

# THUNDERBOLT PETROLEUM

P.O. BOX 10523 MIDLAND, TX 79702 PHONE (915) 682-1251

RECEIVED

February 26, 2004

MAR 08 2004

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

OIL CONSERVATION  
DIVISION

ATTN: Mr. Richard Ezeanyim:

Dear Mr. Ezeanyim:

Thunderbolt Petroleum respectfully requests an increase in the Maximum Surface Injection Pressure to 1100 psi for the Calmon Nos. 1 and 3 from the current limit of 650# for the #1 and 550 psi for the #3, as authorized by letter from the OCD dated 8/9/02, see attached.

Please find attached step rate tests and tracer surveys pertaining to my Calmon Waterflood located in the SW/4 of Section 16, T-18-S, R-29-E Eddy County, New Mexico. This flood was approved by the NMOCD Order # R-11275, (copy attached) in which the Maximum Surface Injection pressure of 453 PSIG was set for the Calmon State #1 and Calmon State #3. In 2002 a pressure increase was requested and was granted increasing the maximum pressure of the Calmon #1 to 650 psi and increasing the Calmon #3 to 550 psi.

We have been battling an iron sulfide problem that has plugged off some injectivity and has caused our injection pressure to increase. We have tried back flowing and acidizing the wells with minimal benefit. Mr. Mike Bratcher, from the OCD Artesia office, recently performed a field inspection which showed the injection pressure to be above the last pressure increase order, a copy of his report is attached.

Attached are tracer surveys, which verify that the injection water is staying within the Grayburg injection interval. The Calmon Well #1 injection water goes out the upper <sup>MIDDLE</sup> perfs with no water reaching the lowest set of perfs, at 2676-80. The tracer survey indicates some channeling down about 10 feet below the perfs, at 2608-10, and no channeling up. The Calmon #3 injection water goes out the perfs, and the tracer does not indicate any channeling outside the pipe. The temperature survey on the #3 well indicates there may be a channel behind pipe up to about 2140'. The temperature log looks fairly erratic and the Cardinal personnel could not explain the behavior. However, the radioactive tracer does not indicate any channeling. Even if there was a channel to 2140', we are still in the Grayburg and well below any fresh water, which is above 400' in this area. What appears to be channeling could also be due to the frac jobs when the wells were initially completed. The #1 well was fraced with 75,500 # of sand and the #3 well was fraced with 129,300 # of sand.

An attached plot of injection water and oil production demonstrates that the injection of a sufficient volume of water is necessary to increase the oil production. We have ran step rate tests on the Calmon #1 and Calmon #3 showing the parting pressure to be 805 psi and 787 psi respectively. We are requesting an increase in the Maximum Surface Injection Pressure to 1100 psi for the Calmon #1 and 1050 psi for the Calmon #3 because this is the pressure at which these wells will take injection water on a consistent basis.

These wells are injecting into the Grayburg interval at a depth of about 2250' to 2600'. The top of the ~~Grayburg~~ <sup>Queen</sup> is about 2100'. As is typical with wells of this nature, the wellhead injection pressure has to be around 1000 to 1100 psi to inject water into the formation. These zones are fairly tight and over time plugging occurs due to microscopic particles being carried in the injection water. This seems to occur even when filters are used.

I am also sending you a chart showing the water injection rates compared to oil rates over time. Initially the oil production was about 50 to 80 BOPM and we were injecting about 5000 BWPM. In September 2001, I was able to secure additional water and was able to increase injection to almost 15000 BWPM. In about 5 months the oil rate increased to about 200 BOPM. The additional water source became unavailable after about 3 months and we went back to injecting around 5000 BWPM. In April 2003 we were able to get additional water and injection started climbing to about 10000 BWPM. The oil rate has since increased to nearly 400 BOPM.

Based on the results of the tracer survey, which shows the water remaining within the Grayburg zone, Thunderbolt Petroleum is requesting a wellhead pressure increase to 1100 psi for the Calmon #1 and #3.

If you need anything else please contact me. Thanks for everything you have done.

Sincerely,

A handwritten signature in cursive script that reads "Robert Lee".

Robert Lee



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

August 9, 2002

**GARY E. JOHNSON**

Governor

**Betty Rivera**

Cabinet Secretary

Thunderbolt Petroleum

PO Box 10523

Midland, Texas 79702

Attn: Mr. Robert Lee

**Lori Wrotenbery**

Director

Oil Conservation Division

**Re: Injection Pressure Increase  
Cal-Mon No. 1 and Cal-Mon No. 2<sup>3</sup>  
Section 16, Township 18 South, Range 29 East, NMPM  
Eddy County, New Mexico**

Dear Mr. Lee:

Reference is made to your request dated July 3, 2002 (received in this office July 8, 2002), to increase the surface injection pressure on the above referenced injection wells. This request is based on step rate tests conducted on the wells on June 25, 2002. After reviewing test results, we feel an increase in injection pressure is justified at this time.

With size and type of tubing remaining 2 3/8 inch, you are authorized to increase the surface injection pressure to the following:

Well and Location	Maximum Surface Injection Pressure
Cal-Mon Well No. 1 (2310 FSL, 990 FWL) API: 30-015-25635	650 PSIG Water
Cal-Mon Well No. 3 (990 FSL, 990 FWL) API: 30-015-25754	550 PSIG Water

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

*Lori Wrotenbery* (initials)

LORI WROTENBERY,  
Division Director

cc: Oil Conservation Division – Artesia  
Files: R-11275; IPI 2002

ABOVE THIS LINE FOR DIVISION USE ONLY

**NEW MEXICO OIL CONSERVATION DIVISION**  
 - Engineering Bureau -  
 1220 South St. Francis Drive, Santa Fe, NM 87505



**ADMINISTRATIVE APPLICATION COVERSHEET**

THIS COVERSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

**Application Acronyms:**

- [NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
- [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
- [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
- [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
- [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
- [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION - Check Those Which Apply for [A]**

- [A] Location - Spacing Unit - Simultaneous Dedication  
 NSL  NSP  SD

*Case 13249*

Check One Only for [B] or [C]

- [B] Commingling - Storage - Measurement  
 DHC  CTB  PLC  PC  OLS  OLM

- [C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery  
 WFX  PMX  SWD  IPI  EOR  PPR

[2] **NOTIFICATION REQUIRED TO: - Check Those Which Apply, or  Does Not Apply**

- [A]  Working, Royalty or Overriding Royalty Interest Owners
- [B]  Offset Operators, Leaseholders or Surface Owner
- [C]  Application is One Which Requires Published Legal Notice
- [D]  Notification and/or Concurrent Approval by BLM or SLO  
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
- [E]  For all of the above, Proof of Notification or Publication is Attached, and/or,
- [F]  Waivers are Attached

[3] **INFORMATION / DATA SUBMITTED IS COMPLETE - Certification**

I hereby certify that I, or personnel under my supervision, have reviewed the applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common.

*I understand that any omission of data (including API numbers, pool codes, etc.), pertinent information and any required notification is cause to have the application package returned with no action taken.*

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

<u>Thunderbolt Petroleum</u>	<u>Robert Lee</u>	<u>President</u>	<u>7/2/02</u>
Print or Type Name	Signature	Title	Date
Robert Lee		<u>robertlee5@worldnet.att.net</u>	
		e-mail Address	

# THUNDERBOLT PETROLEUM

P.O. BOX 10523 MIDLAND, TX 79702 PHONE (915) 682-1251

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July 3, 2002

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

ATTN: Mr. David Catanach

Dear Mr. Catanach:

Thunderbolt Petroleum respectfully requests an increase in the Maximum Surface Injection Pressure to 675# for the Calmon #1 and 565# for the Calmon #3 from the current limit of 453# set up by Order # R-11275.

Please find attached step rate tests pertaining to my Calmon Waterflood located in the SW/4 of Section 16, T-18-S, R-29-E Eddy County, New Mexico. This flood was approved by the NMOCD Order # R-11275, a copy is attached. In that order the Maximum Surface Injection pressure of 453 PSIG was set for the Calmon State #1 and Calmon State #3.

We have been battling an iron sulfide problem that has plugged off some injection zone and has caused our injection pressure to increase. We have tried back flowing the wells with minimal benefit. Gerry Guye from the Artesia office recently performed a bradenhead inspection which showed the injection pressure to be above the 453 PSIG set by Order # R-11275, a copy of his report is attached.

We have ran step rate tests on the Calmon #1 and Calmon #3 showing the parting pressure to be 700# and 590# respectively. We are requesting an increase in the Maximum Surface Injection Pressure to 675# for the Calmon #1 and 565# for the Calmon #3.

If you need anything else please contact me. Thanks for everything you have done.

Sincerely,

**STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION**

**IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:**

**CASE NO. 12250  
ORDER NO. R-11275**

**APPLICATION OF THUNDERBOLT PETROLEUM, LLC FOR A WATERFLOOD  
PROJECT AND QUALIFICATION FOR THE RECOVERED OIL TAX RATE  
PURSUANT TO THE "NEW MEXICO ENHANCED OIL RECOVERY ACT", EDDY  
COUNTY, NEW MEXICO.**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This case came on for hearing at 8:15 a.m. on October 21, 1999, at Santa Fe, New Mexico, before Examiner Mark W. Ashley.

NOW, on this 9th day of November, 1999, the Division Director, having considered the testimony, the record and the recommendations of the Examiner,

**FINDS THAT:**

- (1) Due public notice has been given and the Division has jurisdiction of this case and its subject matter.
- (2) The applicant, Thunderbolt Petroleum, LLC, seeks authority to institute a waterflood project on its Calmon State Lease, which comprises the SW/4 of Section 16, Township 18 South, Range 29 East, NMPM, Eddy County, New Mexico, by the injection of water into the Queen Grayburg and San Andres formations, Loco Hills-Queen Grayburg San Andres Pool, through two injection wells described in Exhibit "A" attached to this order.
- (3) The applicant currently operates five producing wells and one temporarily abandoned well within the proposed project area. Two of the producing wells, the Calmon State Well No. 1 located in Unit L of Section 16 and the Calmon State Well No. 3 located in Unit M are to be used as injection wells within the proposed waterflood project. The temporarily abandoned well, the Calmon State Well No. 4 located in Unit K, will remain temporarily abandoned. The three remaining wells, the Calmon State Well No. 2 located in Unit L, the Calmon State Well No. 5 located in Unit M, and the Calmon State Well No. 6 located in Unit N, will be utilized as producing wells within the proposed waterflood project.

(4) The producing wells within the proposed project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(5) The applicant's testimony indicates that the applicant controls 100 percent of the working interest within the proposed project area.

(6) Applicant testified that the proposed waterflood operations within the project area should result in the recovery of an additional 115,000 barrels of oil that would otherwise not be recovered, thereby preventing waste.

(7) The estimated cost to implement the waterflood project is \$125,200 dollars.

(8) Approval of the proposed waterflood project will not violate correlative rights.

(9) The injection of water into the wells shown in Exhibit "A" should be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforations; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(10) The evidence presented by the applicant indicates that all of the wells within the "area of review" of the wells shown in Exhibit "A" are cased and cemented or plugged and abandoned in a manner to confine the injection fluid to the proposed injection interval.

(11) Prior to commencing injection operations into the wells in Exhibit "A", the casing should be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

(12) The wells in Exhibit "A" should be equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure to that shown on Exhibit "A."

(13) The Division Director should have the authority to administratively authorize a pressure limitation in excess of the pressure limitation shown on Exhibit "A" upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(14) The operator should give advance notification to the supervisor of the Division's Artesia District Office of the date and time of installation of the injection

equipment and performance of the mechanical integrity pressure test in order that the same may be witnessed.

(15) The proposed waterflood project should be approved and the project should be governed by the provisions of Division Rules No. 701 through 708.

(16) The injection authority granted herein for any well in Exhibit "A" should terminate one year after the effective date of this order if the operator has not commenced injection operations into the well, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(17) The applicant further requested that the proposed waterflood project be approved by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "New Mexico Enhanced Oil Recovery Act," Sections 7-29A-1 through 7-29A-5, NMSA 1978.

(18) The evidence presented indicates that the proposed waterflood project meets all the criteria for approval.

(19) The approved project area should comprise the SW/4 of Section 16.

(20) To be eligible for the enhanced oil recovery (EOR) tax rate the operator must request from the Division a Certificate of Qualification prior to commencing injection operations, which certificate will specify the project area as described above.

(21) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response. The application shall identify the area actually benefiting from enhanced recovery operations and the specific wells the operator believes are eligible for the tax rate. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells that are eligible for the tax rate.

**IT IS THEREFORE ORDERED THAT:**

(1) The applicant, Thunderbolt Petroleum, LLC, is hereby authorized to institute a waterflood project on its Calmon State Lease, which comprises the SW/4 of Section 16, Township 18 South, Range 29 East, NMPM, Eddy County, New Mexico, by the injection of water into the Queen Grayburg and San Andres formations, Loco Hills-Queen Grayburg San Andres Pool, through two injection wells described in Exhibit "A" attached to this order.

(2) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(3) The injection of water into the wells shown in Exhibit "A" shall be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforations; the casing-tubing annulus shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(4) Prior to commencing injection operations into the wells shown in Exhibit "A", the casing shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

(5) The wells in Exhibit "A" shall be equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure to that shown on Exhibit "A."

(6) The Division Director shall have the authority to administratively authorize a pressure limitation in excess of the pressure limitation shown on Exhibit "A" upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(7) The operator shall give advance notification to the supervisor of the Division's Artesia District Office of the date and time of installation of the injection equipment and performance of the mechanical integrity pressure test in order that the same may be witnessed.

(8) The operator shall immediately notify the supervisor of the Division's Artesia District Office of the failure of the tubing, casing or packer in any injection well, the leakage of water, oil or gas from or around any producing well, or the leakage of water, oil or gas from any plugged and abandoned well within the project area, and shall take such steps as may be timely and necessary to correct such failure or leakage.

(9) The project is hereby designated the Calmon State Waterflood Project.

(10) The operator shall conduct injection operations in accordance with Division Rules No. 701 through 708 and shall submit monthly progress reports in accordance with Division Rules No. 706 and 1115.

(11) The Calmon State Waterflood Project is hereby approved as an "Enhanced Oil Recovery Project" pursuant to the "New Mexico Enhanced Oil Recovery Act," Sections 7-29A-1 through 7-29A-5, NMSA 1978.

(12) The approved project area shall comprise the SW/4 of Section 16 of Section 34.

(13) To be eligible for the enhanced oil recovery (EOR) tax rate, the operator must request from the Division a Certificate of Qualification prior to commencing injection operations, which certificate will specify the project area as described above.

(14) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response. The application shall identify the area actually benefiting from enhanced recovery operations and the specific wells the operator believes are eligible for the tax rate. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells that are eligible for the tax rate.

(15) The injection authority granted herein for any well in Exhibit "A" shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the well, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(16) Jurisdiction of this case is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



S E A L

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

*Lori Wrotenbery*  
LORI WROTENBERY  
Director

EXHIBIT "A"  
DIVISION ORDER NO. R-11275  
APPROVED INJECTION WELLS  
CALMON STATE WATERFLOOD PROJECT

Well Name & Number	Location	Injection Interval	Plugging Depth	Max. Surface Inj. Pressure
Calmon State No. 1	2310 FSL & 990 FWL, Unit L, Section 16, Township 18 South, Range 29 East	2,265' - 2,679'	2,176'	453 PSIG
Calmon State No. 3	990 FSL & 990 FWL, Unit M, Section 16, Township 18 South, Range 29 East	2,264' - 2,599'	2,180'	453 PSIG

# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON  
Governor  
Betty Rivera  
Cabinet Secretary

Lori Wrotenbery  
Director  
Oil Conservation Division

## *Underground Injection Control Program "Protecting Our Underground Sources of Drinking Water"*

07-Jun-02

THUNDERBOLT PETROLEUM, LLC  
PO BOX 10523  
MIDLAND TX 79702-

Dear Operator:

The following test(s) were performed on the listed dates on the following well(s) shown below in the test detail section. The test(s) indicates that the well or wells failed to meet mechanical integrity standards of the New Mexico Oil Conservation Division. To comply with guidelines established by the U.S. Environmental Protection Agency, the well must be shut-in immediately until it is successfully repaired. The test detail section which follows indicates preliminary findings and/or probable causes of the failure. This determination is based on a test of your well or facility by an inspector employed by the Oil Conservation Division. Additional testing during the repair operation may be necessary to properly identify the nature of the well failure.

Please notify the proper district office of the Division at least 48 hours prior to the date and time that repairs will be attempted so that such operations may be witnessed by a field representative.

### **MECHANICAL INTEGRITY TEST DETAIL SECTION**

CAL-MON 001

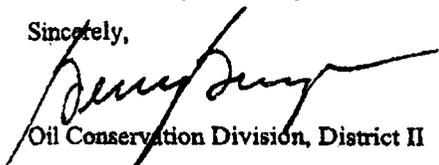
30-015-25635-00-00  
L-16-18S-29E

Active Injection - (All Types)

Test Date: 6/6/2002 2:45:15 PM	Permitted Injection PSI:	Actual PSI: 600
Test Reason: Annual IMIT	Test Result: F	Repair Due: 9/9/2002
Test Type: Bradenhead Test	FAIL TYPE: Other Internal Failure	FAIL CAUSE:
Comments on MIT: Injection pressure over limit. Permit Violation.		

Thank you for your prompt attention to this matter and your efforts in helping to protect our ground water

Sincerely,

  
Oil Conservation Division, District II

6/19/02  
Pressure too high -  
Getting step rates lined up

Note: Pressure Tests are performed prior to initial injection, after repairs and otherwise, every 5 years; Bradenhead Tests are performed annually. Information in Detail Section comes directly from field inspector data entries - not all blanks will contain data. "Failure Type" and "Failure Cause" and any Comments are not to be interpreted as a diagnosis of the condition of the wellbore. Additional testing should be conducted by the operator to accurately determine the nature of the actual failure. \* Significant Non-Compliance events are reported directly to the EPA, Region VI, Dallas, Texas.

# THUNDERBOLT PETROLEUM

P.O. BOX 10523 MIDLAND, TX 79702 PHONE (915) 682-1251

January 20, 2004

Oil Conservation Division  
1301 W. Grand  
Artesia, New Mexico 88210

ATTN: Mr. Mike Bratcher

RECEIVED

JAN 28 2004

OIL CONSERVATION  
DIVISION

RECEIVED

JAN 21 2004

OCD-ARTESIA

Dear Mr. Bratcher,

This letter addresses the concerns the OCD has expressed in regard to the Calmon Lease operated by Thunderbolt Petroleum. In response to your request, I have replaced the sign at the Calmon #4. I am sending you data pertaining to the two injection wells, the Calmon #1 and the Calmon #3. These wells were found to be injecting over the max pressure of 650 psi and 550 psi for the #1 and #3, respectively. These wells are injecting into the Grayburg interval at a depth of about 2250' to 2600'. The top of the ~~Grayburg~~ <sup>Grayburg</sup> is about 2100'. As is typical with wells of this nature, the wellhead injection pressure has to be around 1000 to 1100 psi to inject water into the formation. These zones are fairly tight and over time plugging occurs due to microscopic particles being carried in the injection water. This seems to occur even when filters are used.

I am sending you an injection profile for each well. The Calmon #1 well shows injection water going out the perfs with no water reaching the lowest set of perfs at 2676-80. The tracer survey indicates some channeling down about 10 feet below the perf at 2608-10 and no channeling up. The Calmon #3 shows water going out the perfs and the tracer does not indicate any channeling outside the pipe. The temperature survey on the #3 well indicates there may be a channel behind pipe up to about 2140'. The temperature log looks fairly erratic and the Cardinal personnel could not explain the behavior. But still the radioactive tracer does not indicate any channeling. Even if there was a channel to 2140', we are still in the Grayburg and well below any fresh water.

I am also sending you a chart showing the water injection rates compared to oil rates over time. Initially the oil production was about 50 to 80 BOPM and we were injecting about 5000 BWPM. In September 2001, I was able to secure additional water and was able to increase injection to almost 15000 BWPM. In about 5 months the oil rate increased to about 200 BOPM. The additional water source became unavailable after about 3 months and we went back to injecting around 5000 BWPM. In April 2003 we were able to get additional water and injection started climbing to about 10000 BWPM. The oil rate has since increased to nearly 400 BOPM.

Based on the results of the tracer survey, which shows the water remaining within the Grayburg zone, Thunderbolt Petroleum is requesting a wellhead pressure increase to 1100 psi for the Calmon #1 and #3.

Thank you for your consideration.

*Robert Lee*

*For new Case File*

Monthly Oil & Water Inj

RECEIVED  
JAN 21 2004  
OCD  
ARTESIA

BBL/MO Water \* 100

◆ Total Oil BOPM  
■ H2O Inj BWPM

