OPERATOR Massau Resources, Inc. Ho Jerome P. Mellugh & Mesociales <u>P.O. Box 809</u> Farming for, NM 87499-0804 ATTENTION: <u>Gary</u> J. Johnson

ADMINISTRATIVE ORDER DD- 35

4

DATE

Under the provisions of General Rule 111 (c), (d) and (e), Nassau Resources Inc. made application to the New Mexico on 12/1990 . Oil Conservation Division for to directionally drill its authorization proposed Carracas Uniz Well No. 16. Rie Arriba County, New Mexico.

The Division Director Finds That:

(1) The application has been duly filed under the provisions of Rule 111 (d) and (e) of the Division General Rules and Regulations;

(2) Satisfactory information has been provided that all offset operators have been duly notified;

(3) The applicant has presented satisfactory evidence that all requirements prescribed in General Rule 111 will be met; and

(4) No objections have been received within the waiting period prescribed by said rule.

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### IT IS THEREFORE ORDERED THAT:

(1) The applicant, <u>Massau Resources Inc.</u>, is hereby authorized to directionally drill its <u>Carcacas Mart 15-6</u> Well No. <u>(()</u>, the surface location of which shall be <u>100</u> feet from the <u>Surface</u> line and <u>500</u> feet from the <u>Cart</u> line (Unit <u>A</u>) of Section <u>15</u>, Township <u>32 Mart</u>, Range <u>5 West</u>, NMPM, <u>Mo Marika</u> County, New Mexico, by kicking off from the vertical at a depth of approximately <u>540</u> feet, and drilling in such a manner as to bottom it in the

\_\_\_\_\_\_ (pool)(formation) at a standard location within the \_\_\_\_\_\_ of said Section \_\_\_\_\_\_ forming a standard \_\_\_\_acre \_\_\_\_ spacing and proration unit for said pool.

(a) float formation within <del>50</del> feet of a point 20 feet from the South line and East for from the lipes of Section 15 being a standard well location for said formation.

<u>PROVIDED HOWEVER THAT</u>: prior to directional drilling, the operator shall determine the subsurface location of the kick-off point; and

(2) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth in addition to measured depths.

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March 30, 1990

New Mexico Oil Conservation Division Attn: Michael Stogner P O Box 2088 Santa Fe, New Mexico 87504

RE: Application for Administrative Approval of Directional Drilling Nassau Resources, Inc., Carracas Unit 15 A #16 Section 15, T32N, R5W, NMPM Rio Arriba County, New Mexico

Dear Mr. Stogner:

Nassau Resources, Inc., hereby requests administrative approval to directionally drill the subject well as follows:

Proposed Surface Location:	200' FSL and 500' FEL
Proposed Bottom Hole Location:	1320' FSL and 1320' FEL (within a 100' radius)
True Vertical Depth:	Approx. 4000'
Measured Depth:	Approx. 4308'

The well is at a previously approved unorthodox location, (OCD Order \*R-8844), approximately 880' west of the NRI Carracas Unit 14 A #13. Due to archeological and topographic considerations the well cannot be located at a location more to the north and west, which will be a more desirable target, geologically.

This well is in Nassau's Carracas Unit. The E/2 of Section 16, T32N, R5W, is unleased federal minerals. Kindermac Partners and Jerome P. McHugh are operating affiliates with Nassau Resources, Inc. Amoco Production Co., a party to the unit, has also been notified.

Also attached are copies of the C-102 plat, a topographic map (showing both the surface and bottom hole locations) and a schematic of the well bore.

Please withdraw Nassau's pending application for horizontal drilling. Please contact me immediately if anything further is required to complete this application.

Thank you, Gary J/ Jbhnson

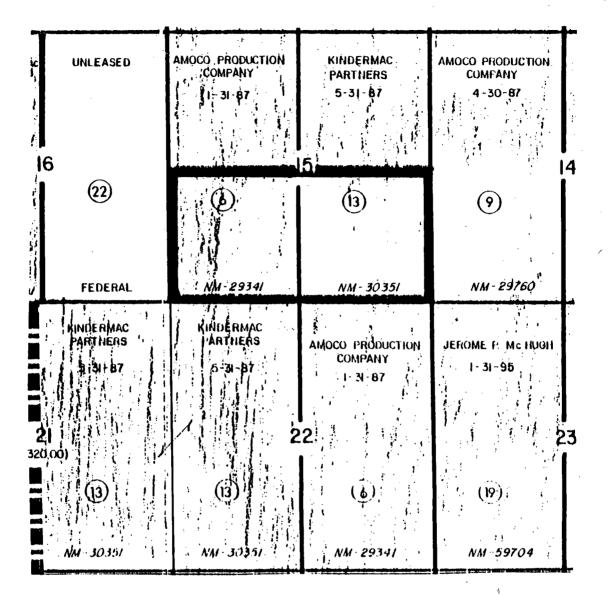
Attachments Main Office Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111 xc: Ernie Busch, NMOCD Amoco Production Co. Jerome P. McHugh and Kindermac Partners

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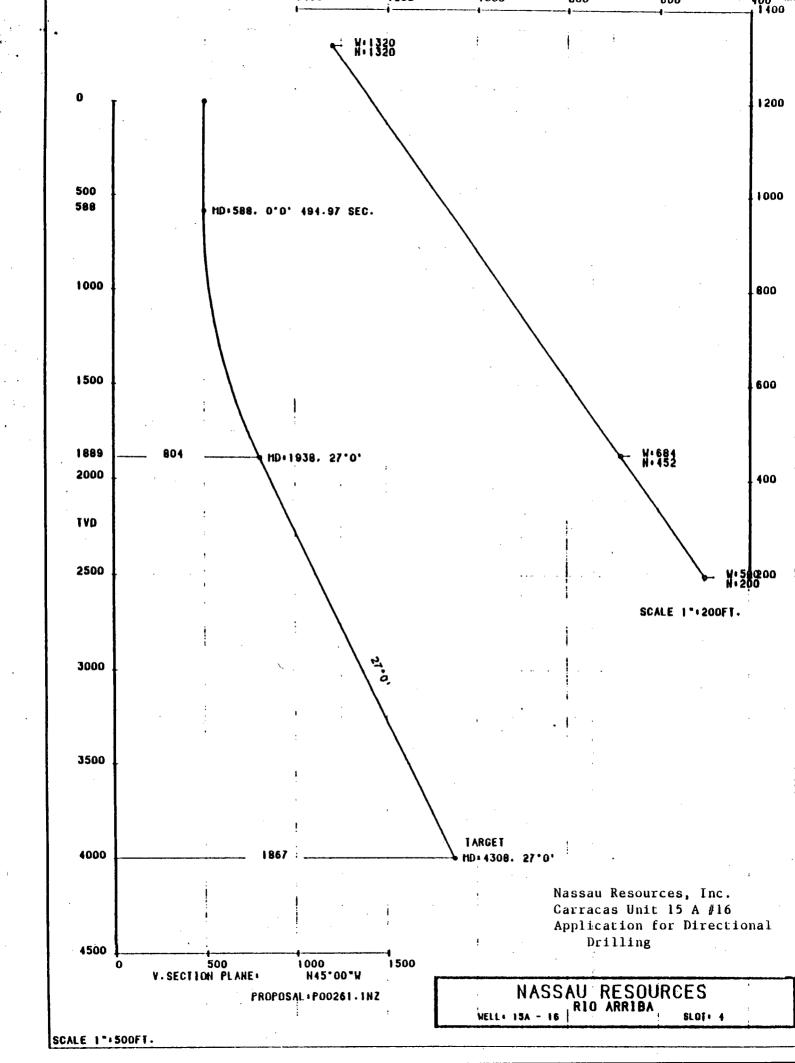
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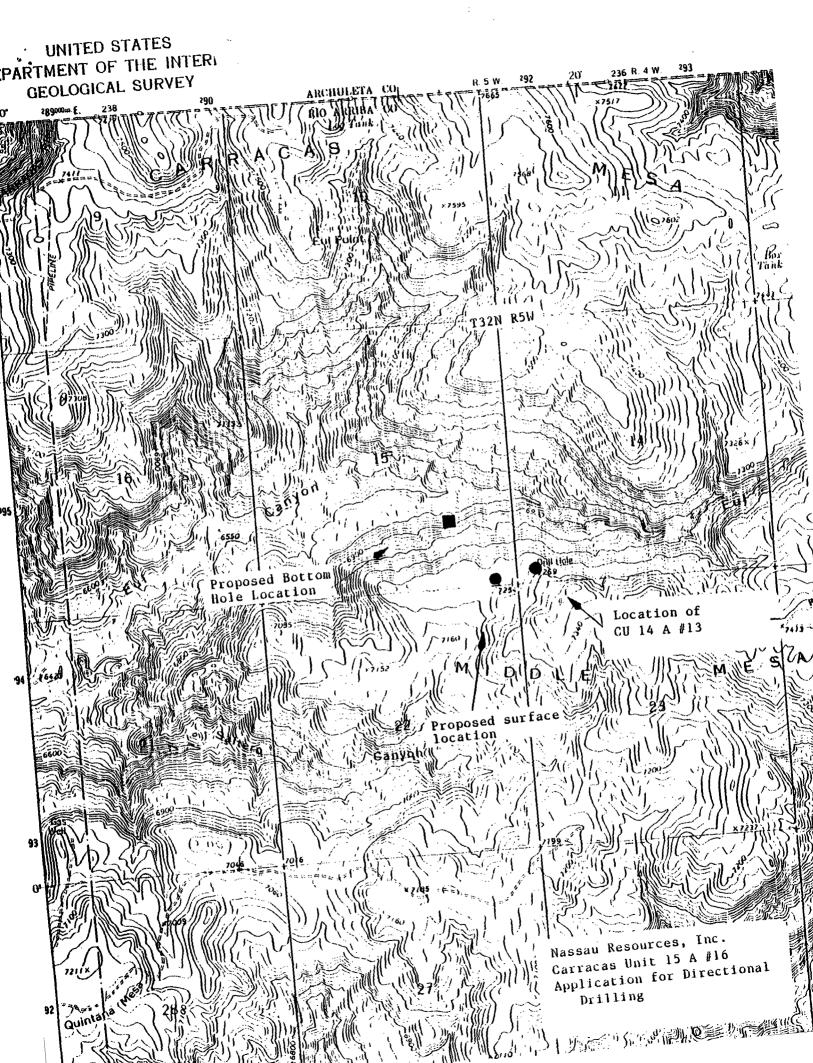


PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2





March 30, 1990

### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Amoco Production Co. Attn: J W Hawkins - Land Department, Proration Group P 0 800 Denver, CO 80201

RE: Application for Administrative Approval of Directional Drilling Nassau Resources, Inc., Carracas Unit 15 A #16 Section 15, T32N, R5W, NMPM Rio Arriba County, New Mexico

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An application for this same well was previously submitted, then withdrawn. Nassau is also withdrawing its application for horizontal drilling.

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Enclosure

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Main Office Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111

#### Jerome P. McHugh & Associates P O Box 809, Farmington, New Mexico 87499-0809 (505) 326-7793

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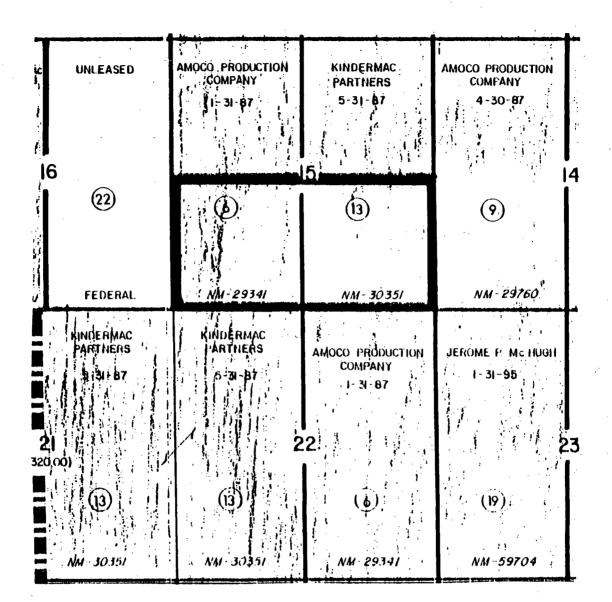
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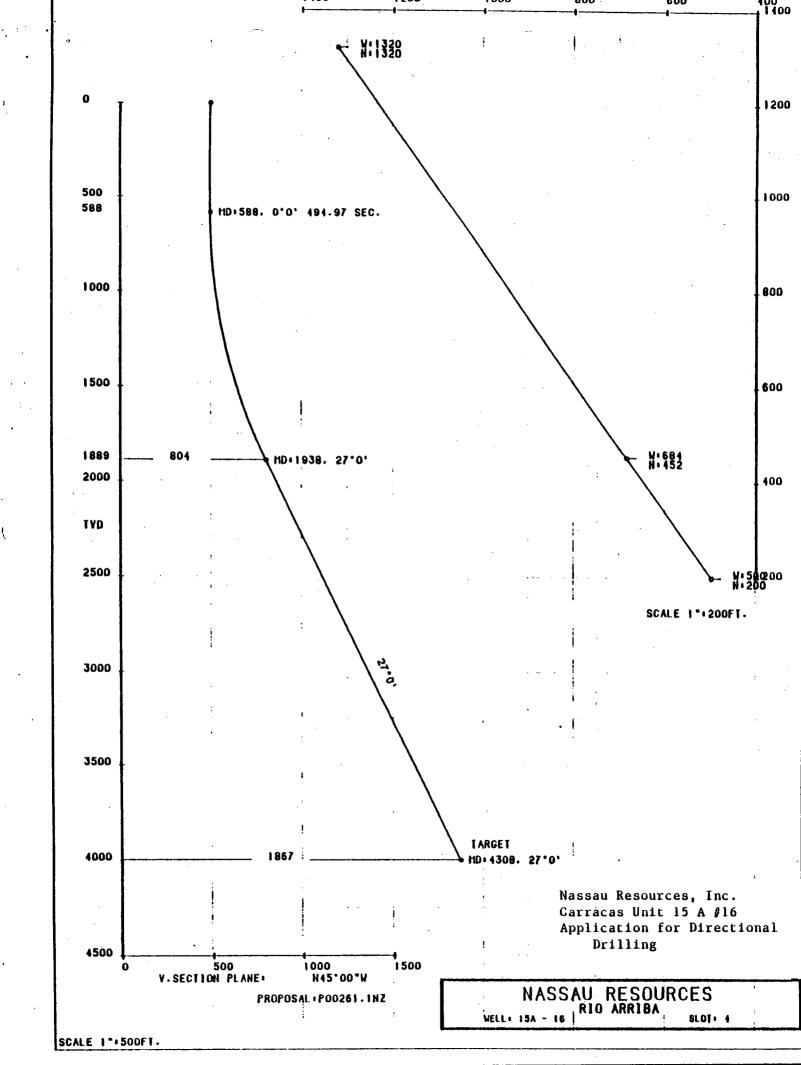
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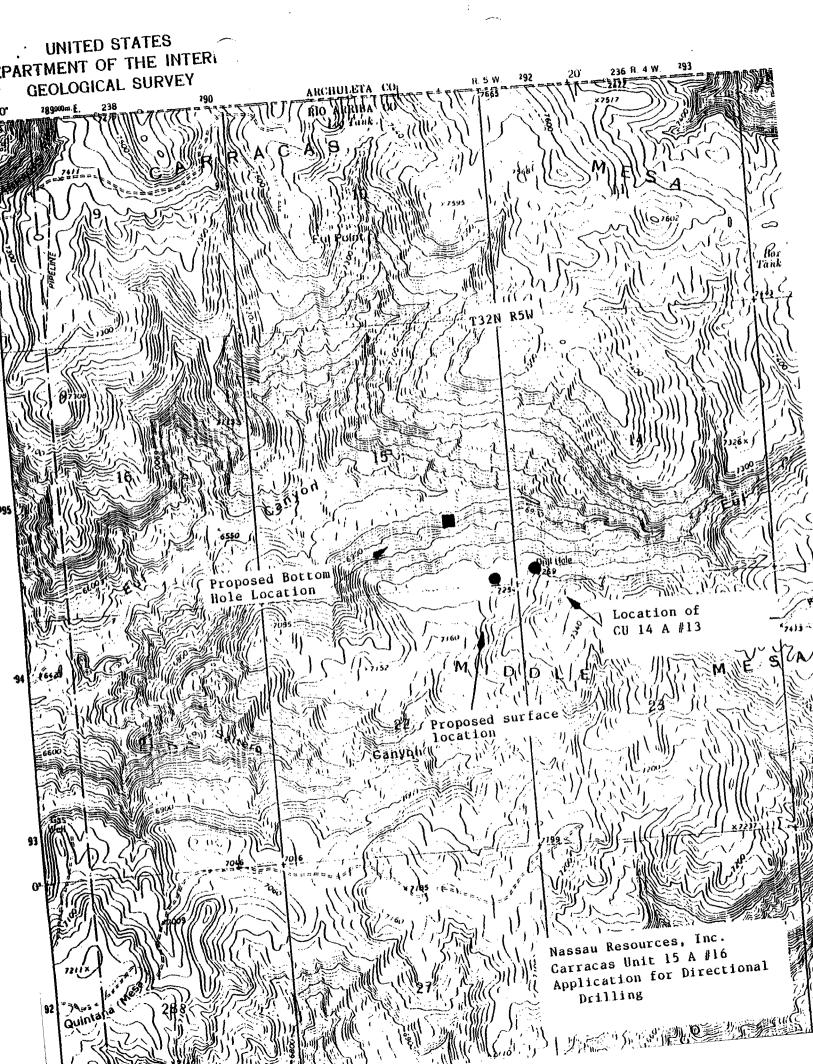


PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2





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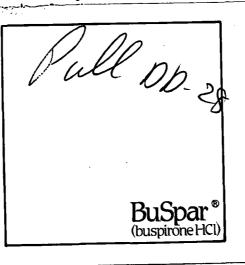
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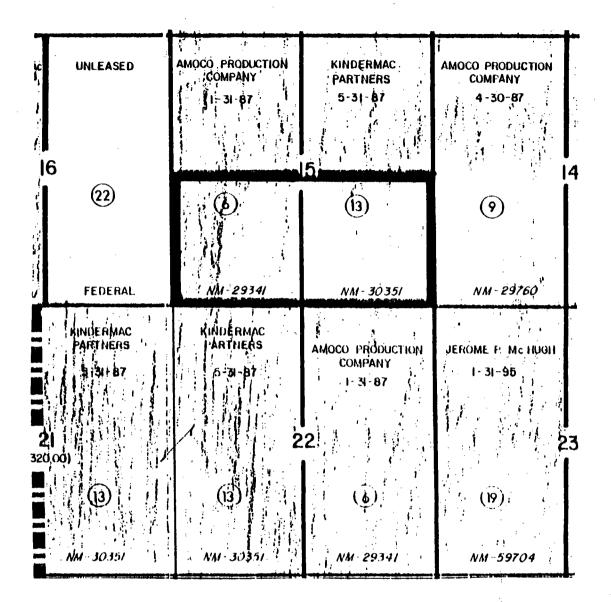
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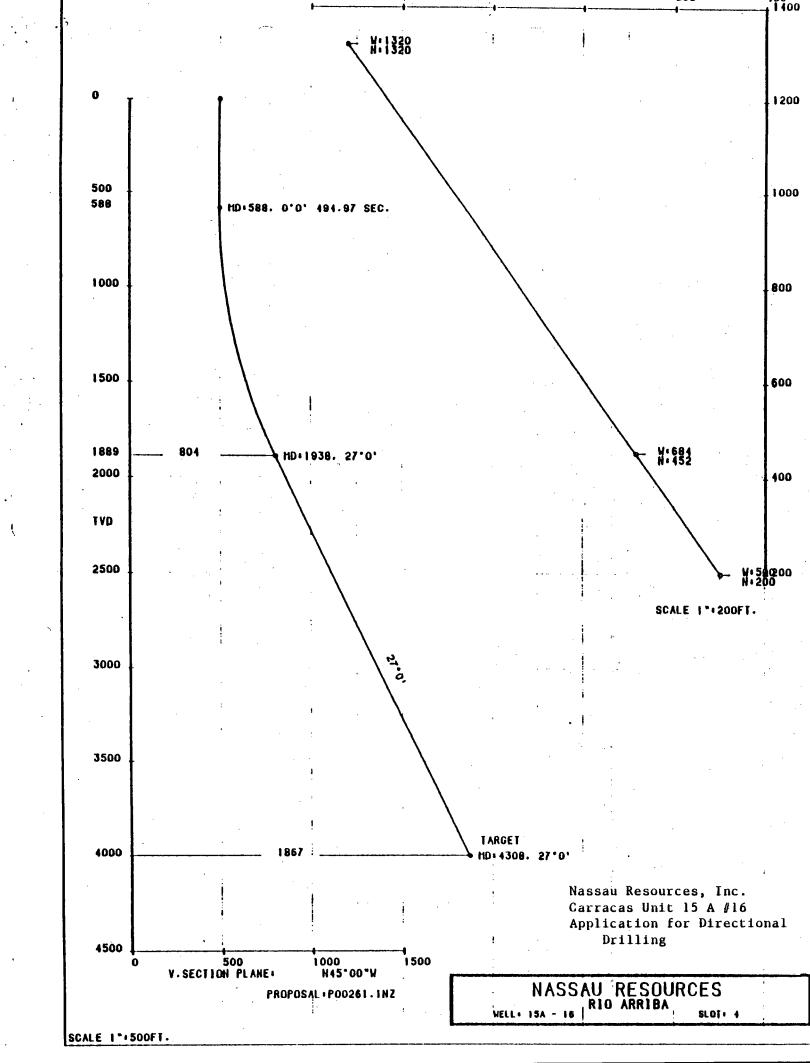
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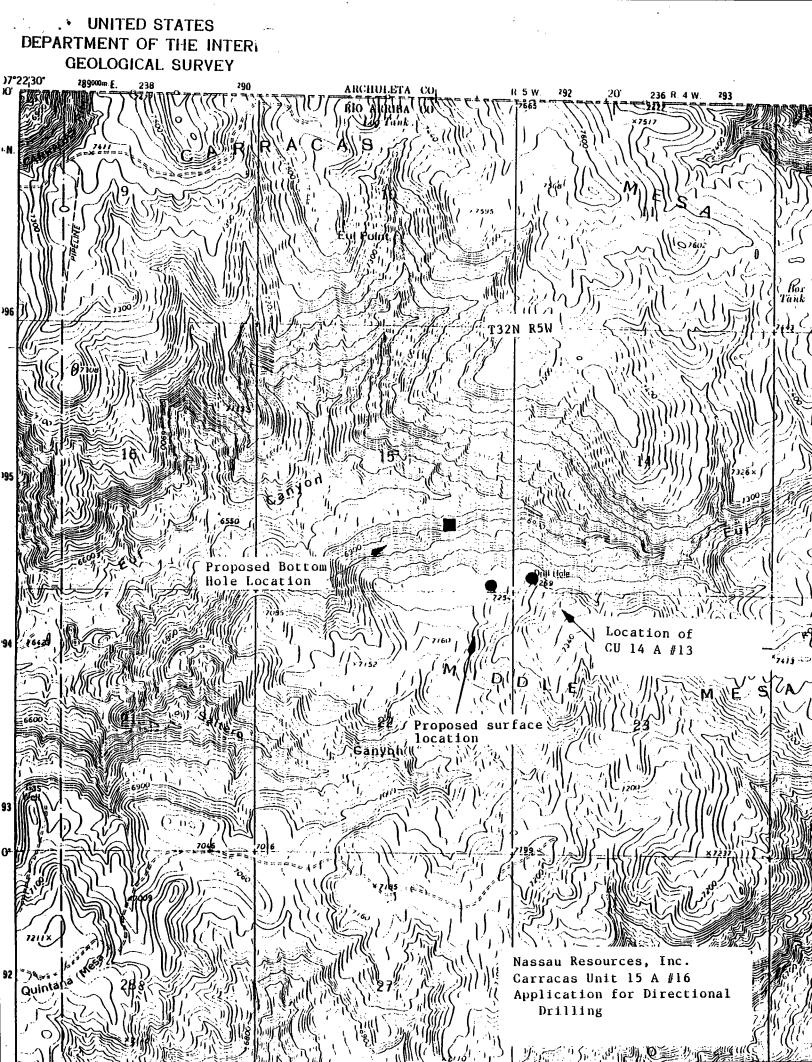


PARTY TO THE UNIT: Amoco Production Co.

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July 25, 1989

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RECEIVED

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Also attached are copies of the C-102 plat, a topographic map (showing both the surface and bottom hole locations) and a schematic of the well bore.

Please contact me immediately if anything further is required to complete this application.

Thank you,

Fran Perrin

Fran Perrin

Attachments

Main Office Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111 xc: Ernie Busch, NMOCD Amoco Production Co. Jerome P. McHugh and Kindermac Partners

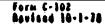
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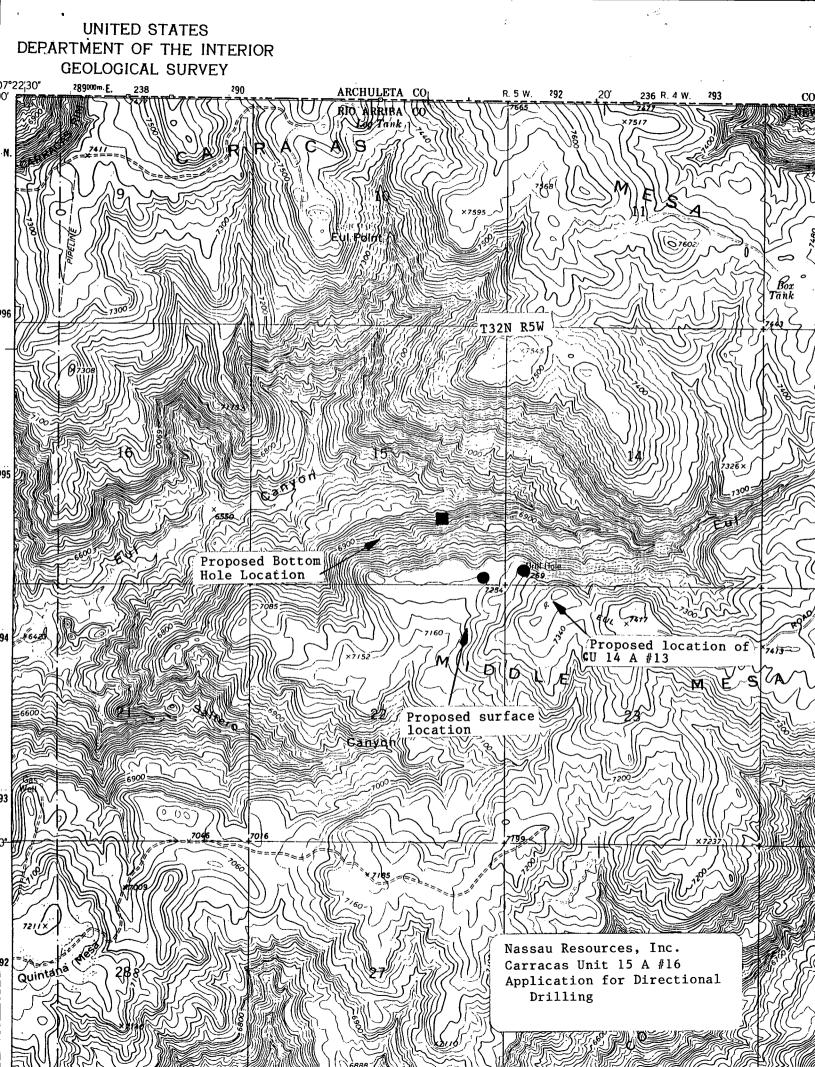
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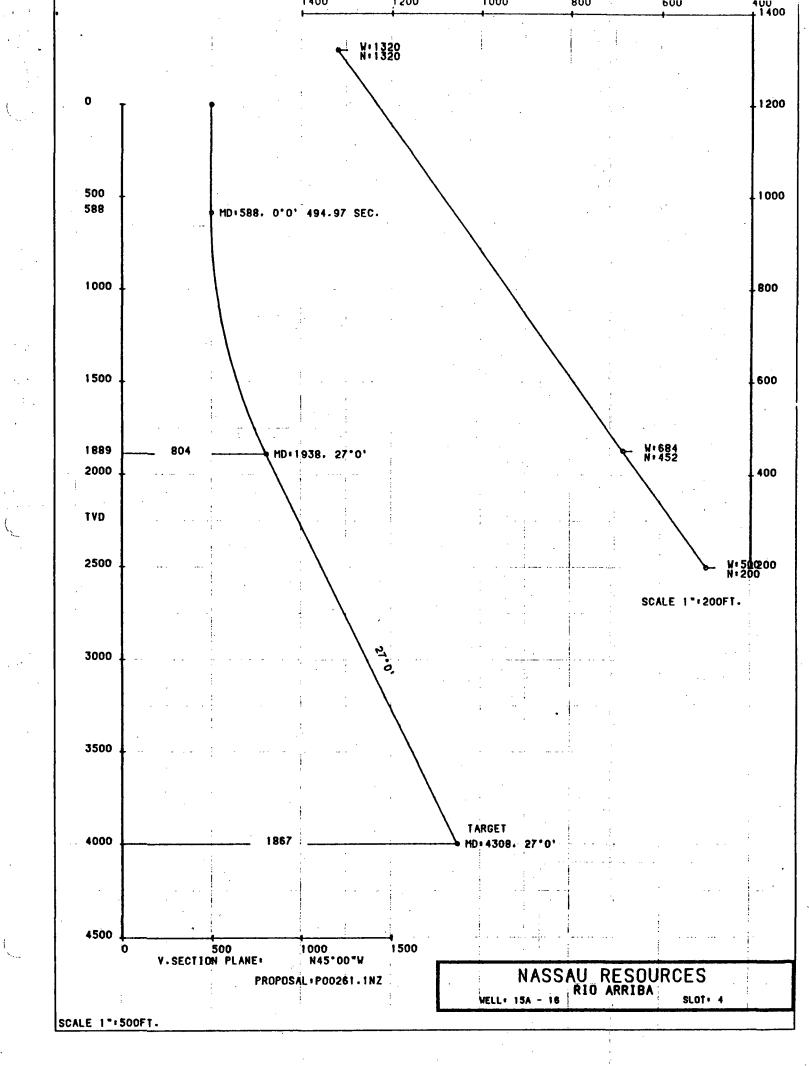
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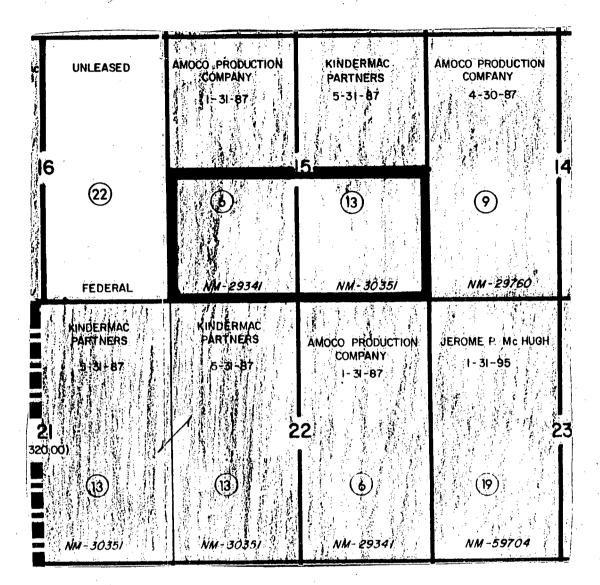
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PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2

July 25, 1989

New Mexico Oil Conservation Division Attn: Michael Stogner P O Box 2088 Santa Fe, New Mexico 87504

RE: Application for Administrative Approval of Directional Drilling Nassau Resources, Inc., Carracas Unit 15 A #16 Section 15, T32N, R5W, NMPM Rio Arriba County, New Mexico

Dear Mr. Stogner:

Nassau Resources, Inc., hereby requests administrative approval to directionally drill the subject well as follows:

Proposed Surface Location:	200' FSL and 500' FEL
Proposed Bottom Hole Location:	1320' FSL and 1320' FEL
True Vertical Depth: Measured Depth:	(within a 50' radius) Approx. 4000' Approx. 4308'

The well is at a previously approved unorthodox location, (OCD Order R-8844), approximately 880' west of the NRI Carracas Unit 14 A #13. Due to archeological and topographic considerations the well cannot be located at a location more to the north and west, which will be a more desirable target, geologically.

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Also attached are copies of the C-102 plat, a topographic map (showing both the surface and bottom hole locations) and a schematic of the well bore.

Please contact me immediately if anything further is required to complete this application.

Thank you,

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xc: Ernie Busch, NMOCD Amoco Production Co. Jerome P. McHugh and Kindermac Partners

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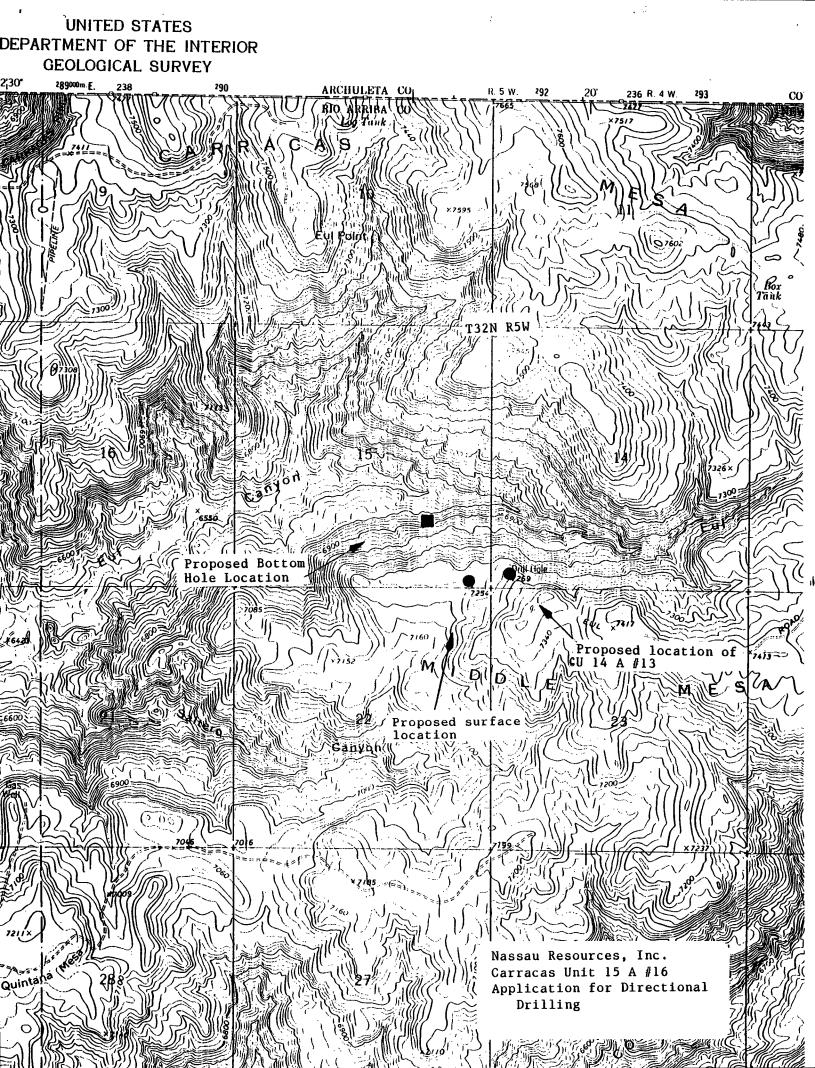
Main Office Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111

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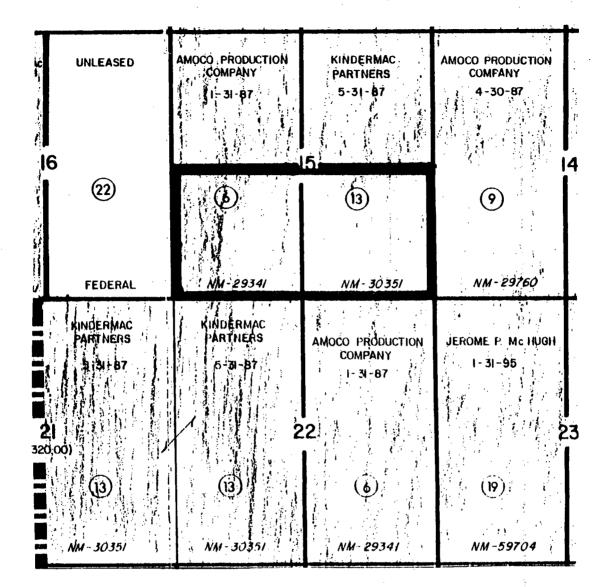
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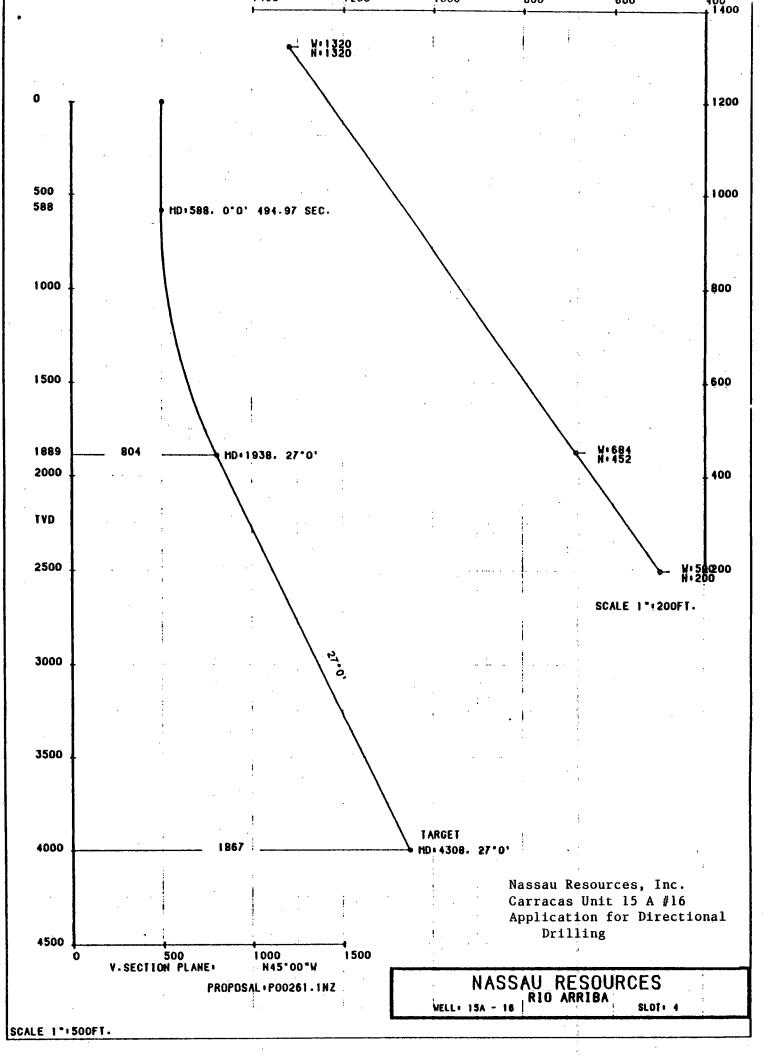
Township 32 North, Range 5 West, NMPM, Rio Arriba County, New Mexico



PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2



#### Jerome P. McHugh & Associates P O Box 809, Farmington, New Mexico 87499-0809 (505) 326-7793

July 25, 1989

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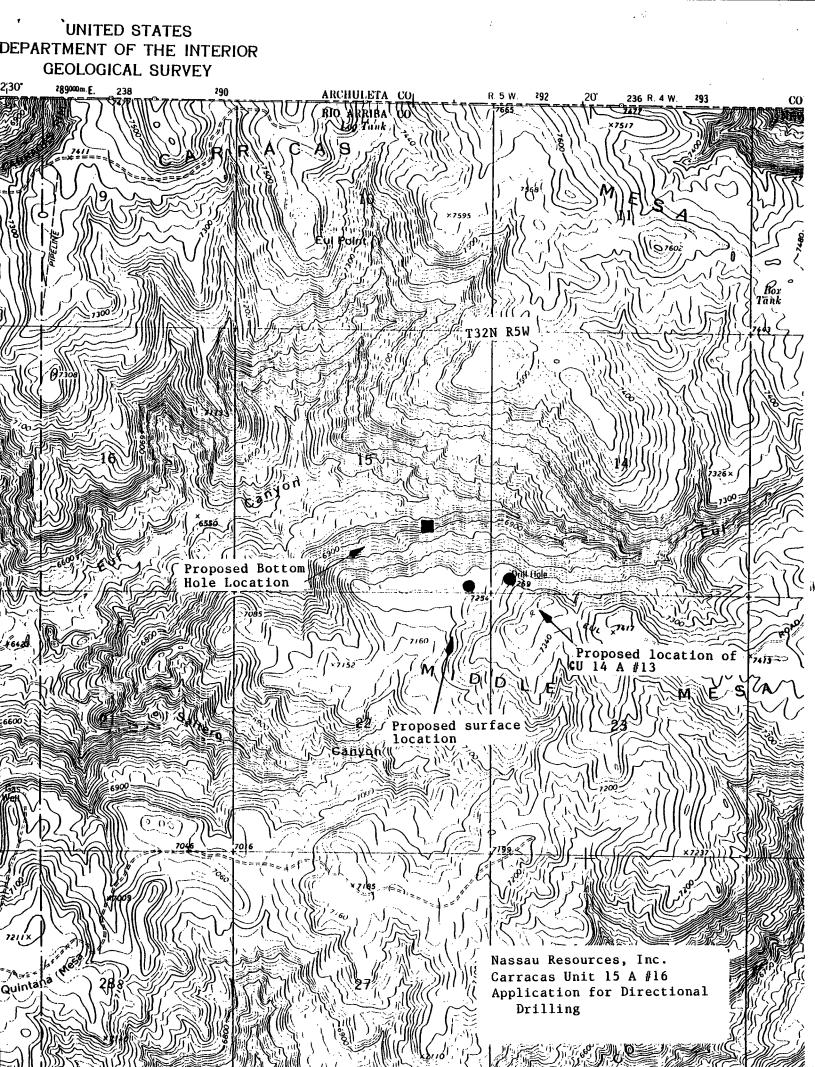
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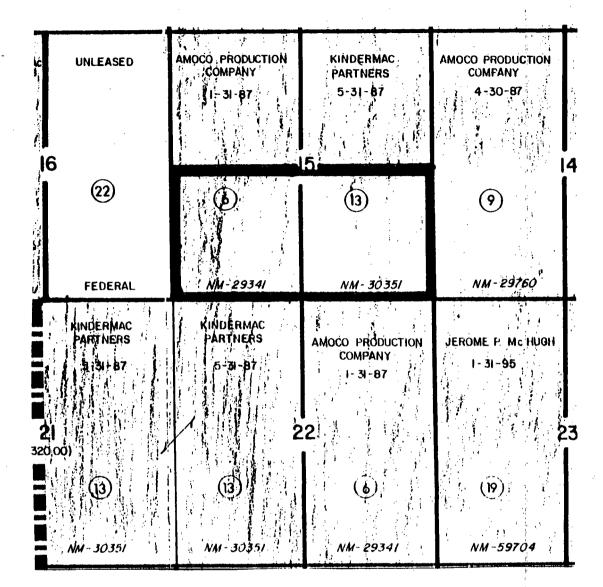
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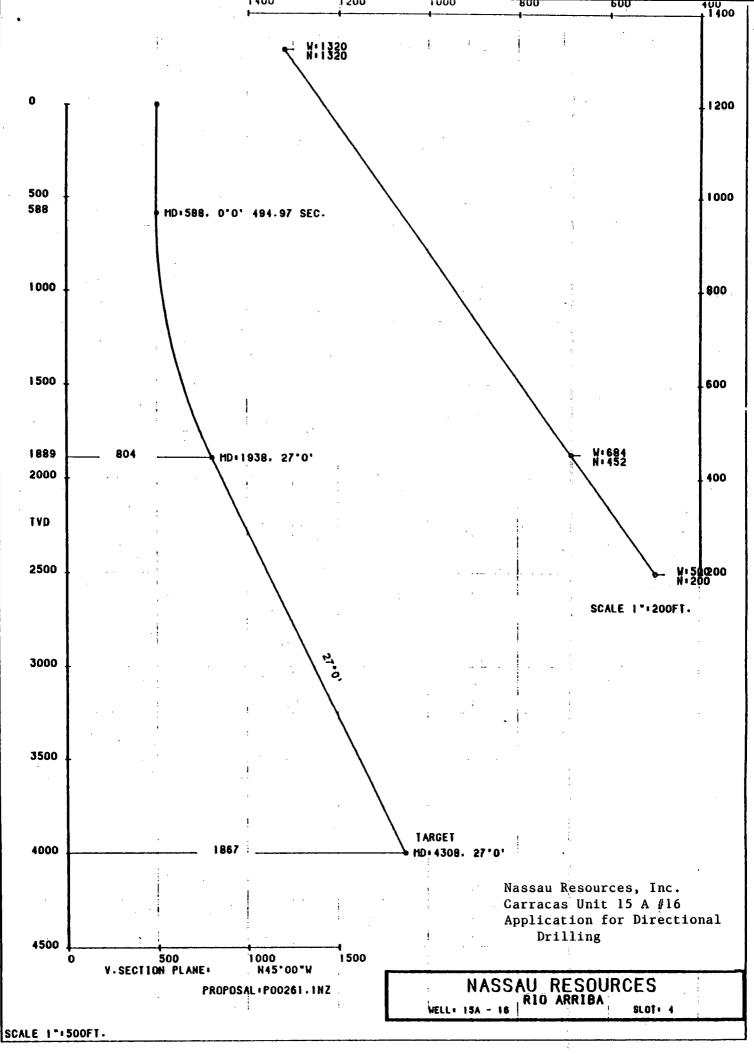
Township 32 North, Range 5 West, NMPM, Rio Arriba County, New Mexico



PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2



i

July 24, 1989

### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Amoco Production Co. Attn: J W Hawkins - Land Department, Proration Group P 0 800 Denver, CO 80201

RE: Application for Administrative Approval of Directional Drilling Nassau Resources, Inc., Carracas Unit 15 A #16 Section 15, T32N, R5W, NMPM Rio Arriba County, New Mexico

Dear Mr. Hawkins:

Enclosed is a copy of the subject Application for Directional Drilling.

Although Amoco Production Co. is a party to the Nassau Resources, Inc., Carracas Unit, if Amoco has no objection to this application, we request that you notify the Oil Conservation Division as soon as possible. Please send a waiver to the attention of Michael Stogner, New Mexico Oil Conservation Division, P O Box 2088, Santa Fe, New Mexico, 87504.

Please feel free to call if you have any questions.

Thànk you, *Fran Perri*n

Enclosure

xc: NMOCD, Santa Fe, NM

Main Office Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111

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A.r.

#### Amoco Production Company

Denver Region 1870 Broedway P.O. Box 800 Denver, Colorado 80201 300 930 4040

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J.L. Spitler - Buladise

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**Amoco Production Company** 

Denver Region 1670 Broadway P.O. Box 800 Denver, Colorado 80201 303-830-4040

RECEIVED

July 28, 1989

AUG 3 1989

Michael Stogner New Mexico Oil Conservation Division PO Box 2088 Santa Fe, NM 87504 QIL CONSERVATION DIV. SANTA FE

File: NWA-594-986.511

Wiaver of Objection to Nassau Resources, Inc. application to directionally drill Carracas Unit 15 "A" Well No. 16 Section 15-T32N-R5W Rio Arriba County, New Mexico

Amoco Production Company has no objection to the above referenced application by Nassau Resources, Inc. to directionally drill the Carracas Unit 15 "A" Well No. 16 as proposed.

Sincerel 5.W. Hawkins

/JWH/ae

cc: Fran Perrin Jerome P. McHugh and Associates PO Box 809 Farmington, NM 87499

J.L. Spitler - Building



### STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT OIL CONSERVATION DIVISION AZTEC DISTRICT OFFICE

1000 RIO 8RAZOS ROAD AZTEC, NEW MEXICO 87410 (505) 334-6178

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OIL CONSERVATION DIV.

SANTA FE

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4 1989

GARREY CARRUTHERS GOVERNOR

Date: 8-1-89

Oil Conservation Division P.O. Box 2088 Santa Fe, NM 87504-2088

Proposed MC\_ Re: Proposed DHC Proposed NSL\_ Proposed SWD\_\_\_ Proposed WFX\_ Proposed PMX

Gentlemen:

I have examined the application dated 7 - 26 - 89for the Massan Resources, Inc. arracas Unit 15A# 16 ease &

15-32N-5W and my recommendations are as follows: Unit. S-T-R

10 rove

Yours truly,

Burch



OIL CONSERVATION DIVISION RECEIVED

'89 OCT 12 AM 8 30

#### Amoco Production Company

Denver Region 1670 Broadway P.O. Box 800 Denver, Colorado 80201 303-830-4040

October 5, 1989

Michael Stogner New Mexico Oil Conservation Division PO Box 2088 Santa Fe, NM 87504

File: NWA-692-986.511

Dear Mr. Stogner:

Waiver of Objection to Nassau Resources, Inc. Application for Horizontal Drilling Carracas Unit 15A No. 16 Section 15-T32N-R5W Rio Arriba County, New Mexico

Amoco Production Company has no objection to the above referenced application by Nassau Resources, Inc. for the Carracas Unit 15A No. 16 well as proposed.

Sincerely, 11 J.W. Hawkins

JWH/ae

cc: F. Perrin Jerome P. McHugh and Associates PO Box 809 Farmington, NM 87499

J.L. Spitler - Building

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Jeròme P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111 FAX (303) 321-1563

SEP 1 1 1989

OIL CONSERVATION DIV. SANTA FE

7 September 1989

New Mexico Oil Conservation Division Attn: Mr. Michael Stogner P. O. Box 2088 Santa Fe, New Mexico 87504

Re: Application for Administrative Approval of Horizontal Drilling Nassau Resources, Inc., Carracas Unit 15A-16 Section 15, T32N, R05W, NMPM Rio Arriba County, New Mexico

Dear Mr. Stogner:

Nassau Resources, Inc., hereby requests administrative approval to horizontally drill the subject well as follows:

2

Proposed surface location: 200' FSL, 500' FEL Proposed bottomhole location: 1850' FSL, 2510' FEL (see attached well plan) True vertical depth: Approximately 4000' Measured depth: Approximately 6191' Completed interval will be within drilling window as required by setback requirements of Rule 7. (see attached well plan)

The surface location for Well 15A-16 is at a previously approved unorthodox and off pattern location per OCD Order R-8844. Due to archeological and topographic considerations, the well cannot be moved to a more geologically desireable surface location to the north and west.

Well 15A-16 will offset Nassau Resources, Inc. well 14A-13 by approximately 800' to the west. To increase well spacing, Nassau desires to complete the 15A-16 at a subsurface location northwest of the surface location. To evaluate the merit of a horizontal completion in the Fruitland Coal, Nassau requests approval to complete the 15A-16 as a horizontal well. The completed interval will be entirely within the drilling window allowed by normal spacing regulations, within the southeast quarter of Section 15. The well will be completed using slotted casing below an external casing packer which will allow the completion to be confined to the drilling window prescribed. The attached well schematic illustrates the proposed completion. The well will be drilled such that the horizontal section will be entirely within the drilling window. Well 15A-16 is in Nassau's Carracas Unit. The south half of Section 16 is the well's spacing unit. The attached lease plat illustrates offset lease owners. All offset lease owners have been notified of this application. Kindermac Partners and Jerome P. McHugh are operating affiliates of Nassau Resources, Inc. Amoco Production Co. is a party to the Carracas Unit and have been notified of this application.

Copies of the C-120 Plat, a topographic map showing surface and subsurface locations and the required well plan and schematic are attached.

Please contact me immediately if any further data is necessary to complete this application.

Yours very truly,

Gary J. Johnson Petroleum Engineer

xc w/ attachments: Ernie Busch, NMOCD, Aztec Amoco Production Co., Denver Jerome P. McHugh Kindermac Partners MCHUGH

Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111 FAX (303) 321-1563

#### 7 September 1989

#### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Amoco Production Co. P. O. Box 800

Denver, Colorado 80201

Attn: Mr. J. W. Hawkins - Land Dept., Proration Group

Re: Application for Administrative Approval of Horizontal Drilling Nassau Resources, Inc., Carracas Unit 15A-16 Section 15, T32N, R05W, NMPM Rio Arriba County, New Mexico

Dear Mr. Hawkins:

Per the attached Application , Nassau Resources, Inc. is requesting permission to drill and complete a horizontal well in Section 15, T32N, R05W, Rio Arriba County, New Mexico.

Amoco is a leaseholder of record in the area affected by this application. Amoco is also a party to the Carracas Unit.

If Amoco has no objection to this horizontal well, Nassau requests that Amoco notify the New Mexico Oil Conservation Division as soon as possible. Please send the waiver to the attention of Mr. Michael Stogner, New Mexico Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87504.

If you have any questions concerning this proposal, please contact this office.

Yours very truly,

Gary J. Johnson Petroleum Engineer

Enclosure

xc: NMOCD, Santa Fe, NM NMOCD, Aztec, NM

## III SMITH INTERNATIONAL

Division of Smith International, Inc.

Suite 1100-N 600 17th Street Denver, Colorado 80202 Phone: (303) 623-8195 Rapicom: (303) 629-0909

August 8, 1989

NASSAU RESOURCES, INC. 650 South Cherry Street, Suite 1225 Denver, Colorado 80222

Attn: Gary Johnson

SMITH INTERNATIONAL appreciates the opportunity to present the following horizontal drilling proposal for your consideration. Included in this PRELIMINARY proposal is a well plan and plot, Bottom Hole Assembly recommendations, a torque/drag analysis, a hydraulic analysis, and a detailed cost estimate.

As indicated by the well plot, if a straight line is drawn from the surface to the northwest corner of the target that represents a total displacement of 2600 feet. However, only the last 1645 feet are within the legal target, or lease lines. For this reason we have gone from what would have been a medium radius well to what is now a long radius well. We recommend the well be kicked off at 3,045' TVD. Angle will be built at approximately 6 degs/100 feet to 90 degrees. The 1645 feet of horizontal extension is then carried to Total Measured Depth. By going with a long radius well design we have eliminated the need for a tangent section(s), and have eliminated a minimum of two trips.

Bottom Hole Assembly recommendations are outlined in Section II. Α steerable assembly designed to get a minimum of 6 degs/100 feet in the sliding mode has been designed for the build section. Because of the inherent advantages of a steerable system which can be rotated, versus a medium-radius build motor which cannot, it is not necessary to design a tangent section into the well plan. A needed safety factor which allows for less than predicted build rates and unforeseen hole conditions is designed into the assembly, not the well plan. Also included is a steerable motor assembly designed to hold angle in the 90 degree horizontal section. These assemblies have been optimized by the DRILCO BHAP computer program. This computer model allows us to evaluate an assemblies response to changing: hole angle, dip angle, dip direction, hole gauge, weight-on-bit, stabilizer placement, stabilizer gauge, tool dimensions, etc... This flexibility translates into increased on-bottom drilling time with maximized penetration rates and fewer trips for BHA changes.

DATADRIL . DRILCO . DYNA-DRILL . SERVCO . SMITH TOOL

## SMITH INTERNATIONAL, INC.

NASSAU RESOURCES, INC. August 8, 1989 Page 2.

Section III contains a worst case torque/drag analysis of the well at TD. Because of the shallow kickoff point, it will be necessary to run some drill collars in the vertical section of the hole. Slightly higher than expected coefficients of friction have been used for a safety margin. Our calculations do not include overpull at the bit. Your desired overpull should be added to the Maximum Pick-up Loads before examining the outputs. Torsional and Tensile Data Tables from the API RP7G Publication, "Recommended Practice for Drill Stem Design and Operating Limits" have been enclosed for your reference.

A hydraulics analysis is included in Section IV. We have selected the optimum volume parameters for our 6 1/2" motor. However, certain drilling conditions may be changed depending on your rig selection and its capacity. This hydraulic analysis, along with the torque/drag analysis, should assist you in selecting a rig capable of drilling your horizontal well.

SMITH INTERNATIONAL has the tools, experience, and engineering support required to drill your horizontal well as planned. Should you have any questions or need additional assistance, please contact us. We are looking forward to working with you on this project.

Sincerely, MARI KERR

Terry Werr Technical Sales Representative

TMK/tk

Enclosures

#### DATADRIL

NASSAU RESOURCES WELL: 15A-15 SAN JUAN BASIN HORIZONTAL PROSPECT

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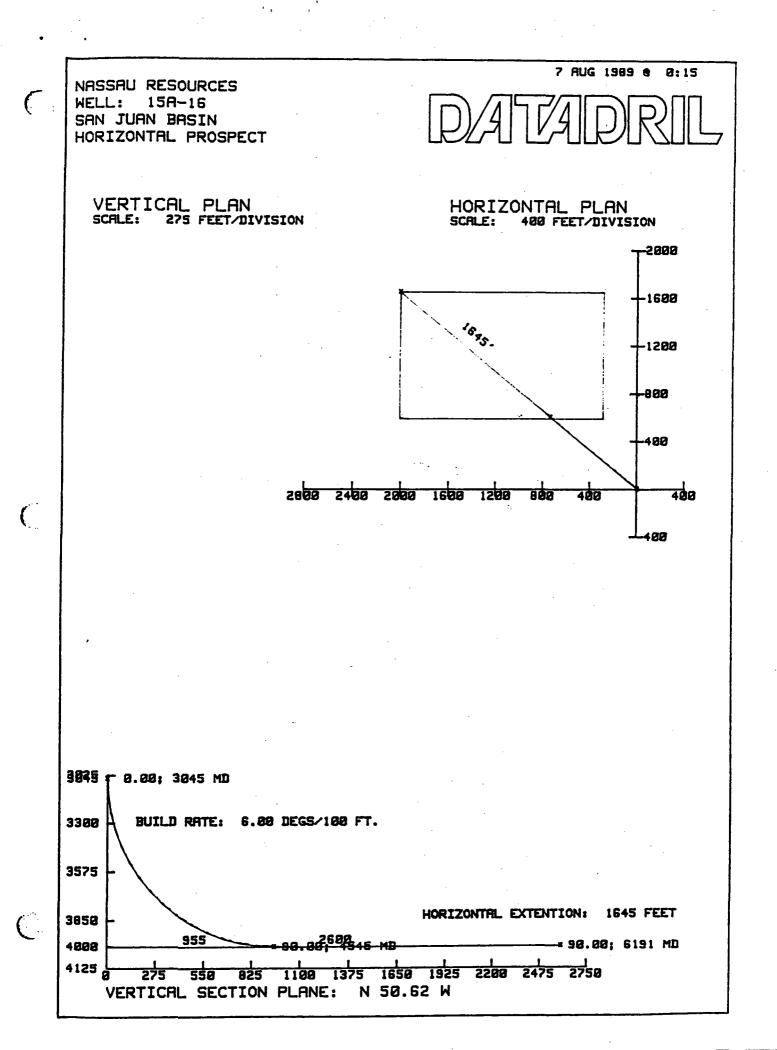
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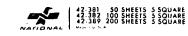
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#### \*\*\*\*\* RECORD OF PROPOSAL \*\*\*\*\*

#### RADIUS OF CURVATURE METHOD PROPOSAL COMPUTED BY THE DATADRIL C.A.D.D.S. SYSTEM VERTICAL SECTION PLANE: N 50.62 #

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9%", 36\*, K-55 Surface Casing @ 300' NASSAU RESOURCES, INC. C.C.U. 15A-16 Horizontal Well Plan Schematic Vertical hole - 834"@ 300'- 3045' NOT TO SCALE Note: Tubing deleted from drowing for clarity. Well to be gas KICK-OFF POINT - 3045'MD & TVD lifted from approximistely 3900' in curve section of well. .5%", 15.5", K-55, LTC Casing 5%", 15.5 #, K-55, LTC Slotted Casing - to be This section of hole cemented to surface centralized through this interval Horizontal Point Drillable 4000'TVD, 4545'MD Packoff Bushing External Casing Packer 5'4" Guide This point represents for isolation 806'FSL, 1238'FEL Shoe Stage Collar for cementing

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Title 18 U.S.C. Section 1001, makes it a crime tor any person knowingly and willfully to make to any department or agency of the United States any false, fictutious or fraudulent statements or representations as to any matter within its jurisdiction.

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# OIL CONSERVATION DIVISION STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT SANTA FE, NEW MEXICO 8750 All distances must be from the outer lounderies of the Section.

Form C-102 Revised 10-1-78

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### STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT OIL CONSERVATION DIVISION AZTEC DISTRICT OFFICE

GARREY CARRUTHERS GOVERNOR

 $M - E - M - O - R - A - N - D - U - M \quad (3 - 88 - 11)$ 

RECEIVE
JUN 1 - 1989

1000 RIO BRAZOS ROAD AZTEC, NEW MEXICO 87410 (505) 334-6178

TO:

OPERATORS DRILLING FOR OIL AND GAS IN THE SAN JUAN BASIN OF NEW MEXICO

FROM: Frank T. Chavez, Supervisor District III

SUBJECT: Drill Cuttings Samples

DATE: May 26, 1988

The attached Application for Permit to Drill has been approved by this office.

As a condition of approval, you are required to submit 4 4" x 6" sample bags of drill cuttings from the Fruitland Coal formation and from the Menefee Coal interval if it is encountered and if drilling conditions permit. If a geolograph is used, a copy of that recording from 50 feet above to 50 feet below the coal intervals will be submitted. Include the following information:

Operator name Well name and number Footage location, Section, Township and Range Date taken The name and address of the person in your company who is to receive a copy of the analysis.

Submit samples, information, and geolograph to the following address:

Mr. James Fassett U.S. Geological Survey P.O. Box 25046, MS 939 DFC Lakewood, CO 80225

Coal analyses gathered in the San Juan Basin will be added to a data base available from the USGS in periodic reports.

This information will be used to evaluate coals and coal gas potentials in the San Juan Basin. Jercing P. Michogh

dj Farmington, 11.61.

MAY 30 1989

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	*See Instructions On Reverse Side	FAREA MANAGER

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any folse figuidulent statements or representations as to any matter within its invitation



#### ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87504 (505) 827-5800

#### November 7, 1988

Nassau Resources, Inc. c/o Jerome P. McHugh & Associates P.O. Box 809 Farmington, NM 87499-0809

Attention: James S. Hazen,

#### Administrative Order NSL-2598

Dear Mr. Hazen:

Reference is made to your application of October 11, 1988 for a non-standard gas well location for your Carracas Unit <u>15-A Well</u> <u>No. 16</u> to be located 200 feet from the South line and 500 feet from the East line (Unit P) of Section 15, Township 32 North, Range 5 West, NMPM, to test the Fruitland (Sand) formation, Rio Arriba County, New Mexico. The SE/4 of said Section 15 shall be dedicated to the well forming a standard 160-acre gas spacing and proration unit.

By the authority granted me under the provisions of General Rule 104 F(I), the above-described unorthodox gas well location is hereby approved.

Sincerely, William J. LeMay

Director

WJL/MES/ag

cc: Oil Conservation Division - Aztec New Mexico Oil & Gas Engineering Committee - Hobbs US Bureau of Land Management - Farmington

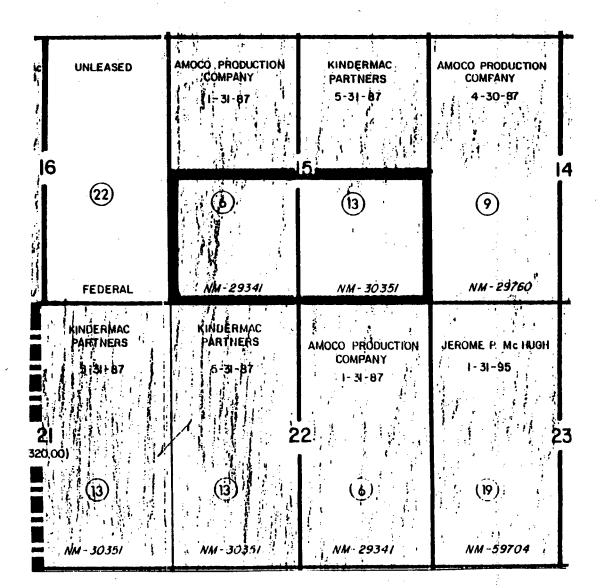
Jeromo P. McHugh Farmington, N.M.

MOV 18 1988





Township 32 North, Range 5 West, NMPM, Rio Arriba County, New Mexico



PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2

Nassau Resources, Inc. Carracas Unit 15 A #16 Application for Horizontal Drilling



Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111 FAX (303) 321-1563



7 September 1989

New Mexico Oil Conservation Division Attn: Mr. Michael Stogner P. O. Box 2088 Santa Fe, New Mexico 87504

Re: Application for Administrative Approval of Horizontal Drilling Nassau Resources, Inc., Carracas Unit 15A-16 Section 15, T32N, R05W, NMPM Rio Arriba County, New Mexico

Dear Mr. Stogner:

Nassau Resources, Inc., hereby requests administrative approval to horizontally drill the subject well as follows:

Proposed surface location: 200' FSL, 500' FEL Proposed bottomhole location: 1850' FSL, 2510' FEL (see attached well plan) True vertical depth: Approximately 4000' Measured depth: Approximately 6191' Completed interval will be within drilling window as required by setback requirements of Rule 7. (see attached well plan)

The surface location for Well 15A-16 is at a previously approved unorthodox and off pattern location per OCD Order R-8844. Due to archeological and topographic considerations, the well cannot be moved to a more geologically desireable surface location to the north and west.

Well 15A-16 will offset Nassau Resources, Inc. well 14A-13 by approximately 800' to the west. To increase well spacing, Nassau desires to complete the 15A-16 at a subsurface location northwest of the surface location. To evaluate the merit of a horizontal completion in the Fruitland Coal, Nassau requests approval to complete the 15A-16 as a horizontal well. The completed interval will be entirely within the drilling window allowed by normal spacing regulations, within the southeast quarter of Section 15. The well will be completed using slotted casing below an external casing packer which will allow the completion to be confined to the drilling window prescribed. The attached well schematic illustrates the proposed completion. The well will be drilled such that the horizontal section will be entirely within the drilling window. Well 15A-16 is in Nassau's Carracas Unit. The south half of Section 16 is the well's spacing unit. The attached lease plat illustrates offset lease owners. All offset lease owners have been notified of this application. Kindermac Partners and Jerome P. McHugh are operating affiliates of Nassau Resources, Inc. Amoco Production Co. is a party to the Carracas Unit and have been notified of this application.

Copies of the C-120 Plat, a topographic map showing surface and subsurface locations and the required well plan and schematic are attached.

Please contact me immediately if any further data is necessary to complete this application.

Yours very truly,

Gary J. Johnson Petroleum Engineer

xc w/ attachments: Ernie Busch, NMOCD, Aztec Amoco Production Co., Denver Jerome P. McHugh Kindermac Partners MCHUGH

Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111 FAX (303) 321-1563

#### 7 September 1989

#### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Amoco Production Co. P. O. Box 800 Denver, Colorado 80201 Attn: Mr. J. W. Hawkins - Land Dept., Proration Group

 Re: Application for Administrative Approval of Horizontal Drilling
 Nassau Resources, Inc., Carracas Unit 15A-16 Section 15, T32N, R05W, NMPM Rio Arriba County, New Mexico

Dear Mr. Hawkins:

Per the attached Application , Nassau Resources, Inc. is requesting permission to drill and complete a horizontal well in Section 15, T32N, R05W, Rio Arriba County, New Mexico.

Amoco is a leaseholder of record in the area affected by this application. Amoco is also a party to the Carracas Unit.

If Amoco has no objection to this horizontal well, Nassau requests that Amoco notify the New Mexico Oil Conservation Division as soon as possible. Please send the waiver to the attention of Mr. Michael Stogner, New Mexico Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87504.

If you have any questions concerning this proposal, please contact this office.

Yours very truly,

Gary J. Johnson Petroleum Engineer

Enclosure

xc: NMOCD, Santa Fe, NM NMOCD, Aztec, NM

## SMITH INTERNATIONAL

Division of Smith International, Inc.

Suite 1100-N 600 17th Street Denver, Colorado 80202 Phone: (303) 623-8195 Rapicom: (303) 629-0909

August 8, 1989

NASSAU RESOURCES, INC. 650 South Cherry Street, Suite 1225 Denver, Colorado 80222

Attn: Gary Johnson

SMITH INTERNATIONAL appreciates the opportunity to present the following horizontal drilling proposal for your consideration. Included in this PRELIMINARY proposal is a well plan and plot, Bottom Hole Assembly recommendations, a torque/drag analysis, a hydraulic analysis, and a detailed cost estimate.

As indicated by the well plot, if a straight line is drawn from the surface to the northwest corner of the target that represents a total displacement of 2600 feet. However, only the last 1645 feet are within the legal target, or lease lines. For this reason we have gone from what would have been a medium radius well to what is now a long radius well. We recommend the well be kicked off at 3,045' TVD. Angle will be built at approximately 6 degs/100 feet to 90 degrees. The 1645 feet of horizontal extension is then carried to Total Measured Depth. By going with a long radius well design we have eliminated the need for a tangent section(s), and have eliminated a minimum of two trips.

Bottom Hole Assembly recommendations are outlined in Section II. Α steerable assembly designed to get a minimum of 6 degs/100 feet in the sliding mode has been designed for the build section. Because of the inherent advantages of a steerable system which can be rotated, versus a medium-radius build motor which cannot, it is not necessary to design a tangent section into the well plan. A needed safety factor which allows for less than predicted build rates and unforeseen hole conditions is designed into the assembly, not the well plan. Also included is a steerable motor assembly designed to hold angle in the 90 degree horizontal section. These assemblies have been optimized by the DRILCO BHAP computer program. This computer model allows us to evaluate an assemblies response to changing: hole angle, dip angle, dip direction, hole gauge, weight-on-bit, stabilizer placement, stabilizer gauge, tool dimensions, etc... This flexibility translates into increased on-bottom drilling time with maximized penetration rates and fewer trips for BHA changes.

DATADRIL = DRILCO = DYNA-DRILL = SERVCO = SMITH TOOL

## SMITH INTERNATIONAL, INC.

NASSAU RESOURCES, INC. August 8, 1989 Page 2.

Section III contains a worst case torque/drag analysis of the well at TD. Because of the shallow kickoff point, it will be necessary to run some drill collars in the vertical section of the hole. Slightly higher than expected coefficients of friction have been used for a safety margin. Our calculations do not include overpull at the bit. Your desired overpull should be added to the Maximum Pick-up Loads before examining the outputs. Torsional and Tensile Data Tables from the API RP7G Publication, "Recommended Practice for Drill Stem Design and Operating Limits" have been enclosed for your reference.

A hydraulics analysis is included in Section IV. We have selected the optimum volume parameters for our 6 1/2" motor. However, certain drilling conditions may be changed depending on your rig selection and its capacity. This hydraulic analysis, along with the torque/drag analysis, should assist you in selecting a rig capable of drilling your horizontal well.

SMITH INTERNATIONAL has the tools, experience, and engineering support required to drill your horizontal well as planned. Should you have any questions or need additional assistance, please contact us. We are looking forward to working with you on this project.

Sincerely, un Ken

Terry Werr Technical Sales Representative

TMK/tk

Enclosures

### DATADRIL

NASSAU RESOURCES WELL: 15A-16 SAN JUAN BASIN HORIZONTAL PROSPECT

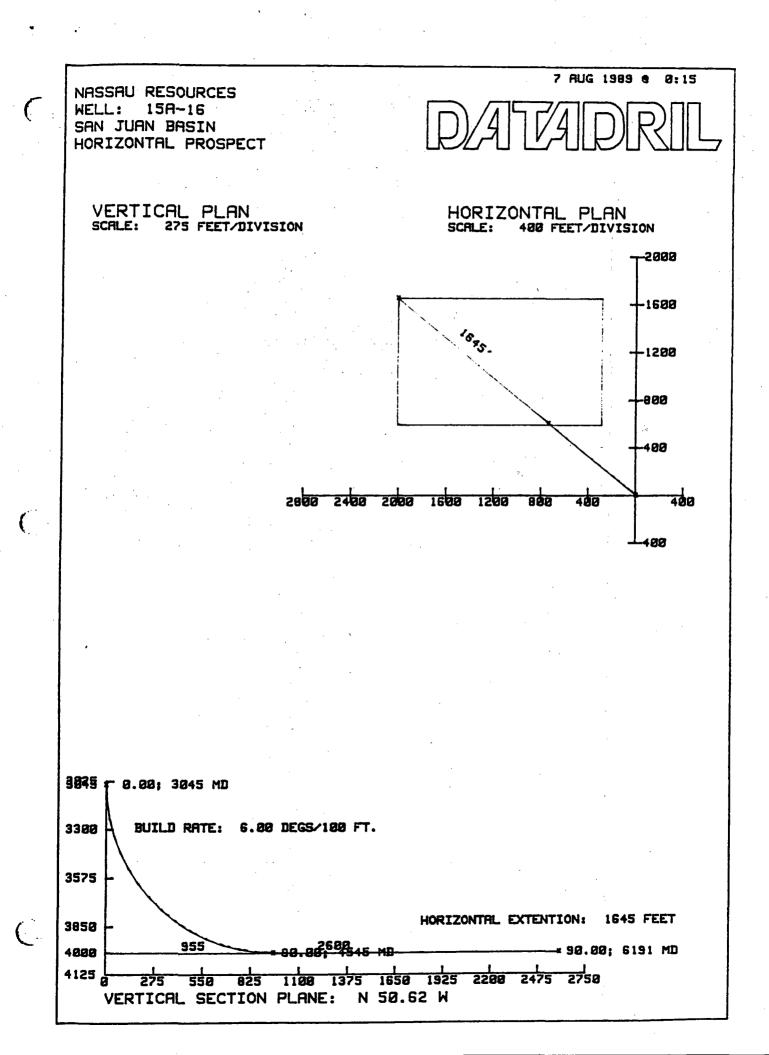
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PAGE No. 1

#### \*\*\*\*\* RECORD OF PROPOSAL \*\*\*\*\*

#### RADIUS OF CURVATURE METHOD PROPOSAL COMPUTED BY THE DATADRIL C.A.D.D.S. SYSTEM VERTICAL SECTION PLANE: N 50.62 W

MEASURED Depth (FT)	COURSE Length (FT)	INCL. Angle (Deg)	D R I F T Direction (DEG)	TRUE VERTICAL DEPTH	T O RECT CO (FT)	T A L DRDINATES (FT)	VERTICAL SECTION (FT)	DOGLEG SEVERITY (DEG/100')
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3245.07	100.00	12.00	N 50.62 W	3243.61	13.24 N	16.13 W	20.87	6.00
3345.07	100.00	18.00	N 50.62 W	3340.16	29.65 N	36.12 W	46.74	6.00
3445.07	100.00	24.00	N 50.62 W	3433.47	52.38 N	63.81 ₩	82.56	6.00
3545.07	100.00	30.00	N 50.62 W	3522.53	81.17 N	78.87 H	127.94	6.00
3645.07	100.00	36.00	N 50.62 W	3606.36	115.72 N	140.96 W	182.38	6.00
3745.07	100.00	42.00	N 50.62 W	3684.04	155.63 N	189.58 ₩	245.28	6.00
3845.07	100.00	48.00	N 50.62 W	3754.72	200.47 N	244.21 ₩	315.96	6.00
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4145.07	100.00	55.00	N 50.62 N	3917.44	359.46 N	437.88 W	566.52	6.00
4245.07	100.00	72.00	N 50.62 W	3953.26	418.66 N	510.01 W	659.84	6.00
4345.07	100.00	78.00	N 50.62 W	3979.13	479.92 N	`584.63 ₩	756.39	6.00
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6190.64	1645.57	90.00	N 50.62 W	4000.00	1650.00 N	2010.00 W	2600.50	0.00





9%", 36\*, K-55 Surface Casing @ 300' NASSAU RESOURCES, INC. C.C.U. 15A-16 Horizontal Well Plan Schematic Vertical hole - 834" @ 300' - 3045' -NOT TO SCALE Note: Tubing deleted from drowing for clarity. Well to be gas KICK-OFF POINT - 3045'MD & TVD lifted from approximistely 3900' in curve section of well. 51/2", 15.5", K-55, LTC Casing 51/2", 15.5 #, K-55, LTC Slotted Casing - to be Smith Inder This section of hole cemented to surface centralized through this interval Horizontal Point Drillable 4000'TVD, 4545'MD Packoff Bushing we consistering External Casing Packer 54" Guide This point represents 806'FSL, 1238'FEL for isolation Shoe Stage Collar for cementing

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Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

STATE OF NEW MEXICO

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## OIL CONSCIEVATION DIVISION STATE OF NEW MEXICO P. O. UOX 2000

Form C-102 Revised 10-1-78

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### STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT OIL CONSERVATION DIVISION AZTEC DISTRICT OFFICE

GARREY CARRUTHERS GOVERNOR

M-E-M-O-R-A-N-D-U-M (3-88-11)

RECEIVEU	
JUN 1 - 1989	

1000 RIO BRAZOS ROAD AZTEC, NEW MEXICO 87410

(505) 334-6178

то:

OPERATORS DRILLING FOR OIL AND GAS IN THE SAN JUAN BASIN OF NEW MEXICO

FROM: Frank T. Chavez, Supervisor District III

SUBJECT: Drill Cuttings Samples

DATE: May 26, 1988

The attached Application for Permit to Drill has been approved by this office.

As a condition of approval, you are required to submit 4 4" x 6" sample bags of drill cuttings from the Fruitland Coal formation and from the Menefee Coal interval if it is encountered and if drilling conditions permit. If a geolograph is used, a copy of that recording from 50 feet above to 50 feet below the coal intervals will be submitted. Include the following information:

Operator name Well name and number Footage location, Section, Township and Range Date taken The name and address of the person in your company who is to receive a copy of the analysis.

Submit samples, information, and geolograph to the following address:

Mr. James Fassett U.S. Geological Survey P.O. Box 25046, MS 939 DFC Lakewood, CO 80225

Coal analyses gathered in the San Juan Basin will be added to a data base available from the USGS in periodic reports.

This information will be used to evaluate coals and coal gas potentials in the San Juan Basin.

dj Farmington, 11.41.

MAY 30 1989

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Form 3160-3				l File SUBMIT IN 7	JCATE		
(November 1983)	LINI	TED STATES	•	(Other instr		Budget Bureau	No. 1004-0136
(formerly 9-331C)	DEPARTMEN			Deverse	alde)	Expires August	31, 1985
						5. LEASE DESIGNATION	AND BERIAL NO.
	BUREAU O	F LAND MANAG	EMENT	RECEIVED	0.14	NM 30351	
APPLICATION	FOR PERMIT	TO DRILL, D	DEEPEN	OR PLUG	BACK	6. IF INDIAN, ALLOTTE	B OR TRIBE NAME
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D. TIPE OF WELL					CE AREA	Carracas Uni	
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2. NAME OF OPERATOR			FF	RMIRGION		Carracas Uni	t 15 A
NASSAU	RESOURCES, INC	<b></b>				9. WELL NO.	
3. ADDRESS OF OPERATOR						#16	
P.O. BO	x 809, Farming	ton. N.M. 8	7499			10. FIELD PND POGL	
4. LOCATION OF WELL (Be At surface	port location clearly an	4 In accordance with	h any State	e requirements.*)		HO Fruitian	d Cett
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At proposed prod. sone						$\rho$	
	·				÷	Sec. 15, T32N	
14. DISTANCE IN MILES A			OFFICE*			12. COUNTY OR PARISH	18. STATE
	les N. of Gobe	rnador, N.M.				Rio ARriba	NM
10. DISTANCE FROM PROPUL LOCATION TO REARBET	sto*		16. NO. 01	ACRES IN LEASE	17. NO. C	OF ACRES ASSIGNED His Well	<u> </u>
PROPERTY OR LEASE LI (Also to nearest drig.		200'	1.	280.0	S/	320 4000	
18. DISTANCE FROM FROFO	SED LOCATION*			SED DEPTH	20. 10TA	AT OR CABLE TOOLS	
TO NEAREST WELL, DR OB APPLIED FOR, ON THU		850'	3	990'	Rot	ату	1. A.
21. ELEVATIONS (Show whether	ther DF, RT, GR, etc.) [	RILLING OPERATIO				22. APPROX. DATE WO	EK WILL START*
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23.	l	GENERAL BEOLUR	EMENISC	MENTING PROGRA	M Procedu	rel review purcuant (	नगराज समग्र
BIZE OF HOLE	SIZE OF CASING	WEIGHT PER FO		SETTING DEPTH	and app		ER 3185 A
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7-7/8"	5-1/2"	15.5	<u></u>	90'	<u>  809 CI</u>	u.ft. circ. to	_surface
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	drill with spo						
water an	nd gel-chem. mu	id to test t	he Frui	itland coal :	zone at	± 3990'. W11	l run

water and gel-chem. mud to test the Fruitland coal zone at  $\pm$  3990'. Will run DIL-GR-SP and FDC-CNL-GR Caliper logs. If well appears productive, will set 5-1/2" casing at TD, cement in 1 stage, selectively perforate, frac, clean out after frac and complete with 2-7/8" tubing.

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MAY2 2 1989	
OIL CON. DIV	

GAS IS NOT DEDICATED.

IN ABOVE STACE DESCRIBE PROFOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive sone and proposed new productive sone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program if any.

SIGNED James & Hoten	TITLE Field Supt.	9/20/88
(This poet for Federal or Stoke office use)		
PERITT NO	APPROVAL DATE	
V		AS AMENDED
APPROVED BY Conditions of Approval, if any :	TITLE	MOX1 8,1989
K-8844 (2.5 L)	NMOCC	FAREA MANAGER
	San Instructions On Revene Side	AREA MANAGER

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

**OIL CONSERVATION DIVISION** 

GARREY CARRUTHERS



1113

#### November 7, 1988

Nassau Resources, Inc. c/o Jerome P. McHugh & Associates P.O. Box 809 Farmington, NM 87499-0809

Attention: James S. Hazen,

#### Administrative Order NSL-2598

Dear Mr. Hazen:

Reference is made to your application of October 11, 1988 for a non-standard gas well location for your Carracas Unit <u>15-A Well</u> <u>No. 16</u> to be located 200 feet from the South line and 500 feet from the East line (Unit P) of Section 15, Township 32 North, Range 5 West, NMPM, to test the Fruitland (Sand) formation, Rio Arriba County, New Mexico. The SE/4 of said Section 15 shall be dedicated to the well forming a standard 160-acre gas spacing and proration unit.

By the authority granted me under the provisions of General Rule 104 F(I), the above-described unorthodox gas well location is hereby approved.

Sincerely, William J. LeMay Director

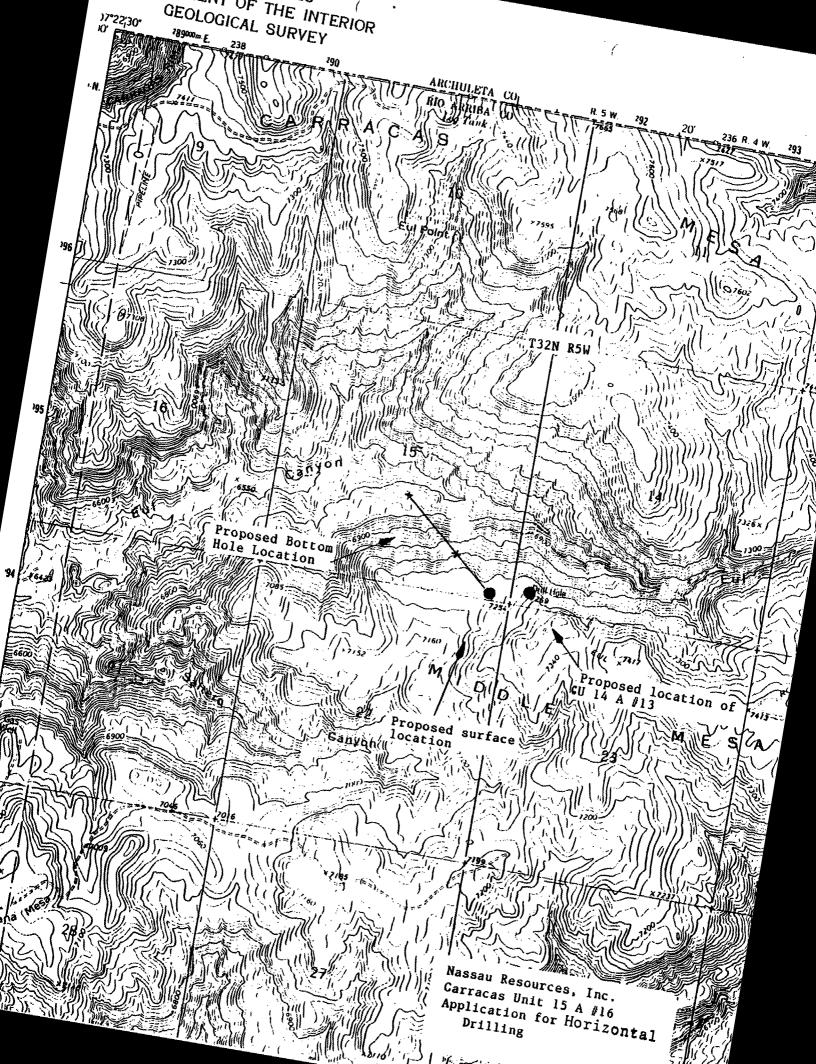
WJL/MES/ag

cc: Oil Conservation Division - Aztec New Mexico Oil & Gas Engineering Committee - Hobbs US Bureau of Land Management - Farmington

Jeroma P. McHogh Farmington, N.M.

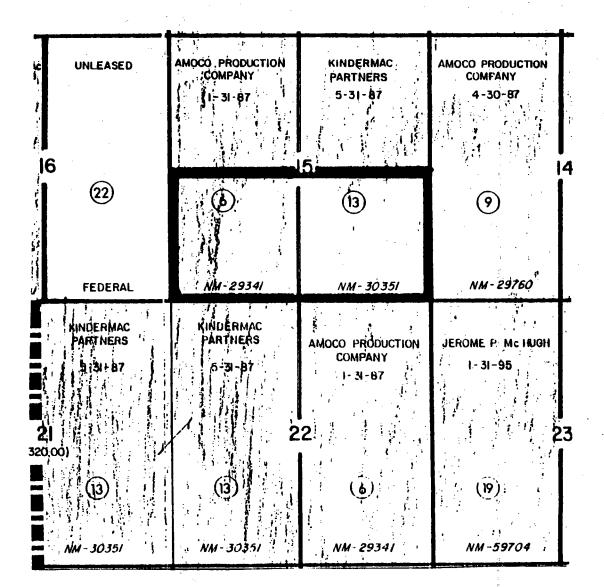
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Township 32 North, Range 5 West, NMPM, Rio Arriba County, New Mexico



PARTY TO THE UNIT: Amoco Production Co.

OPERATING AFFILIATES: Jerome P. McHugh Kindermac Partners

UNLEASED FEDERAL MINERALS: T32N, R5W Section 16: E/2

Nassau Resources, Inc. Carracas Unit 15 A #16 Application for Horizontal Drilling 303 321 1563 JEROME P MCHUGH

## TELECOPY TRANSMITTAL

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DATE: 10-3-89

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THE FOLLOWING <u>3</u> PAGE(S) ARE FOR <u>MICHAEL</u>	STOGNER
FIRM NAME New MEXICO OCD	f T
CITY, STATE Santa Fe, NM	
TELECOPY NO. 1-505-827-574/	
FROM GARY Johnson	1
	1

JEROME P. MCHUGH AND ASSOCIATES/NASSAU RESOURCES, INC. FAX NUMBER (303) 321-1563

10/03/08 11:24

Main Office Jerome P. McHugh & Associates Operating Affiliate: Nassau Resources, Inc. 650 South Cherry, Suite 1225 Denver, Colorado 80222 (303) 321-2111

OCT-03-89 TUE 11:24

#### 303 321 1563

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12/91	0.000	157.153	0.000	117.865	N/A	1.50	9.000	176.797	0,000	176.7
12/92	0.000	182.500	0.000	136.875	N/A	1.50	0.000	205.313	0.000	205.3
12/93	0.000	181.885	0.000	136.414	N/A	1.50	0.000	204.621	0,000	204.6
12/94	0.000	157.056	0.000	117.792	N/A	1.50	0.000	176.688	0.000	176.6
12/95	0.000	129.025	0.000	96,768	N/A	1.50	0.000	145.153	0,000	145.1
12/96	0.000	107.349	0,000	82.012	N/A	1.50	0.000	123.017	0.000	123.0
12/97	0,000	94.790	0.000	71.092	N/A	1.50	0.000	106.639	0.000	106.6
12/98	0.000	83.590	0.000	62.692	N/A	1.50	0.000	94.038	0.000	94.0
SUB TOTAL	0.000	1197.612	0.000	890,708			0,000	1336.063	0.000	1336.0
REMAINDER		768.739	0.000	576.554			0.000	864.831	0.000	864.8
TOTAL	0.000	1956.351	0.000	1467.262			0.000	2200.894	0.000	550018
IND OF	NET	NET PROD.	NET	TOTAL	NET CASH	NET	NET	NET OPER	ATING INCOM	- NFIT
PERIOD	EXPENSES	TAXES		EXP+TAXES	OPER. INC.			UNDISC DIS		
NO/YR)							( <u>N</u> \$)			
17/80	12.000	0 340	0,000	12.349	-4.364	450,000	0.000	-454.364	-450.607	-450.6
12/89 12/90	42.408		0.000	46.591	49.221	0.000		49,221	44.698	-405.
12/91	46.400		0.000	22.503	154.294	0,000		154.294	128,635	-277.8
12/92	15.360		0.000	24.324	180.989			180,989	137.121	~140.
12/93	15.936		0.000	24.870	179.751	0.000		179.751	123.294	-16.0
12/94	16.512		0.000	24.226	152.461	0.000		152.461	94.835	77.
12/95	17.088		0.000	23.425	121.727	0.000		121.727	68.521	146.4
12/96	17.664		0.000	23.035	99,982	0.000		79.982	50.936	197.4
12/97	18.240		0.000	22,896	83.743	0.000		83.743	38.614	236.0
12/98	18.816		0.000		71.117	0.000		71.117	29.681	265,
	(00.000	58.333	0,000	247,141	1088.921	450.000	0.000	638.921	265.728	
SUB TOTAL					392.343	0.000		372.343	102.723	
REMAINDER Total	434./3V 623.538		0.000		1481,264	450,000		1031.264	368,451	
TUTHE	020,030	701976	V • V V	1111000	11411247	,40,000				
¥										<b>*</b>
		368,452 M\$		50 % 26.			-50.573 M\$	7 - 35.00	- 134.	844 M\$
_	X 00.05	74.911 M\$	4 - 25.0	10 v _14	465 M\$ 6 -	20 00 8	-82.225 M\$	,		

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NASSAU RESOURCES, INC. 9%, 36, K-55 Surface Casing @ 300' C.C.U 15A-16 HORIZONTAL WELL PLAN (revised) SCHEMATIC VERTICAL HOLE - 83/4"@ 300'-3045' ഥ -not to scale -----Stage Collar for Cementing to Surface Nore: Tubing deleted from drawing 0 for clarity. Well to be gas lifted Kick-off Point - 30.45' MD & TVD or pumped from approximately 3900'. WELL to be cemented from TD to Surface in 2 Stages. Horizontal Point 51/2", 17", LTC, K-55 Casing ≈ 4000'TVD, 4545'MD to be centralized through this section 51/2" Guide This point represents 806' FSL , 1238' FEL Shoe