Marathon **Oil Company**

5555 San Felipe
Houston, TX 77056
P. O. Box 3128
Houston, TX 77253-3128
Telephone 713-629-6600

October 31, 2006

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

Dear Ms. Fine:

Please find attached to this letter a grant application from Marathon Oil Company to the North Dakota Oil and Gas Research Council requesting $120,000 of matching funds to conduct a surface tiltmeter study of a hydraulic fracture stimulation on a newly drilled Bakken horizontal well in North Dakota (total cost estimate $240,000). The purpose of this study is to further understand the mechanics of fracture stimulation in the Bakken, specifically with regard to the orientation of the created fracture. This knowledge will allow optimization of the wellbore azimuth of future horizontal wells. It will also provide for improved future stimulation methods. This knowledge may enhance overall Bakken well productivity, increase ultimate well recoveries, and enhance the economic viability of the Bakken play.

This letter shall form a binding commitment on behalf of Marathon Oil Company to complete a surface tiltmeter study of a Bakken fracture stimulation if the Industrial Commission makes the grant requested.

Sincerely

David L. Brimberry
Bakken Project Subsurface Manager

Surface Tiltmeter Study of a Bakken Fracture Stimulation

A Grant Application in the Amount of $120,000

To the

North Dakota Oil and Gas Research Council

Made by

Marathon Oil Company

October 31, 2006

Principal Investigators
Ken Dunek, Advanced Production Engineer, Marathon Oil Company
Glynn Williams, Advanced Senior Production Engineer, Marathon Oil Company

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Section 1.0—Abstract

One of the significant unknowns in the current development of the Middle Bakken horizontal play is the preferred fracture orientation, which is determined by the current subsurface minimum and maximum horizontal stresses on the Bakken formation Understanding fracture orientation is critical in planning the optimum direction to drill the wellbore and in designing the fracture stimulation. A wellbore may be drilled parallel to the fracture orientation in order to create a single, longitudinal conductive fracture along its entire length. Alternatively, a wellbore can be drilled perpendicular to the fracture orientation in order to intercept as many existing natural fractures as possible. However, understanding fracture orientation is critical to implementing or evaluating either design.

This grant requests funds to conduct a surface tiltmeter study of a fracture stimulation on one of Marathon's wells in Dunn County, North Dakota during the first six months of 2007. A surface tiltmeter study consists of burying an array of highly sensitive levels, called tiltmeters, in the ground around the target well. These tiltmeters measure minute deflections in the earth's surface that occur during the fracture stimulation. Data from the array will be processed in order to reveal the orientation of the fracture created during the stimulation. As described above, this information will allow for better well designs, which will enhance the economic viability of the Bakken play.

Installation of the array and background data measurement will take approximately two months. The fracture stimulation will be completed in one day, and data analysis will take 2 weeks.

Marathon will participate in the study as the operator, and Pinnacle Technologies will be the contractor installing the array and analyzing the data. The total project cost is estimated to be $240,000.

Section 2.0—Project Description

The objective of this study is to conduct a surface tiltmeter study of a fracture stimulation on one of Marathon's wells in Dunn County, North Dakota. The Klatt 31-14H is currently the candidate well, but may change as detailed planning continues. The information gathered in this study will be applicable to wells in the area regardless of which well it is gathered from.

Tiltmeters are similar to an extremely sensitive carpenter's level that are buried into the ground surrounding the candidate well. The tiltmeter array will cover an area on the earth's surface of roughly a 7500' radius around the path of the horizontal wellbore. There will be several dozen tiltmeters within this area making up the array. During the fracture stimulation of the well, the tiltmeters will measure minute deflections of the earth's surface (see Appendix 11.1) that are caused by slippage of rock layers near the wellbore. This data will then be processed in order to determine the orientation of the fracture created during the stimulation.

A better understanding of fracture orientation is the primary result of this study. Fracture orientation at depth is controlled by the direction of the minimum and maximum in-situ stresses in the rock itself. A fracture will propagate in a direction parallel to the maximum principal stress. Marathon, so far, has been unsuccessful in determining these stress orientations through other means, including various types of wireline logs.

This orientation is important because it is a major component in the optimal direction of the horizontal wellbore. If a well is drilled parallel to the fracture orientation, a fracture stimulation can be pumped that will create a longitudinal propped fracture along the wellbore itself. However, a wellbore may be drilled perpendicular to the fracture orientation in order to intercept a maximum number of natural fractures, or to create a transverse propped fracture that extends some distance away from the wellbore. These differing methods of wellbore construction will require different stimulation designs and may result in very different production profiles for the well. If the fracture orientation is not known, it is difficult or impossible to optimize the production of the well. However, with this grant, Marathon, and subsequently other operators in the Bakken horizontal play, will be able to determine fracture orientation, which will allow for optimization in wellbore direction and completion methods.

Marathon will utilize Pinnacle Technologies as a contractor to provide the tiltmeter array design, installation, data capture and data analysis for this project. Pinnacle specializes in engineering solutions for fracture stimulation and fracture mapping, including surface tiltmeter studies. They have conducted successful tiltmeter studies throughout the world with objectives similar to those in this study.

In summary, this study will advance several of the purposes of the Oil and Gas Research Council. It will add to the pool of Bakken knowledge that will benefit operators as well as the state and people of North Dakota in several ways, including enhanced oil and gas production rates, increased ultimate well recovery, enhanced well economics, and increased viability of the Bakken horizontal play.

These things will result in increased tax revenues, and ultimately can result in the creation of oil and gas jobs and wealth for the state of North Dakota.

Section 3.0—Standards of Success

There are two levels of success that will be measured in this project. The first will be to acquire and analyze the tiltmeter data necessary to determine the fracture orientation of the measured stimulation. If the orientation can be measured, this level will be considered successful. The second level of success will be if this information can be used by Marathon (and, once it is released to the public, other operators) to improve well design and achieve higher production rates and ultimate oil and gas recoveries.

Section 4.0—Background/Qualifications

Marathon Oil Corporation (www.marathon.com) is engaged in the worldwide exploration and production of crude oil and natural gas, as well as the domestic refining, marketing and transportation of petroleum products. Marathon is among the leading energy industry players, applying innovative technologies to discover valuable energy resources and deliver the highest quality products to the marketplace. Marathon is the 4th largest US-based integrated oil and gas company, and has actively drilled for and produced oil and gas since its founding in Ohio since 1887. Business activities of Marathon Oil Corporation have included North Dakota through the years, but most recently in Marathon's entry into the North Dakota Bakken play.

Glynn Williams has 28 years of experience with Marathon and has been involved with well completions around the world. He is currently an Advanced Senior Engineer working in the Reservoir and Well Performance Section of Marathon's Technology Services Group, and has been involved with Bakken completions since Marathon entered the play in 2006.

Ken Dunek has 6 years of completion experience with Marathon and has been involved in fracture stimulation design and implementation in various basins in the United States throughout that time. He is currently an Advanced Engineer responsible for Bakken completions in North Dakota, and has been involved with the Bakken since Marathon began drilling and completion operations in North Dakota in 2006.

"Pinnacle Technologies is an energy industry engineering service, consulting and software firm specializing in the optimization of hydraulic fracturing." (Copied from www.pinntech.com)

Section 5.0—Management

Key milestones in the project will be as follows (not necessarily being completed consecutively—some work can be completed in parallel): 1) Approval of grant from NDOGRC and authorization for work to begin, 2) Completion of tiltmeter array design, specifying location and number of tiltmeters to be installed, 3) Completion of agreements with surface landowners and subsurface mineral interest where tiltmeters will be installed, 4) Installation of the tiltmeter array, 5) End of drilling of well and wellbore prepared for fracture stimulation, 6) Fracture stimulation and 7) Analysis of tiltmeter data for projected changes.

This project will be managed through consistent communication between the principal investigators, other Marathon employees, and Pinnacle Technologies, the primary contractor. The fracture stimulation is currently estimated to occur sometime near March 15. The project timetable will be based on this date.

Section 6.0—Timetable

November 1, 2006—Detailed design of tiltmeter data acquisition process

December 1, 2006—Project Authorization from Marathon and OGRC

December 1, 2006—Begin obtaining agreements with surface owners for tiltmeter installation

January 1, 2007—Klatt 31-14H spuds

January 15, 2007—Tiltmeter Array staking completed

February 1, 2007—Tiltmeter Array in place and collecting background data

February 15, 2007—Drilling phase of well finished and completion begins.

March 15, 2007—Fracture Stimulation

March 23, 2007—Data Analysis Complete

Section 7.0—Budget

- Project pre-planning survey and construction assessment	$ 5,000
- Array installation, maintenance and reclamation (~80 sites)	$200,000
- Data Acquisition & Analysis Fee (1 stage)	$ 35,000
Total	$240,000

Marathon only costs associated with this project:

- Well Preparation	$ 50,000
- Hydraulic Fracture Stimulation	$700,000

As seen above, the funding for the tiltmeter study is not the largest expenditure of this project and as such, the fracture stimulation will proceed even without the grant being awarded.

Section 8.0—Tax Liability

Affidavits from Marathon's Tax Organization are attached.

Section 9.0—Confidential Information

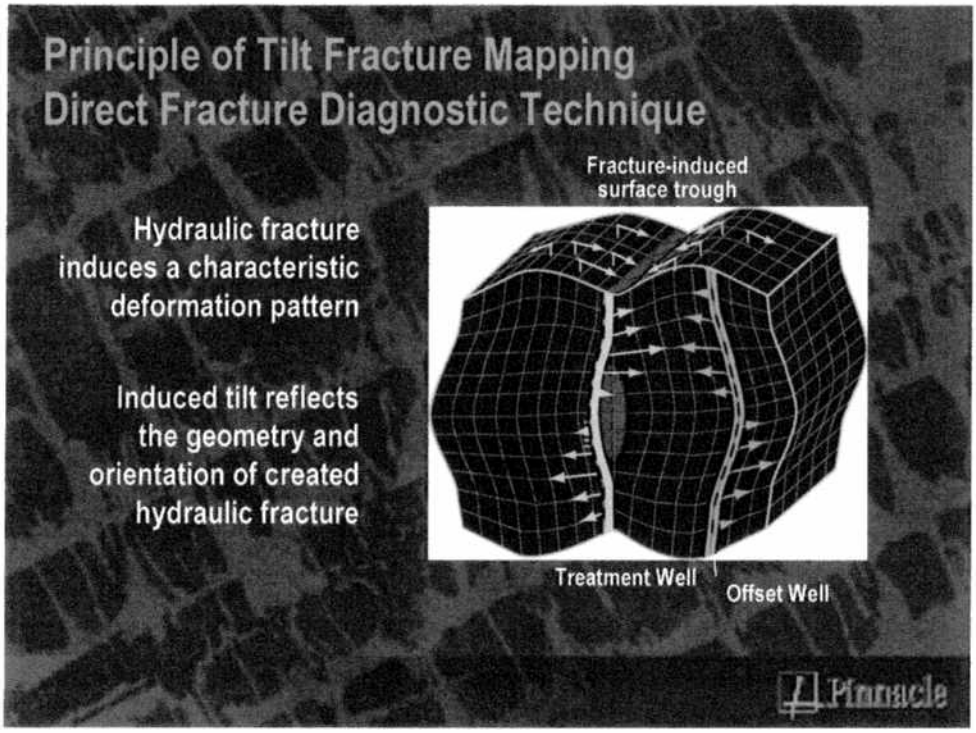
Marathon requests that the results and interpretations of the results remain confidential for a period of 1 year following the release of the "Data Analysis Complete" date to protect Marathon's business interest.

Section 10.0—Patents and Rights to Technical Data

None

Section 11.0—Appendices

11.1 Principle of Fracture Mapping



Check No	Check Date	Bank	Bank No	Vendor No	Marathon Oil Company P. O. Box 22164 Tulsa, OK 74121-2164	Direct Inquiries to: ACCOUNTS PAYABLE DEPARTMENT Accts Payable Contact Center Phone: 918-925-6097	Hndlg
1243992	10/30/2006	NCBAS	7780	5003155			HS

Invoice Number	Invoice Date	Document No	Remit Comment	Gross Amount	Discount	Invoice/Pay Amount
ST100.00	10/30/2006	1900047586		100.00		100.00
			TOTAL:	100.00		100.00

(FOLD ON PERFORATION BELOW AND DETACH CHECK STUB BEFORE DEPOSITING)

DO NOT CASH UNLESS WARNING BAND AND THE CHECK BACKGROUND ARE IN VIOLET. THE LINE BELOW CONTAINS MICROPRINTING.

FORM 2501 REV. 5/00

7780

ACCOUNTS PAYABLE CHECK

Marathon Oil Company
P. O. Box 22164
Tulsa, OK 74121-2164

56-389/412

CHECK DATE **10/30/2006**

CHECK NUMBER **1243992**

U.S. Funds

VOID AFTER 180 DAYS

PAY TO THE ORDER OF:
STATE OF NORTH DAKOTA
P.O. BOX 5523
BISMARCK, ND 58506-5523

$100.00
ONE ZERO ZERO ZERO ZERO

MATCH AMOUNT IN WORDS WITH NUMBERS

By: James A Ballard
Authorized Representative

NATIONAL CITY BANK
Ashland, Ohio

One hundred and 00/100 Dollars

DO NOT CASH UNLESS THIS CHECK IS ON WATERMARKED PAPER. HOLD TO LIGHT TO VIEW. THE LINE ABOVE CONTAINS MICROPRINTING.

⑈001243992⑈ ⑆041203895⑆ 0183181⑈

AFFIDAVIT REGARDING OUTSTANDING TAX LIABILITY

I, Mary M. Joseph, am employed by Marathon Oil Company as the State Tax Manager. In that capacity, I am responsible for the administration of all state income and franchise taxes for Marathon Oil Corporation. I certify that there are no outstanding state income and franchise taxes owed to the State of North Dakota or any of its political subdivisions.

My signature certifies that all information provided in this affidavit is complete and accurate.

Mary M. Joseph
State Tax Manager

Before me, a Notary Public in and for said state, personally appeared Mary M. Joseph, who being by me duly affirmed deposes and says that she is the State Tax Manager of Marathon Oil Corporation.

Further, affiant sayeth naught.

Mary M. Joseph

Affirmed before me and signed in my presence this 30 day of October, 2006.

ALLICIA ANN HULETT
Notary Public, State of Texas
Commission Expires 07-23-2007

Seal

Allicia Ann Hulett
Name
Notary Public, State of Texas
My commission expires: 7-23-2007

AFFIDAVIT REGARDING OUTSTANDING TAX LIABILITY

I, John A. Fletcher, am employed by Marathon Petroleum Company LLC as the Severance Tax Coordinator. In that capacity, I am responsible for overseeing the administration of all severance taxes through IBM. I certify that there are no outstanding severance taxes owed to the State of North Dakota or any of its political subdivisions. My signature certifies that all information provided in this affidavit is complete and accurate.

John A. Fletcher
Severance Tax Coordinator

Before me, a Notary Public in and for said state, personally appeared John A. Fletcher, who being by me duly affirmed deposes and says that he is the Severance Tax Coordinator of Marathon Petroleum Company LLC.

Further, affiant sayeth naught.

John A. Fletcher

Affirmed before me and signed in my presence this 26th day of October, 2006.

Renee Pochard
Name
Notary Public, State of Ohio
My commission expires: June 29, 2009

Renee Pochard
Notary Public, State of Ohio
My Commission Expires June 29, 2009

Seal

AFFIDAVIT REGARDING OUTSTANDING TAX LIABILITY

I, Kenneth R. Cooksey, am employed by Marathon Petroleum Company LLC as the Property & Severance Tax Manager. In that capacity, I am responsible for the administration of all property taxes for Marathon Oil Corporation. I certify that there are no outstanding property taxes owed to the State of North Dakota or any of its political subdivisions.

My signature certifies that all information provided in this affidavit is complete and accurate.

Kenneth R. Cooksey
Property & Severance Tax Manager

Before me, a Notary Public in and for said state, personally appeared Kenneth R. Cooksey, who being by me duly affirmed deposes and says that he is the Property & Severance Tax Manager of Marathon Petroleum Company LLC.

Further, affiant sayeth naught.

Kenneth R. Cooksey

Affirmed before me and signed in my presence this 26th day of October, 2006.

Renee Pochard
Name
Notary Public, State of Ohio
My commission expires: June 29, 2009

Seal

Renee Pochard
Notary Public, State of Ohio
My Commission Expires June 29, 2009

AFFIDAVIT REGARDING OUTSTANDING TAX LIABILITY

I, Glenn W. Brickman, am employed by Marathon Petroleum Company LLC as the Sales & Use Tax Audit Coordinator. In that capacity, I am responsible for the administration of all sales and use taxes for Marathon Oil Corporation. I certify that there are no outstanding sales and use taxes owed to the State of North Dakota or any of its political subdivisions.

My signature certifies that all information provided in this affidavit is complete and accurate.

Glenn W. Brickman

Glenn W. Brickman
Sales & Use Tax Audit Coordinator

Before me, a Notary Public in and for said state, personally appeared Glenn W. Brickman, who being by me duly affirmed deposes and says that he is the Sales & Use Tax Audit Coordinator of Marathon Petroleum Company LLC.

Further, affiant sayeth naught.

Glenn W. Brickman

Affirmed before me and signed in my presence this 26th day of October, 2006.

Renee Pochard

Name
Notary Public, State of Ohio
My commission expires: June 29, 2009

Seal

Renee Pochard
Notary Public, State of Ohio
My Commission Expires June 29, 2009