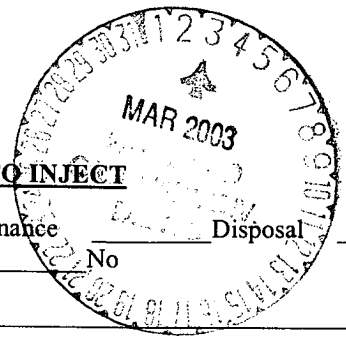
STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

30-045-05598

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



FORM C-108
Revised 4-1-98

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: XX Secondary Recovery _____ Pressure Maintenance _____ Disposal _____ Storage
Application qualifies for administrative approval? XX Yes _____ No

II. OPERATOR: Dugan Production Corp.

ADDRESS: P. O. Box 420, Farmington, NM 87499-0420

CONTACT PARTY: Hank Baca PHONE: (505)325-1821

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? XX Yes _____ No
If yes, give the Division order number authorizing the project: R-1638

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 geologic data on the injection zone including appropriate lithologic detail, geologic 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 sources 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 sources 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: Hank Baca TITLE: Petroleum Engineer

SIGNATURE: Hank Baca DATE: February 24, 2003

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

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

Attachment V
Application to Convert WBU #157 to Injection

Attachment III – Dugan Production Corp. West Bisti Unit #157 Salt Water Disposal Application

A. Injection Well Information

1) West Bisti Unit #157, Sec. 36, Twn. 26N, Rng 13W, 660' FSL & 660' FEL

2) 10-3/4" @ 212', cemented with 200 sx Class B cmt in 15-1/2" hole. Cement circulated to surface.

   7" @ 5018', cemented with 200 sx Class B cmt in 9" hole. TOC calculated @ 75% at 4004'.

3) Injection tubing will be 2-3/8" plastic lined 4.7#/ft EUE 8rd. Setting depth will be ± 4775'.

4) Packer will be externally and internally plastic coated Baker Model AD-1. Setting depth will be ± 4775'.

B. Formation Information

1) Gallup Sandstone. Bisti Lower Gallup Field.

2) Injection interval perforated 4831-4854'

3) Well was originally drilled as a producer.

4) No other perforations exist.

5) The next higher oil and gas zone is the Pictured Cliffs at 1194', and the next lower is the Dakota at 5700' (estimated, as not penetrated).

VII

1) Proposed average injection rate is 400 bwpd with a maximum of 1000 bwpd

2) System will be closed

3) Proposed average injection pressure is 650 psi with a maximum of 960psi.

4) Source of injected water will be Fruitland Coal and Gallup wells within the immediate area. Attachment VIIa is and analysis of the Fruitland water and Attachment VIIb is the Gallup water analysis.

5) This is not a disposal well

VIII

Injection will be into the Gallup sandstone. Top of the Gallup is 4680' with total thickness of 290'. The Ojo Alamo is a possible source of drinking water. It is near the surface and behind the surface casing.

IX

No stimulation is proposed

X

Logs are on file with the Division

XI

There are no fresh water wells within one mile of this location.

XII

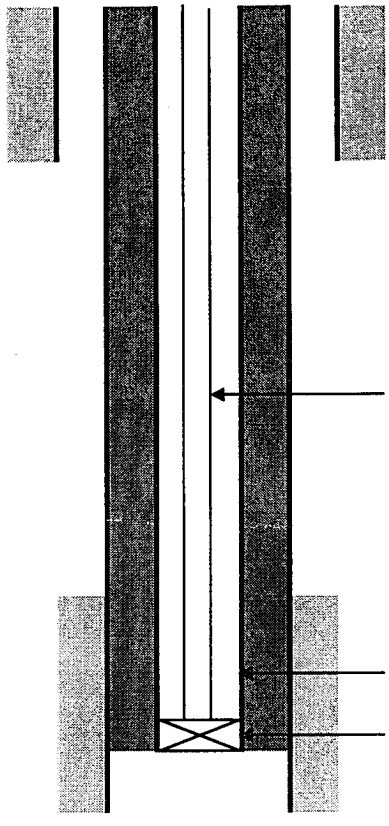
This is not a disposal well.

XIII

Attached are copies of the certified mail receipts notifying The Navajo Tribe as surface owners and offset lease owners. A copy of the letter provided is also attached.

A certified copy of the legal notice published in the Farmington Times is attached.

WBU #157 PROPOSED
WELLBORE DIAGRAM



TOPS

FC
895'

PC
1190'

MV
2100'

GALLUP
4680'

10-3/4" @ 212'
15-1/2" hole
cmt w/ 200 sx, circulated to surface

2-3/8" PLASTIC LINED TUBING

7" TOC 4004' (calc @ 75%)

4-1/2" LINER @ 4830' CEMENTED BACK TO SURFACE

Baker AD-1 tension packer, plastic coated (internally & externally) @ 4830'

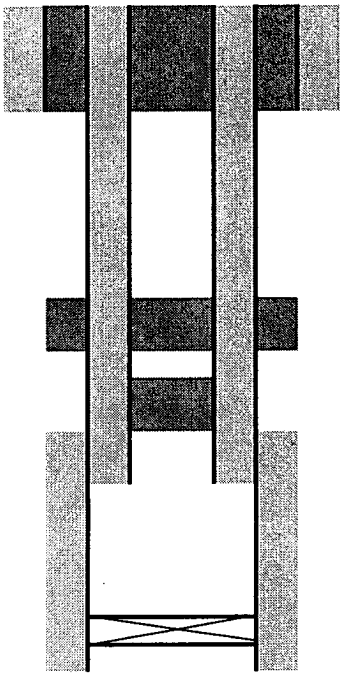
7" csg @ 5018' in 9" hole
cmt w/ 200 sx
Gallup perfs: 4834-4945' (112 holes total)

ATTACHMENT IV

WELL	LOCATION	TYPE	DRILLED	DEPTH	DATA
CBU WI #5	660' FNL & 660' FWL Sec. 6 25N-12W	PRODUCER	4/2/1956	5002	10-3/4" @ 200' CEMENTED W/ 175 SX 7" @ 5001' CEMENTED W/ 200 SX GALLUP PERFORATED 4828-4938' ACIDIZED 4-1/2" LINER SURFACE -3877' SET IN 1984 CMTD W/ 200SX FRAC W/ 30,000# SAND & 30,000 GAL OIL
CBU WI #2	1980' FNL & 660' FWL Sec. 6 25N-12W	INJECTOR	4/27/1956	5026	10-3/4" @ 177' CEMENTED W/ 200 SX 5-1/2" @ 5025' CEMENTED W/ 175 SX GALLUP PERFORATED 4834-4848' SAND OIL FRAC
CBU WI#1	5' FNL & 5' FWL Sec. 6 25N-12W	INJECTOR	7/21/1957	4974	8-5/8" @ 366' CEMENTED W/ 225 SX 5-1/2" @ 4973' CEMENTED W/ 200 SX GALLUP PERFORATED 4826-4847' ACIDIZED
CBU #4	660' FNL & 1980' FWL Sec. 6 25N-12W	PRODUCER	7/28/1959	5000	8-5/8" @ 311' CEMENTED W/ 200 SX 4-1/2" @ 5000' CEMENTED W/ 300 SX GALLUP PERFORATED 4818-68' ACIDIZED
CBU #1	660' FSL & 660' FWL Sec. 31 26N-12W	PRODUCER	4/28/1956	5000	10-3/4" @ 173' CEMENTED W/ 200 SX 5-1/2" @ 4998' CEMENTED W/ 200 SX 4-1/2" LINER @ 3988' CMT W/ 150 SX GALLUP PERFORATED 4836-4960' SAND WATER FRAC
CBU #81	660' FSL & 1980' FWL Sec. 31 26N-12W	PRODUCER	4/12/1982	5100	8-5/8" @ 219' CEMENTED W/ 225 SX 4-1/2" @ 5086' CEMENTED W/ 525 SX GALLUP PERFORATED 4834-4910' SAND WATER FRAC
WBU #162	1880' FNL & 1980' FEL Sec. 1 25N-13W	PRODUCER	1/21/1957	5000	9-5/8" @ 213' CEMENTED W/ 200 SX 5-1/2" @ 4999' CEMENTED W/ 100 SX TOC @ 4200' BY TEMP SURVEY GALLUP PERFORATED 4881-83' FRAC W/ 20,000# SAND & 20,250 GAL OIL
WBU #161	600' FNL & 600' FEL Sec. 1 25N-13W	PRODUCER	2/21/1956	5000	9-5/8" @ 225' CEMENTED W/ 200 SX 5-1/2" @ 4999' CEMENTED W/ 150 SX TOC @ 4315' BY TEMP SURVEY GALLUP PERFORATED 4836-54' FRAC W/ 20,000# SAND & 20,000 GAL OIL
WBU #158	660' FSL & 1980' FWL Sec. 36 26N-13W	PRODUCER	4/29/1956	5050	9-5/8" @ 206' CEMENTED W/ 200 SX 5-1/2" @ 5028' CEMENTED W/ 200 SX TOC @ 4150' BY TEMP SURVEY GALLUP PERFORATED 4873-4896' FRAC W/ 20,000# SAND & 20,000 GAL OIL
WBU #156	1980' FSL & 1980' FEL Sec. 36 26N-13W	PRODUCER	7/22/1956	5028	9-5/8" @ 202' CEMENTED W/ 175 SX 5-1/2" @ 5000' CEMENTED W/ 250 SX TOC @ 3402' BY TEMP SURVEY GALLUP PERFORATED 4923-4876' FRAC W/ 40,000# SAND & 30,000 GAL OIL

CBU #1 P&A DIAGRAM
PLUGGED 1/22/1996

TOPS



FC
930'

PC
1199'

MV
1522'

GALLUP
4572'

10-3/4" @ 173'

PERFORATED @ 223' & PUMP 159 CU FT PLUG DOWN 4-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED @ 1578' & SET CMT RETAINER @ 1524'
PUMPED 251 CU FT PLUG INTO ANNULUS, LEAVE 64 CU FT ON TOP OF RETAINER
TAG @ 865'

SPOT 14 CU FT PLUG @ 3824', TAG @ 3666'

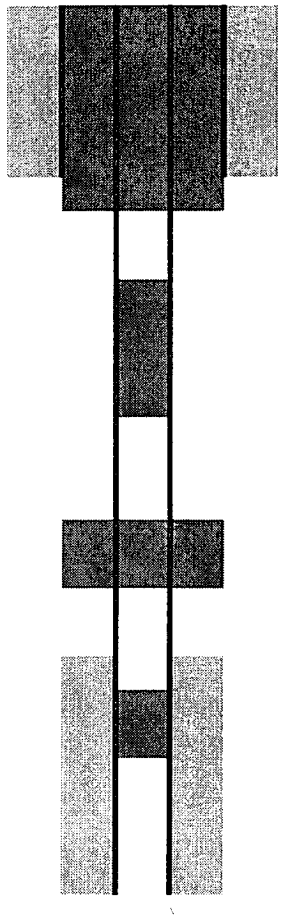
4-1/2" liner @ 3988', cement circulated to surface

STUCK TUBING ANCHOR @ 3858' & 2-3/8" TBG STUB @ 3830'
PERFORATE @ 3800' THROUGH BOTH STRINGS, UNABLE TO PUMP IN

Gallup perfs: 4836-4960'
CMT RETAINER @ 4872'
7" csg @ 5001'
TOC 300' (calc @ 75%)

CBU #81 P&A DIAGRAM
PLUGGED 7/26/2001

TOPS



FC
879'

PC
1180'

MV
1900'

GALLUP
4682'

8-5/8" @ 219'

PERFORATED @ 269' & PUMP 119 CU FT PLUG DOWN 4-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED @ 929' & SET CMT RETAINER @ 865'
PUMPED 59 CU FT PLUG

PERFORATED @ 1230' & SET CMT RETAINER @ 1174'
PUMPED 59 CU FT PLUG

PERFORATED @ 1950' & SET RETAINER @ 1916'
PUMP 59 CU FT OF CMT, TAG @ 1693'

TOC 2395' (temp survey)

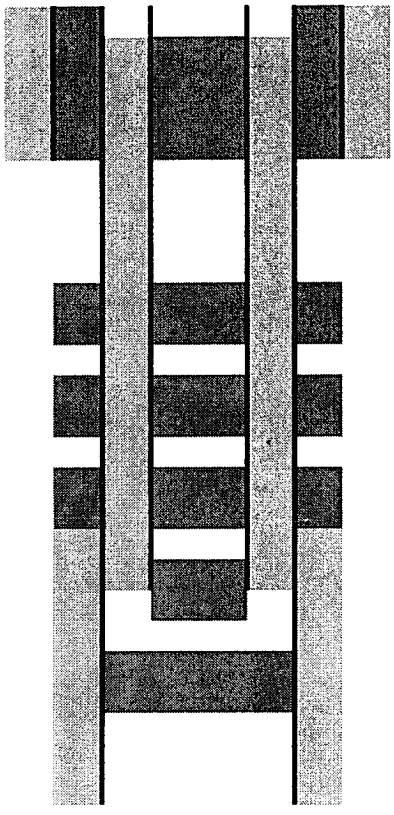
SPOT 13 CU FT OF CMT @ 4632', TAG @ 4517'

Gallup perfs: 4834-4910'

4-1/2" csg @ 5086'

CBU WI #5 P&A DIAGRAM
PLUGGED 8/23/2001

TOPS



FC
887'

PC
1200'

MV
1950'

GALLUP
4671'

10-3/4" @ 209'

PERFORATED @ 259' & PUMP 142 CU FT PLUG DOWN 4-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED @ 937' & SET CMT RETAINER @ 896'
PUMPED 76 CU FT PLUG

PERFORATED @ 1250' & SET CMT RETAINER @ 1205'
PUMPED 76 CU FT PLUG

PERFORATED @ 2000', UNABLE TO PUMP IN
SPOT 18 CU FT @ 2008'

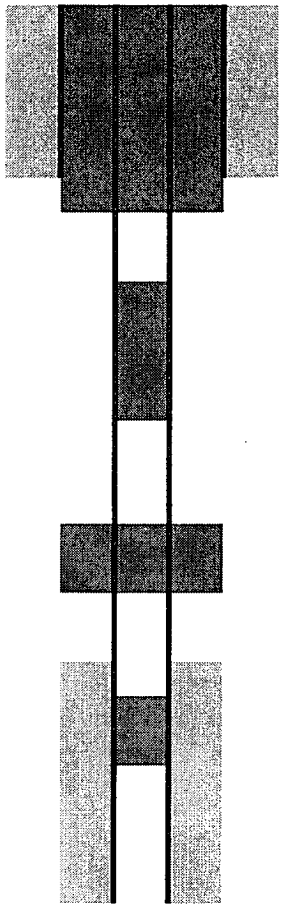
4-1/2" liner @ 3877', cement circulated to surface
PUMP 30 CU FT PLUG @ 3925'

SPOT 52 CU FT OF CMT, TAG @ 4511'

Gallup perfs: 4828-4938'

7" csg @ 5001'
TOC 3700' (temp survey)

TOPS



FC
870'

PC
1180'

MV
1902'

GALLUP
4657'

CBU WI #2 P&A DIAGRAM
PLUGGED 3/19/2002

10-3/4" @ 177'

PERFORATED @ 227' & PUMP 138 CU FT PLUG DOWN 5-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED @ 920' & SET CMT RETAINER @ 880'
PUMPED 57 CU FT PLUG

PERFORATED @ 1230' & SET CMT RETAINER @ 1173'
PUMPED 57 CU FT PLUG

PERFORATED MV @ 1952' & SET RETAINER @ 1922'
PUMP 57 CU FT OF CMT

TOC 3850' (temp survey)

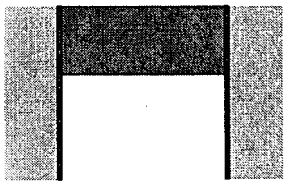
SPOT 52 CU FT OF CMT, TAG @ 4421'

Gallup perfs: 4834-4910'

5-1/2" csg @ 5025'

CBU WI #1 P&A DIAGRAM
PLUGGED 7/22/1974

TOPS



8-5/8" @ 366'

CUT OFF SURFACE CSG 10' BELOW GROUND LEVEL &
SPOT 10SX SURFACE PLUG

PC
1140'

SPOT 40 SX ACROSS PC @ 1140'

CUT 5-1/2" CSG OFF @ 1677' AND PULLED
SPOT 35 SX ACROSS STUB, 1727-1620'

MV
1905'

SPOT 15 SX ACROSS TOP OF POINT LOOKOUT (3630')

PL
3630

TOC 3650' (temp survey)

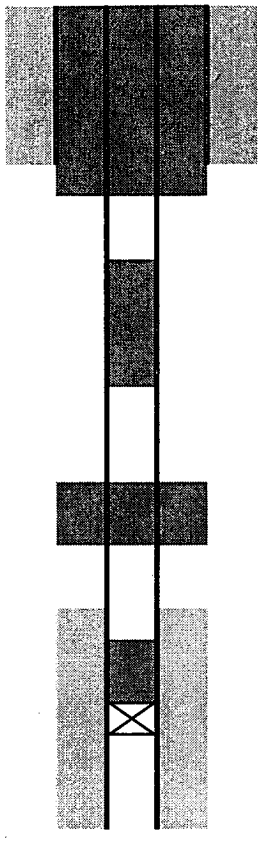
SQZ PERFS W/ 20 SX
CIBP @ 4795'

GALLUP
4836'

Gallup perfs: 4826-47'

5-1/2" csg @ 4973'

TOPS



FC
895'

MV
1960'

GALLUP
4695'

WBU #158 P&A DIAGRAM
PLUGGED 7/9/1998

9-5/8" @ 206'

PERFORATED @ 262' & PUMP 153 CU FT PLUG DOWN 5-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED PC @ 1260' & SET CMT RETAINER @ 1200'
PUMPED 143 CU FT PLUG THROUGH RET. & SPOT 61 CU FT ON TOP FC/PC PLUG FROM 1200-740'

PERFORATED MV @ 2010' & SPOT 54 CU FT PLUG FROM 2828-1655' INSIDE AND OUTSIDE CASING

TOC 4150' (temp survey)

SPOT 27 CU FT OF CMT FROM TOP OF CIBP TO 4580'
CIBP @ 4795'

Gallup perfs: 4873-96'

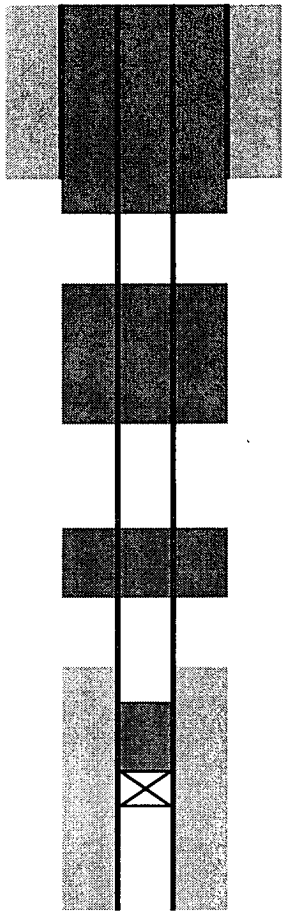
5-1/2" csg @ 5028'

TOPS

FC
872'

MV
2601'

GALLUP
4683'



WBU #161 P&A DIAGRAM
PLUGGED 5/25/1993

9-5/8" @ 225'

PERFORATED @ 275' & PUMP 153 CU FT PLUG DOWN 5-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED PC @ 1264' & SPOT 220 CU FT PLUG FROM 822-1265'

PERFORATED MV @ 2651' & SPOT 77 CU FT PLUG FROM 2451-2665' INSIDE AND OUTSIDE CASING

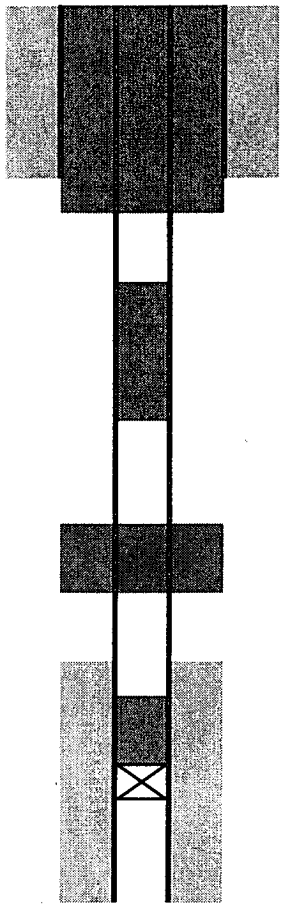
TOC 4315' (temp survey)

CMT FROM TOP OF CIBP TO 4560'
CIBP @ 4800'

Gallup perfs: 4836-54'

5-1/2" csg @ 4999'

WBU #162 P&A DIAGRAM
PLUGGED 6/25/1992



9-5/8" @ 213'

PERFORATED @ 263' & PUMP 162 CU FT PLUG DOWN 5-1/2" CASING & CIRCULATED TO BRADENHEAD

PERFORATED PC @ 1221' & SPOT 130 CU FT PLUG UNABLE TO PUMP IN

PERFORATED MV @ 2000' & SPOT 80 CU FT PLUG FROM 1780-2000 INSIDE AND OUTSIDE CASING

TOC 4200' (temp survey)

SPOT 24 CU FT OF CMT FROM TOP OF CIBP TO 4565'
CIBP @ 4800'

Gallup perfs: 4881-83'

5-1/2" csg @ 4999'

01W663

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W663

FARMINGTON LAB

GENERAL INFORMATION

OPERATOR: DUGAN PRODUCTION
WELL: WBU WTR INJ. PLANT
FIELD:
SUBMITTED BY: J. ALEXANDER
WORKED BY : M. LOGAN
PHONE NUMBER: 327-6222

DEPTH:
DATE SAMPLED: 09/27/99
DATE RECEIVED: 09/28/99
COUNTY: SAN JUAN STATE: NM
FORMATION:

SAMPLE DESCRIPTION

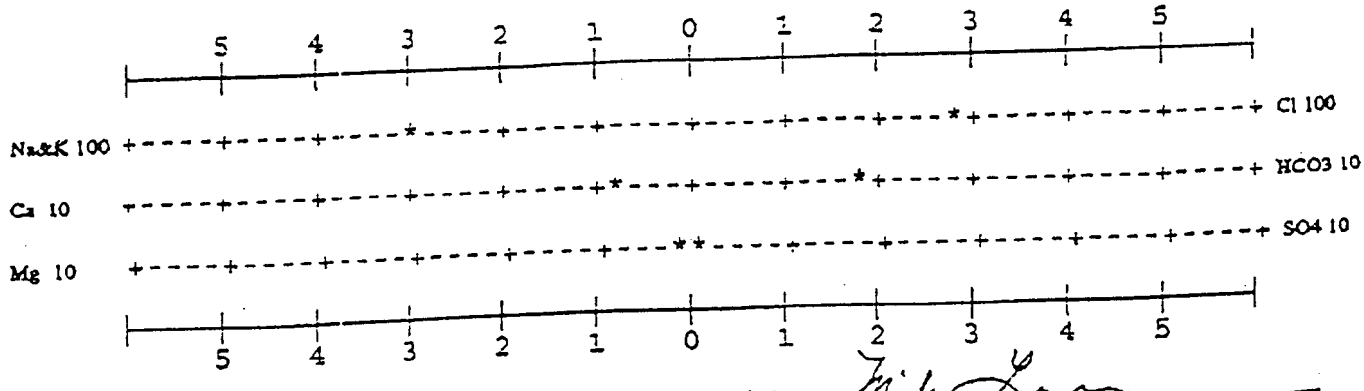
WBU WTR INJECTION PLANT
Sample date: 9/27/99

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.010 @ 66°F	PH:	7.43
RESISTIVITY (MEASURED):	0.440 ohms @ 66°F		
IRON (FE++) :	3 ppm	SULFATE:	0 ppm
CALCIUM:	167 ppm	TOTAL HARDNESS	515 ppm
MAGNESIUM:	24 ppm	BICARBONATE:	1,063 ppm
CHLORIDE:	10,180 ppm	SODIUM CHLORIDE(Calc)	16,745 ppm
SODIUM+POTASS:	9,134 ppm	TOT. DISSOLVED SOLIDS:	20,892 ppm
IODINE:		POTASSIUM: 23 ppm	

REMARKS

STIFF TYPE PLOT (IN MEQ/L)



ANALYST Mike Logan
M. LOGAN

WBU #157 Conversion

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Bertha Spencer
Bureau of Indian Affairs
Realty Section
P.O. Box 1060
Gallup, NM 87305

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☑ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☑ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7002 2410 0001 0133 9850

PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-0835

WBU #157 Investor

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Elm Ridge Resources
P.O. Box 189
Farmington, NM 87499-0189

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☑ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☑ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7002 2410 0001 0133 8495

PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-0835

WBU #157 Investor

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Questar Petroleum
Independence Plaza
1050 17th Street, Suite 500
Denver, CO 80202

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☑ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☑ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7002 2410 0001 0133 8488

PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-0835

dugan production corp.

February 24, 2003

CERTIFIED MAIL RECEIPT
7002 2410 0001 0133 8488

Questar Petroleum
Independence Plaza
1050 17th Street, Suite 500
Denver, CO 80202

Re: Conversion of West Bisti Unit #157 to
Water Injection Service

Dear Ladies/Gentlemen:

This is your notification, as offsetting operator that Dugan Production Corp. has applied to the New Mexico Oil Conservation Division for conversion of the West Bisti Unit No. 157 from Gallup formation oil producer to Gallup formation waterflood injection well. The well is located at 660 FEL & 660 FSL, Section 36, T26N, R13W, San Juan County, NM. The same interval currently used for production will be used as the injection interval. A copy of the application is attached. You must notify the NMOCD at 1220 South St. Francis Drive, Santa Fe, NM 87505 within 15 days if you object to this application.

Sincerely,

Hank Baca
Petroleum Engineer

HB/tmf

attachment

709 E. MURRAY DR. • P. O. BOX 420 • FARMINGTON, N.M. 87499-0420 • PHONE: (505) 325-1821 • FAX# (505) 327-4613

AFFIDAVIT OF PUBLICATION

Ad No. 47492

STATE OF NEW MEXICO
County of San Juan:

CONNIE PRUITT, being duly sworn says: That she is the Advertising Manager of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meeting of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication on the following day(s): Monday, February 24, 2003.

And the cost of the publication is $27.05

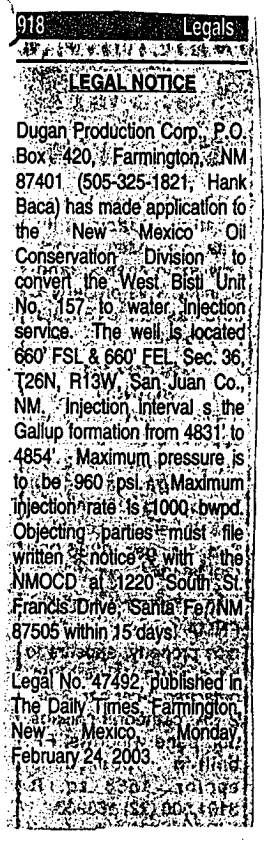
Connie Pruitt

ON 2-26-03 CONNIE PRUITT appeared before me, whom I know personally to be the person who signed the above document.

Ginny Beck

My Commission Expires April 2, 2004.

COPY OF PUBLICATION



918 Legals

LEGAL NOTICE

Dugan Production Corp., P.O. Box 420, Farmington, NM 87401 (505-325-1821, Hank Baca) has made application to the New Mexico Oil Conservation Division to convert the West Bisti Unit No. 157 to water injection service. The well is located 660' FSL & 660' FEL, Sec. 36, T26N, R13W, San Juan Co., NM. Injection interval is the Gallup formation from 4831' to 4854'. Maximum pressure is to be 960 psi. Maximum injection rate is 1000 bwpd. Objecting parties must file written notice with the NMOCD at 1220 South St. Francis Drive, Santa Fe, NM 87505 within 15 days.

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