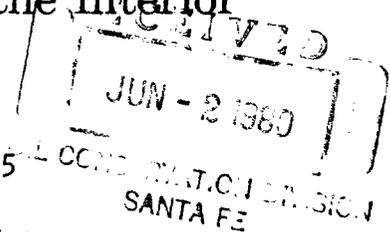




# United States Department of the Interior

GEOLOGICAL SURVEY  
South Central Region  
P. O. Box 26124  
Albuquerque, New Mexico 87125



MAY 29 1980

#6182

Union Oil Company of California  
Attention: Richard R. Oelze  
500 North Marienfeld  
Midland, Texas 79701

Gentlemen:

The Consent to Ratification and Joinder to the Laguna Deep Unit Agreement by Amoco Production Company, submitted to this office with your transmittal letter of February 12, 1980, is accepted for record purposes. Two signed copies are enclosed.

Sincerely yours,

(ORIG. SGD.) JACK WILLOCK

FOR Floyd L. Stelzer  
Acting Deputy Conservation Manager  
Oil and Gas

Enclosures 2

cc:  
NMOCD, Santa Fe/

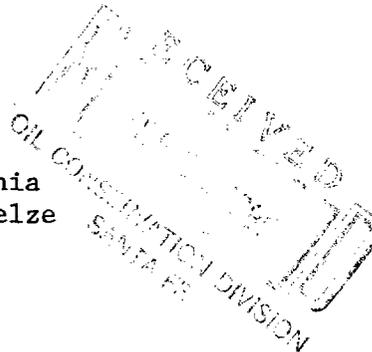


# United States Department of the Interior

GEOLOGICAL SURVEY  
Conservation Division  
P. O. Box 26124  
Albuquerque, New Mexico 87125

25 FEB 1980

Union Oil Company of California  
Attention: Mr. Richard R. Oelze  
P. O. Box 671  
Midland, Texas 79702



6182

Gentlemen:

Your application of April 6, 1979 requesting approval of the initial Morrow participating area for the Laguna Deep unit agreement, Lea County, New Mexico, was approved by the Oil and Gas Supervisor, U.S. Geological Survey, effective as of January 7, 1979.

The application proposes 640.00 acres which embraces all of sec. 35, T. 19 S., R. 33 E., N.M.P.M. as the initial Morrow participating area. Such participating area is based on the completion of well No. 1 in the SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35 on January 7, 1979 as the discovery well and determined to be commercial as a paying well pursuant to section 9 of the unit agreement by letter of April 11, 1979.

Copies of the approved application are being distributed to the appropriate Federal offices and one copy is returned herewith. You are requested to furnish the State of New Mexico and all interested parties with evidence of this approval.

Sincerely yours,

(ORIG. SGD.) JACK WILLOCK

James W. Sutherland  
Oil and Gas Supervisor, SRMA

Enclosure

cc:

NMOCD, Santa Fe



ONE HUNDRED YEARS OF EARTH SCIENCE IN THE PUBLIC SERVICE

# State of New Mexico



ALEX J. ARMIJO  
COMMISSIONER



## Commissioner of Public Lands

March 17, 1980

P. O. BOX 1148  
SANTA FE, NEW MEXICO 87501

Union Oil Company of California  
500 North Marienfeld  
Midland, Texas 79701

6182

Re: Laguna Deep Unit  
Lea County, New Mexico  
1980 PLAN OF DEVELOPMENT AND  
OPERATION

ATTENTION: Mr. Richard R. Oelze

Gentlemen:

The Commissioner of Public Lands has this date approved your 1980 Plan of Development and Operation for the Laguna Deep Unit, Lea County, New Mexico. Such plan proposes the drilling of a Morrow well in Section 35, Township 19 South, Range 33 East. Our approval is subject to like approval by the United States Geological Survey and the New Mexico Oil Conservation Division.

Enclosed is one approved copy for your files.

Your Three (\$3.00) Dollar filing fee has been received.

Very truly yours,

ALEX J. ARMIJO  
COMMISSIONER OF PUBLIC LANDS

BY:  
RAY D. GRAHAM, Director  
Oil and Gas Division  
AC 505-827-2748

AJA/RDG/s  
encl.  
cc:

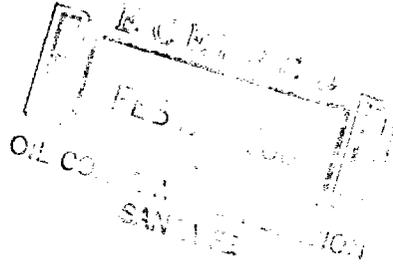
OCD-Santa Fe, New Mexico ✓  
USGS-Roswell, New Mexico  
USGS-Albuquerque, New Mexico



# United States Department of the Interior

GEOLOGICAL SURVEY

P. O. Box 26124  
Albuquerque, New Mexico 87125



20 FEB 1980

6182

Union Oil Company of California  
Attention: Mr. Richard R. Oelze  
P. O. Box 671  
Midland, Texas 79702

Gentlemen:

Two approved copies of your 1980 plan of development for the Laguna Deep unit area, Lea County, New Mexico, proposing the drilling of a Morrow well in sec. 35, T. 19 S., R. 33 E., are enclosed. Such plan was approved on this date subject to like approval by the appropriate officials of the State of New Mexico.

Sincerely yours,

(ORIG. SGD.) JACK WILLOCK

Oil and Gas Supervisor, SRMA

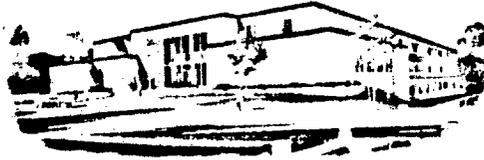
Enclosure

cc: NMOCD, Santa Fe (1tr only) ← This Copy for



ONE HUNDRED YEARS OF EARTH SCIENCE IN THE PUBLIC SERVICE

State of New Mexico



Commissioner of Public Lands

March 17, 1980

ALEX J. ARMIJO  
COMMISSIONER

P. O. BOX 1148  
SANTA FE, NEW MEXICO 87501

Union Oil Company of California  
500 North Marienfeld  
Midland, Texas 79701

6182

Re: Laguna Deep Unit  
Laguna Prospect (7729)  
Lea County, New Mexico  
Initial Morrow Participating area

ATTENTION: Mr. Richard R. Oelze

Gentlemen:

The Commissioner of Public Lands has this date approved the Initial Morrow Participating Area for the Laguna Deep Unit, Lea County, New Mexico. The USGS gave their approval February 25, 1980.

By your letter of March 11, 1980, you have advised this office that the effective date of this participating area is February 9, 1979 and not January 7, 1979.

Enclosed is one approved copy for your records.

Your Three (\$3.00) Dollar filing fee has been received.

Very truly yours,

ALEX J. ARMIJO  
COMMISSIONER OF PUBLIC LANDS

BY:  
RAY D. GRAHAM, Director  
Oil and Gas Division  
AC 505-827-2748

AJA/RDG/s  
encls.  
cc:

OCD-Santa Fe, New Mexico  
USGS-Roswell, New Mexico  
USGS-Albuquerque, New Mexico

OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

April 2, 1980

Union Oil Company of California  
500 North Marienfeld  
Midland, Texas 79701

Attention: Richard R. Oelze

Re: Case No. 6182  
Laguna Deep Unit  
1980 Plan of Development  
and Operation

Gentlemen:

We hereby approve the 1980 Plan of Development and Operation for the Laguna Deep Unit, Lea County, New Mexico, subject to like approval by the United States Geological Survey and the Commissioner of Public Lands.

One approved copy of the Plan of Development and Operation is returned herewith.

Yours very truly,

JOE D. RAMEY  
Director

JDR/EP/fd  
enc.

cc: U.S.G.S. - Roswell  
Commissioner of Public Lands

C  
O  
P  
Y

Union Oil and Gas Division: Central Region

Union Oil Company of California  
500 North Marienfeld, Midland, Texas 79701  
P.O. Box 671, Midland, Texas 79702  
Telephone (915) 682-9731

**UNION** **76**



Robert V. Lockhart  
District Land Manager  
Midland District

February 11, 1980

*OK for approval  
4/1/80  
S/P*

*6152*

Oil Conservation Division  
Energy and Minerals Department  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Attn: Mr. Joe D. Ramey, Director

Gentlemen:

Laguna Deep Unit  
Lea County, New Mexico  
T-19 & 20-S, R-33-E, NMPM

Enclosed for your review please find one (1) copy of Union Oil Company of California's "1980 Plan of Development and Operation for Laguna Deep Unit Area."

Union, as Operator, respectfully requests your consideration and approval of this plan. Should you have any additional questions, please contact the undersigned.

Sincerely yours,

UNION OIL COMPANY OF CALIFORNIA

*Richard R. Oelze*  
Richard R. Oelze  
Landman

RRO/sb

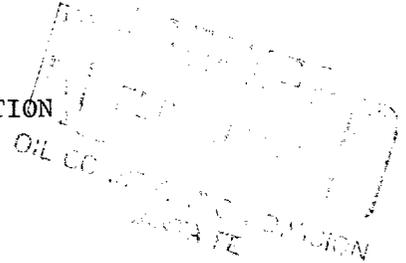
Encl: (1)

1980 PLAN OF DEVELOPMENT AND OPERATION

FOR

LAGUNA DEEP UNIT AREA

LEA COUNTY, NEW MEXICO



TO: The Director  
Oil Conservation Division  
Energy and Minerals Department  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Union Oil Company of California, as Unit Operator for the Laguna Deep Unit Area, pursuant to the provisions of Section 10 of the Unit Agreement for Development and Operation of the Laguna Deep Unit Area, dated June 22, 1978 (No. 14-08-0001-16905), respectfully submits for the approval of the Director, Oil Conservation Division, or its duly authorized representative, this 1980 Plan of Development and Operation for the Laguna Deep Unit Area. This plan is for the period ending December 31, 1980.

SUMMARY OF 1979 and 1980 OPERATIONS TO DATE

In our 1979 Plan of Development and Operation you were informed that the Laguna Deep Unit Federal Well No. 1, located 1650' FNL and 1980' FEL Section 35, T-19-S, R-33-E, Lea County, New Mexico, was drilled to a total depth on January 5, 1979, at 14,753'. By respective letters dated April 11, 1979, and April 17, 1979, the Oil and Gas Supervisor, U.S.G.S., and the Commissioner of Public Lands, concurred with our determination the #1 Well did qualify as a Unit Well and validated the Unit Area. A gas contract was finalized August 1, 1979, and initial delivery was made at 2:00 P.M., September 24, 1979. On October 12, 1979, application was made to the Supervisor for Approval of the Initial Participating Area of the Morrow Formation, Laguna Deep Unit.

The Laguna Deep Unit Federal Well No. 2 was spudded on November 8, 1979, at 990' FSL and 1980' FWL Section 26, T-19-S, R-33-E, Lea County, New Mexico. This test was drilled to a total depth of 13,490' on January 4, 1980. The lower Morrow was perforated January 21, 1980, at an interval between 13,381'-13,390' and on January 23, 1980, this Morrow interval was flowed at a stabilized rate of 2,000 MCFD at 1700 PSI FTP for 7 hours then SI. The well produced condensate at the rate of 108 BPD during this 7 hour flow period. SITP (12 hours) was 3900 PSI. The well is currently shut-in awaiting a pipeline connection.

We expect to finalize a gas contract within the next 45-60 day period and proceed with connecting the well to a sales outlet. We are presently drafting our determination letter seeking the Director's concurrence that the #2 Well does qualify as a Unit Well. A revised Participating Area request will be submitted following the #2 Well determination.

PLAN OF DEVELOPMENT AND OPERATION FOR REMAINDER OF 1980

During the year 1980, we are proposing a third Morrow Well to be commenced in the first half of 1980 and to be located in the SW/4 Section 35, T-19-S, R-33-E, Lea County, New Mexico. Additional studies and evaluations will be made based on monitorings of the Laguna Deep Unit Federal Well No.'s 1 & 2, and the proposed test in SW/4 Section 35. Our plan may be modified or supplemented from time to time with the approval of the Conservation Director when necessary to meet changed conditions or to protect the interest of all parties to the Unit agreement.

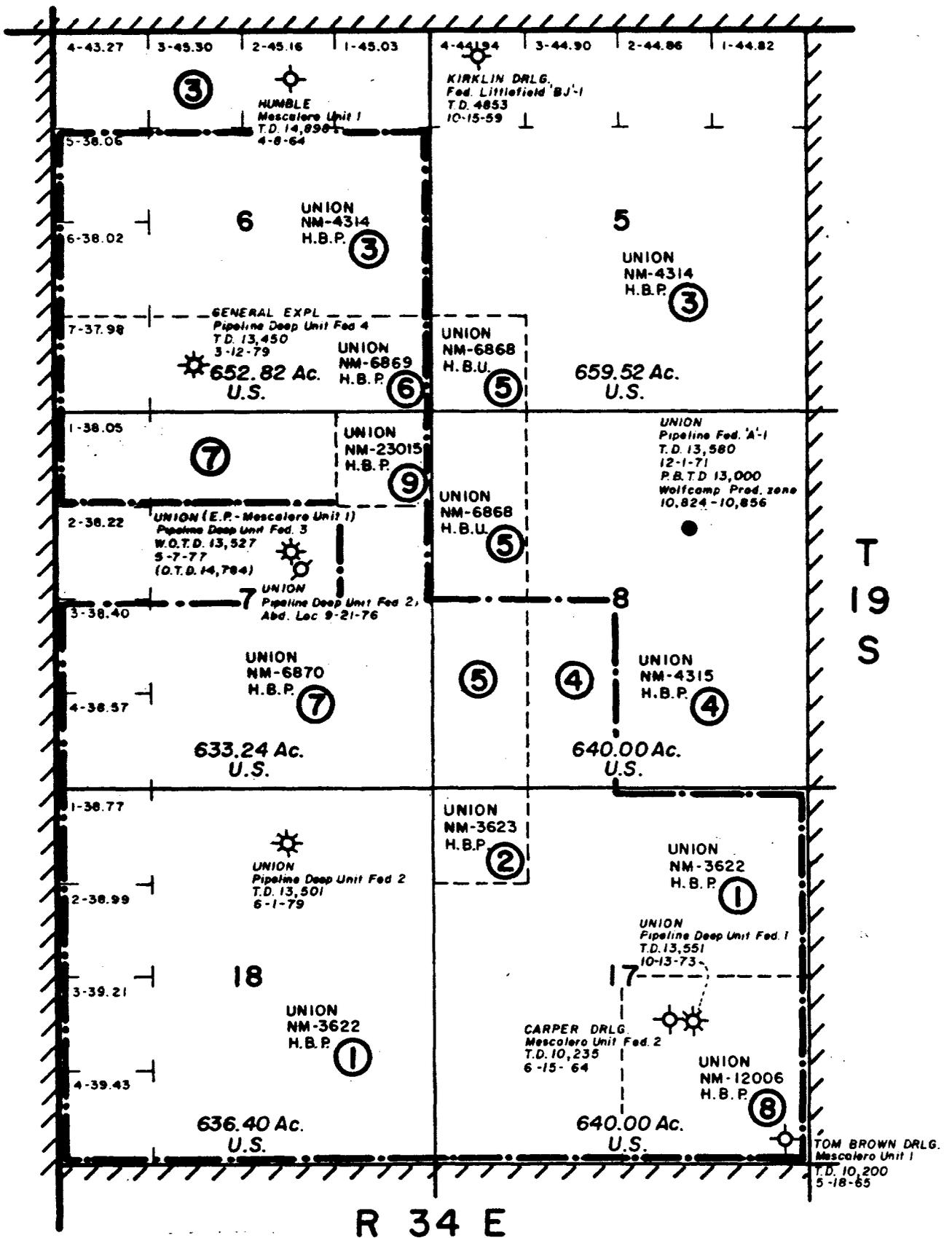
Your assistance in expediting approval of this Plan of Development and Operation will be greatly appreciated.

Submitted this 11th day of February, 1980

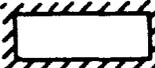
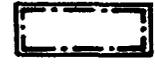
UNION OIL COMPANY OF CALIFORNIA

BY: Robert V. Lockhart  
District Land Manager

Received 4/3 19 80  
J. R. Ames  
Oil Conservation Division  
Energy and Minerals Department



**EXHIBIT "A" - (REVISED)**  
**LAND OWNERSHIP MAP - PIPELINE DEEP UNIT**  
 (AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979)  
 LEA COUNTY, NEW MEXICO

-  ORIGINAL UNIT BOUNDARY
-  REVISED UNIT BOUNDARY & PARTICIPATING AREA
-  TRACT NUMBER-INDEX TO EXHIBIT "B"

SCALE: 1" = 2000'

REVISED EXHIBIT "B"  
 PIPELINE DEEP UNIT AREA - LEA COUNTY, NEW MEXICO  
 TOWNSHIP 19 South, Range 34 East  
 AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979

TRACT	DESCRIPTION OF LAND	NUMBER OF ACRES	SERIAL NO. & EXPIRATION DATE OF LEASE	BASIC ROYALTY AND OWNERSHIP PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY OR PRODUCTION PAYMENT & PERCENTAGES	WORKING INT. AND PERCENTAGE
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FEDERAL LANDS

1	Sec. 17: NE/4, E/2 NW/4, 1076.40 SW/4 NW/4, SW/4	40.00	NM-3622 12-31-79	USA - All (12.5%)	Union Oil Company of California	Easton E. Brodsky 5%	Union: All
2	Sec. 17: NW/4 NW/4	40.00	NM-3623 10-31-77	USA - All (12.5%)	Union Oil Company of California	Lucretia G. Goldsmith 5%	Union: All
3	Sec. 6: Lots 5,6, S/2 NE/4, SE/4 NW/4 NE/4 SW/4, N/2 SE/4	316.08	NM-4314 1-31-78	USA - All (12.5%)	Union Oil Company of California	Wm. A. Jurkiewicz 3%	FROM SURFACE TO 13,245 FEET Summark Expl. Company .1416750
							Martin B. Seretean .0244043
							B. Jackson Bandy .0244043
							Gifford E. Joseph .0069726
							Kenat Oil & Gas, Inc. .0150563
							Frank O. Elliot Living Trust .0619828

REVISED EXHIBIT "B"  
 PIPELINE DEEP UNIT AREA - LEA COUNTY, NEW MEXICO  
 TOWNSHIP 19 South, Range 34 East  
 AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979

TRACT	DESCRIPTION OF LAND	NUMBER OF ACRES	SERIAL NO. & EXPIRATION DATE OF LEASE	BASIC ROYALTY AND OWNERSHIP PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY OR PRODUCTION PAYMENT & PERCENTAGES	WORKING INT. AND PERCENTAGE
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FROM SURFACE  
 TO 13,245 FEET

FEDERAL LANDS - (Continued)

					Edna Ione Hall Living Trust .0619828		
					McKay Oil Corp .0212513		
					Resource Partners .0070837		
					C&K Petroleum, Inc. .0070837		
					Frederick H. Prince .0354188		
					Robert E. Landreth .0177094		
					C.W. Trainer .0333334		
					David M. Trainer .0333333		
					Marvin C. Gross .0333333		

REVISED EXHIBIT "B"  
 PIPELINE DEEP UNIT AREA - LEA COUNTY, NEW MEXICO  
 TOWNSHIP 19 South, Range 34 East  
 AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979

TRACT	DESCRIPTION OF LAND	NUMBER OF ACRES	SERIAL NO. & EXPIRATION DATE OF LEASE	BASIC ROYALTY AND OWNERSHIP PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY OR PRODUCTION PAYMENT & PERCENTAGES	WORKING INT. AND PERCENTAGE
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FEDERAL LANDS - (Continued)

FROM SURFACE TO 13,245 FEET

Stephen A. Wells  
 .0708375

Charles E. Nearburg  
 .0708375

Union Oil Co. of California  
 .3333000

BELOW 13,245 FEET

Union: All

4 Sec. 8: E/2 SW/4 80.00 NM-4315 1-31-78 USA - All (12.5%) Union Oil Company of California Ray O. Traylor 3.33% Tom Hoover 1.67% Union 90.44296%

Getty  
 9.55704%

5 Sec. 8: W/2 SW/4 80.00 NM-6868 7-31-73 USA - All (12.5% to 25%) Union Oil Company of California None Union 90.44296%

Getty  
 9.55704%

6 Sec. 6: Lot 7, SE/4 SW/4, S/2 SE/4 157.98 NM-6869 7-31-73 USA - All (12.5% to 25%) Union Oil Company of California None FROM SURFACE TO 13,245 FEET Summark Explo. Company .1416750

REVISED EXHIBIT "B"  
 PIPELINE DEEP UNIT AREA - LEA COUNTY, NEW MEXICO  
 TOWNSHIP 19 South, Range 34 East  
 AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979

TRACT	DESCRIPTION OF LAND	NUMBER OF ACRES	SERIAL NO. & EXPIRATION DATE OF LEASE	BASIC ROYALTY AND OWNERSHIP PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY OR PRODUCTION PAYMENT & PERCENTAGES	WORKING INT. AND PERCENTAGE
<u>FEDERAL LANDS - (Continued)</u>							
							FROM SURFACE TO 13,245 FEET
					Martin B. Seretean		.0244043
					B. Jackson Bandy		.0244043
					Gifford E. Joseph		.0069726
					Kenal Oil & Gas, Inc.		.0150563
					Frank O. Elliott Living Trust		.0619828
					Edna Ione Hall Living Trust		.0619828
					Mckay Oil Corp		.0212513
					Resource Partners		.0070837

REVISED EXHIBIT "B"  
 PIPELINE DEEP UNIT AREA - LEA COUNTY, NEW MEXICO  
 TOWNSHIP 19 South, Range 34 East  
 AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979

TRACT	DESCRIPTION OF LAND	NUMBER OF ACRES	SERIAL NO. & EXPIRATION DATE OF LEASE	BASIC ROYALTY AND OWNERSHIP PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY OR PRODUCTION PAYMENT & PERCENTAGES	WORKING INT. AND PERCENTAGE
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FEDERAL LANDS - (Continued)

FROM SURFACE  
 TO 13,245 FEET

C&K Petroleum,  
 Inc.  
 .0070837

Frederick H.  
 Prince  
 .0354188

Robert E.  
 Landreth  
 .0177094

C. W. Trainer  
 .0333334

David M.  
 Trainer  
 .0333333

Marvin C.  
 Gross  
 .0333333

Stephen A.  
 Wells  
 .0708375

Charles E.  
 Nearburg  
 .0708375

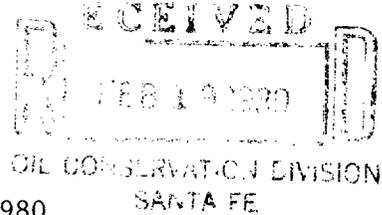
Union Oil Co.  
 of California  
 .3333000

REVISED EXHIBIT "B"  
 PIPELINE DEEP UNIT AREA - LEA COUNTY, NEW MEXICO  
 TOWNSHIP 19 South, Range 34 East  
 AS CONTRACTED EFFECTIVE SEPTEMBER 1, 1979

TRACT	DESCRIPTION OF LAND	NUMBER OF ACRES	SERIAL NO. & EXPIRATION DATE OF LEASE	BASIC ROYALTY AND OWNERSHIP PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY OR PRODUCTION PAYMENT & PERCENTAGES	WORKING INT. AND PERCENTAGE
FEDERAL LANDS - (Continued)							
7	Sec. 7: Lots 1,3,4, NE/4 NW/4, NW/4 NE/4, SE/4 NE/4, E/2 SW/4, SE/4	475.02	NM-6870 7-31-73	USA - All (12.5% to 25%)	Union Oil Company of California	None	BELOW 13,245 FEET Union: All
8	Sec. 17: SE/4	160.00	NM-12006 8-31-75	USA - All (12.5% to 25%)	Union Oil Company of California 50% Getty Oil Company 50%	None	Union: 50% Getty: 50%
9	Sec. 7: NE/4 NE/4	40.00	NM-23015 1-31-79	USA - All	Union Oil Company of California	None	Union: All
Nine (9) Federal Tracts 2,425.48 acres							

Union Oil and Gas Division: Central Region

Union Oil Company of California  
500 North Marienfeld, Midland, Texas 79701  
P.O. Box 671, Midland, Texas 79702  
Telephone (915) 682-9731



Robert V. Lockhart  
District Land Manager  
Midland District

*Case  
6182*

February 12, 1980

Oil Conservation Division  
Energy and Minerals Department  
P. O. Box 2088  
Santa Fe, New Mexico 87501  
  
Attn: Mr. Joe D. Ramey, Director

Gentlemen:

Laguna Deep Unit  
Lea County, New Mexico

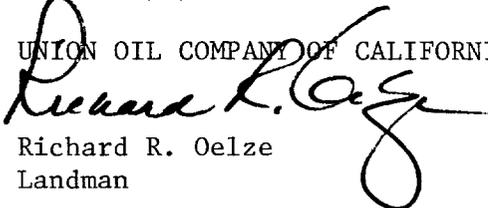
In connection with the captioned unit, we are enclosing for your approval and file, one (1) xerox copy of "Consent to Ratification and Joinder to the Laguna Deep Unit Agreement", signed June 13, 1979, by Amoco Production Company.

The foregoing instrument gives consent to the late ratifications of overriding royalty interest owners (Elizabeth Bate Brady, et al), copies which were transmitted to your office on May 17, 1979.

We are still awaiting Four (4) ORRI owner ratifications under Tract One and will provide you with the necessary copies when they become available to us.

Please advise the undersigned if you have any questions or need anything further in this regard.

Sincerely yours,

UNION OIL COMPANY OF CALIFORNIA  
  
Richard R. Oelze  
Landman

RRO/sb  
Encl: (1)

CONSENT TO RATIFICATION AND JOINDER TO THE  
LAGUNA DEEP UNIT AGREEMENT  
DATED FEBRUARY 2, 1978  
DESIGNATED NO. 14-08-0001-16905  
LEA COUNTY, NEW MEXICO

The undersigned working interest owner in the Laguna Deep Unit Agreement and the Unit Operating Agreement, hereby consents to the joinder of the overriding royalty interests of Elizabeth Bate Brady; Ethel B. Bate; Deborah Bate McDaniels; Virginia W. Hess, Trustee, and R. W. Hess, Trustee; in Tract No. 1, described as:

Township 19 South, Range 33 East

Section 26: SW/4

to said Unit Agreement.

AMCOO PRODUCTION COMPANY

Date: June 13, 1979

By *C. N. Menninger*  
Attorney-in-Fact  
*C. N. Menninger*

APPROVED  
*as*

Address: P. O. Box 3092  
Houston, Texas 77001

WORKING INTEREST OWNER

STATE OF TEXAS,           X  
                                  X   ss.  
COUNTY OF HARRIS.     X

The foregoing instrument was acknowledged before me this 13<sup>th</sup> day of June, 1979, by *C. N. Menninger*, *Attorney-in-Fact* of AMCOO PRODUCTION COMPANY, a Delaware corporation, on behalf of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year above written.

My Commission expires:

*Patricia A. Brown*  
Notary Public

PATRICIA A. BROWN  
Notary Public in Harris County  
for the State of Texas

My c

2-2-81

CONSENT TO RATIFICATION AND JOINDER TO THE  
LAGUNA DEEP UNIT AGREEMENT  
DATED FEBRUARY 2, 1978  
DESIGNATED NO. 14-08-0001-16905  
LEA COUNTY, NEW MEXICO

The undersigned working interest owner in the Laguna Deep Unit Agreement and the Unit Operating Agreement, hereby consents to the joinder of the overriding royalty interests of Elizabeth Bate Brady; Ethel B. Bate; Deborah Bate McDaniels; Virginia W. Hess, Trustee, and R. W. Hess, Trustee; in Tract No. 1, described as:

Township 19 South, Range 33 East

Section 26: SW/4

to said Unit Agreement.

AMCOO PRODUCTION COMPANY

Date: June 13, 1979

By *C. N. Menninger*  
Attorney-in-Fact  
*C. N. Menninger*

APPROVED  
*CS*

Address: P. O. Box 3092  
Houston, Texas 77001

WORKING INTEREST OWNER

STATE OF TEXAS,                    X  
  X   ss.  
COUNTY OF HARRIS.            X

The foregoing instrument was acknowledged before me this 13<sup>th</sup> day of June, 1979, by *C. N. Menninger*, *Attorney-in-Fact* of AMCOO PRODUCTION COMPANY, a Delaware corporation, on behalf of said corporation.

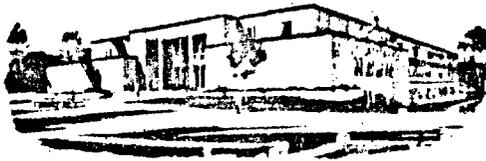
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year above written.

My Commission expires:

*Patricia A. Brown*  
Notary Public

PATRICIA A. BROWN  
Notary Public in Harris County  
for the State of Texas

# State of New Mexico



## Commissioner of Public Lands

August 22, 1979



ALEX J. ARMIJO  
COMMISSIONER

P. O. Box 1148  
SANTA FE, NEW MEXICO

Union Oil Company of California  
P. O. Box 671  
Midland, Texas 79702

6182

Re: Laguna Deep Unit  
Lea County, New Mexico  
1979 PLAN OF DEVELOPMENT

ATTENTION: Mr. Richard R. Oelze

Gentlemen:

The Commissioner of Public Lands has this date approved your 1979 Plan of Development for the Laguna Deep Unit, Lea County, New Mexico. Such plan proposes the drilling of a well in the SW/4 Section 26, Township 19 South, Range 33 East. The USGS gave their approval August 9, 1979.

Enclosed is one approved copy for your files.

Please remit a Three (\$3.00) Dollar filing Fee.

Very truly yours,

ALEX J. ARMIJO  
COMMISSIONER OF PUBLIC LANDS

BY:  
RAY D. GRAHAM, Director  
Oil and Gas Division

AJA/RDG/s  
encl.  
cc:

OCD-Santa Fe, New Mexico ✓  
USGS-Roswell, New Mexico  
USGS-Albuquerque, New Mexico

State of New Mexico



ALEX J. ARMIJO  
COMMISSIONER



Commissioner of Public Lands

April 17, 1979

P. O. BOX 1148  
SANTA FE, NEW MEXICO 87501

Union Oil Company of California  
P. O. Box 671  
Midland, Texas 79702

6182

Re: Laguna Deep Unit  
Eddy County, New Mexico  
Laguna Prospect (7729)

ATTENTION: Mr. Robert V. Lockhart

Gentlemen:

We are in receipt of your letter of March 16, 1979, together with a copy of your letter to the USGS dated March 14, 1979, and other attachments pertaining to the Laguna Deep Unit well No. 1 located in the SW/4NE/4 of Section 35, Township 19 South, Range 33 East.

We concur with your determination that such well is capable of producing unitized substances in paying quantities. The USGS concurred with your determination by their letter of April 11, 1979. This office also concurs with the USGS that you must submit an application for the initial Morrow participating area.

Very truly yours,

ALEX J. ARMIJO  
COMMISSIONER OF PUBLIC LANDS

BY:  
RAY D. GRAHAM, Director  
Oil and Gas Division

AJA/RDG/s

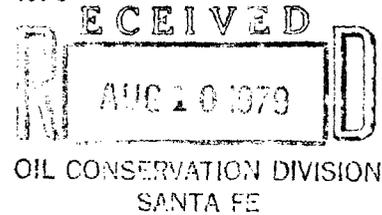
cc:           OCD-Santa Fe, New Mexico  
              USGS-Roswell, New Mexico  
              USGS-Albuquerque, New Mexico



# United States Department of the Interior

GEOLOGICAL SURVEY  
P. O. Box 26124  
Albuquerque, New Mexico 87125

AUG 09 1979



Union Oil Company of California  
Attention: Mr. Robert V. Lockhart  
P. O. Box 671  
Midland, Texas 79702

Gentlemen:

On this date, your 1979 plan of development and operation for the Laguna Deep unit area, Lea County, New Mexico, wherein you propose to drill a well in the SW $\frac{1}{4}$  section 26, T. 19 S., R. 33 E., N.M.P.M., was approved. Such approval is subject to like approval by the appropriate State officials.

One approved copy is enclosed.

Sincerely yours,

(ORIG. SGD.) JACK WILLOCK

Jack Willock  
Acting Oil and Gas Supervisor, SRMA

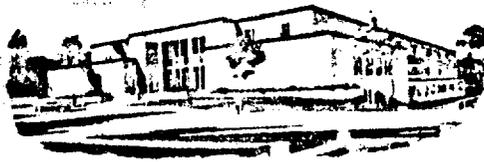
Enclosure

cc:  
NMOCD, Santa Fe  
Comm. Pub. Lands, Santa Fe

State of New Mexico



ALEX J. ARMIJO  
COMMISSIONER



Commissioner of Public Lands

May 23, 1979

P. O. BOX 1148  
SANTA FE, NEW MEXICO 87501

6182

Union Oil Company of California  
500 North Marienfeld  
Midland, Texas 79701

Re: Laguna Deep Unit  
Lea County, New Mexico

ATTENTION: Mr. Richard R. Oelze

Gentlemen:

We are in receipt of your letter dated May 17, 1979, together with Ratifications and Joinders of Royalty and Overriding Royalty Interest Owners as follows:

1. Elizabeth Bate Brady
2. Ethel B. Bate
3. Deborah Bate McDaniels
4. Virginia W. Hess and R. W. Hess

These instruments have this date been approved and filed in the unit agreement file.

Very truly yours,

ALEX J. ARMIJO  
COMMISSIONER OF PUBLIC LANDS

BY:  
RAY D. GRAHAM, Director  
Oil and Gas Division

AJA/RDG/s

cc: OCD-Santa Fe, New Mexico  
USGS-Roswell, New Mexico  
USGS-Albuquerque, New Mexico

OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

August 21, 1979

Union Oil Company of California  
P. O. Box 671  
Midland, Texas 79701

Attention: Richard R. Oelze

Re: Case No. 6182  
Laguna Deep Unit  
1979 Plan of  
Development and  
Operation

Gentlemen:

We hereby approve the 1979 Plan of Development and Operation for the Laguna Deep Unit, Lea County, New Mexico, subject to like approval by the United States Geological Survey and the Commissioner of Public Lands.

One approved copy of the Plan is returned herewith.

Yours very truly,

JOE D. RAMEY  
Director

JDR/EP/fd  
enc.

cc: U.S.G.S. - Roswell  
Commissioner of Public Lands

C  
O  
P  
Y

Union Oil and Gas Division: Central Region

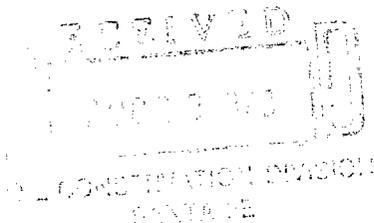
Union Oil Company of California  
500 North Marienfeld, Midland, Texas 79701  
P.O. Box 671, Midland, Texas 79702  
Telephone (915) 682-9731



*Case 6182*

Robert V. Lockhart  
District Land Manager  
Midland District

August 14, 1979



Oil Conservation Division  
Energy and Minerals Department  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Attn: Mr. Joe D. Ramey, Director

Gentlemen:

Laguna Deep Unit  
Lea County, New Mexico  
T-19 & 20-S, R-33-E, N.M.P.M.

Enclosed for your review please find two (2) copies of Union Oil Company of California's "1979 Plan of Development and Operation for Laguna Deep Unit Area." One copy included herein has been approved by the U. S. Geological Survey, effective August 9, 1979.

Union, as Operator, respectfully requests your consideration and approval of this plan. Should you have any additional questions, please contact the undersigned.

Sincerely yours,

UNION OIL COMPANY OF CALIFORNIA

*Richard R. Oelze*

Richard R. Oelze  
Landman

RRO/mw  
Encl.

*Approved  
S/R*

1979 PLAN OF DEVELOPMENT AND OPERATION

FOR

LAGUNA DEEP UNIT AREA

LEA COUNTY, NEW MEXICO

TO: The Director  
Oil Conservation Division  
Energy & Minerals Department  
P. O. Box 2088  
Santa Fe, New Mexico 87501

UNION OIL COMPANY OF CALIFORNIA, as Unit Operator for the Laguna Deep Unit Area, pursuant to the provisions of Section 10 of the Unit Agreement for Development and Operation of the Laguna Deep Unit Area, dated June 22, 1978 (No. 14-08-0001-16905), respectfully submits for the approval of the Director, Oil Conservation Division, or its duly authorized representative, this 1979 Plan of Development and Operation for the Laguna Deep Unit Area. This plan is for the period ending December 31, 1979.

SUMMARY OF 1978 AND 1979 OPERATIONS TO DATE

On July 29, 1978, the Laguna Deep Unit Federal Well No. 1 was spudded at 1650' FNL and 1980' FEL Section 35, T-19-S, R-33-E, Lea County, New Mexico. This test was drilled to a total depth on January 5, 1979, at 14,753'. The lower Morrow was perforated February 3, 1979, at an interval between 13,365' - 13,369' and on February 10, 1979, this Morrow interval was flowed at a stabilized rate of 2040 MCFD at 940 PSI FTP for 6 hours then SI. The well produced condensate at the rate of 82 BPD during this 6 hour flow period. SITP (48 hours) was 4250 PSI. The well is currently SI waiting on a pipeline connection. Our gas department has been negotiating several gas contracts with various parties interested in this area. We expect to finalize a contract within the next 45-60 day period and proceed with connecting the well to a sales outlet. After producing the well for approximately two months we will file a request for initial participating area. By respective letters dated April 11, 1979, and April 17, 1979, the Oil and Gas Supervisor, USGS, and the Commissioner of Public Lands, State of New Mexico concurred with our determination the #1 Well did qualify as a unit well and validated the unit area.

PLAN OF DEVELOPMENT AND OPERATION FOR REMAINDER OF 1979

For the remainder of the year 1979, we are scheduled to present to our management for last quarter review, a plan for the drilling of an offset well in SW/4 Section 26, T-19-S, R-33-E, Lea County, New Mexico. Additional studies and evaluations will be made pending the outcome of the Laguna Deep Unit Federal Well No. 1 and Union Oil Company of California's proposed test in Section 26. Our plan may

be modified or supplemented from time to time with the approval of the Oil Conservation Division Director when necessary to meet changed conditions or to protect the interest of all parties to the unit agreement.

Your assistance in expediting approval of this Plan of Development and Operation will be greatly appreciated.

Submitted this 31 day of May 1979.

UNION OIL COMPANY OF CALIFORNIA

By: Robert V. Lockhart  
District Land Manager

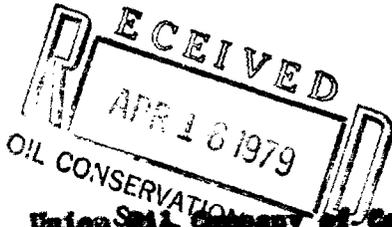
*John D. [Signature]* 8/21/79.  
THIS APPROVAL GRANTED SUBJECT TO LIKE APPROVAL  
BEING GRANTED BY THE UNITED STATES GEOLOGICAL  
SURVEY AND BY THE COMMISSIONER OF PUBLIC LANDS  
OF THE STATE OF NEW MEXICO.



# United States Department of the Interior

GEOLOGICAL SURVEY  
P. O. Box 26124  
Albuquerque, New Mexico 87125

APR 11 1979



Union ~~SRMA~~ Company of California  
Attn: Mr. Robert W. Lockhart  
P. O. Box 671  
Midland, Texas 79702

6182

Gentlemen:

Your letter of March 14, 1979 indicates that as unit operator of the Laguna Deep unit agreement, Lea County, New Mexico, you have determined that unit well No. 1 in the NW1/4 sec. 35, T. 19 S., R. 33 E., N.M.P.M., is capable of producing unitized substances in paying quantities.

Unit well No. 1 was tested January 7, 1979 for a calculated flow of 2,040 MCF/Day from the Lower Morrow interval 13,365 - 13,369 feet.

This office concurs with your determination that such well is capable of producing unitized substances in paying quantities from the Lower Morrow formation pursuant to Section 9 of the unit agreement. You are also requested, pursuant to Section 11 of the unit agreement, to submit an application for the initial Morrow participating area embracing those lands reasonably proven capable of producing from the Morrow in paying quantities at your earliest convenience.

Sincerely yours,

(ORIG. SGD.) JAMES W. SUTHERLAND

Oil and Gas Supervisor, SRMA

cc:

BLM, Santa Fe (ltr only)

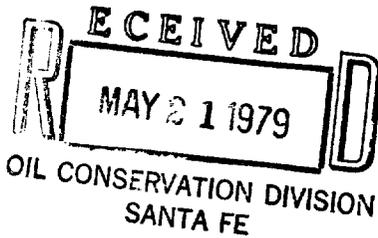
Com. Pub. Lands, Santa Fe (ltr only)

NMOCB (ltr only) ← This Copy 100

Union Oil and Gas Division: Central Region

Union Oil Company of California  
500 North Marienfeld, Midland, Texas 79701  
Telephone (915) 682-9731

Mailing Address: P. O. Box 671  
Midland, Texas 79702



Midland District

May 17, 1979

Oil Conservation Division  
Energy and Minerals Department  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Attn: Mr. Joe D. Ramey, Director

Gentlemen:

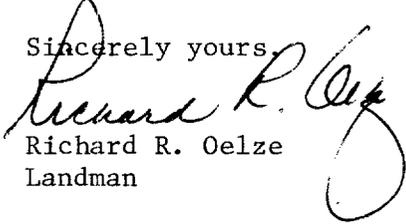
Case No. 6182  
Order No. R-5684  
Laguna Deep Unit  
Lea County, New Mexico

In connection with the captioned unit, we are enclosing for your approval and file the following "Royalty and Overriding Royalty Interest Owner" Ratification and Joinders.

Elizabeth Bate Brady (Tract One), granted 1/4 of 1 1/2% of 8/8  
by virtue of instrument dated 8-1-78;  
Ethel B. Bate (Tract One), granted 1/4 of 1 1/2% of 8/8 by  
virtue of instrument dated 8-1-78;  
Deborah Bate McDaniels (Tract One), granted 1/4 of 1 1/2% of  
8/8 by virtue of instrument dated 8-1-78;  
Virginia W. Hess and R. W. Hess, Trustees under Agreement  
dated April 10, 1972 (Tract One).

With this mailing, our records indicate four (4) outstanding ratifications under Tract One; when these become available to us, we will forward you a copy at that time. Please feel free to call if you have any further questions in this regard.

Sincerely yours,

  
Richard R. Oelze  
Landman

RRO/jr  
Encls.



RECEIVED  
MAY 21 1979

CONSENT, RATIFICATION AND JOINDER OF  
LAGUNA DEEP UNIT AGREEMENT  
LEA COUNTY, NEW MEXICO

(Royalty and Overriding Royalty Interest Owner)

KNOW ALL MEN BY THESE PRESENTS, THAT:

WHEREAS, a certain instrument entitled UNIT AGREEMENT FOR THE DEVELOPMENT AND OPERATION OF THE LAGUNA DEEP UNIT AREA, LEA COUNTY, NEW MEXICO, has been executed as of the 2nd day of February, 1978, by various persons conducting operations with respect to the Laguna Deep Unit Area, located in Lea County, New Mexico, as more particularly described in said Agreement; and

WHEREAS, the Unit Agreement, by Exhibit "A", shows on a map the boundary lines of the Unit Area and the Tracts therein and, by Exhibit "B", describes each Tract within the Unit Area; and

WHEREAS, the Unit Agreement provides that a person may become a party thereto by signing an instrument agreeing to be bound by the provisions thereof; and

WHEREAS, the undersigned (whether one or more) is, or claims to be, the owner of a royalty and/or overriding royalty interest in one or more of the Tracts described in Exhibit "B" of the Unit Agreement.

NOW, THEREFORE, the undersigned (whether one or more), for and in consideration of the premises and the benefits anticipated to accrue under said agreement, does hereby agree to become a party to and to be bound by the provisions of the said Unit Agreement, and the undersigned does hereby agree that the parties to said agreement are those persons signing the originals of said instruments, counterparts thereof, or other instruments agreeing to be bound by the provisions thereof. The undersigned does also hereby acknowledge receipt of a true copy of the said Unit Agreement.

IN WITNESS WHEREOF, the undersigned has executed this instrument on the date set forth opposite the undersigned's signature.

Date: April 18, 1979  
Address: 933 W. McDowell  
Phoenix Az. 85017

Ethel B. Bate  
  
(Royalty or Overriding Royalty OWNER)

STATE OF Arizona )  
COUNTY OF Maricopa ) SS.

(Individual)

The foregoing instrument was acknowledged before me this 18<sup>th</sup> day of April, 19 79, by Ethel B. Bate.

My Commission expires:  
My Commission Expires Feb. 7, 1983

Guy Hobbs  
Notary Public

STATE OF \_\_\_\_\_ )  
COUNTY OF \_\_\_\_\_ ) SS.

(Corporate)

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by \_\_\_\_\_, of \_\_\_\_\_, a \_\_\_\_\_ corporation, on behalf of said corporation.

My Commission expires:  
\_\_\_\_\_

\_\_\_\_\_  
Notary Public

RECEIVED  
MAY 21 1978  
MONTANA DEPARTMENT OF REVENUE DIVISION

CONSENT, RATIFICATION AND JOINDER OF  
LAGUNA DEEP UNIT AGREEMENT  
LEA COUNTY, NEW MEXICO

(Royalty and Overriding Royalty Interest Owner)

KNOW ALL MEN BY THESE PRESENTS, THAT:

WHEREAS, a certain instrument entitled UNIT AGREEMENT FOR THE DEVELOPMENT AND OPERATION OF THE LAGUNA DEEP UNIT AREA, LEA COUNTY, NEW MEXICO, has been executed as of the 2nd day of February, 1978, by various persons conducting operations with respect to the Laguna Deep Unit Area, located in Lea County, New Mexico, as more particularly described in said Agreement; and

WHEREAS, the Unit Agreement, by Exhibit "A", shows on a map the boundary lines of the Unit Area and the Tracts therein and, by Exhibit "B", describes each Tract within the Unit Area; and

WHEREAS, the Unit Agreement provides that a person may become a party thereto by signing an instrument agreeing to be bound by the provisions thereof; and

WHEREAS, the undersigned (whether one or more) is, or claims to be, the owner of a royalty and/or overriding royalty interest in one or more of the Tracts described in Exhibit "B" of the Unit Agreement.

NOW, THEREFORE, the undersigned (whether one or more), for and in consideration of the premises and the benefits anticipated to accrue under said agreement, does hereby agree to become a party to and to be bound by the provisions of the said Unit Agreement, and the undersigned does hereby agree that the parties to said agreement are those persons signing the originals of said instruments, counterparts thereof, or other instruments agreeing to be bound by the provisions thereof. The undersigned does also hereby acknowledge receipt of a true copy of the said Unit Agreement.

IN WITNESS WHEREOF, the undersigned has executed this instrument on the date set forth opposite the undersigned's signature.

Date: April 9, 1979  
Address: 2627 Beckman Pl. E.  
Phoenix, Arizona 85016

Virginia W. Hess Trustee  
R. W. Hess Trustee  
(Royalty or Overriding Royalty OWNER)

STATE OF ARIZONA §  
COUNTY OF MARICOPA § SS. (Individual)

The foregoing instrument was acknowledged before me this 9th day of April, 1979, by Virginia W. Hess & R.W. Hess.

My Commission expires: \_\_\_\_\_  
Notary Public

Quincy Taylor  
Notary Public

STATE OF \_\_\_\_\_ §  
COUNTY OF \_\_\_\_\_ § SS. (Corporate)

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by \_\_\_\_\_ of \_\_\_\_\_, a \_\_\_\_\_ corporation, on behalf of said corporation.

My Commission expires: \_\_\_\_\_  
Notary Public

\_\_\_\_\_  
Notary Public

Union Oil and Gas Division: Central Region

Union Oil Company of California  
500 North Marienfeld, Midland, Texas 79701  
P.O. Box 671, Midland, Texas 79702  
Telephone (915) 682-9731



Robert V. Lockhart  
District Land Manager  
Midland District

March 16, 1979

Oil Conservation Division of the  
Energy and Minerals Department  
State of New Mexico  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Attention: Joe D. Ramey, Director

Gentlemen:

*No. 6182*

Laguna Deep Unit  
Eddy County, New Mexico  
Laguna Prospect (7729)

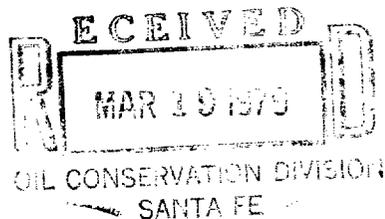
Enclosed for your review and file is a copy of Union Oil Company of California's letter dated March 14, 1979, and attachments thereto, requesting validation from the U.S.G.S. for the Union operated Laguna Deep Unit Area. You will be furnished with a copy of the Survey's decision as soon as it becomes available. If anything further is required, please advise me accordingly.

Very truly yours,

A handwritten signature in cursive script that reads "Robert V. Lockhart".

Robert V. Lockhart  
District Land Manager

RVL/bh  
Encls.



Union Oil and Gas Division: Central Region

Union Oil Company of California  
500 North Marienfeld, Midland, Texas 79701  
P.O. Box 671, Midland, Texas 79702  
Telephone (915) 682-9731



Robert V. Lockhart  
District Land Manager  
Midland District

March 14, 1979

Regional Manager  
Conservation Division  
United States Geological Survey  
Denver, Colorado 80202

Attn: Supervisor  
United States Geological Survey  
P. O. Box 1857  
Roswell, New Mexico 88201

Gentlemen:

SUBJECT:  
Validation of Laguna Deep Unit Area  
Lea County, New Mexico

Union Oil Company of California respectfully requests validation of our Laguna Deep Unit Area based on the discovery of commercial hydrocarbons in the middle and lower Morrow Sands in our Laguna Deep Unit Federal Well No. 1.

In support of this application we are enclosing the following in triplicate:

1. A brief drilling history of the Laguna Deep Unit Federal Well No. 1.
2. A gas analysis taken from our Pipeline Federal Well No. 1, located in Sec. 4, T-19S, R-34E, Lea County, New Mexico for calculation of initial gas formation volume factor. A gas analysis was not taken from the Laguna Deep Unit Federal No. 1.
3. A computer calculation of flowing and static bottom hole pressure for the subject well.
4. Volumetric calculations for gas in place for the zone of completion, as well as four (4) additional intervals, not perforated, which are believed to be productive.
5. A Development Well Analysis form, which shows the economics of the subject well, using reserves for only the current zone of completion.
6. Copies of the CNL-FDC logs and Dual Laterolog which indicate, in red, the current zone of completion, and proposed zones of completions.

Conservation Division  
United States Geological Survey  
March 14, 1979  
Page 2  
Validation of Laguna Deep Unit Area

7. A map of the area, showing the subject well location and surrounding acreage.

Note that the enclosed economic evaluation uses the total cost for this well, which was drilled to, and tested the Silurian. This cost of \$1,738,000 compares to our estimated cost of \$1,100,000 for future Morrow wells, therefore economics for future wells will be greatly enhanced by reduced drilling costs.

We believe the enclosed engineering data demonstrates Morrow gas and condensate reserves sufficient to produce in paying quantities, and which will allow recovery of all costs of drilling, completing, and producing operations, with a reasonable profit, as defined in Section 9 of the Unit Agreement. The subject well is currently shut-in. Negotiations are underway for a gas sales contract, which may or may not be completed prior to the expiration of the Tract 3: Lease NM-9992, which expires 7-31-79.

If you need any additional information, or have any questions, please notify the undersigned.

Very truly yours,

UNION OIL COMPANY OF CALIFORNIA



Robert V. Lockhart  
District Land Manager

RVL/bh  
Attachments

DRILLING HISTORY  
UNION OIL COMPANY OF CALIFORNIA  
LAGUNA DEEP UNIT FEDERAL WELL NO. 1

- 7-29-78 Spudded well at 1650' FNL and 1980 FEL Section 25 T-19S R-33E Lea County, New Mexico set 30" conductor pipe at 47'
- 8-7-78 Drilled 26" hole to 1370' ran 20" casing to 1370'
- 8-15-78 Drilled 17-1/2" hole to 3095' ran 13-3/8" casing to 3095'
- 8-28-78 Drilled 12-1/4" hole to 5278' ran 9-5/8" casing to 5278'
- 11-2-78 Drilled 8-1/2" hole to 14348' ran 5-1/2" casing to 14348'
- 1-5-79 Drilled 4-3/4" hole to TD-14753' ran 3-1/3" casing as liner 14753-14224'
- 1-16-79 Perf'd lower Silurian 14704-710' A/600 gallons 15% HCL swabbed water
- 1-22-79 Set CMT retainer at 14700' squeezed w/30 sx
- 1-24-79 Perf'd upper Silurian at 14676-684', 14656-58', 14610-12' 14580-84' A/600 gallons 15% HCL swabbed water.
- 1-29-79 Set CMT ret at 13986' squeezed w/35sxs below ret.
- 2-3-79 Perf lower Morrow w/1 JSPF at 13365-13369'. GTS in 4 hours
- 2-7-79 SITP 4250 48 hours
- 2-10-79 SITP 4250 psi/42 hours flw'd well 6 hours last 5 hours Gas rate 2040 MCFGPD w/940 psi FTP sep press 450 psi. Prod. 17 BC + Tr water 24 hour rate (82 BC + 2 BW) Cond GR-58<sup>0</sup> at 56<sup>0</sup> F Gas GR-.672
- 2-11-79 SI waiting on pipeline connection.

CALCULATION OF GAS PROPERTIES

Flash Gas From High Pressure Separator  
 Pipeline Federal Well No. 1  
 La Rica (Morrow) Field  
 Lea County, New Mexico  
 Sec 4 T-19S R-34E

<u>COMPONENT</u>	<u>MOL%</u>	<u>MOLECULAR WT</u>	<u>Pc Psia</u>	<u>Tc DR</u>	<u>(1x2)</u>	<u>(1x3)</u>	<u>(1x4)</u>
Methane, C <sup>1</sup>	84.31	16.04	673.1	343.2	13.52	567.49	289.35
Ethane, C <sup>2</sup>	8.96	30.07	708.3	549.9	2.69	63.46	49.27
Propane, C <sup>3</sup>	3.51	44.09	617.4	666.0	1.55	21.67	23.38
Iso-Butane, C <sup>4</sup>	.44	58.12	529.1	734.6	.26	2.33	3.23
N-Butane	.80	58.12	550.1	765.7	.46	4.40	6.13
Iso-Pentane	.20	72.15	483.5	829.6	.14	.97	1.66
N-Pentane	.17	72.15	489.8	846.2	.12	.83	1.44
Hexane	.09	86.17	440.1	914.2	.08	.396	.823
Heptanes	.07	100.2	395.9	972.4	.07	.28	.68
Carbon Dioxide	.66	44.01	1070.2	547.5	.29	7.06	3.61
Nitrogen	.79	28.02	492.2	227.0	.22	3.89	1.79
					19.412315	672.78	381.36

$$S_g = \frac{\text{MOL. WT. GAS}}{\text{MOL. WT. AIR}} = \frac{19.41}{28.97} = .670$$

$$P_c = 672.78 \quad P_r = \frac{5758.94}{672.78} = 8.56 \quad Z = 1.043$$

$$T_c = 381.36 \quad T_r = \frac{629}{381.36} = 1.65$$

$$B_{gi} = \frac{V_{sc}}{V_r} = \frac{P_r T_{sc}}{Z T_r P_{sc}} = \frac{(5759)(520)}{(1.043)(629)(15.025)} = 303.81 \frac{\text{SCF}}{\text{RCF}}$$

LAGUNA NO.1 PT.1

PRESSURE VS DEPTH  
TUBING FLOW

FLOWING SURFACE PRESSURE (PSIA)	940.0000
FLOWING BOTTOM HOLE PRESSURE (PSIA)	1360.9375
FLOW RATE (MMCF/DAY)	1.9810
SURFACE TEMPERATURE (DEG.F)	60.0000
BOTTOM HOLE TEMPERATURE (DEG.F)	169.0000
DRY GAS GRAVITY (S.G.(AIR=1))	0.6720
CONDENSATE GRAVITY (SP. GRA OR DEG API)	
PRODUCING GAS/OIL RATIO (CU. FT./BBL)	0
WET GAS GRAVITY (S.G.(AIR=1))	0.6720
FIRST TUBING I.D. (INCHES)	2.4410
FIRST TUBING O.D. (INCHES)	2.8750
FIRST TUBING LENGTH (FEET)	13060.0000
SECOND TUBING LENGTH (FEET)	13060.0000
SECOND TUBING I.D. (INCHES)	
TUBING LENGTH/TOTAL DEPTH	*****

DEPTH (FEET)	PRESSURE (PSIA)	GRADIENT (PSI/FT)
-----	-----	-----

0	940	0
687	961	0.0310
1375	983	0.0312
2062	1004	0.0313
2749	1026	0.0315
3437	1048	0.0316
4124	1070	0.0317
4812	1091	0.0319
5499	1113	0.0320
6186	1135	0.0321
6874	1158	0.0322
7561	1180	0.0324
8248	1202	0.0325
8936	1225	0.0326
9623	1247	0.0327
10311	1270	0.0329
10998	1292	0.0330
11685	1315	0.0331
12373	1338	0.0332
13060	1361	0.0334

FINAL Z 0.880017  
P/Z = 1546

RDR/FEB 19,1979

LAGUNA NO.1 PT.1

PRESSURE VS DEPTH  
FOR STATIC CONDITIONS

SHUT IN SURFACE PRESSURE (PSIA)	4250.0000
SHUT IN BOTTOM HOLE PRESSURE (PSIA)	5758.9440
SURFACE TEMPERATURE (DEG.F)	60.0000
BOTTOM HOLE TEMPERATURE (DEG.F)	169.0000
DRY GAS GRAVITY (S.G.(AIR=1))	0.6720
CONDENSATE GRAVITY (SP. GRA OR DEG API)	
PRODUCING GAS/OIL RATIO (CU. FT./BBL)	0
WET GAS GRAVITY (S.G.(AIR=1))	0.6720
FIRST TUBING I.D. (INCHES)	2.4410
FIRST TUBING O.D. (INCHES)	2.8750
FIRST TUBING LENGTH (FEET)	13060.0000
SECOND TUBING LENGTH (FEET)	13060.0000
SECOND TUBING I.D. (INCHES)	
TUBING LENGTH/TOTAL DEPTH	1.0000

DEPTH (FEET)	PRESSURE (PSIA)	GRADIENT (PSI/FT)
-----	-----	-----
0	4250	0
687	4334	0.1218
1375	4417	0.1207
2062	4499	0.1200
2749	4581	0.1192
3437	4663	0.1185
4124	4744	0.1178
4812	4824	0.1172
5499	4904	0.1165
6186	4984	0.1159
6874	5063	0.1152
7561	5142	0.1146
8248	5220	0.1141
8936	5298	0.1135
9623	5376	0.1130
10311	5453	0.1124
10998	5530	0.1119
11685	5607	0.1114
12373	5683	0.1110
13060	5759	0.1105

FINAL Z 1.044520  
P/Z = 5513

RDR/FEB 19,1979

L  
10 NAME LAGUNA NO.1 PT.1  
20 B .672 1.981 60 169 940 4250 13060 13060  
30 2.441 1.0 G 0.007 0.0064 A 0 2.875  
40 M 20 .5 0 1 END  
END OF DATA

L

VOLUMETRIC CALCULATIONS  
OF GAS IN PLACE  
MORROW FORMATION

---

Open Perfs - 13365 - 13369' - Lower Morrow

Porosity,  $\phi = 5.5\%$   
Water Saturation,  $S_w = 22\%$   
Net pay,  $h = 6'$

Acres = 640  
 $B_{gi} = 303.8$  SCF/RCF  
R.E. = 85% Recovery Factor

$$\begin{aligned} \text{GIP} &= (43560) (\text{Acres}) (h) (\phi) (1-S_w) (B_g) \\ &= (43560) (640) (6) (.055) (1 - .22) (303.8) \\ &= 2.18 \text{ BCF} = (2.18 \text{ BCF}) (.85) = 1.853 \text{ BCF of Recoverable Gas} \end{aligned}$$

Proposed Perforated Intervals

13146-50'       $\phi = 9.7\%$        $S_w = 30\%$        $h = 6'$   
 $\text{GIP} = (43560) (640) (6) (.097) (1 - .3) (303.8)$   
 $= 3.45 \text{ BCF} = (3.45 \text{ BCF}) (.85) = 2.93 \text{ BCF of Recoverable Gas}$

13115-118'       $\phi = 11.2\%$        $S_w = 46\%$        $h = 4'$   
 $\text{GIP} = (43560) (640) (4) (.112) (1 - .46) (303.8)$   
 $= 2.05 \text{ BCF} = (2.05) (.85) = 1.74 \text{ BCF of Recoverable Gas}$

13108 - 109'       $\phi = 10\%$        $S_w = 27\%$        $h = 3'$   
 $\text{GIP} = (43560) (640) (3) (.10) (1 - .27) (303.8)$   
 $= 1.85 \text{ BCF} = (1.85) (.85) = 1.58 \text{ BCF of Recoverable Gas}$

13005 - 013'       $\phi = 13.6\%$        $S_w = 23\%$        $h = 11'$   
 $\text{GIP} = (43560) (640) (11) (.136) (1 - .23) (303.8)$   
 $= 9.76 \text{ BCF} = (9.76) (.85) = 8.29 \text{ BCF of Recoverable Gas}$

Additional Total Recoverable Gas  
From The Proposed Perforated Intervals

<u>INTERVAL</u>	<u>RECOVERABLE GAS</u>
13146-150'	2.94 BCF
13115-118'	1.74 BCF
13108-09'	1.58 BCF
13005-013'	8.29 BCF
	14.54 BCF
	Recoverable Gas From Proposed Perfs

Total Recoverable Gas From  
The Laguna Deep Unit Federal Well No. 1:

Rec. Gas From Proposed Perfs + Rec. Gas From Existing Perfs  
 $14.54 \text{ BCF} + 1.85 \text{ BCF} = 16.39 \text{ BCF Total Rec. Gas}$



LEASE TOTAL

LAGUNA DEEP UNIT FED NO.1

N MEXICO MM

TYPE 03/06/79 6:38 AM

YEAR	GAR	TOTAL EXP	TOTAL INV	CASH-BT	CASH-AT
1979	909,662	59,130	1,296,547	-446,015	-546,404
1980	762,372	50,879		711,493	429,066
1981	508,373	35,468		472,905	299,127
1982	349,726	25,944		323,782	218,001
1983	243,421	19,661		223,760	161,381
1984-90	450,996	61,930		389,066	356,166
TOTAL	3,224,550	253,012	1,296,547	1,674,991	917,337

TYPE 03/06/79 6:38 AM

*32.5 to Down Road*

YEAR	GROSS GWG	NET GWG	GWG SOLD	TOT GAS SLD	GROSS COND	
1979	<i>1739 mch/d</i> 529,075	321,884	321,884	321,884	18,762	<i>13.97</i>
1980	<i>1214</i> 443,180	269,626	269,626	269,626	11,100	<i>14.81</i>
1981	<i>817</i> 298,143	181,387	181,387	181,387	3,694	<i>15.70</i>
1982	<i>550</i> 200,571	122,025	122,025	122,025	1,193	<i>16.63</i>
1983	134,931	82,090	82,090	82,090	250	<i>17.64</i>
1984-90	247,098	150,333	150,333	150,333		
TOTAL	1,852,998	1,127,345	1,127,345	1,127,345	34,999	

TYPE 03/06/79 6:38 AM

YEAR	NET COND
1979	11,415
1980	6,753
1981	2,248
1982	726
1983	152
1984-90	
TOTAL	21,294

Option: PWROR

INVESTMENT PARAMETERS

EFFECTIVE DATE: 3/79

PRESENT WORTH

	BEFORE TAX	AFTER TAX		BEFORE TAX	AFTER TAX
5%	1,364,429	678,839	RATE OF RETURN	66.0	33.2
10%	1,118,842	494,138	PROFITABILITY INDEX	0.86	0.38
20%	756,739	228,117	PAYOUT, YRS	1.5	2.2
50%	172,522	-186,956	INITIAL INVESTMENT	1,296,546	

Option: AFE

E LAGUNADH.DATA OLD

E  
L

10 NAME LAGUNA DEEP UNIT FED NO.1, 33 MM  
20 GWG RSRV 1.853E6 379  
30 ONCE 60222 379  
40 DIST 1000 479  
50 COND RSRV 35000 379  
60 ONCE 2400 379  
70 DECLN .500 479  
71 ONCE 1200 380  
72 DIST 30 480  
80 GWGPR ONCE 2.29 379  
90 INCLN .06 479  
100 CAPCY 3.00 479  
110 CNDPR ONCE 13.50 379  
120 INCLN .06 479  
130 CAPCY 18.00 479  
140 GRINT HOLD .7417313 379  
150 NTINT HOLD .6083898 379  
170 OPEX ONCE 350 379  
171 INCLN .06 479  
180 INVT ONCE 1196000 379  
190 INVI ONCE 552000 379  
200 ZIND HOLD .09 379  
210 E LAGUNAA.DATA OLD  
END OF DATA  
END  
READY

E LAGUNAA.DATA OLD

E  
L

10 2. LAGUNA DEEP UNIT FEDERAL NO.1, 384014  
20 UNDESIGNATED, UNION OIL COMPANY OF CALIFORNIA, MORROW  
30 DEPTH 14753 13365  
40 PAY 6  
50 ACRES 640  
60 INTEREST .7417313 .6083898  
70 PRICE GWG(2.29) COND(13.50)  
80 RATE GWG(1981) COND(80)  
90 AFE 1738000 1186000 1186000  
100 REMARKS ECOMONICS BASED ON TOTAL WELL COSTS TO DATE AND ACTUAL  
110 REMARKS PRODUCTION RATES DURING A 6 HOUR FLOW TEST.  
120 BY MM  
END OF DATA  
END  
READY

LACIAR  
Gamma Ray

LAGUNA Deep Unit FEDERAL #1  
CNC  $\phi$  U.FDC  $\phi$

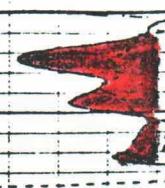
MIDDLE MORROW

12980  
(-9367)

13000

SS w/ LIME

GAS SHOW



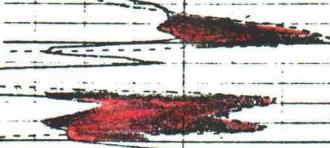
$\bar{\phi} = 13.6\%$   $\bar{S}_w = 23\%$

Proposed Perforations  
13005' - 13013'

13100

Proposed Perforations  
13108-118'

GAS SHOW



$\bar{\phi} = 10\%$   $\bar{S}_w = 27\%$

GAS SHOW



$\bar{\phi} = 11.2\%$   $\bar{S}_w = 40\%$

GAS SHOW (COAL)

Proposed Perforations  
13146-150'



$\bar{\phi} = 9.7\%$   $\bar{S}_w = 30\%$

GAS SHOW

13200  
WEAK GAS SHOW w/ COAL

13200  
WEAK  
GAS  
SHOW  
w/COAL

LABONA DDD Unit Focera Coal No. 1.

Gamma Ray  
CALIPER

GAS  
SHOW

CNLG

FOC-A

LOWER  
MORROW

13300  
(-9687)

? SS

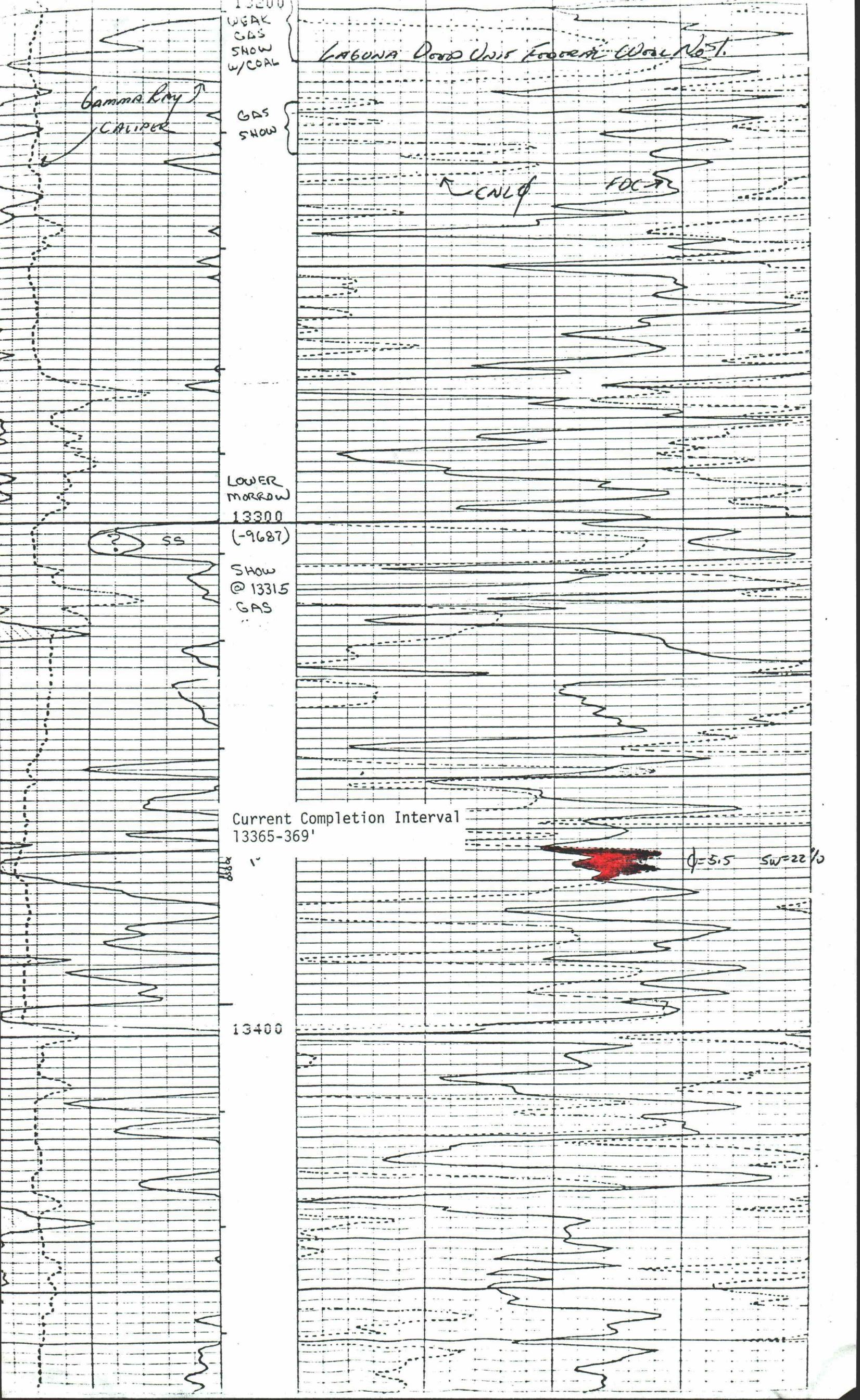
SHOW  
@ 13315  
GAS

Current Completion Interval  
13365-369'

6884

q=5.5 SW=22%

13400



CASBENTIA Deep Core Federal Core No. 1

DONE CARBON 06

13000

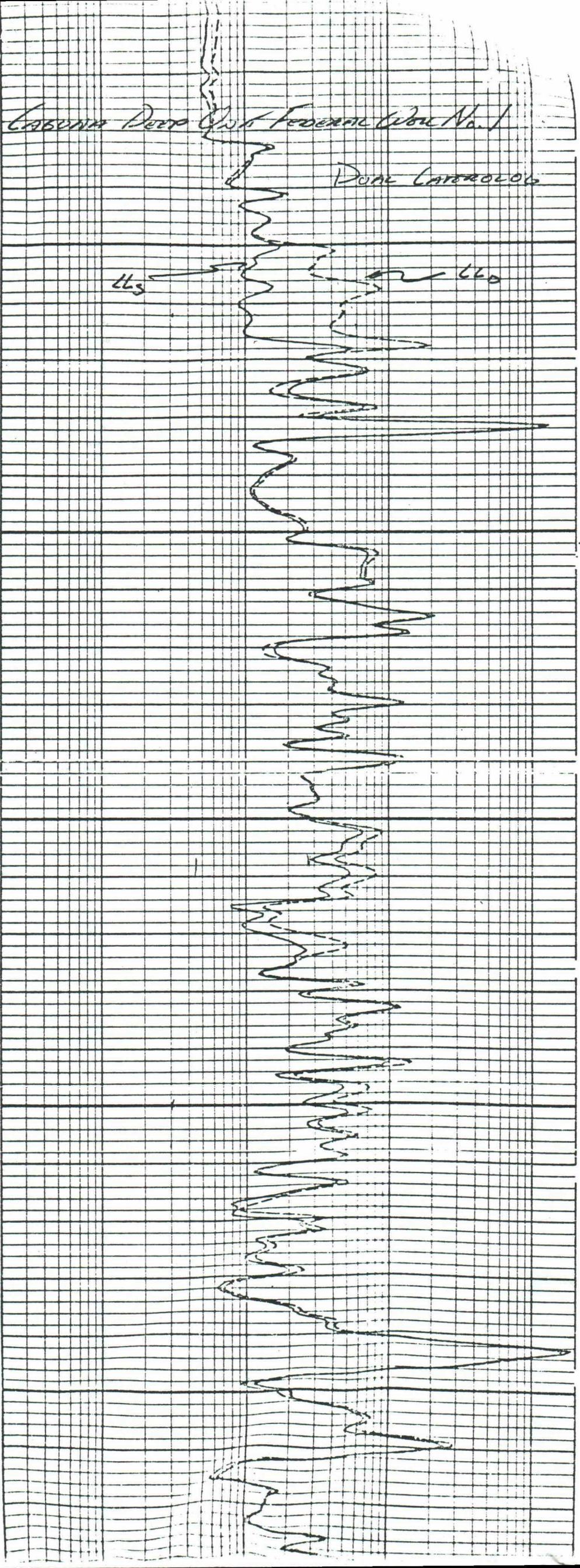
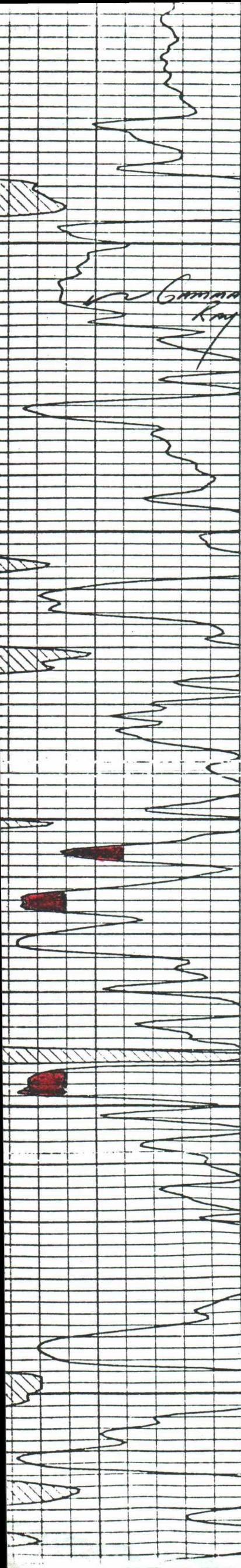
LLS

LLD

Gamma  
Ray

13100

13200



Laguna Deep Unit - Fossiliferous (No. 1)

DUAL CARTRIDGE

Gamma Ray

13300

LLS

LLD

13400

