Whiting Petroleum Corporation
and its wholly owned subsidiary
Whiting Oil and Gas Corporation

1700 Broadway, Suite 2300, Denver, CO 80290-2300
Phone: 303.837.1661 | FAX: 303.861.4023

May 27, 2016

Ms. Karlene Fine
North Dakota Industrial Commission
ATTN: Oil and Gas Research Program
State Capitol – Fourteenth Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

SUBJECT: Whiting Oil and Gas Corporation Proposal Entitled "Refrac Pilot Program"

Dear Ms. Fine,

Whiting Oil and Gas Corporation (WOGC) respectfully submits for your consideration a proposal for a Refrac Pilot program designed to explore the potential for a more broad-based refracturing program to revitalize aging and potentially under-performing horizontal oil wells across the Williston Basin.

The entire Refrac Pilot could involve ten (10) wells across the Williston Basin, but funding is requested only for the top candidate, the TWO SHIELDS BUTTE 14-33-6H well, located in Dunn County, ND, estimated to cost $1.3 MM (gross). WOGC requests $600K in funding from the ND Oil & Gas Research Council in participation with the TWO SHIELDS BUTTE 14-33-6H Refrac.

Please find enclosed an original and copy of the Refrac Pilot proposal, as well as a check for the application fee in the amount of $100. Please also find enclosed and Affidavit of Tax Liability for WOGC.

Sincerely,

Charles Ohlson

Charles Ohlson, P.E.
Completions Manager
Whiting Oil and Gas Corporation

Oil and Gas Research Program

North Dakota

Industrial Commission

Application

Project Title: Refrac Pilot

Applicant: Whiting Petroleum Corporation

Principal Investigator: Charles Ohlson, P.E.

Date of Application: 05/27/2016

Amount of Request: $ 600,000

Total Amount of Proposed Project: $1,300,000

Duration of Project: 30 Days

Point of Contact (POC): **Charles Ohlson, P.E.**

POC Telephone: 303-390-4905

POC E-Mail Address: charles.ohlson@whiting.com

POC Address: Whiting Petroleum Corporation, 1700 Broadway, Suite 2300, Denver, CO 80023

TABLE OF CONTENTS

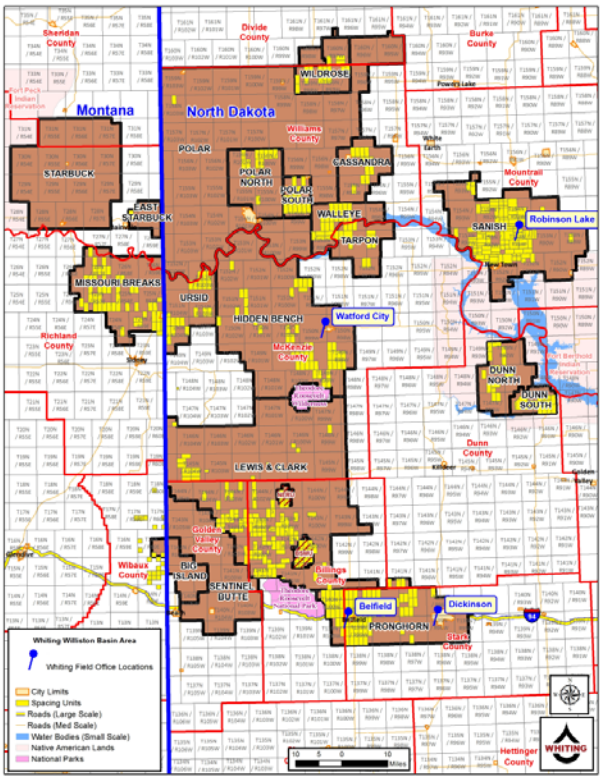
***Please use this table to fill in the correct corresponding page number*.**

ABSTRACT

Objective:

In January, 2016, Whiting Oil and Gas Corporation (WOGC) embarked on a study to explore the potential benefit related to refracturing existing horizontal oil wells in the Williston Basin. With its inventory of over 1400 horizontal wellbores in the Williston Basin, WOGC recognized that developing the experience and methodology to unlock additional reserves through the process of refracturing would be central to maximizing reserve recovery from its assets. Corporate interest in the project resulted in the creation of a budget specific to the Refrac Program for work in 2016. Funding for approximately ten (10) refrac candidates was allocated for 2016.

WOGC assembled multidisciplinary teams comprising a Geologist, Completions Engineer, Production Engineer, Reservoir Engineer and Landman for each of seven (7) different prospect areas across the Williston Basin (refer to map below).



Teams were charged with the task of evaluating each well for its refrac potential, each discipline contributing his/her respective expertise, and providing a top list of candidates along with the associated recommended treatment, job details, costs and economics. Throughout the process the team invested hours studying refracturing techniques applied in other basins, reading through technical papers related to refracturing, attending conferences and learning from industry experts. Since January, the technical teams have assembled their top candidates, and WOGC is prepared to start the "Refrac Pilot" in July, 2016.

Several refrac candidates were identified through WOGC's process, and they were placed in different categories according to their perceived shortcoming or potential issue. There were four (4) specific categories:

1. Refrac to connect to bypassed pay (e.g. stage length too long, failed stages, etc.);
2. Refrac to restore conductivity to the original fractures (i.e. there is evidence they have degraded);
3. Refrac to reconnect the wellbore to the original completion (i.e. there is evidence of scale or salt precipitation plugging the perforations); and
4. Refrac of a parent well when offsetting with infill wells to protect the parent well and ensure optimum proppant distribution around the new infill well(s).

The project that sorted to the top of the list was the TWO SHIELDS BUTTE 14-33-6H well, located in Dunn County, ND, and is the well for WOGC is seeking funding support. The TWO SHIELDS BUTTE 14-33-6H well was completed in May, 2009, and was chosen as the top refrac candidate for several reasons:

- By today's standards, the completion is extremely undersized;
- The geological and reservoir characteristics of the Bakken in this area are very favorable;
- The well is short (4200' lateral), lending it to be a more simple refrac candidate;
- The cumulative production of 146 MBO & 102 MMCF indicate high remaining reserves;
- This well significantly underperforms compared to subsequent wells drilled in the area; and
- Technology has evolved to the point that a refrac is capable of unlocking additional potential.

Expected Results:

Through the Refrac Pilot, WOGC expects to start developing expertise in the refracturing process and refine certain techniques for both candidate selection and job execution that result in a high rate of economic success. Specifically, the proposed refrac of the TWO SHIELDS BUTTE 14-33-6H is expected cost $1.3 MM (gross) and generate the following results:

- Incremental reserve development of 132 MBOE;
- NPV10 of $199K;
- Undiscounted ROI of 2.2;
- ROR of 19%; and
- Payout in 4.0 years.

The TWO SHIELDS BUTTE 14-33-6H well is currently producing at a rate of 31 BOPD, 22 MCFPD, and 18 BWPD, and after the refracturing is performed and the well is cleaned-out and returned to production, the post-work daily initial rate is expected to be 100 BOPD average, for the first 30 days of production. This production behavior response and production profile is based on the WOGC team's research of refrac analogs across the Williston Basin. Learnings from the TWO SHIELDS BUTTE 14-33-6H will be carried forward and applied to the other nine (9) candidates in the Refrac Pilot program.

Duration:

WOGC will start the Refrac Pilot in July, 2016. The well work for the TWO SHIELDS BUTTE 14-33-6H will entail the following general steps:

1. Extract artificial lift equipment from wellbore (2 days);
2. Install a fracstring, test the casing and ensure pressure integrity (2 days);
3. Clean-out well to the Total Depth (3 days);
4. Perforate additional holes in the casing for additional access points for the refrac (1 day);
5. Perform the refrac (design is 2 MMlbs proppant, 26 cycles, each separated by diversion material (2 days);
6. Flowback well for clean-up (7 days);
7. Clean-out wellbore to Total Depth (3 days);
8. Remove fracstring from well (1 day);
9. Install artificial lift equipment, return to production (2 days); and
10. Test well and report results.

Based on the basic steps outlined above, WOGC expects the work to finish by August, 2016. The success of the project will be analyzed in the following months and will be based on production behavior. More specific timing and procedural details are described later in the application.

Total Project Cost:

The TWO SHIELDS BUTTE 14-33-6H refrac is estimated to cost $1.3 MM (gross). WOGC respectfully requests $600 MM of funding assistance from the North Dakota Industrial Commission (NDIC) Oil and Gas Research Program. The cost breakdown is detailed below:

DESCRIPTION OF WORK OR SERVICE	EST. COST
Well Preparation (pull rods, run fracstring)	$110K
Initial Clean-out of well	$100K
Refrac: 2MM lbs proppant (includes water)	$670K
Flowtesting (post refrac)	$30K
Post-Refrac Clean-out of well	$100K
Run equipment back, return to production	$140K
Miscellaneous services and contingency	$150K
TOTAL COST	**$1,300K**

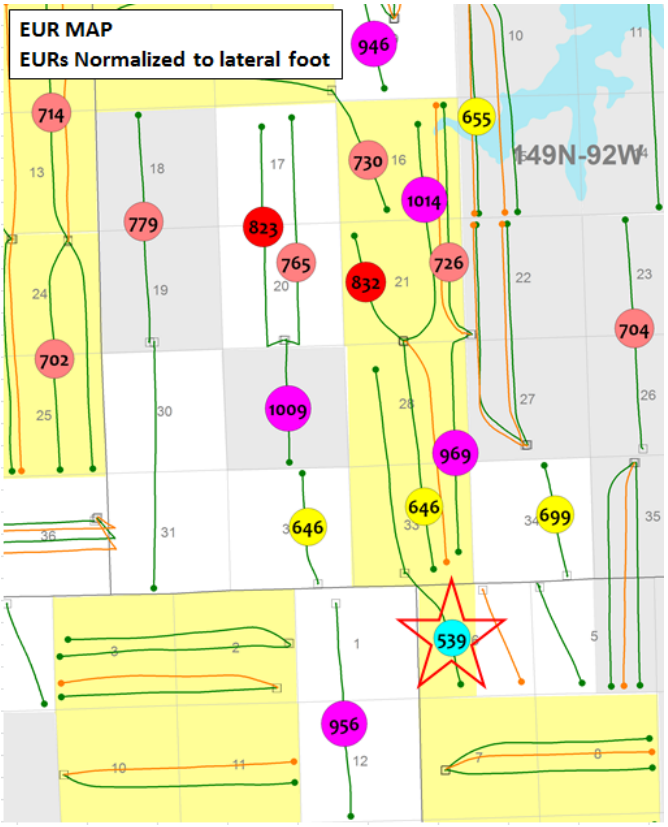
Participants:

WOGC (named operator) and its affiliated working interest owners (WIO) will be the sole participant in the proposed TWO SHIELDS BUTTE 14-33-6H Refrac Pilot project.

PROJECT DESCRIPTION

Objectives:

WOGC's proposed Refrac Pilot will start with refracturing the TWO SHIELDS BUTTE 14-33-6H to unlock reserve potential that is thought to have been bypassed during the initial completion. TWO SHIELDS BUTTE 14-33-6H is a short lateral (4200') that was completed in May, 2009, with only 6 Frac Stages and 929,000 lbs of proppant, which calculates to only 600 lbs proppant per lateral foot of wellbore, and a stage spacing of 700' per stage. Although considered an adequate completion at the time, the TWO SHIELDS BUTTE 14-33-6H well is surrounded by subsequent wells with enhanced completions that yield far better results (refer to map below of EUR's normalized to lateral foot – TWO SHIELDS BUTTE 14-33-6H marked with red star):



Given the known reservoir characteristics and expected recovery (refer to table below), it is anticipated the TWO SHIELDS BUTTE 14-33-6H well is capable of recovering an additional 132 MBOE if adequately refractured.

RESERVOIR PARAMETER	VALUE
Formation	Middle Bakken
Max Porosity (%)	8.2%
Avg Porosity (%)	4.5%
Net Pay (ft)	46
Upper Bakken Shale Thickness (ft)	16

Lower Bakken Shale Thickness (ft)	22
Water Saturation (%)	42%
Estimated Matrix Perm (md)	0.13
Estimated BHT (deg F)	242
Oil Formation Volume Factor (rb/STB)	1.1
Oil Viscosity (cp)	1
Oil Gravity (deg API)	42
Gas Gravity (SG)	0.9938
Water Specific Gravity (SG)	1.19
Estimated Initial Reservoir Pressure (psi)	7694
Current Cumulative Oil Production (MBO)	**146**
Projected DSU Recovery (MBO)	**250**

Methodology:

The TWO SHIELDS BUTTE 14-33-6H Refrac methodology will take advantage of the experience gained by the industry in perfecting the refrac process in other unconventional basins requiring horizontal wellbores with multiple stimulations.

To recap the general Refrac Pilot procedure, it will involve four (4) general phases:

1. Pull the artificial lift equipment, clean-out the well, test the casing for integrity, perforate additional holes in the liner in preparation for the refrac;
2. Refrac the wellbore with 2 MMlbs proppant, divided into twenty-six (26) sub-stages separated by a diversion product designed to temporarily block perforations taking the refrac stimulation and encourage find new perforations and stimulate new portions of the reservoir;
3. Flowback and clean-out the wellbore, run back artificial lift and return the well to production; and
4. Monitor the well for changes in behavior, report results, evaluate and generate feedback loop to the multidisciplinary team for optimization efforts.

The refrac design and execution in particular will be “key” to unlocking potential that was left behind during the original completion. The fact that the lateral is short (4200’) to begin with is a huge advantage to WOGC in the anticipated success of accessing new reservoir all along the lateral. In early rerfrac attempts of long laterals (i.e. 9500’ or longer), operators experienced difficulty conveying proppant beyond the first third or half of the lateral, often seeing bridging occurring mid-way through the lateral. WOGC is pleased to be trying a shorter lateral during its refrac pilot.

In preparing the lateral for refrac, it will be cleaned-out to the Total Depth to ensure access for the refrac. The original completion included a liner with Swell Packers with a Ball-n-Sleeve style opening, which essentially provides one access point to the reservoir between any two packers, spaced approximately 700’ apart (refer to wellbore diagram below).

Well Name: **Two Shields Butte 14-33-6H**

Surface Loc: 530' FSL & 2340' FWL (SESW) Sect 33, T148N, R 92W
Btm Hole Loc: 553' FSL & 1869' FWL (SESW) Sect 6, T148N, R 92W
API: 33-025-00934
Elev: 2278 GL 2306 KB
Total Depth: 15919' MD 10340' TVD
Lease No: 7420A48509 (14-20-A04-8509)
Dunn County, ND
File # : 18107

Single Lateral
Field: Wildcat
Spud Date: 5/12/2009
Producing Zone: Middle Bakken

Wellbore Diagram as of : 8/12/2009 BD

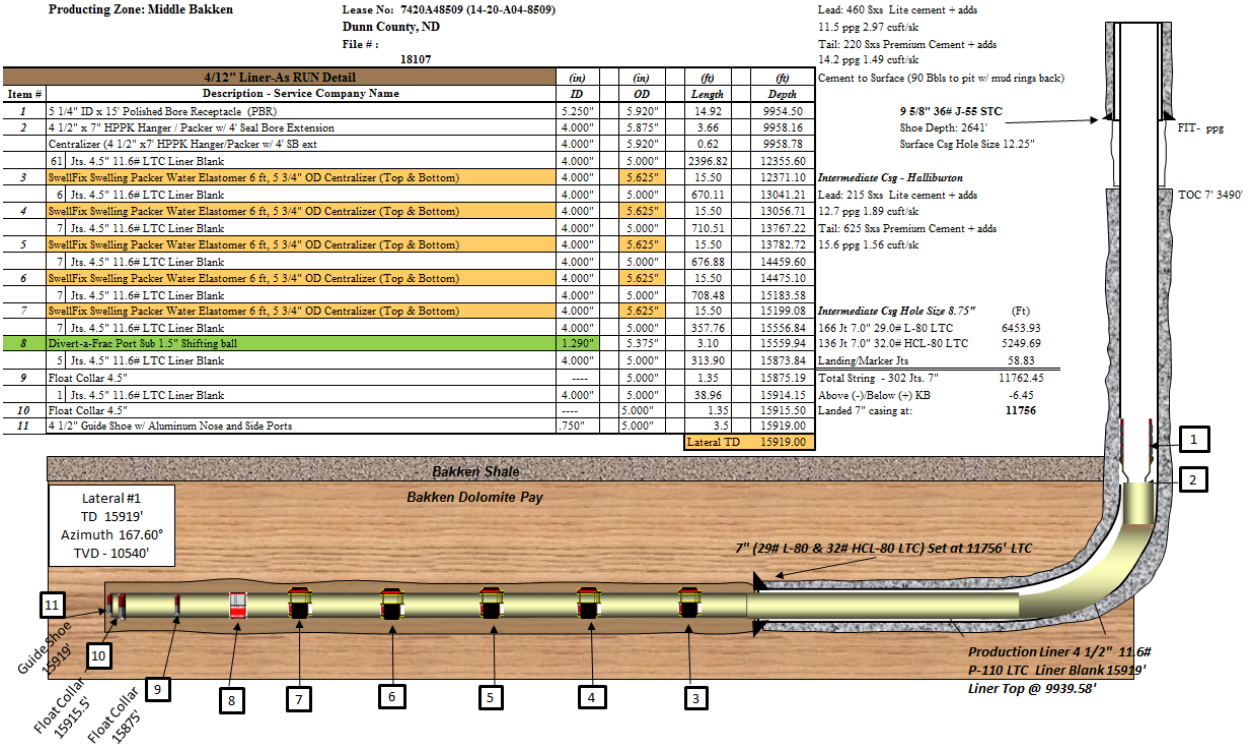
4/12" Liner-As RUN Detail		(in)		(in)		(ft)		(ft)
Item #	Description - Service Company Name	ID		OD		Length		Depth
1	5 1/4" ID x 15' Polished Bore Receptacle (PBR)	5.250"		5.920"		14.92		9954.50
2	4 1/2" x 7" HPPK Hanger / Packer w/ 4' Seal Bore Extension	4.000"		5.875"		3.66		9958.16
	Centralizer (4 1/2" x7' HPPK Hanger/Packer w/ 4' SB ext	4.000"		5.920"		0.62		9958.78
	61 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		2396.82		12355.60
3	SwellFix Swelling Packer Water Elastomer 6 ft, 5 3/4" OD Centralizer (Top & Bottom)	4.000"		5.625"		15.50		12371.10
	6 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		670.11		13041.21
4	SwellFix Swelling Packer Water Elastomer 6 ft, 5 3/4" OD Centralizer (Top & Bottom)	4.000"		5.625"		15.50		13056.71
	7 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		710.51		13767.22
5	SwellFix Swelling Packer Water Elastomer 6 ft, 5 3/4" OD Centralizer (Top & Bottom)	4.000"		5.625"		15.50		13782.72
	7 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		676.88		14459.60
6	SwellFix Swelling Packer Water Elastomer 6 ft, 5 3/4" OD Centralizer (Top & Bottom)	4.000"		5.625"		15.50		14475.10
	7 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		708.48		15183.58
7	SwellFix Swelling Packer Water Elastomer 6 ft, 5 3/4" OD Centralizer (Top & Bottom)	4.000"		5.625"		15.50		15199.08
	7 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		357.76		15556.84
8	Divert-a-Frac Port Sub 1.5" Shifting ball	1.290"		5.375"		3.10		15559.94
	5 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		313.90		15873.84
9	Float Collar 4.5"	----		5.000"		1.35		15875.19
	1 Jts. 4.5" 11.6# LTC Liner Blank	4.000"		5.000"		38.96		15914.15
10	Float Collar 4.5"	----		5.000"		1.35		15915.50
11	4 1/2" Guide Shoe w/ Aluminum Nose and Side Ports	.750"		5.000"		3.5		15919.00
						Lateral TD		15919.00

Surface Csg - Halliburton
Lead: 460 Sxs Lite cement + adds
11.5 ppg 2.97 cuft/sk
Tail: 220 Sxs Premium Cement + adds
14.2 ppg 1.49 cuft/sk
Cement to Surface (90 Bbls to pit w/ mud rings back)

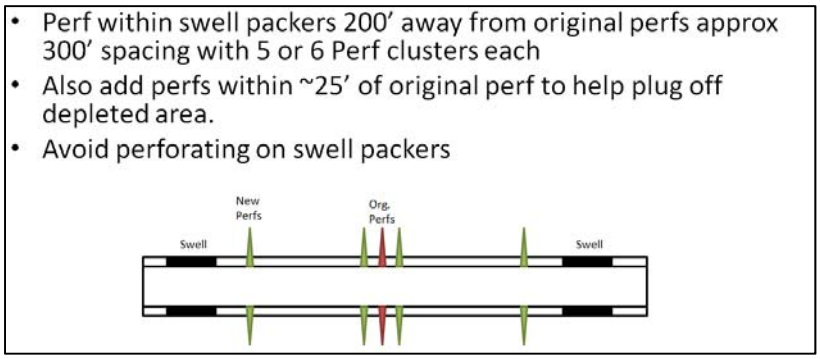
9 5/8" 36# J-55 STC
Shoe Depth: 2641'
Surface Csg Hole Size 12.25"

Intermediate Csg - Halliburton
Lead: 215 Sxs Lite cement + adds
12.7 ppg 1.89 cuft/sk
Tail: 625 Sxs Premium Cement + adds
15.6 ppg 1.56 cuft/sk

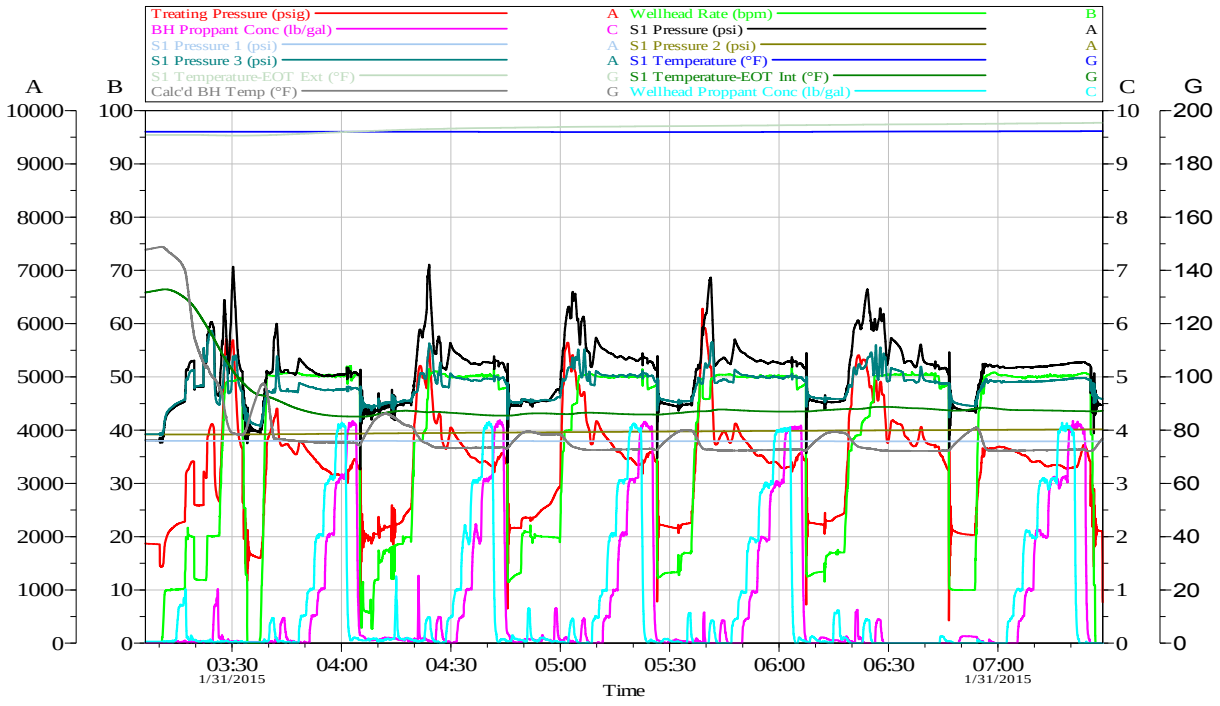
Intermediate Csg Hole Size 8.75"	(Ft)
166 Jt 7.0" 29.0# L-80 LTC	6453.93
136 Jt 7.0" 32.0# HCL-80 LTC	5249.69
Landing/Marker Jts	58.83
Total String - 302 Jts. 7"	11762.45
Above (-)/Below (+) KB	-6.45
Landed 7" casing at:	**11756**



After clean-out, perforations will be added to the liner to allow additional access points, enabling the refrac to target previously unstimulated portions of the lateral (refer to diagram below).



The refrac design will involve continuous pumping approximately 2 MMlbs of proppant in 20 – 30 smaller "cycles", divided by events whereby diversion material is pumped in the well to force proppant into different perforations and/or induced fractures throughout the job, to ensure optimum coverage of the lateral and encourage even distribution of the refrac. An example of a 6-cycle job is included below for illustration.



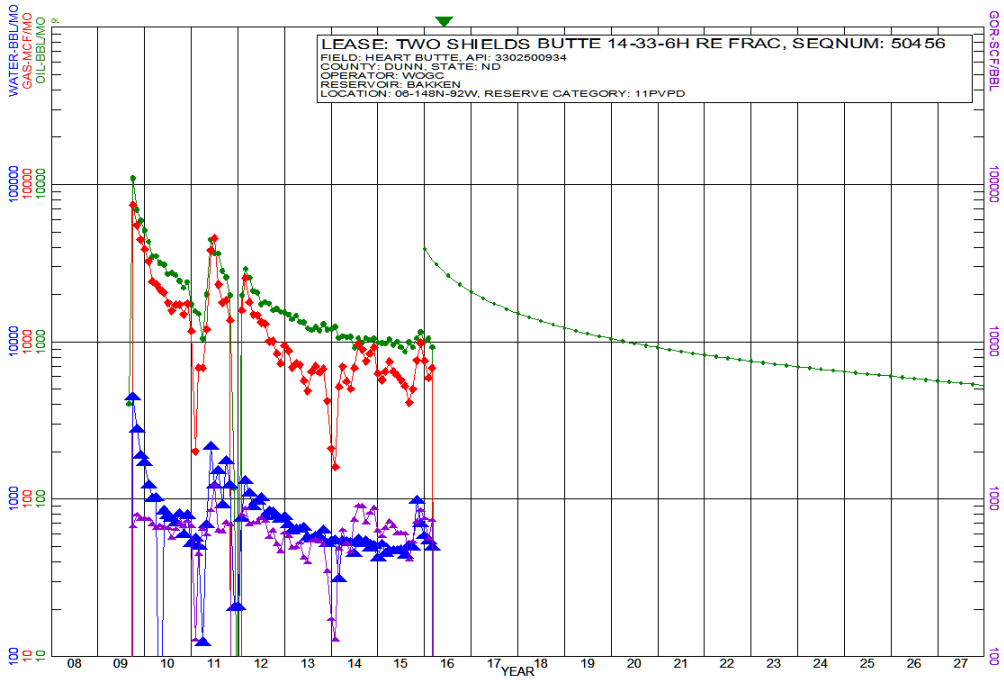
After the refrac is complete, the well will be opened-up for flowtesting where stimulation fluids will be recovered from the well and initial oil and gas rates are carefully measured and recorded. After the flowback period is complete (anticipated duration of flowback is 7 days), the well will be cleaned-out, and artificial lift equipment (i.e. rod pump) will be installed and the well will be returned to production. Careful production measurements will be made in the ensuing days, weeks, and months, and the artificial lift will be adjusted as necessary to optimize production from the well.

Anticipated Results:

As mentioned earlier, the TWO SHIELDS BUTTE 14-33-6H is expected cost $1.3 MM (gross) and generate the following results:

- Incremental reserve development of 132 MBOE;
- NPV10 of $199K;
- Undiscounted ROI of 2.2;
- ROR of 19%; and
- Payout in 4.0 years.

The TWO SHIELDS BUTTE 14-33-6H well is currently producing at a rate of 31 BOPD, 22 MCFPD, and 18 BWPD, and after the refracturing is performed and the well is cleaned-out and returned to production, the post-work daily initial rate is expected to be 100 BOPD average, for the first 30 days of production, followed by a production decline seen in other refrac analogs in the Williston Basin (refer to plot below).



Facilities:

The necessary facilities to ensure a successful Refrac Pilot are as follows:

- A strong candidate well;
- Personnel with the skills to evaluate and execute the Refrac Pilot;
- Service companies that can perform the desired work;
- Funds to complete the work; and
- The support of management.

WOGC has demonstrated that it has all of the facilities to complete a successful Refrac Pilot.

Resources:

WOGC has allocated the funds necessary to complete the Refrac Pilot and is committed to its success. WOGC has allocated several teams of Petroleum Professionals to evaluate and execute the Refrac Pilot. The tangible resources necessary to perform the work (i.e. workover rigs, frac crews, service companies) are already employed by WOGC and will be available to perform the proposed Refrac Pilot.

Techniques to Be Used, Their Availability and Capability:

WOGC will use standard hydraulic fracture stimulation equipment to perform the Refrac Pilot. Those crews are currently active with WOGC, performing similar work to new well completions in the Williston Basin. Their availability and capability will meet WOGC's needs and timetable.

Environmental and Economic Impacts while Project is Underway:

No significant environmental or economic impacts are anticipated while this project is underway. Because the TWO SHIELDS BUTTE 14-33-6H well is in a sparsely drilled area with no close offset wells, frac protecting (i.e. preparing for potential impact from offset frac) offset wells is not anticipated to be necessary. Offset operators will, however, be notified of WOGC's intended activities as a general courtesy.

Ultimate Technological and Economic Impacts:

Thousands of horizontal Bakken and Three Forks wells have been drilled and completed across the Williston Basin in the last decade. Because of evolving technology and the industry's ever-improving understanding of this resource, many of the initial completions in the Williston Basin were performed in an insufficient manner by today's completion standards. This leaves a tremendous opportunity for the oil and gas industry to perfect a technique to intelligently choose good refrac candidates, and refrac those candidates in a manner that unlocks the remaining, bypassed potential. WOGC's proposed Refrac Pilot is a first step in applying the latest fracture stimulation and diversion techniques developed for new wells, to the wells of the past. The ultimate impact to WOGC and the State of North Dakota will be enhanced recovery from the Bakken/Three Forks system.

Why the Project is Needed:

WOGC's proposed Refrac Pilot is needed because the concept of refracturing in the Williston Basin can ultimately only be proven through testing. Modeling and the study of analog refracs in other unconventional basins provide encouragement that refracturing can be successful in the Williston Basin as well, but the only true measure of success will be executing the pilot, measuring the outcome, and applying the lessons to future refrac candidates. Through unlocking the successful combination of refrac candidate selection and job execution, the recovery of bypassed reserves in substandard wells will ensure the remaining resource is responsibly captured.

STANDARDS OF SUCCESS

Standards of Success should include: The measurable deliverables of the project that will determine whether it is a success; The method to be utilized in measuring success; The value to North Dakota; An explanation of what parts of the public and private sector will likely make use of the project's results, and when and in what way; The potential that commercial use will be made of the project's results; How the project will enhance the education, research, development and marketing of North Dakota's oil and natural gas resources; How it will preserve existing jobs and create new ones; How it will otherwise satisfy the purposes established in the mission of the Program; How it will be reporting on the success of the project.

The ultimate standard of success for the proposed Refrac Pilot will be the economic outcome of the project, and how well the techniques used translate to additional candidates. After the refrac is complete, WOGC will closely monitor the performance of the TWO SHIELDS BUTTE 14-33-6H well and make any operational adjustment necessary to ensure the well produces at its optimum potential. Well tests will be taken at regular intervals (at least monthly) to gauge the production performance. Through regular reports to the WOGC, along with a detailed final report, other operators in the Williston Basin will be able to apply the lessons learned from WOGC's proposed Refrac Pilot and begin to unlock potential in their respective inventories of older wells. The eventual result will be an overall enhancement of production and reserve recovery across the Williston Basin, bringing value to the operators in North Dakota, their employees, and the State of North Dakota.

BACKGROUND/QUALIFICIATIONS

Please provide a summary of prior work related to the project conducted by the applicant and other participants as well as by other organizations. This should also include summary of the experience and qualifications pertinent to the project of the applicant, principal investigator, and other participants in the project.

Refer to resumes of participants in the following pages.

KELLY LONGWELL EISELE

Experience

Whiting Oil & Gas

December 2014 - Present

Operations Engineer

- Team lead for Dunn County, ND acreage
- Responsible for Development Plan for area
-

Kodiak Oil & Gas

April 2013 - December 2014

Completions Engineer

- Completion design, execution and evaluation - field research to production
- Supervise, evaluate and optimize frac ops remotely and on location
- Supervise flowback for IP
- Product research and evaluation
- Bid request and analysis

Baker Hughes Incorporated

June 2012 - April 2013

Operations Manager - Performance Drilling

- Asset management and planning
- Revenue planning, tracking and reporting
- Responsible for business strategy in the Rockies
- Direct Reports - 3 Field personnel and 1 Engineer
- Specified and initiated new product development
- Set pricing and negotiated contracts
- Tool deployment and field management

June 2010 - June 2012

Engineer III - Performance Drilling

- Performance research for bits, motors, mud & directional
- Recommendations for bit and motor choice
- Part of high speed bit development team
- Field wide study of Williston basin horizontal unconventional wells
- Provided optimized drilling parameters for customers
- Incident analysis

KELLY LONGWELL EISELE

Honda Research & Development, Raymond, OH

February 2007 - January 2010

Engineer II

- Managed full product development process (concept to market)
- Product testing and evaluation
- Project leader for three model developments
- Coordinated domestically & internationally designed vehicles
- Responsible for part fabrication, inspection, comparison & reverse engineering

Education

University of Colorado, Boulder, CO

May 2002- December 2006

- Bachelors Degree in Mechanical Engineering
- Emphasis in Business

Other Education

- GOPHER Simulation software training
- Practical Drilling Technology - Murchinson Drilling School
- Baker Hughes Drilling Optimization Course
- Baker Hughes Bit, Mud, Motor and Formation Evaluation courses including MWD/LWD, OnTrak, Rotary Steerable, StarTrak & TruTrak

MICHAEL HILLIX

Professional Experience

Senior Geologist, Whiting Petroleum Corp., Denver, CO: December 2015-present

Project Geologist for Dunn County and Pronghorn prospects, Williston Basin, ND.

- Responsible for geologic analysis and assessment of projects areas located in Dunn, Billings, and Stark Counties, ND including representing Whiting as an expert Geologic Witness in all NDIC cases involving these areas.
- Responsible for detailed geologic mapping of the Middle Bakken and Three Forks for incorporation into and improvement of Reservoir and OOIP models.
- Responsible for Operations Geology over project areas including supervising and coordinating development planning, geo-steering, coring, and logging operations.

Geologist, Kodiak Oil and Gas Corp., Denver, CO: June 2011-December 2015

Development and Operations Geology, Williston Basin, ND.

- Responsible for Operations Geology and geo-steering on over 100 horizontal wells targeting the Bakken/Three Forks.
- Performed detailed geologic and production mapping to better understand well performance and the effects of wellbore orientation on production. These efforts resulted in the reconfiguration of multiple spacing units to adjust them to the preferred orientation that would maximize production.
- Created and presented to management full field development plans over challenging acreage positions across Dunn, McKenzie, and Williams County, ND.
- Presented testimony and exhibits as an expert Geologic Witness for over twenty North Dakota Industrial Commission spacing cases.
- Worked with Reservoir Engineering and Land groups on unitization issues for the Twin Buttes Federal Exploratory Unit including the successful expansions of the unit Participating Area.
- Assisted the Facilities Group in locating successful Salt Water Disposal locations though detailed geologic mapping of the Dakota Group sandstones.
- Involved in the planning and permitting of over two hundred Bakken and Three Forks horizontal wells on State, Federal, and Indian lands.

Geologist, El Paso Exploration and Production, Denver, CO: August 2009-May 2011

Production Geology for House Creek North and Savageton Fields, Powder River Basin, WY.

- Identified multiple Sussex infill opportunities in the mature House Creek North Field.
- Successfully identified re-completion candidate wells and determined intervals for horizontal well re-completions to improve water injectivity into the Parkman sandstone to support the Savageton Field water flood.
- Completed Niobrara and Mowry Shale geologic assessments in the Powder River Basin focusing on potential underneath existing leasehold.
- Completed geologic evaluations of Porcupine Field (Powder River Basin) and Outlook Field (Williston Basin) for potential acquisition.

MICHAEL HILLIX

Professional Experience Cont.

Intern Geologist, El Paso Exploration and Production, Houston, TX: May -August 2008
International Division, Egypt Group

- Conducted a detailed Fault Seal Analysis on the Company's first Western Desert prospect by designing a custom workflow utilizing non-specialized software.
- Continued in a Contract Position evaluating the Fault Seal risk on six additional Western Desert prospects.

Intern Geologist, El Paso Exploration and Production, Houston, TX: May -August 2007
Gulf of Mexico-South Louisiana Group

- Conducted geologic and amplitude mapping utilizing 3D seismic and well logs to identify multiple prospects in a nine block area in the Offshore Gulf of Mexico in preparation for an upcoming Federal Lease Sale.

EDUCATION

Bachelor of Science in Geology
University of Kansas, Lawrence, KS
2003-2007

Graduate Studies in Geology
University of Missouri, Columbia, MO
2007-2009

Affiliations

AAPG, Rocky Mountain Association of Geologists, Wyoming Geological Association, RMS-SEPM, Denver Well Logging Society.

COMPUTER SKILLS

GeoGraphix, SpotFire, PETRA, Kingdom, PowerLog, IHS Enerdeq, ArcGIS, SeisWorks, GeoProbe, Microsoft Office Suite

RALPH L. NELMS

CAREER SUMMARY

Licensed petroleum engineer with 40 years of reservoir engineering, production engineering, and project management experience. Proven expertise in the Rocky Mountains, Mid-Continent, South Texas, and Gulf Coast. Innovative, results-oriented, self-motivated individual with strong interpersonal skills. Capable of applying advanced engineering and geological concepts to find oil and gas in conventional, and unconventional, reservoirs. Society of Petroleum Evaluation Engineers member with M.S. Petroleum Engineering.

EXPERTISE

- Reservoir simulation
- Expert witness
- Tight gas sands
- Transient analysis
- SEC reserve evaluations
- Team management
- Production enhancement
- Coal bed methane
- Well completions
- Property acquisitions
- Unconventional reservoirs
- Secondary/Tertiary recovery
- Field development planning
- Fractured reservoirs
- Log evaluation

PROFESSIONAL EXPERIENCE

WHITING PETROLEUM CORPORATION, Denver, Colorado **March 2008 to present**
Senior Reservoir Engineer

- Unconventional oil reservoir development and reserve assessment in the Bakken, Three Forks, Eagleford, Niobrara, Sussex, Shannon, Woodford, and Marchand formations. Responsible for re-frac candidate screening and analysis for un-conventional reservoirs in the Northern and Central Rockies including Rate Transient Analysis and enhanced production reservoir computer modeling. Major contributor to economic and reservoir input for property sales and acquisitions analysis and third party OBO project working interest analysis.
- Responsible for Reservoir Engineering and economic feasibility analysis in the Northern and Central Rockies , Gulf Coast and offshore Texas, Louisiana, Mississippi, Oklahoma, Arkansas and Michigan. Horizontal and vertical wells. Over pressured reservoirs both on shore and offshore for 7 years.
- Responsible for SEC reserve reporting both operated and non-operated Rockies, Gulf Coast, Mid-Cont.

ST. MARY LAND AND EXPLORATION
CONSULTING RESERVOIR ENGINEER, Billings, Montana **March 2007 to March 2008**

- Horizontal Bakken / Madison drilling and field optimization. Secondary water flood unitization for four fields in North Dakota and Montana in the Madison, Red River, Gunton, Duperow, and Nisku formations.
- Tertiary oil recovery analysis for Madison and Bakken formations. Williston Basin Corporate SEC reserves and property acquisition analysis up to $400MM.

ANADARKO PETROLEUM/KERR MCGEE ONSHORE, Denver, Colorado **2004-March 2007**
Senior Staff Reservoir Engineer

- Took severance package from Anadarko Petroleum in March 2007 as Senior Staff Reservoir Engineer.
- Responsible for Northern Division drilling and workover prospect identification, budgeting, planning, tracking and reporting for $70MM budget in 2006 and $65MM budget in 2005. Green River Basin Reservoir Engineer.
- Responsible for SEC reserve database management and SOX's reporting for Northern Division which includes Montana, North Dakota, Wyoming, New Mexico and Utah.
- Responsible for screening and economic evaluations for operated and non-operated drilling and workover projects in 2005 and 2006. Identified five Madison fields with water flood and horizontal development potential in North Dakota and Montana.
- Represented KMG in all WOGCC hearings, OBO Unit meetings and NDIC hearings as needed. Prepared and presented annual KMG Unit meetings in 2005.
- Built ECLIPSE 100 model for evaluation of pressure depletion in Frontier formation in Moxa Arch. Used ECLIPSE 100 program to successfully identify 90 infill drilling candidates.

WESTPORT OIL AND GAS COMPANY, Denver, Colorado **2001-2004**
Senior Reservoir Engineer

- Original reservoir engineer in three-man Exploitation Team created in 2000. Directly involved in planning, project economic analysis and reserve assignment for 47 horizontal wells drilled in the Wiley Unit.
- Identified drilling prospects, created NBU budgets and performed SEC reserve analysis 2001-2003. Created volumetric and economic analysis for 166 PRB CBM wells of which 32 Wyodak wells were drilled in 2003.
- Reservoir engineering and risk analysis support for Exploration Staff for Wyoming deep tight gas prospects.
- Represented Westport in all WOGCC hearings 2001 though 2004 and all NDIC hearings 2001 through 2003. Created 5th well infill drilling application used by WOGCC as "best case" model for all future submittals.
- Principal contributor to creation of WRC Moxa Arch Frontier 5th well selection methodology using RPI. Moxa Team Reservoir Engineer responsible for selection and preliminary economic analysis for $13.7 MM 17-well 2003 drilling program that added 22 Bcf gross gas reserves generating a 26% total project DCFROR.
- Prepared and presented WRC waterflood unit meetings and represented WRC in non-operated unit meetings.
- Created reservoir simulation models for North Dakota horizontal wells and Moxa Arch infill 5th and 6th wells.
- Principal coordinator for creation of the TR Madison Waterflood Unit. Completed feasibility studies for waterflood unitization of the Westhope and Lonebutte Fields. ASP flood reservoir management in the Minnelusa formation at Mellott Ranch Field and Fireflood reservoir management at Horse Creek Field.

Independent Consultant, **Denver, Colorado** **April to Dec. 2000**

- Provided services to Westport for CO2 project evaluation for Sussex, West Sussex and Meadow Creek Fields in Wyoming. Reservoir engineering and full field develop planning for Wyoming and North Dakota prospects.
- Prior to working for WRC, represented a client in $4 MM lawsuit against Arco for violation of correlative rights in San Juan Basin Fruitland Coal well on Southern Ute Tribal lands. Supervised drilling and completion of one Fruitland Coal well with IP of 4 MMcfpd. Evaluated Minnelusa reservoirs for water flood unitization.
- Completed Powder River Basin Coal Bed Methane reserve analysis for client who sold properties to Phillips Petroleum for $28 MM. Represented client before WOGCC for 80-acre and 40-acre CBM spacing hearings.

BURLINGTON RESOURCES, INC., Farmington, New Mexico **1998-April 2000**
Senior Staff Reservoir Engineer/Team Leader

- Promoted to Team Leader for New Opportunities Team in 1999.
- Managed 108 projects with a budget of $22 million and a staff of eight geologists, engineers and technicians.
- Charged with finding and developing tight gas sands and coal bed methane in new areas in the San Juan Basin.
- Identified drilling and workover candidates using state-of-the-art engineering and geological analysis techniques. Identified 80-acre infill Mesaverde candidates using SA Holdrich moving domain techniques.
- New Opportunities Team added 142 new projects to capital inventory with a net reserve of 124 Bcf and received highest available end of year bonus in 1999. Developed "Under Pressured" Fruitland Coal program
- Instrumental in selection of drilling location and completion of well with highest sustained daily gas production for the San Juan Basin Division in 2000. Identified and drilled Dakota channel with IP of 7 MMcfpd.
- Expert witness before New Mexico Oil and Gas Conservation Commission for tight sand and CBM hearings.
- Developed production enhancement field programs using pressure transient analysis, material balance, production history, improved completion techniques, and application of compression and pipeline equipment.

PETROGLYPH OPERATING COMPANY, Hutchinson, Kansas **1996-1998**
Manager of Engineering and Development

- Managed staff of 25 field and office employees and a 108 new well drilling and completion program with a budget of $60 MM. Managed a 135-well water flood and gas injection project in the Antelope Field in Utah.
- Provided reservoir engineering analysis for a coal bed methane project in Raton Basin, a Frio/Wilcox program in south Texas and production enhancement, property acquisitions and sales in the Mid-Continent.
- Prepared SEC reserve reports for a publicly held company used in $33 MM IPO and $24 MM MCN merger.
- Created a full development business plan for a 369-well Utah Black Wax water flood project used to raise $33 million in an IPO in October 1997. Natural Gas Partners, a major venture capital company and owner in the project, stated this full development business plan was one of the best they had ever seen.

- Designed and installed a $6 million 20,000 bwpd fresh and production water treatment and injection facility with 54 miles of pipeline. Purchased all equipment and supervised 100-man construction project on site.
- Created computerized water and gas injection material balance programs to manage and predict well performance. Created comprehensive waterflood simulation models on Boast III using PVT analysis and Geographix reservoir maps. Developed log interpretation models on QLA2 using computerized LAS logs.

FORELAND CORPORATION, Lakewood, Colorado **1994-1996**
Senior Petroleum Engineer

- Provided drilling, completion, production and reservoir engineering for unconventional fractured oil reservoirs in Nevada. Property acquisitions and SEC reserve reporting.

WINDSOR GAS PROCESSING, Loveland, Colorado **1988-1994**
Vice President

- Managed operations and growth of a small independent gas processing company with staff of eight.
- Negotiated interstate and intrastate gas purchase and sales contracts, oil and gas leases, farmout agreements and joint operating agreements. Bought and sold wells, hedged gas prices and created financial plan for $3 million IPO.
- Expanded gas plant from 2 MMcfpd to 12 MMcfpd.

COORS ENERGY COMPANY, Golden, Colorado **1980-1988**
Petroleum Engineer

- Performed in house Corporate SEC reserve evaluations including property sales and purchases.
- Planned, permitted and supervised drilling and completion operations for 160 new oil and gas wells from 4,000 to 14,000 feet deep in Colorado, Utah, and southern Wyoming.

SCIENCE APPLICATIONS, INC., Golden, Colorado **1978-1980**
Petroleum/Mining Engineer

- Provided consulting engineering services for the design, planning, construction, and operation of oil and gas, tar sands, oil shale, in situ mining projects in Utah, Colorado, Wyoming, Arizona, West Virginia, and Oklahoma.

SUN OIL COMPANY, Lafayette, Louisiana **1975-1976**
Associate Drilling Engineer

- Designed, planned, supervised, and evaluated costs for deep drilling and workover operations on land and inland waters from 4,000 feet to 20,000 feet.

EDUCATION

Colorado School of Mines	M.S.	Petroleum Engineering* (Class Rank 1 of 518)	1997
	B.S.	Mining Engineering	1977
	B.S.	Petroleum Engineering (First graduate thesis horizontal well simulation at CSM)	1974
Regis University	M.B.A.	Finance and Accounting	1987

American Management Association Management Skills & TRACOM Producing Results with Others training 1999.

LICENSED PROFESSIONAL PETROLEUM ENGINEER

State of Wyoming # 9380 Member Society of Petroleum Evaluation Engineers (SPEE)
State of Colorado #18063

COMPUTER SKILLS

ARIES	PEEP	OFM	ECLIPSE 100	BOAST	PETRA
OGRE	QLA2	CMG	PAN SYSTEMS	IFLO	PERFORM
RTA	RPI	EXODUS	POWER TOOLS	HARMONY	SAPHIR
SPOTFIRE	Neural Net III	RUBIS	TOPAZ	ENERGY NAVIGATOR	

Created and presented study of 95 fields in North Dakota for CO2 candidate screening and improved oil recovery potential reserves at Williston Basin Horizontal Drilling symposium in conjunction with NGDS staff. Report is available on NDGS web site. Report referenced by DOE CO2 Williston Basin publication in 2006 and nine other publications up to 2011.

Principal founder and coordinator for three years for the DOE Petroleum Technology Transfer Council Rocky Mountain reservoir simulation users group.

MANAGEMENT

*A description of **how** the applicant will manage and oversee the project to ensure it is being carried out on schedule and in a manner that best ensures its objectives will be met, **and a description of the evaluation points to be used** during the course of the project.*

WOGC will carefully manage the Refrac Pilot to ensure its success. Already the multidisciplinary teams have extensively evaluated over one-thousand (1,000) potential candidate wells, sorted them into the different refrac categories, ranked the best candidate wells, and performed economic projections and analysis for each candidate.

Through the guidance and direction of WOGC's Refrac Steering Committee, careful planning and engineering have gone into WOGC's top Refrac Pilot, the TWO SHIELDS BUTTE 14-33-6H well.

During the next phase of the project, which will entail job execution of the Refrac Pilot, WOGC will be using its top performing employees and service companies to perform the refrac on the TWO SHIELDS BUTTE 14-33-6H well. Directly after the refrac is performed, a detailed post-job report will be compiled to compile the learnings from the Refrac Pilot. Those lessons learned will be immediately applied to additional wells associated with the Refrac Pilot the further refine the process. Testing of the TWO SHIELDS BUTTE 14-33-6H well will be done to gauge the success, and the well will be optimized accordingly to take advantage of the anticipated enhanced well performance. As defined in the timetable below, regular reports will be prepared and submitted to the ND Oil & Gas Research Council (OGRC).

TIMETABLE

Please provide a project schedule setting forth the starting and completion dates, dates for completing major project activities, and proposed dates upon which the interim reports will be submitted.

WOGC expects the TWO SHIELDS BUTTE 14-33-6H Refrac Pilot project to take twelve (12) months to complete a full evaluation. After the refrac is performed and the well is returned to production, a post-job report detailing the events of the refrac and initial learnings will be prepared and submitted to the ND Oil & Gas Research Council (OGRC). Testing of the well will be performed, and Reservoir Engineering analysis will be performed to evaluate the initial well performance results. After the first month of well-testing analysis, and initial well performance evaluation report will be prepared and submitted to the ND OGRC. An additional two (2) months of well tests, performance monitoring and analysis will be performed and results submitted to the OGRC. Finally, a four (4) month period of testing is recommended to establish the final well performance and allow adequate time for Reservoir Engineering to determine the appropriate uplift in the wells Estimated Ultimate Recovery (EUR). At the end of the twelfth (12^{th}) month, a final report will be prepared that recaps the entire project and details the findings and results (refer to table below).

DESCRIPTION OF PHASE OF WORK	Jul-2016	Aug-2016	Sep-2016	Oct-2016	Nov-2016	Dec-2016	Jan-2017	Feb-2017	Mar-2017	Apr-2017	May-2017	Jun-2017
Perform refrac, return well to production												
Post-job report to OGRC detailing the initial findings from the refrac												
Testing and monitoring of performance												
Post-job report to OGRC detailing the initial changes in production behavior												
Testing and monitoring of performance												
Post-job report to OGRC detailing the changes in production behavior & established production trend												
Testing and monitoring of performance												
Final report to OGRC summarizing project, resulting changes in EUR, application to remaining wells in Refrac Pilot												

BUDGET

*Please use the table below to provide an **itemized list** of the project's capital costs; direct operating costs, including salaries; and indirect costs; and an explanation of which of these costs will be supported by the grant and in what amount. The budget should identify all other committed and prospective funding sources and the amount of funding from each source, differentiating between cash, indirect costs, and in-kind services. Justification must be provided for operating costs not directly associated to the costs of the project. Higher priority will be given to those projects that have matching private industry investment equal to at least 50% or more of total cost. (Note ineligible activities or uses are listed under OGRP 2.02)* ***Please feel free to add columns and rows as needed.***

BUDGET CATEGORY	GROSS	WOGC Share	ND OGRC Share
RIG - DAYWORK	$ 180,000	$ 96,923	$ 83,077
SUPERVISION	$ 28,500	$ 15,346	$ 13,154
LOCATION, ROADS, PITS	$ 5,000	$ 2,692	$ 2,308
RENTAL-DOWNHOLE TOOL/EQUIPMENT	$ 58,000	$ 31,231	$ 26,769
COMPLETION FLUIDS/WATER	$ 91,000	$ 49,000	$ 42,000
COIL TUBING EQUIP & SERVICES	$ 100,000	$ 53,846	$ 46,154
PERFORATING	$ 50,000	$ 26,923	$ 23,077
STIMULATION TREATMENT	$ 413,100	$ 222,438	$ 190,662
CONTINGENCIES	$ 150,000	$ 80,769	$ 69,231
CONTRACT SERVICES & EQUIPMENT	$ 87,000	$ 46,846	$ 40,154
RENTAL - WORKSTRING	$ 46,000	$ 24,769	$ 21,231
DISPOSAL - FLUID WASTE	$ 62,400	$ 33,600	$ 28,800
TUBING	$ 15,000	$ 8,077	$ 6,923
PUMPS AND RODS	$ 10,000	$ 5,385	$ 4,615
PACKERS & DOWNHOLE EQUIPMENT	$ 1,500	$ 808	$ 692
MATERIALS & SUPPLIES	$ 2,500	$ 1,346	$ 1,154
TOTAL AFE COST	**$ 1,300,000**	**$ 700,000**	**$ 600,000**

Please use the space below to justify project associated expenses, and discuss if less funding is available that that requested, whether the project's objectives will be unattainable or delayed.

The table above represents careful planning and use of WOGC's experienced a sophisticated capital planning process. The costs indicated above reflect that the Refrac Pilot will be performed under strict guidance and management, ensuring careful capital control and responsible operating. The costs also reflect the careful cost planning WOGC uses (i.e. regular RFQ's to ensure a cost-competitive operating environment) to ensure the best services at the best costs are secured.

CONFIDENTIAL INFORMATION

Any information in the application that is entitled to confidentiality and which the applicant wants to be kept confidential should, if possible, be placed in an appendix to allow for administrative ease in protecting the information from public disclosure while allowing public access to the rest of the application. Such information must be clearly labeled as confidential and the applicant must explain why the information is entitled to confidentiality as described in North Dakota Century Code 54-17.6. Oil and gas well data that is a result of financial support of the Council shall be governed by North Dakota Century Code 38-08-04(6). ***If there is no confidential information please note that below.***

No Confidential Information.

PATENTS/RIGHTS TO TECHNICAL DATA

Any patents or rights that the applicant wishes to reserve must be identified in the application. ***If this does not apply to your proposal, please note that below.***

Does not apply.

STATUS OF ONGOING PROJECTS (IF ANY)

If the applicant is a recipient of previous funding from the Commission, a statement must be provided regarding the current status of the project.

No previous projects on which to report.

APPENDIX

LETTERS OF SUPPORT

AFFIDAVITE OF TAX LIABILITY

Three letters of support in following pages.

Affidavit of Tax Liability Included

Hank Porter
Advanced Reservoir Engineer – Bakken Asset Team

Marathon Oil
5555 San Felipe St, Houston TX 77056
Telephone: 713.296.
HLPorter@marathonoil.com

May 26, 2016

Mr. Charles Ohlson, PE
Completions Manager
Whiting Petroleum
1700Broadway, Suite 2300
Denver, CO 80290

Whiting Petroleum is seeking a grant to help advance the oil and gas industries' knowledge of refracturing of older producing well in order to increase the overall recoverable oil per well. Advancements in refracturing technology are needed to help the upstream oil and gas industry to take the next step in the Williston Basin, especially in the current price environment.

Whiting Petroleum would apply this grant towards testing and developing refracturing technologies that can be applied to majority of older wells that already have casing installed in the Williston Basin. The oil and gas industry has only been pushing for advancements in refracturing technology for a few years and a lot of improvement is still needed. Marathon Oil recognizes that there is a need for developing expertise in refracturing to help maximize the potential of the Williston Basin and supports Whiting Petroleum endeavors to progress the technology.

Respectfully submitted,

Hank Porter
Advanced Reservoir Engineer – Bakken Asset Team
Marathon Oil

Schlumberger Technology Corporation
300 Schlumberger Drive
Sugar Land, Texas 77478

Schlumberger

May 24th, 2016

Mr. Charles Ohlson
Completion Manager
Whiting Petroleum Corporation
1700 Broadway, Suite 2300
Denver, CO 80290

Dear Mr. Ohlson,

This letter is in written to support the Refracturing Pilot project for Whiting Petroleum Corporation.

From the recent studies performed by Schlumberger and the operators in the Basin, including Whiting Petroleum, Broadband Services have helped to improve reservoir coverage (SPE Paper 175911, 180379, 180966). In US land, Schlumberger Well Services used Broadband Sequence* fracturing services to refracture multiple short lateral wells for an operator in the Williston Basin. Post job fracture gradient analysis on the wells indicated that new rock was encountered, which resulted in a threefold to sixfold increase among four wells that were refractured.

With the encouraging initial results from the refracturing in short laterals (5,000 feet), many operators have looked into refracturing the extended laterals (9,000 feet), which have potential upside across the Williston Basin. The current commodity environment limits operators to deploy diagnostic tools that could help advance the re-fracturing technology so it can effectively cover extended laterals.

Schlumberger has been working on improving diversion in horizontal wells for many years (first Broadband services was introduced to the Williston Basin in 2014). The process involved a thorough candidate selection of workflows that looks at the well conditions to understand the proper fluid system and diversion recipe. Broadband technology overcame the challenges posed by the exposed wellbore and the need for effective diversion by sequentially isolating fractures in the wellbore to ensure each cluster in every zone was fracture and contributed to the well's production. Also, a low viscosity composite fluid from the BroadBand* family of unconventional reservoir completion services ensured adequate proppant suspension and avoided screen outs or unwanted sand settling across the entire lateral section. The refracturing workflow looks favorable at Whiting for utilizing the technology and techniques to perform the pilot project.

Schlumberger

Schlumberger Technology Corporation
300 Schlumberger Drive
Sugar Land, Texas 77478

In conclusions, Schlumberger recommends to Whiting setting up a pilot plan to refracture 3-5 wells and run a set of diagnostics tools to:

(a) Understand the effectiveness of the treatments

(b) Identify current gaps and

(c) Propose solutions that help improve lateral coverage and maximize recovery factors in the Basin.

Sincerely,

Andrew Acock
Technology Integration Manager

HALLIBURTON

1125 - 17th Street, Suite 1900 • Denver, CO 80202
PHONE 303.899.4700 • FAX 303.573.7856

Mr. Charles Ohlson
1700 Broadway, Suite 2300
Denver, CO 80290

Dear Mr. Ohlson,

In response to Whiting Petroleum Corporation's interest in undertaking a refracturing project in the Williston Basin, I would like to bring a few points of interest to attention.

The downturn in commodity prices has renewed the industry focus on refracturing as a method to increase production at a low unit cost in North American resource plays. Relatively low recovery factors in the single to teen values leave a vast amount of oil in place for added recovery if economical. The success of refracturing in the Bakken Formation dates back to early projects in the Elm Coulee Field where open-hole horizontal completions were restimulated. More recently, since the inception of the multistage horizontal completions, refracturing is being applied along the Nesson-Little Knife anticline and in the basin depocenter west of the anticline. Empirical results show that refracturing has potential to add reserves in the Bakken and Three Forks Formations. A recent study analyzed more than 90 wells that have been refractured with methods including mechanical isolation and chemical diversion. In many cases, production rates have been increased with similar decline rates, resulting in added production to the life of the wells.

Refracturing is not a new technique within the industry; however, predictable and repeatable results have limited the application in most unconventional plays. Predicting the well performance after a refracture is a multifarious challenge. Halliburton has collaborated with numerous operators to apply a strategic process in the Bakken, and other resource plays, where the delineation of reserve potential and use of the subsurface diagnostics are continuing to improve the post treatment well performance. Through collaborative efforts between service providers and operators, the learning curve to advance refracturing technology can be shortened. Halliburton has monitored more than a dozen refracture treatments in the Rockies region using microseismic monitoring, fiber-optic distributed sensing, and radioactive tracers. Such projects have provided engineers with valuable mindshare in understanding and mitigating the issues that often encumber refracture projects.

Average well production in the Bakken/Three Forks play has improved with advancements in new well completion practices. Applying those same engineering principles to refracturing has not shown a consistent trend in performance. The advancement of process execution with a unique approach to refracturing has significant potential for improved results. As new design processes are tested, it remains necessary to measure the subsurface behavior and further correlate well performance with execution efficacy.

Properly engineered refracturing projects have potential for many operators who have vintage completion types, wells with low completion efficiency, wells that experienced problems during the initial completion, and even wells that were more recently completed with multistage refracturing. In 2014, Whiting Petroleum Corporation collaborated with Halliburton to perform a five-well refracture project in the Sanish Field of Williston Basin. Through the test of time on production, the results of this project provide the initial proof of concept to further develop a refracturing program. A focused program that leverages the prior knowledge will inevitably benefit Whiting Petroleum Corporation, Halliburton and the industry at large.

Sincerely,

William Ruhle
Principal Technical Professional
1125 17th Street, Suite 1900
Denver, CO 80202

STATE OF COLORADO)
) ss AFFIDAVIT OF TAX LIABILITY
CITY AND COUNTY OF DENVER)

MICHAEL J. STEVENS, being first duly sworn, states:

1. That he is the Senior Vice President and Chief Financial Officer of Whiting Oil and Gas Corporation, who is duly authorized to make this affidavit on behalf of Whiting Oil and Gas Corporation.

2. That, to the current knowledge of the undersigned, Whiting Oil and Gas Corporation does not have any outstanding unpaid tax liability owed to the State of North Dakota or any of its political subdivisions.

Dated this 27th day of May, 2016.

WHITING OIL AND GAS CORPORATION

By: _____
Michael J. Stevens
Senior Vice President and Chief Financial Officer

SUBSCRIBED AND SWORN TO before me this 27th day of May, 2016.

_____
Notary Public

YVETTE A. ARCENEAUX
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19964017066
MY COMMISSION EXPIRES 03/16/2017

YVETTE A. ARCENEAUX
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19964017066
MY COMMISSION EXPIRES 03/16/2017

APPLICATION CHECKLIST

Use this checklist as a tool to ensure that you have all of the components of the application package. Please note, this checklist is for your use only and does not need to be included in the package.

☒	Application
☒	Transmittal Letter
☒	$100 Application Contribution
☒	Tax Liability Statement
☒	Letters of Support (If Applicable)
☐	Other Appendices (If Applicable)

When the package is completed, send an electronic version to Ms. Karlene Fine at kfine@nd.gov, and 2 hard copies by mail to:

Karlene Fine, Executive Director
North Dakota Industrial Commission
State Capitol – 14th Floor
600 East Boulevard Ave Dept 405
Bismarck, ND 58505-0840

For more information on the application process please visit:
http://www.nd.gov/ndic/ogrp/info/ogrcsubgrant-app.pdf

Questions can be addressed to Ms. Fine at 701-328-3722 or Brent Brannan at 701-425-1237.