

BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

OIL CONSERVATION DIV.

05 JUN 12 PM 1:48

APPLICATION OF POGO PRODUCING COMPANY FOR  
APPROVAL OF A PILOT PRESSURE MAINTENANCE  
PROJECT AND TO QUALIFY THE PROJECT FOR  
THE RECOVERED OIL TAX RATE, EDDY COUNTY,  
NEW MEXICO.

Case No. 12223

APPLICATION

Pogo Producing Company ("Pogo") applies for an order approving a pilot pressure maintenance project, and qualifying the project for the recovered oil tax rate. In support thereof, Pogo states:

1. Pogo is the operator of the following Federal Oil and Gas Leases, as to the Delaware formation, all located in Township 23 South, Range 31 East, N.M.P.M.: (a) Lease NM 38463, covering all of Section 20, containing 640 acres of land; (b) Lease NM 38464, covering all of Section 21, containing 640 acres of land; (c) Lease NM 40859, covering all of Section 28, containing 640 acres of land; and (d) Lease NM 0281482-A, covering the E½ of Section 29, containing 320 acres of land.

2. Pogo proposes to institute a pilot pressure maintenance project on the above-described leases, designated the Sand Dunes Cooperative Pilot Pressure Maintenance Project. Pogo's address is P.O. Box 10340, Midland, Texas 79702 (Attention: R. Scott McDaniel).

3. Pogo proposes to inject water into the Brushy Canyon member of the Delaware Mountain Group (West Sand Dunes-Delaware Pool) through the Pure Gold "B" Fed. Well No. 20, located 1260 feet from the South line and 250 feet from the East line (Unit P)

of Section 20.<sup>1</sup> The initial project area will comprise the SE¼ of Section 20, the W½SW¼ of Section 21, the NW¼NW¼ of Section 28, and the NE¼NE¼ of Section 29. A plat outlining the project area, and marking the locations of the initial injection and producing wells, is attached hereto as Exhibit A.

4. Pogo requests that the Sand Dunes Cooperative Pilot Pressure Maintenance Project be qualified for the recovered oil tax rate, pursuant to the Enhanced Oil Recovery Act (L. 1992, Ch. 38) and Division Rule 30. Project data includes:

- (a) Number of initial producing wells: 8.
- (b) Number of initial injection wells: 1.
- (c) Capital cost of additional facilities: \$50,000.00.
- (d) Estimated total project cost: \$150,000.00.
- (e) Estimated total value of incremental production recovered from the project: \$1,500,000.00.
- (f) Anticipated injection commencement date: October 1, 1999.
- (g) Type of fluid injected: Produced water.
- (h) Anticipated injection volumes: 6000 BWPd maximum.

5. A Form C-108 for the injection well and project is attached hereto as Exhibit B.

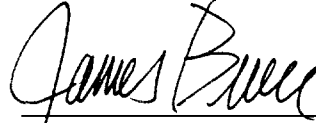
**WHEREFORE,** Pogo requests that the Division approve the injection application and the Sand Dunes Cooperative Pilot Pressure Maintenance Project, including a provision allowing administrative approval for expansion of the project area, qualify the project as

---

<sup>1</sup>The unorthodox location was approved by Administrative Order NSL-4217 (SD).

an enhanced oil recovery project, and certify the project for the recovered oil tax rate.

Respectfully submitted,

A handwritten signature in cursive script, reading "James Bruce". The signature is written in dark ink and is positioned above a horizontal line.

James Bruce  
P.O. Box 1056  
Santa Fe, New Mexico 87504  
(505) 982-2043


Attorney for Pogo Producing Company

**VERIFICATION**


STATE OF TEXAS

COUNTY OF MIDLAND

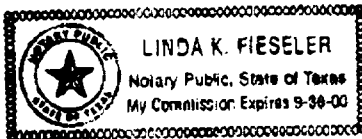
Ron Gasser, being duly sworn upon his oath, deposes and states: He is a petroleum engineer employed by Pogo Producing Company, he is familiar with the matters set forth in the foregoing Application, and the statements therein are true and correct to the best of his knowledge.

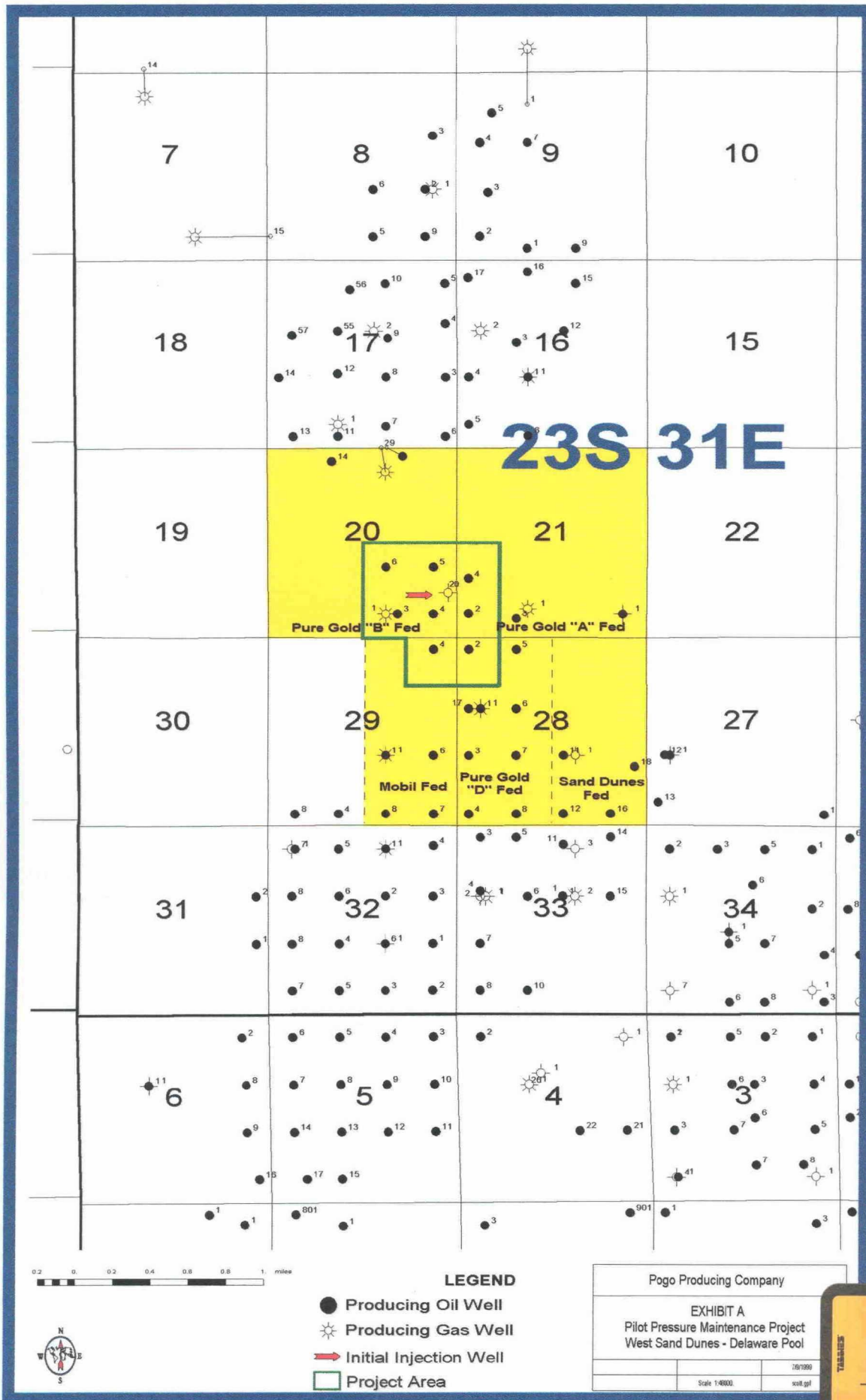
  
Ron Gasser

SUBSCRIBED AND SWORN TO before me this 12<sup>th</sup> day of July, 1999  
by Ron Gasser.

  
Notary Public

My Commission Expires:

9-30-00



EXHIBIT

A

APPLICATION FOR AUTHORIZATION TO INJECT

POGO PRODUCING COMPANY  
PURE GOLD FEDERAL "B" 20

- I. Purpose: ☐ Secondary Recovery ☒ Pressure Maintenance ☐ Disposal ☐ Storage  
Application qualifies for administrative approval? ☐ yes ☒ no
- II. Operator: POGO PRODUCING COMPANY  
Address: P. O. Box 10340, Midland, Texas 79702  
Contact party: Richard L. Wright Phone: 915/685-8100
- III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project? ☐ yes ☒ no  
If yes, give the Division order number authorizing the project \_\_\_\_\_.
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- \* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
  2. Whether the system is open or closed;
  3. Proposed average and maximum injection pressure;
  4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
  5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- \*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- \* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)
- \* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

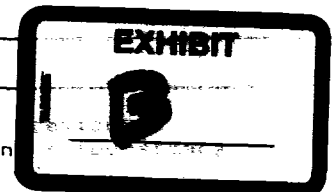
Name: Bill F. Halpeska

Title: Agent, PE

Signature: Bill Halpeska

Date: 06-30-99

- \* If the information required under Sections VI, VIII, X, and XI above has been submitted, it need not be duplicated and resubmitted. Please show the date and of the earlier submittal.



## III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

- (1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

## XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

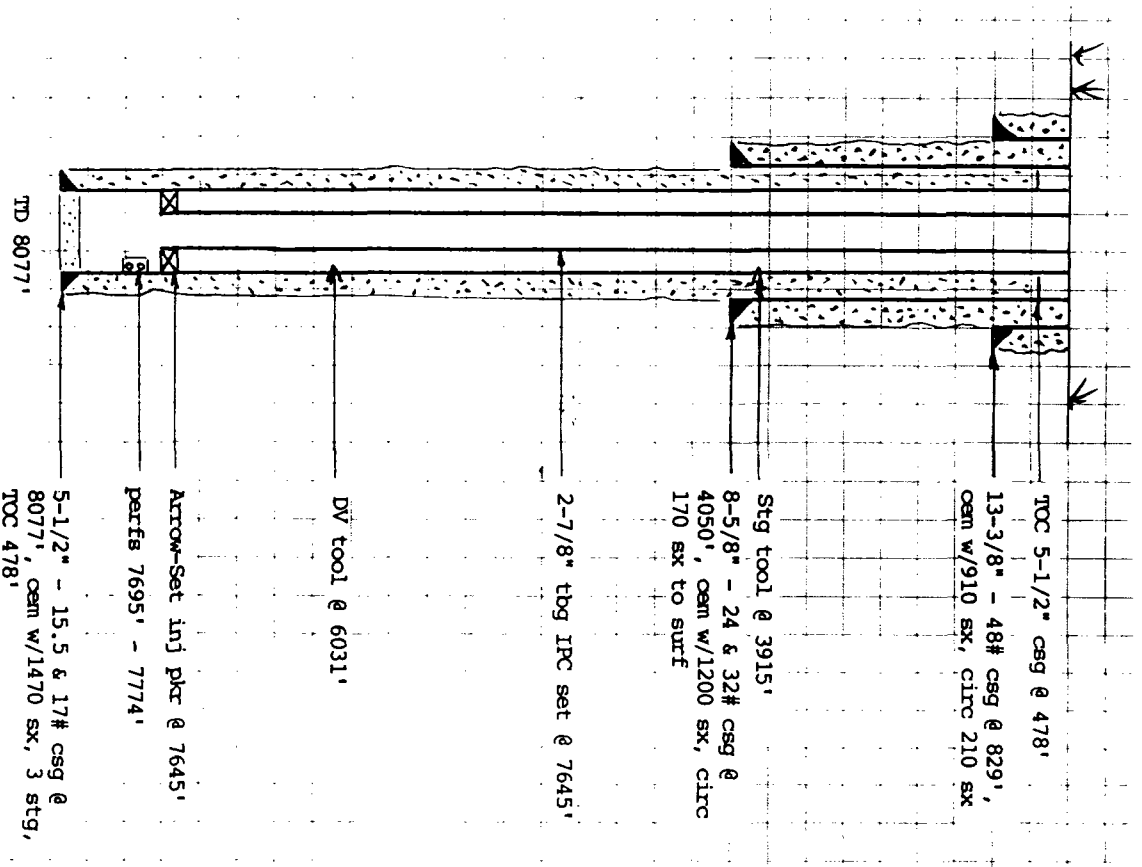
- (1) The name, address, phone number, and contact party for the applicant;
- (2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) the formation name and depth with expected maximum injection rates and pressures; and
- (4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

---

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

ITEM 111-A

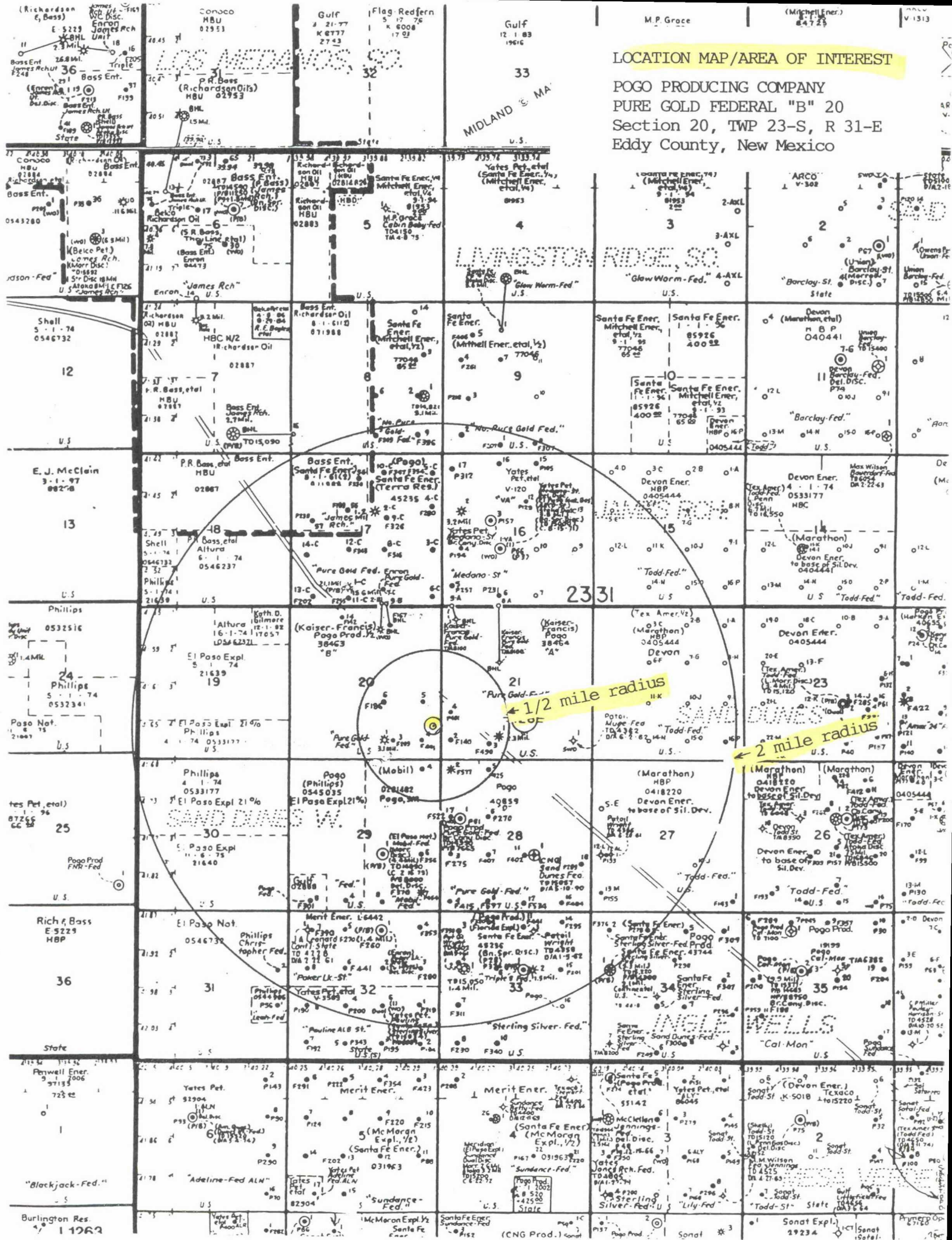
INJECTION WELL DATA SHEETSCHEMATICTABULAR DATA

- (1). LEASE: Pure Gold Fed. "B" WELL # 20  
 LOCATION: Sec. 20 TWP 23 S Range 31 E  
 County Eddy  
 Footage 1260' FSL & 250' FEL
- (2). CASING STRINGS:
- Surface Casing  
 Size 13-3/8" Depth 829' Cemented w/ 910 sx.  
 TOC surface Determined by circulated 210 sx  
 Hole size 17-1/2"
- Intermediate Casing  
 Size 8-5/8" Depth 4050' Cemented w/ 1200 sx.  
 TOC surface Determined by circulated 170 sx  
 Hole size 11"
- Long String  
 Size 5-1/2" Depth 8077' Cemented w/ 1470 sx.  
 TOC 478' Determined by CBL  
 Hole size 7-7/8"  
 Injection interval, from 7695 to 7774 ft.
- (3). INJECTION TUBING STRING:  
 Size 2-7/8 in., coated/lined with plastic coated  
 Setting depth 7645 ft.
- (4) INJECTION PACKER:  
 Size 5-1/2 in.; Make/Model Arrow/Arrow-Set  
 Setting depth 7645 ft.

ITEM 111-B

INJECTION WELL DATA

- (1). Injection Formation: Delaware  
Field/Pool: West Sand Dunes (Delaware)
- (2). Injection interval, From 7695 ft. to 7774 ft.  
Perforated XX Open Hole \_\_\_\_\_
- (3). Original purpose well drilled -- test Delaware section for production
- (4). Other perforated intervals; \_\_\_\_\_ Yes XX No  
Squeezed with \_\_\_\_\_ sx., or isolated by \_\_\_\_\_
- (5). Oil or gas productive zone(s):  
Next higher: 6630' - 7275'  
Next lower: Atoka/13,930'



ITEM VI

WELL DATA - AREA OF REVIEW

- (1). Location: 660' FSL & 1650' FEL sec 20, 23 S, 31 E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Pure Gold Fed. "B" Well # 3  
 Well type: Oil XX Gas      DSA      Total depth 8100 Ft.  
 Date drilled: spud 2-14-93; comp. 4-29-93  
 Completion Data: 13-3/8" @ 730' w/650 sx; circ cmt; 8-5/8" @ 4100' w/1275 sx;  
circ cmt; 5-1/2" @ 8100' w/1290 sx (DV tool @ 6281'), TOC 2800'; perf 7723' -  
7883'; A/3200 gal; F/57,000 gal and 133,750 # 16/30 sd; IPF 295 BO +134 BW and  
500 MCFG  
 Plugged      Date:      (Schematic attached)
- (2). Location: 660' FS & EL sec 20, 23 S, 31 E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Pure Gold Fed. "B" Well # 4  
 Well Type: Oil XX Gas      DSA      Total Depth: 8100 Ft.  
 Date Drilled: spud 1-30-93; comp. 3-05-93  
 Completion Data: 13-3/8" @ 700' w/650 sx, circ cmt; 8-5/8" @ 4100' w/1200  
sx, circ cmt; 5-1/2" @ 8100' w/1275 sx (DV tool @ 6192'), TOC @ 2650'; perf  
7734 - 7896'; acid 7846 - 96' w/3200 gal; F/10,000 gal & 32,050# 16/30 sd;  
acid 7734 - 86 w/4200 gal; F/14,000 gal & 35,000# sd; IPF 401 BO + 100 BW &  
 Plugged      Date      (Schematic attached)  
339 MCFG
- (3). Location: 1980' FSL & 660' FEL, sec 20, 23 S, 31 E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Pure Gold Fed. "B" Well # 5  
 Well Type ; Oil XX Gas      DSA      Total Depth: 8100' Ft.  
 Date Drilled: spud 5-21-93; comp 6-23-93  
 Completion Data: 13-3/8" @ 722' w/ 615 sx, circ cmt; 8-5/8" @ 4070' w/1250 sx,  
circ cmt; 5-1/2" @ 8100' w/1150 sx (DV tool @ 6208'), TOC 2500'; perf 7735 -  
97' & 7854 - 96'; A/3200 gal; F/50,750 gal & 169,540# 16/30 sd; IPF 273 BO  
+ 224 BW and 374 MCFG  
 Plugged      Date      (Schematic attached)
- (4). Location: 1980' FS & EL, sec 20, 23 S, 31 E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Pure Gold Fed. "B" Well # 6  
 Well type: Oil XX Gas      DSA      Total depth 8100 Ft.  
 Date drilled: spud 6-03-93; comp 6-29-93 PB 8029'  
 Completion Data: 13-3/8" @ 727' w/965 sx, TOC 403'; cmt via 1" into annulus  
w/350 sx, circ cmt; 8-5/8" @ 4070' w/ 1450 sx, circ cmt; 5-1/2" @ 8100' w/1250 sx  
(DV tool @ 6193'), TOC 2750'; perf 7704 - 58' & 7825 - 68'; A/3200 gal; F/  
50,750 gal & 168,260# 16/30 sd; IPF 186 BO + 187 BW & 585 MCFG  
 Plugged      Date:      (Schematic attached)

ITEM VI

WELL DATA - AREA OF REVIEW

- (5). Location: 660' FSL & 1980' FEL sec 20, 23 S, 31 E, Eddy Co.  
 Operator: Kaiser-Francis Lease: Pure Gold Fed. "B" Well #1  
 Well type: Oil \_\_\_\_\_ Gas XX DSA \_\_\_\_\_ Total depth 14,866 Ft.  
 Date drilled: spud 7-11-81; comp 5-27-82  
 Completion Data: 20" @ 600' w/1100 sx, circ cmt; 13-3/8" @ 4106' w/4000 sx,  
circ cmt; 9-5/8" @ 12,395' w/3650 sx (DV tool @ 6969'), TOC 4200'; sq 9-5/8"  
thru perms @ 4120' w/1240 sx, TOC 1987'; 7-5/8" liner @ 10,939-14,268' w/  
1116 sx, sq liner top; 5-1/2" liner 14,062-865' w/320 sx; perf 14,811-824';  
A/1500 gal; CIBP @ 14,723' w/11' cmt cap; perf 14,286-294' & 13,344-366';  
CIBP @ 14,025' w/10' cmt cap; perf 13,866-904' 13,926-930', 13,910-913',  
13,916-920', 13,577-582' & 13,590-593'; IPCAOF 3140 MCFG
- (6). Location: 330' FNL & 660' FEL sec 29, 23 S, 31 E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Mobil Federal Well #4  
 Well Type: Oil XX Gas \_\_\_\_\_ DSA \_\_\_\_\_ Total Depth: 8100' Ft.  
 Date Drilled: spud 1-09-93; comp 2-11-93  
 Completion Data: 13-3/8" @ 550' w/ 725 sx, circ cmt; 8-5/8" @ 4010' w/1600 sx,  
circ cmt; 5-1/2" @ 8100' w/1680 sx (DV tool @ 5805' & 3781"), circ cmt; perf  
7840-64'; A/1000 gal; F/49,000 gal & 35,000 # sd; IPF 580 BO + 146 BW & 973  
MCF; perf 7726-78'; A/1500 gal; F/50,000 gal + 44,800# sd; FLO 434 BO & 443 MCFG  
 Plugged \_\_\_\_\_ Date \_\_\_\_\_ (Schematic attached)
- (7). Location: 800' FSL & 1980' FWL sec 21, 23 S, 31 E, Eddy Co.  
 Operator: Kaiser-Francis Lease: Pure Gold Federal "A" Well #1  
 Well Type ; Oil \_\_\_\_\_ Gas XX DSA \_\_\_\_\_ Total Depth: 14,924 Ft. PB  
 Date Drilled: spud 8-12-80; comp 1-20-81  
 Completion Data: 20" @ 583' w/625 sx; 13-3/8" @ 4206' w/2550 sx; 9-5/8"  
@ 12,398' w/1450 sx; 7-7/8" liner 11,860-14,161' w/615 sx; 5" liner 13,702-  
967' w/200 sx; perf 14,414- 633'; IPCAOF nat 2397 MCFGD; re-comp 9/85;  
perf 14,165-228'; nat flow 1038 MCFGD; CIBP @ 14,335' w/10' cmt cap  
 Plugged \_\_\_\_\_ Date \_\_\_\_\_ (Schematic attached)
- (8). Location: 660' FSL & 330' FWL sec 21, 23 S, 31 E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Pure Gold "A" Federal Well #2  
 Well type: Oil XX Gas \_\_\_\_\_ DSA \_\_\_\_\_ Total depth 8100 Ft.  
 Date drilled: spud 1-12-93; comp 2-13-93  
 Completion Data: 13-3/8" @ 560' w/500 sx, circ cmt; 8-5/8" @ 4100' w/1250 sx,  
circ cmt; 5-1/2" @ 8100' w/1414 sx (DV tool @ 6184'), TOC 2700'; perf 7860-7901';  
A/3200 gal; F/43,600 gal & 50,000# 20/40 sd; IPF 280 BO + 18 BW & 266 MCFG  
 Plugged \_\_\_\_\_ Date: \_\_\_\_\_ (Schematic attached)

WELL DATA - AREA OF REVIEW

- Plugged \_\_\_\_\_ Date: \_\_\_\_\_ (Schematic attached)

WELL DATA - AREA OF REVIEW

(12). Location: 330' FNL & 1650' FNL sec 28-23S-31E, Eddy Co.  
 Operator: Pogo Producing Co. Lease: Pure Gold Fed. "D" Well # 5  
 Well type: Oil XX Gas      DSA      Total depth 8140' Ft.  
 Date drilled: spud 12-26-92; comp 1-14-93 PB 89093  
 Completion Data: 13-3/8" @ 551' w/700 sx, circ cmt; 8-5/8" @ 4060' w/1600 sx,  
circ cmt; 5-1/2" @ 8140' w/ 880 sx, circ cmt (DV tools 5792' & 3817"); perf  
7884-7942'; A/2500 gal; F/55,000 gal + 42,000# 20/40 sd; IPF 425 BO + 61 BW &  
484 MCFG; 8-95, perf 6654-64'; A/1000 gal; F/48,000 gal + 19,320# sd; test  
184 BO + 79 BW & 116 MCFG; 9-93, perf 7749-7816'; A/1200 gal; F/80,500  
gal + 210,000# 20/40 sd; pump 143 BO + 189 BW & 267 MCFG

( ). Location: \_\_\_\_\_  
 Operator: \_\_\_\_\_ Lease: \_\_\_\_\_ Well # \_\_\_\_\_  
 Well Type: Oil \_\_\_\_\_ Gas \_\_\_\_\_ DSA \_\_\_\_\_ Total Depth: \_\_\_\_\_ Ft.  
 Date Drilled: \_\_\_\_\_  
 Completion Data: \_\_\_\_\_  
 \_\_\_\_\_  
 Plugged \_\_\_\_\_ Date \_\_\_\_\_ (Schematic attached)

(3). Location: \_\_\_\_\_  
 Operator: \_\_\_\_\_ Lease: \_\_\_\_\_ Well # \_\_\_\_\_  
 Well Type ; Oil \_\_\_\_\_ Gas \_\_\_\_\_ DSA \_\_\_\_\_ Total Depth: \_\_\_\_\_ Ft.  
 Date Drilled: \_\_\_\_\_  
 Completion Data: \_\_\_\_\_  
 \_\_\_\_\_  
 Plugged \_\_\_\_\_ Date \_\_\_\_\_ (Schematic attached)

( ). Location: \_\_\_\_\_  
 Operator: \_\_\_\_\_ Lease: \_\_\_\_\_ Well # \_\_\_\_\_  
 Well type: Oil \_\_\_\_\_ Gas \_\_\_\_\_ DSA \_\_\_\_\_ Total depth \_\_\_\_\_ Ft.  
 Date drilled: \_\_\_\_\_  
 Completion Data: \_\_\_\_\_  
 \_\_\_\_\_  
 Plugged \_\_\_\_\_ Date: \_\_\_\_\_ (Schematic attached)

## ITEM VII

OPERATIONAL DATA

(1). Average expected injection rate: 4000 BWPD; maximum anticipated rate: 6000 BWPD

(2). Closed system

(3). Estimated average injection pressure: 1000 psi.

Estimated maximum pressure: 1535 psi.

(4). Source of injection water: produced water from surrounding Pogo

leases

Analysis of waters attached. EXHIBIT(S) I, II & III

(5). Analysis of injection zone water attached.

Data source: NA

ITEM V111

GEOLOGICAL DATA

## INJECTION ZONE

Lithological description: ss, lt gy - clr, frosted, vfg shang -  
sbrnd, mod well srted, sl cons - uncons, frly cln

Geological name: Delaware

Zone thickness: 79 ft.; Depth: 7695 ft.

## FRESH WATER SOURCES

Geological name: Santa Rosa

Depth to bottom of zone: ± 650' ft.

## ITEM IX

STIMULATION PROGRAM (Proposed)

## ACIDIZE:

Volume: 2000 Type acid: 7-1/2% HCl

Rate: 7.5 BPM; Misc. ball sealers

## FRACTURE: NA

Fluid volume: \_\_\_\_\_ gal.; Type: \_\_\_\_\_

Prop type: \_\_\_\_\_ Volume (#): \_\_\_\_\_

Rate: \_\_\_\_\_ BPM; Conductor: \_\_\_\_\_ in.

Misc. \_\_\_\_\_

Pogo Producing Company  
Pure Gold Federal "B" 20

# LOGGING PROGRAM

Copy of GR - CND log included in attachments

### FRESH WATER ANALYSIS

Date sampled:

## HYDROLOGY

Engineering data and area well logs reveal no evidence that hydrologic connection might exist between the intended injection zone at 7695' and probable water zone (Santa Rosa) above 650'

## EXHIBIT I

## Nutro Products Corporation

21187 Houston, Texas 77225  
675-3421 \* Fax (713) 675-7646

## ANALYSIS - PRODUCED WATER

WATER ANALYSIS

POGO PRODUCING COMPANY

PURE GOLD FEDERAL "B" 20

Section 20, TWP 23-S, R 31-E

Eddy County, New Mexico

RY SOLANSKY

Code W-1303

State TEXAS

County

Field

Lease PURE GOLD "D"

Well 2

DISSOLVED SOLIDS

<u>CATIONS</u>	mg/l	me/l
Sodium, Na <sup>+</sup> (Calc.)	114,862	4,994
Total Hardness as Ca <sup>++</sup>	26,840	0
Calcium, Ca <sup>++</sup>	24,480	1,224
Magnesium, Mg <sup>++</sup>	1,439	120
Barium, Ba <sup>++</sup>	3	0
Iron (Total) Fe <sup>+++</sup>	58	3

ANIONS

Chlorides, Cl <sup>-</sup>	225,000	6,338
Sulfate, SO <sub>4</sub> <sup>-</sup>	74	2
Carbonate, CO <sub>3</sub> <sup>-</sup>	0	0
Bicarbonate, HCO <sub>3</sub> <sup>-</sup>	73	1
Sulfide, S <sup>-</sup>	0	0
Total Dissolved Solids (Calc.)	365,989	

OTHER PROPERTIES

pH <sup>*</sup>	6.600
Specific Gravity, 60°/60 F	1.194
TURBIDITY	270

Remarks SAMPLE TAKEN ON 05/13/94

## SCALING INDICIES

<u>TEMP, F</u>	<u>CA CO<sub>3</sub></u>	<u>CASO<sub>4</sub>*2H<sub>2</sub>O</u>	<u>CA SO<sub>4</sub></u>	<u>BA SO<sub>4</sub></u>
80	2.7006	-0.3328	-0.8107	-0.3778
120	3.4494	-0.3376	-0.6351	-0.4602
160	4.5746	-0.3076	-0.4325	-0.6413

## EXHIBIT II

## ANALYSIS - PRODUCED WATER

POGO PRODUCING COMPANY

PURE GOLD FEDERAL "B" 20

Section 20, TWP 23-S, R 31-E,

Eddy County, New Mexico

Products Corp.

Box 3394 Midland, Texas 79706

15) 684-4233 \* Fax (915) 684-4277

WATER ANALYSIS

Date 7/24/95

Nutro Rep TERRY SOLANSKY

Code W-0053

Sampling Point/Date WELL HEAD - 7/15/95

State NEW MEXICO

Company POGO PRODUCING

County EDDY

Field

Lease PURE GOLD "B"

Well #4

DISSOLVED SOLIDSCATIONS

	mg/l	me/l
Sodium, Na <sup>+</sup> (Calc.)	94,438	4,106
Total Hardness as Ca <sup>++</sup>	24,500	0
Calcium, Ca <sup>++</sup>	14,800	740
Magnesium, Mg <sup>++</sup>	5,915	493
Barium, Ba <sup>++</sup>	9	0
Iron (Total) Fe <sup>+++</sup>	6	0

ANIONS

Chlorides, Cl <sup>-</sup>	189,500	5,338
Sulfate, SO <sub>4</sub> <sup>-</sup>	0	0
Carbonate, CO <sub>3</sub> <sup>-</sup>	0	0
Bicarbonate, HCO <sub>3</sub> <sup>-</sup>	73	1
Sulfide, S <sup>-</sup>	0	0
Total Dissolved Solids (Calc.)	304,741	

OTHER PROPERTIES

pH <sup>-</sup>	4.500
Specific Gravity, 60-/60 F	1.198
TURBIDITY	175

## SCALING INDICIES

TEMP, F	CA CO <sub>3</sub>	CASO <sub>4</sub> *2H <sub>2</sub> O	CA SO <sub>4</sub>	BA SO <sub>4</sub>
80	-0.3287	-34.2263	-34.6284	-29.5387
120	0.2997	-34.2412	-34.4629	-29.6564
160	1.2317	-34.2512	-34.3002	-29.8550

## EXHIBIT III

ANALYSIS - PRODUCED WATER  
 POGO PRODUCING COMPANY  
 PURE GOLD FEDERAL "B" 20  
 Section 20, TWP 23-S, R 31-E  
 Eddy County, New Mexico

Products Corp.

1394 Midland, Texas 79706  
 684-4233 \* Fax (915) 684-4277

WATER ANALYSIS

Date 7/24/95 Nutro Rep TERRY SOLANSKY  
 Sampling Point/Date WELL HEAD - 7/15/95  
 Company POGO PRODUCING  
 Field Lease PURE GOLD "B"

Code W-0054  
 State NEW MEXICO  
 County EDDY  
 Well #5

DISSOLVED SOLIDS

<u>CATIONS</u>	mg/l	me/l
Sodium, Na <sup>+</sup> (Calc.)	78,384	3,408
Total Hardness as Ca <sup>++</sup>	44,800	0
Calcium, Ca <sup>++</sup>	36,400	1,820
Magnesium, Mg <sup>++</sup>	5,122	427
Barium, Ba <sup>++</sup>	6	0
Iron (Total) Fe <sup>+++</sup>	175	9

ANIONS

Chlorides, Cl <sup>-</sup>	201,000	5,662
Sulfate, SO <sub>4</sub> <sup>-</sup>	0	0
Carbonate, CO <sub>3</sub> <sup>-</sup>	0	0
Bicarbonate, HCO <sub>3</sub> <sup>-</sup>	122	2
Sulfide, S <sup>-</sup>	0	0
Total Dissolved Solids (Calc.)	321,209	

OTHER PROPERTIES

pH-	6.000
Specific Gravity, 60°/60 F	1.198
TURBIDITY	225

## SCALING INDICIES

<u>TEMP, F</u>	<u>CA CO<sub>3</sub></u>	<u>CASO<sub>4</sub>*2H<sub>2</sub>O</u>	<u>CA SO<sub>4</sub></u>	<u>BA SO<sub>4</sub></u>
80	2.3392	-34.1054	-34.5572	-29.5987
120	3.0587	-34.1160	-34.3874	-29.6930
160	4.1402	-34.1039	-34.2026	-29.8801

EXHIBIT IV

FORM C-108, ITEM XI

ANALYSIS - SANTA ROSA WATER

POGO PRODUCING COMPANY

PURE GOLD FEDERAL "B" 20

Section 20, TWP 23-S, R 31-E

Eddy County, New Mexico

**Chemical and radiochemical analyses of water from test hole H-5**

Water produced from the Santa Rosa Sandstone, sample taken 5/24/78

Alkalinity Field (mg/l as HCO <sub>3</sub> )	200
Bicarbonate FET-FLD (mg/l as HCO <sub>3</sub> )	240
Nitrogen, NO <sub>2</sub> + NO <sub>3</sub> Dissolved (mg/l as N)	0.36
Hardness (mg/l as CaCO <sub>3</sub> )	150
Hardness, noncarbonate(mg/l as CaCO <sub>3</sub> )	150
Calcium Dissolved (mg/l as Ca)	56
Magnesium, Dissolved (mg/l as MG)	51
Sodium, Dissolved (mg/l as NA)	280
Potassium, Dissolved (mg/l as K)	25
Chloride, Dissolved (mg/s as CL)	120
Sulfate, Dissolved (mg/l as SO <sub>4</sub> )	530
Fluoride, Dissolved (mg/l as F)	1.2
Silica, Dissolved (mg/l as SiO <sub>2</sub> )	11.0
Boron, Dissolved (ug/l as B)	890
Solids Residue at 105 Deg C, Dissolved (mg/l)	1200