well Pad and Access Road: A Class III Cultural Resource Inventory, Dunn Co., ND.*
10823	Hiemstra, D. 2009 *West Segment Area's 1 and 1A: A Class III Cultural Resource Inventory for a Proposed Waterline on the Fort Berthold Reservation in Dunn and McKenzie Counties, ND.*
12323	Tatman, J. and A. Wuenschel 2009 *A Class I and Class III Cultural Resource Inventory of Petro-Hunts Fort Berthold 148-94-22A-27-1H and 148-94-25A-36-1H Oil Wells and Access Roads, Dunn Co., ND.*
12336	Herson, C. 2011 *A Class I and Class III Cultural Resource Inventory for the Expansion of the Existing Petro-Hunt Fort Berthold 148-94-9D-4-1H Well Pad to Permit Construction of the Petro-Hunt Fort Berthold 148-94-9D-4-2H Well, Dunn Co., ND.*
12501	Schleicher, J. 2011 *A Class I and Class III Cultural Resources Inventory of the Arrow Fort Berthold 148-94-17D-8-1H, 2H Gathering Pipeline and Temporary Access Roads, Fort Berthold Indian Reservation, Dunn Co., ND.*
12502	Schleicher, J. 2011 *A Class I and Class III Cultural Resources Inventory of the Arrow Fort Berthold 148-94-9D-4-1H, 2H Gathering Pipeline and Temporary Access Roads, Fort Berthold Indian Reservation, Dunn Co., ND.*
12540	Schleicher, J. 2011 *A Class I and Class III Cultural Resource Inventory of the Arrow Fort Berthold 148-94-22A-27-1H Gathering Pipeline, Fort Berthold Indian Reservation, Dunn Co., ND.*
12614	Lechert, S., J. Kennedy, and J. Cooper 2010 *A Class I and Class III Cultural Resource Inventory of the Arrow Midstream Holdings Phase 1B South Pipeline, Fort Berthold Indian Reservation, Dunn Co., ND.*
12633	Smith, N. and S. Lechert. 2011 *A Class I and Class III Cultural Resource Inventory of the Arrow Phase 3SW Pipeline, Fort Berthold Indian Reservation, Dunn and McKenzie Co., ND.*

Table 2: Results of the Manuscript Review	
Manuscript #	**Reference**
12718	Riordan, C., C. Herson, and D. Reinhart 2012 *A Class I and Class III Cultural Resource Inventory of the Ethan Hall #2-14H Gathering Pipeline, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
12848	Schleicher, J. and C. Riordan 2011 *A Class I and Class III Cultural Resources Inventory of the Arrow Fort Berthold 148-94-28A-33-1H, 2H Gathering Pipeline, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
12910	Reinhart, D. 2012 *A Class I and Class III Cultural Resource Inventory of the Wounded Face #15-15H Gathering Pipeline, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
12938	Schleicher, J. and C. Riordan 2012 *A Class I and Class III Cultural Resources Inventory of the Arrow Fort Berthold 148-94-21A-20-1H, 2H, 3H Gathering Pipeline, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
12972	Baer, S. 2012 *A Class I and Class III Cultural Resource Inventory of the South Mandaree Lateral Pipeline, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13034	Kohler, T. 2011 *A Class I and Class II Cultural Resources Inventory of the Enerplus Resources Bugle and Trumpet Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13037	Kohler, T. 2010 *A Class I and Class III Cultural Resource Inventory of the Enerplus Resources Habanero, Anvil, Forge, and Jalapeno Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota Report.*
13041	Fewings, N. and T. Kohler 2010 *A Class I and Class III Cultural Resources Inventory of the Hawaii and Maui Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13042	Fewings, N. and T. Kohler 2010 *A Class I and Class III Cultural Resources Inventory of the Hilo and Kona Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13043	Hutchinson. A. and T. Kohler 2010 *A Class I and Class III Cultural Resource Inventory of the Cayenne, Poblano, Vise and Axe Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13079	Riordan, C., C. Herson, and D. Reinhart 2012 *A Class I and Class III Cultural Resource Inventory of the Ethan Hall #2-14H Well Pad Expansion, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13131	Ferris, K. 2009 *A Cultural Resource Inventory of the Nathan Hale #4-25H, Cross #2-13H, Ethan Hall #2-14H, and TAT (751A) #14-19H Well Pads and Access Roads on the Fort Berthold Indian Reservation, Dunn and McKenzie Counties, North Dakota.*
13148	Schleicher, J. 2012 *A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold #148-94-22A-27-2H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13151	Schleicher, J. 2012 *A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold #148-94-21A-20-1H, 2H, 3H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*

Table 2: Results of the Manuscript Review	
Manuscript #	**Reference**
13169	Schleicher, J. 2012 *A Class I and Class III Cultural Resources Inventory of the Petro-Hunt Fort Berthold #148-94-9C-4-3H, 4H, 5H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13170	Schleicher, J. and A. Leroy 2012 *A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold 148-94-28A-31-1H, 2H, Dual Well Pad and Access Road and Fort Berthold #148-94-29A-32-3H, 4H, 5H Triple Well Pad and Access Road, Fort Berthold.*
13370	Leroy, A. and M. Cox 2012 *A Class I and Class III Cultural Resource Inventory of the Arrow Fort Berthold #148-94-22B-27-5H Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13383	Yost, S. and D. Reinhart 2012 *Cultural Resource Monitoring of Construction Activities for the Ethan Hall #2-14H Gathering Pipelines, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
13819	Picka, C. and W. Harding 2012 *A Class I and Class III Cultural Resources Inventory of the Arrow FB #148-94-9C-04-3H, -4H, -5H Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
14306	Wandler, C. and C. Picka 2013 *A Class I and Class III Cultural Resource Inventory of the McKenzie Electric Moccasin Creek Double Circuit and Moccasin Substation BIA North Circuit Electrical Lines on the Fort Berthold Indian Reservation, Dunn County, North.*
14949	McCarty, A. 2013 *A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold #148-94-9D-4-6H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
15033	Picka, C. and M. Cox 2014 *A Class I and Class III Cultural Resource Inventory of the Halcon Fort Berthold #148-94-9C-4-6H, -7H, -8H, -9H, and -10H (Edwards) Well Pad, and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
15799	Schleicher, J. 2015 *A Class I and Class III Cultural Resource Inventory of the Halcon Handes Pad - Fort Berthold #148-94-22A-27-11H, -12H Well Pad Expansion, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
16485	Riordan, C. 2015 *A Class I and Class III Cultural Resource Inventory of the Missouri River Resources Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.*
16486	Riordan, C. 2016 *A Class I and Class III Cultural Resource Inventory of the McKenzie Electric Crystal and Red Cloud Underground Electrical Lines on the Fort Berthold Indian Reservation, Dunn County, North Dakota.*

Field Methods and Conditions: The inventory area was surveyed on July 13, 2016. The inventory block was inspected using parallel pedestrian transects spaced no more than 15 meters apart to cover the extent of the 28 acre area. The general landscape surrounding the inventory consists of a rolling grassland terrain overlooking a gentle swale that contains an intermittent drainage north of the inventoried area.

Overall ground surface visibility (GSV) within the project area averaged 40%. A prairie dog town borders the project area to the north which provided insight into the potential for buried cultural materials that may not have a surface expression (Figure 9). Additional rodent backdirt piles in the center of the inventory area and the roadcut along BIA Road 14 were also inspected for cultural materials (Figure 10). The entirety of the inventory area was inventoried to SHSND Class III I standards.

Results and Recommendations: No new cultural resources were recorded during this project. The closest previously recorded cultural resource is Isolated Find 32Dux728 a KRF flake recorded in 2008. This resource was not relocated during the current inventory. No new and none of the previously recorded cultural resources will be impacted by the proposed undertaking.

Because no new and none of the previously recorded cultural resources will be impacted by the development, and because the MHATHPO did not express any concerns with the proposed undertaking, Juniper recommends a finding of *No Historic Properties Affected* for the proposed construction as inventoried, mapped, photographed, and described herein.

References Cited:

State Historical Society of North Dakota (SHSND)

2008 *North Dakota Comprehensive Plan for Historic Preservation: Archaeological Component.* Produced by and available at the Division of Archaeology and Historic Preservation, State Historical Society of North Dakota, Bismarck.

2015 *North Dakota SHPO Guidelines Manual for Cultural Resource Inventory Projects: Revised Edition.* Produced by and available at the Division of Archaeology and Historic Preservation, State Historical Society of North Dakota, Bismarck.

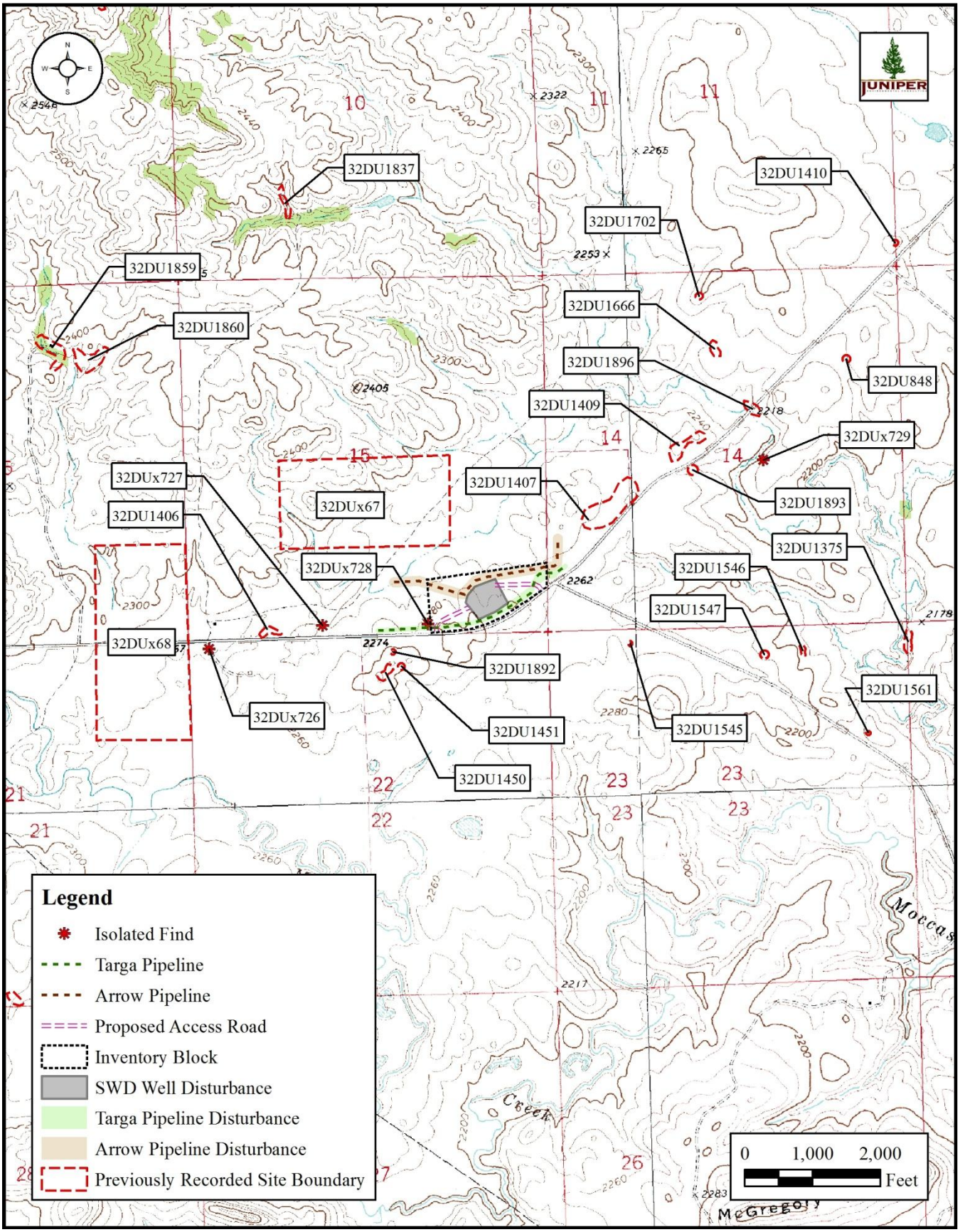

Figure 1: Location of the proposed undertaking in Section 15, T. 148 N., R. 94 W., Dunn County and previously recorded cultural resources, depicted on USGS 7.5' Mandaree (1970), Mandaree NE (1970), Mandaree SW (1970), and Mandaree SE (1970) quadrangle maps.

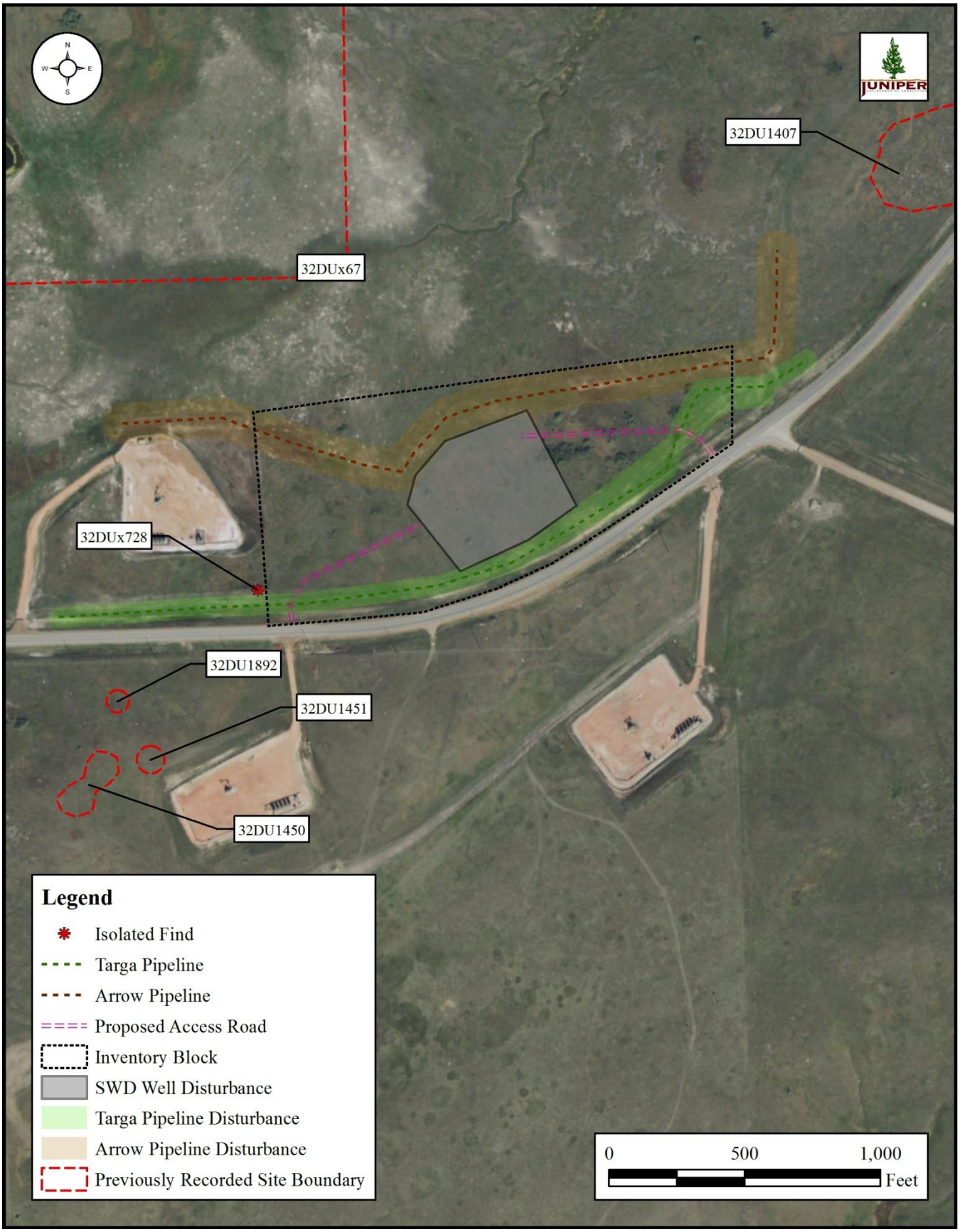

Figure 2: Location of the proposed undertaking, the Targa and Arrow pipelines, other petroleum extraction disturbances, and previously recorded cultural resources, displayed upon 2015 NAIP Dunn County aerial photograph.

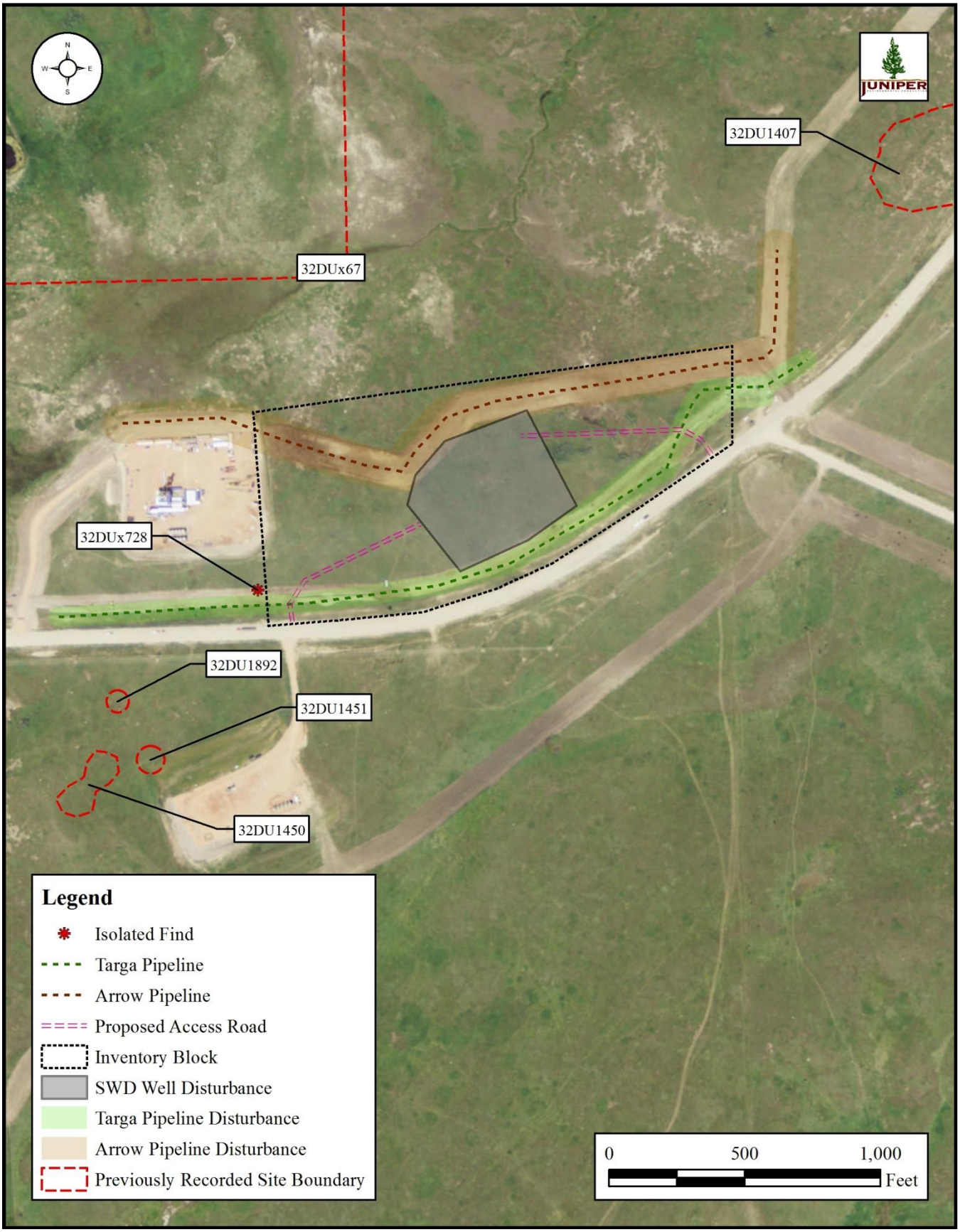

Figure 3: Location of the proposed undertaking, the Targa and Arrow pipeline, other disturbances, and previously recorded cultural resources, displayed upon 2012 NAIP Dunn County aerial photograph.

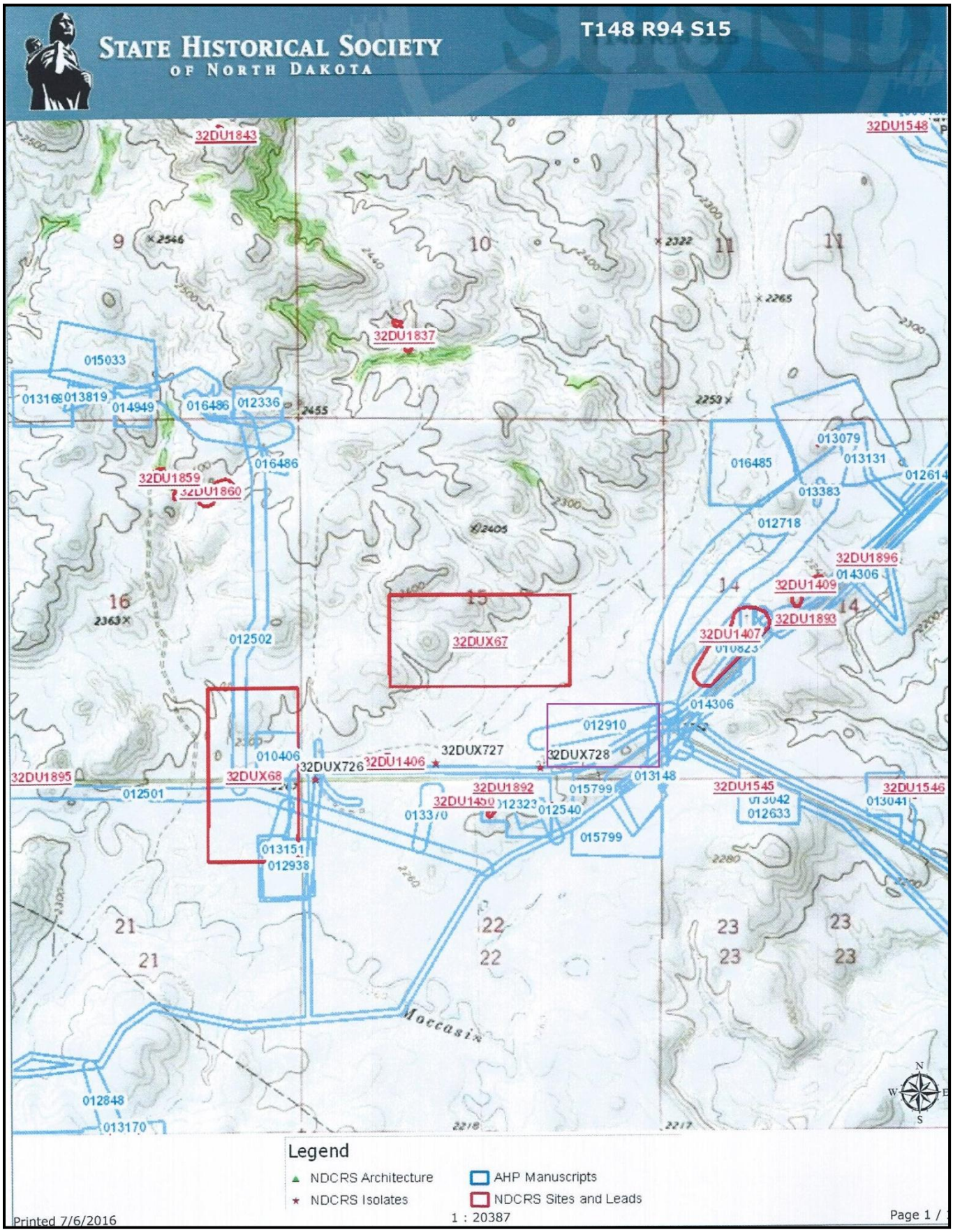

Figure 4: Approximate location of the proposed undertaking (purple box) displayed upon scan of previously conducted inventories and recorded cultural resources generated at the NDSHPOs office on July 6, 2016.

Figure 5: Overview of the proposed RED 1 SWD well location, view from the eastern extent of the access roads, view to west toward pad area.

Figure 6: Overview from western extent of proposed development, view to the east.

Figure 7: Overview of western access road approach to BIA Road 14, view to the west.

Figure 8: View to east along BIA Road from the access road approach.

Figure 9: Overview of the Arrow pipeline corridor with prairie dog mounds, view to the north.

Figure 10: Plan view of typical rodent backdirt pile throughout project area.

U. DESCRIPTION OF BUSINESS

1804 Operating, LLC is a subsidiary of Goodnight Water Solutions, LLC. 1804 Operating, LLC is a North Dakota LLC, incorporated on July 7, 2011, that currently operates 13 Class II disposal wells and 115 miles of saltwater gathering pipelines within the state. 1804's headquarters are located at 5910 North Central Expressway, Suite 630, Dallas, TX 75206.