

GOVERNOR

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION HOBBS DISTRICT OFFICE

3/ 23

POST OFFICE BOX 1980 HOBBS, NEW MEXICO 88241-1980 (505) 393-6161

OIL CONSERVATION DIVISION P. O. BOX 2088 SANTA FE, NEW MEXICO 87501

RE:	Proposed:
	MC
	DHC
	NSL
	NSP
	SWD
	WFX /
	PMX

Gentlemen:

I have examined the application for the: <u>Strata Production Co Gramme 2M State</u> <u>1-E</u> 16-75-346 Operator Lease & Well No. Unit S-T-R API = 30.041.207.

and my recommendations are as follows:

Chris OK.

Yours very truly,

Chris Williams Supervisor, District 1

/ed



TELEPHONE (505) 622-1127 FACSIMILE (505) 623-3533



200 WEST FIRST STREET, ROSWELL PETROLEUM BUILDING, SUITE 700 ROSWELL, NEW MEXICO 88201

March 2, 2000

Oil Conservation Division ATTN: Michael E. Stogner 2040 South Pacheco Street Santa Fe, New Mexico 87505

> Re: Proposed Salt Water Disposal Well Yates Petroleum Gramma ZM State #1 1650' FNL & 330' FWL Section 16-7S-34E Roosevelt County, New Mexico

Gentlemen:

Strata Production Company proposes converting the captioned well for water disposal of produced water from the Chaveroo NE Field San Andres formation into the San Andres formation. Please find enclosed the following data pertinent to the Application:

- 1. Form C-108
- 2. Attachment "A" Well Data
- 3. Attachment "B" Present Wellbore Schematic
- 4. Attachment "C" Proposed Wellbore Schematic
- 5. Attachment "D" Area of Review Plat
- 6. Attachment "E" Area of Review Well Data
- 7. Attachment "F" Operation Data
- 8. Attachment "G" Geologic Data
- 9. Attachment "H" Stimulation Program
- 10. Attachment "I" Log of Proposed Disposal Zone
- 11. Attachment "J" Fresh Water Analysis
- 12. Attachment "K" Affirmative Statement
- 13. Attachment "L" Proof of Notice

Should you have any questions regarding this matter, please contact this office.

Sincerely,

STRATA PRODUCTION COMPANY

Carol J. Garcia ^{*k*} Production Records Manager

CJG:ms Enclosures

	GAM 94			
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ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

ADMINISTRATIVE APPLICATION COVERSHEET

		THIS COVE	RSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS
Applica	ation Acro	רם (DHC-D (PC)	[NSP-Non-Standard Proration Unit] [NSL-Non-Standard Location] [DD-Directional Drilling] [SD-Simultaneous Dedication] ownhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling] C-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement] [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion] [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase] Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]
[1]	TYPE	OF AP [A]	PLICATION - Check Those Which Apply for [A] Location - Spacing Unit - Directional Drilling NSL INSP DD ISD
		Check [B]	One Only for [B] or [C] Commingling - Storage - Measurement DHC CTB PLC PC OLS OLM
			Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
[2]	NOTI	F ICAT [A]	ON REQUIRED TO: - Check Those Which Apply, or Does Not Apply Working, Royalty or Overriding Royalty Interest Owners
		[B]	I Offset Operators, Leaseholders or Surface Owner
		[C]	X Application is One Which Requires Published Legal Notice
		[D]	Notification and/or Concurrent Approval by BLM or SLO U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
		[E]	E For all of the above, Proof of Notification or Publication is Attached, and/or,
		ſFÌ	U Waivers are Attached

[3] INFORMATION / DATA SUBMITTED IS COMPLETE - Statement of Understanding

I hereby certify that I, or personnel under my supervision, have read and complied with all applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common. I further verify that all applicable API Numbers are included. I understand that any omission of data, information or notification is cause to have the application package returned with no action taken.

Note: Statement must be completed by an individual with supervisory capacity.

Carol J. Garcia Print or Type Name Carol J. Darcia

<u>Darcia</u> Production Records Manager 3/2/00 Title Date

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

OIL CONSERVATION DIVISION 2040 SOUTH PACHEC() SANTA FE, NEW MEXICO & 505

APPLICATION FOR AUTHORIZATION TO INJECT

I.	PURPOSE: Secondary Recovery Pressure Maintemance X Disposal Storage Application qualifies for administrative approval? Yes No
П.	OPERATOR: Strata Production Company
	ADDRESS: P. O. Box 1030, Roswell, New Mexico 88202-1030
	CONTACT PARTY: Carol J. Garcia PHONE: 505-622-1127
Ш.	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.
I۷.	Is this an expansion of an existing project?YesXNo 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:
	 Proposed average and maximum daily rate and volume of fluids to be injected; Whether the system is open or closed; Proposed average and maximum injection pressure; Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and, 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.).
* V III.	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:Carol J. GarciaTITL 3: Production Records Manager
	NAME: Carol J. Garcia TITL 3: Production Records Manager SIGNATURE: Carol J. Garcia DATE: March 2, 2000
*	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

Side 2

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, too 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 scal 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 the 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, 2040 South Pacheco, Santa Fe, New Mexico 87505, 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.

ATTACHMENT "A"

III. Well Data

Section A

- Lease Name: Gramma ZM State #1
 Location: 1650' FNL & 330' FWL, Section 16-7S-34E Roosevelt County, New Mexico
- 2. Casing and Cement

EXISTING

<u>Casing Size</u>	Setting Depth	Sacks Cement	<u>Hole Size</u>	Top of Cement
8 5/8"	1916'	950	12 1/4"	Circ to Surface
5 1/2"	4547'	200	7 7/8"	Circ to Surface

NOTE: Cut and pulled 5 1/2" casing at 2500'.

PROPOSED

Casing Size	Setting Depth	Sacks Cement	<u>Hole Size</u>	Top of Cement
8 5/8"	1916'	950	12 1/4"	Circ to Surface
5 1/2"	4547'	200	7 7/8"	Circ to Surface

3. Tubing: 2 3/8" internally plastic coated set at 4372'.

4. Packer: Baker Model R plastic coated set at 4375'.

ATTACHMENT "A" CONTINUED

Section B

1. Injection Formation: San Andres

Field or Pool Name: Chaveroo

- 2. Injection Interval: San Andres interval 4436'-4486' perforated.
- 3. Original Purpose of Well: Drilled to test San Ardres Formation
- 4. Other Perforated Intervals, Bridge Plugs, Cement Plugs:

CIBP is set at 4350' with a 5 sack cement cap Cement Plugs are set at 2550', 1980', 39' to Surface

5. Next Higher Oil and Gas Zone: None

Next Lower Oil and Gas Zone: Penn

Present and Proposed Configuration Schematics ATTACHMENT "B" AND ATTACHMENT "C".

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PERFS - 4436, 37.5, 39, 40.5, 48, 49.5, 51, 51.5, 54, 55, 56, 57.5, 66, 67.5, 69, 72, 73.5, 75, 78, 79.5, 81, 82, 83, 84.5 & 86 25 SHOTS 5 1/2" @ 4547' CMT. W/ 200 Sx. 5 1/2" X 7 7/8" = .2019 CU. FT./FT.	CIBP @ 4350' W/ 5 SX. CEMENT	TOP OF SAN ANDRES @ 3680'	T.O.C. @ +/- 3500'	CEMENT PLUG 2371-2550', 50 SX. CASING CUT @ 2500' AND PULLED	CEMENT PLUG 1795-1980', 50 SX. 85/8" @ 1916' 950 sx. Cmt. CIRC.	VATES PETROLEUM CORPORATION GRAMMA "ZM" STATE #1 1650' FNL & 330' FWL SECTION 16-T7S-R34E ROOSEVELT COUNTY, NEW MEXICO LEASE No.: V-2559 SPUD DATE 4/24/84	ATTACHMENT "B"	10 SX PLUG, SURFACE TO 39'

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PERFS - 4436, 37.5, 39, 40.5, 48, 49.5, 51, 51.5, 54, 55, 56, 57.5, 66, 67.5, 69, 72, 73.5, 75, 78, 79.5, 81, 82, 83, 84.5 & 86 25 SHOTS 5 1/2" @ 4547' CMT. W/ 200 Sx. 5 1/2" X 7 7/8" = .2019 CU. FT./FT.	2 3/8" 4.7#/FT. PLASTIC COATED TUBING BAKER MODEL "R" PACKER @ +/-4375'	T.O.C. @ +/- 3500' TOP OF SAN ANDRES @ 3680'		85/8" @ 1916' 950 sx. Cmt. CIRC.	ROOSEVELT COUNTY, NEW MEXICO LEASE No.: V-2559 SPUD DATE 4/24/84	GRAMMA "ZM" STATE #1 1650' FNL & 330' FWL SECTION 16-T7S-R34E	STRATA PRODUCTION COMPANY	ATTACHMENT "C"	PROPOSED CONFIGURATION

ATTACHMENT "D"

V. LEASE AND WELL MAP

Area of Review wells within $\frac{1}{2}$ mile and 2 mile radius. ATTACHMENT "D-1"

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•	Yates Pet, et al. 18:10:34 19:10:34 19:20 19:20 19:20 19:20 19:20 19:20 10:20	(S.E.Wisdom) to SA DGSC	(Strata Prod) (Strata Prod) 7:5 97 E.H.E. 'Sleber' H.C.Sicber M.Markhem M. Parkey 17	Vares Pri, etal + 1:557 - 7:557 - 7:5	U.S. V.I.	U.S. Ronger
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	12 3 21,200 1160 44 1183 35 22 14 30 00000 front r 2 10 4500 1000 9 Jugan Prod. 9 Jugan Prod. 10 10 17 4 10 10 1	11 / - 11/1 12 31/1.34 Tates Pec J 10.1-33 J Yates Pet, rk 10.4-38 J 31. 90 41336 1.36 J 1.64 J	T.E. Ooris, Jr. etal	ROC	SECTION 16 SECTION 16 SEVELT COUNT ATTACHMEN	-7S-34E Y, NEW MEXICO
• '	CHAVEROO(SA)UNIT DUGAN PROD.(OPER.)		Eastland Oil 10-11-34 10-1-93 VA-254 VA-129 1682	5 . 8 5 . 7		

ATTACHMENT "E"

JI. AREA OF REVIEW WELL DATA

			TYPE						
WELL			OF	SPUD	COMP	TD	COMP	PROD	
NAME	OPERATOR	LOCATION	WELL	DATE	DATE	PBTD	INTERVAL	FORM	CASING PROGRAM
Metzger #2	Permian Resources	1980' FNL & 1980' FEL Section 17-7S-34E	Oil	10/10/83 11/12/83	11/12/83	4382'	4230'-4248'	SA	8 5/8" at 1700', 750 sx, Circ 4 1/2" at 4382', 1450 sx, Circ
Metzger #3 Permian Resourc	Permian Resources	567' FNL & 1787' FEL Section 17-7S-34E	Oil	11/19/83	1/3/84	4390' 4347'	4223'-4263'	SA	8 5/8" at 1930', 750 sx, Circ 4 1/2" at 4390', 1580 sx, Circ
Metzger #4 Permian Resource	Permian Resources	1980' FNL & 853' FEL Section 17-7S-34E	Oil	3/31/84	5/14/84	4518' 4469'	4366'-4386'	SA	8 5/8" at 1648', 750 sx, Circ 4 1/2" at 4518', 1525 sx, Circ
Metzger #6 Permian Resourc	Permian Resources	660' FNL & 853' FEL Section 17-7S-34E	Oil	5/13/84	7/25/84	4550' 4440'	4299'-4336'	SA	8 5/8" at 1663', 750 sx, Circ 4 1/2" at 4549', 1685 sx, Circ

ATTACHMENT "F"

VII. OPERATION DATA

1.	Proposed Average Daily Injection Volume:	100 BWPD
	Proposed Maximum Daily Injection Volume:	200 BWPD
2.	The system will be closed.	
3.	Proposed Average Daily Injection Pressure:	200 Psi
	Proposed Maximum Daily Injection Pressure:	500 psi

4. Sources of injection water will be produced water from area San Andres wells that have been drilled and subsequent proposed well drilled on the Sunrise Federal lease.

List of Produced Water Source Wells:

Sunrise Federal Lease Section 21-7S-34E, Roosevelt County, New Mexico Well #1 and subsequent proposed wells to be drill in this section.

Water analysis from nearby San Andres production were taken from the water tanks adjacent to the Sunrise Federal #1 and Metzger Battery. ATTACHMENTS "F-1" and "F-2".

5. Chlorides in all of the source wells is expected to be similar to the water analysis in ATTACHMENTS "F-1" and "F-2".

YATES PE	TA PRODUCTION COMI FROLEUM GRAMMA ZM S 1650' FNL & 330' FWL SECTION 16-7S-34E EVELT COUNTY, NEW MEX ATTACHMENT "F-1"		
Company: Strata Lease & Well: Sec 21 Tank Btry Sunrise Fee County, State: T7S-R34E, Roosevelt Count Formation: BHT (F):	deral #1 Service Point: hty, NM Prepared by: Prepared for:	HSY2K035 HNM LAB Greg Daniel Lynn Northcutt 12/7/00	
Specific gravity:	75degrees F	ph5.80	
An	ons	Ionic Strength	
FactormlSampleChlorides354520.60.5Sulfates2020Carbonates492492Bicarbonates10000.31Hydroxide2791	700 0.0208 14.56 0 0.0333 0.00	(mg/l) (me/l) 2.0448 2.0594 0.0147 0.0146 0.0000 0.0000 0.0024 0.0025 0.0000 0.0000	(ppm) 124513 597 0 256 0
	ions	Ionic Strength	
Factor ml Sample Barium 01 01 01 Calcium 10001 25.5 0.5 Magnesium 606 11.0 0.5 Iron	mg/l Factor me/l 0 0.0148 0.00 51000 0.0499 2544.90 13332 0.0823 1097.22 1500 0.0358 53.70	(mg/l) (me/l) 0.0000 0.0000 2.5500 2.5449 1.0932 1.0972 0.0120 0.0269	(ppm) 0 43478 11366 1279 #VALUE!
Total Dissolved Solids	212886 8276.41 Total lonic Strength:		
Calcium Carbonate Deposition Stiff-Davis Equation: Stability In			
pH= 5.80 pCa= -0.12 pAlk= 2.60 K= 1.31	Total Ion Equivalent NaCl Conc	entration= #VALUE! p	nqq
SI= 2.01	The Stiff-Davis equation predicts have a tendency toward calcium	this water does carbonate deposition.	
Calcium Sulfate Deposition CaSO4 Solubility: S = 1000] (SQRT (X**2 + 4*K) - X)		
Total Ionic Strength= #VALUE Solubility Constant, K= 0.00290 X= 1.267)		
S= 4. <u>57</u> me/i	Laboratory analysis shows that th 14.56 me/l, therfore the tend sulfate deposition does	is water contains lency towards calcium exist.	

Dowell Schlumberger Hobbs District Laboratory

STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL **SECTION 16-7S-34E** ROOSEVELT COUNTY, NEW MEXICO ATTACHMENT "F-2"

Company:	Strala		Report No.:	FSY2K034		
Lease & Well: Sec 17 Tank Btry Metzger County, State:T7S-R34E, Roosevelt County, N Formation: BHT (F):		NM	Service Point: Prepared by: Prepared for: Date:	HNM LAB Greg Daniel Lynn Northcutt 2/7/00		
Spec	sific gravity: <u>1.076</u>	75	_degrees F	ph6.80		

	Anions					Ionic Strength			
	Factor	m	Sample	mg/l	Factor	me/l	(mg/l)	(mc/l)	(ppm)
Chlorides	3545	11.3	<u> </u>	40059	0.0282	1129.65	0.5608	0.5648	37229
Sulfates	201			1330	0.0208	27.66	0.0279	0,0277	1236
Carbonates	492	· · ·		0	0.0333	0.00	0.00001	0.0000	0
Bicarbonates	10001	0.7	1	700	0.0164	11.48	0.0056	0.0057	651
Hydroxide	279			0	0.0588	0.00	0.0000	0.0000	0

	Cations				Ionic Strength				
	Factor	m	Sample	mg/l	Factor	me/l	(mg/l)	(me/l)	(ppm).
Barium				Ö	0.0148	0.00	0.0000	0.0000	0
Calcium	1000	14.6	0.5	29200	0.0499	1457.08	1.4600	1.4571	27138
Magnesium	606	4.1	0,5	4969.2	0.0823	408.97	0,4075	0.4090	4618
Iron				Ö	0.0358	0.00	0.0000	0.0000	0
Sodium	0	0	0		0.0435	-697.25	#VALUE!	-0.3486	#VALUE!

2337.59 Total Dissolved Solids: 76257.7 2.1156 Total Ionic Strength: #VALUE!

Calcium Carbonate Deposition Stiff-Davis Equation: Stability Index(SI) = pH - pCa - pAlk - K

pH≖ pCa=				
pAlk=		Total Ion Equivalent NaCl Concentration=	#VALUE!	ppm
K=	1.31			
SI=	3.13	The Stiff-Davis equation predicts this water		

The Stiff-Davis equation predicts this w have a tendency toward calcium carbonate deposition.

Calcium Sulfate Deposition CaSO4 Solubility: S = 1000 (SQRT (X**2 + 4*K) - X) Total Ionic Strength= #VALUE! Solubility Constant, K= 0.00290 0.7162 X= Laboratory analysis shows that this water contains S= 8.05 me/l 27.66 me/l, therfore the tendency towards calcium does exist. sulfate deposition

ATTACHMENT "G"

VIII. GEOLOGIC DATA

A. Injection Zone:

The San Andres has a thickness in excess of 1400'. In this disposal well, the top of the formation is at 3680'. The formation is dolomite.

The zone is characterized by light brown to brown, very fine to fine crystalline, oolitic, slightly anhydritic dolomite with vugular, inter-crystalline and fracture porosity.

B. Fresh Water Sources:

The Ogallala, Cretaceous and Alluvium Aquifers occurs between 200 and 300 feet from the surface.

ATTACHMENT "H"

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IX. Stimulation Program

No stimulation is planned.



STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL SECTION 16-7S-34E Schlumberger Doweil ROOSEVELT COUNTY, NEW MEXICO Hobbs District Laboratory ATTACHMENT "J" HSY2K033 Report No .: Company: Strata HNM LAB Service Point: Lease & Well: Fresh Water Well Greg Daniel County, State: Sec 8-7S-34E, Roosevelt County, NMPrepared by: Lynn Northcutt Prepared for: Formation: 2/7/00 Date: BHT (F): 6,70 ph 75 degrees F Specific gravity: 1.000 lonic Strength Anions (mg/l) (mc/l)(npm) Factor me/l Sample Factor ml mg/l 0.0040 284 0.0040 0.0282 8.00 Chlorides 3545 0.8 10 284 300 0.0062 0.0208 6,24 0.0063 300 Sulfates 20 0.0000 ō 0.0000 0.0333 0.00 492 0 Carbonales 150 0.0012 0.0012 2.46 10 150 0.0164 1000 1.5 Bicarbonates 0.0000 0 0.00 0.0000 0.0588 279 0 Hydroxide Ionic Strength Cations (mg/l) · · · (me/l) (ppm) Factor me/l Factor Sample mġ/l ml 0 0.0000 0.0000 0.0148 0.00 0 Barium 0 200 0.0100 0.0100 0.0499 9.98 200 Calcium 1000 21 10 0.0065 79 0.0065 6.48 1.3 10 78.78 0.0823 606 Magnesium 0,0000 0 0.0000 0 0.0358 0.00 tron 5 0.0435 0.23 0.0001 0.0001 0 0 5 Sodium 0 33,40 Total Dissolved Solids: 1017.758 0.0280 0.0280 Total lonic Strength: Calcium Carbonate Deposition Stiff-Davis Equation: Stability Index(SI) = pH - pCa - pAlk - K 6.70 pH≠ 2.29 pCa= 827.0376 ppm Total Ion Equivalent NaCl Concentration= pAlk= 2.90 K= 1.31 The Stiff-Davis equation predicts this water does SI= 0.20 have a tendency toward calcium carbonate deposition. Calcium Sulfate Deposition S = 1000 (SQRT (X**2 + 4*K) - X) CaSO4 Solubility: 0.0280 Total Ionic Strength= Solubility Constant, K= 0.00290 0.0019 X= Laboratory analysis shows that this water contains S= 105.84 me/l me/l, therfore the tendency towards calcium 6.24 does not exist. sulfate deposition

ATTACHMENT "K"

XII. AFFIRMATIVE STATEMENT

The Undersigned has examined all geologic and engineering data available for the Chaveroo San Andres field and finds no evidence of open faults and other hydrologic connection between the disposal zone and any underground drinking water sources.

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George L Scott gr

George L. Scott, Jr. Petroleum Geologist

ATTACHMENT "L"

XIII. PROOF OF NOTICE

Section A

List of Surface Owners Within 1/2 Mile Radius:

Canaan Land and Cattle P. O. Box 1267 Portales, New Mexico 88131-1267 ATTACHMENT "L-1"

List of Leasehold Operators Within ½ Mile Radius:

Permian Resources Inc. P. O. Box 590 Midland, Texas 79702-0590 ATTACHMENT "L-2"

Yates Petroleum Corporation 105 S. Fourth Street Artesia, New Mexico 88210 ATTACHMENT "L-3"

List of Mineral Owners:

New Mexico State Land Office P. O. Box 1148 Santa Fe, New Mexico 87504-1148 ATTACHMENT "L-4"

Section **B**

Legal Notice

Portales News Tribune P. O. Box 848 Portales, New Mexico 88131-0848 ATTACHMENT "L-5"

NOTE: A copy of the legal advertisement will be forwarded upon receipt.



TELEPHONE (505) 622-1127 FACSIMILE (505) 623-3533

200 WEST FIRST STREET, ROSWELL PETROLEUM BUILDING, SUITE 700 ROSWELL, NEW MEXICO 88201 March 2, 2000

CERTIFIED/RETURN RECEIPT REQUESTED

Canaan Land & Cattle P. O. Box 1267 Portales, New Mexico 88131-1267

> Re: Convert to Salt Water Disposal Well Yates Petroleum Gramma ZM State #1 1650' FNL & 330' FWL Section 16-7S-34E Roosevelt County, New Mexico

Gentlemen:

Strata Production Company has filed a Form C-108 Application For Authorization to Inject with the New Mexico Oil Conservation Division for authority to re-inject water produced from the Chaveroo, NE field into the San Andres formation.

As a surface owner within one-half mile of the above referenced well and pursuant to the rules and regulations of the NMOCD, enclosed please find a copy of the Application.

All interested parties opposing the Application must file objections or requests for hearing with the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505 within 15 days. Additional information can be obtained by contacting Mr. Frank Morgan, Strata Production Company, P. O. Box 1030, Roswell, New Mexico 88202-1030 or 505-622-1127.

If you have no opposition to the Application, please so indicate by executing one copy of this letter in the space provided and return it to the undersigned.

Sincerely,

STRATA PRODUCTION COMPANY

Celo-C J. Saluca

Carol J. Garcia Production Records Manager

CANAAN LAND & CATTLE has no opposition

By:_____ Dated:_____ STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL SECTION 16-7S-34E ROOSEVELT COUNTY, NEW MEXICO ATTACHMENT "L-1"



TELEPHONE (505) 622-1127 FACSIMILE (505) 623-3533

200 WEST FIRST STREET, ROSWELL PETROLEUM BUILDING. SUITE 700 ROSWELL, NEW MEXICO 88201

March 2, 2000

CERTIFIED/RETURN RECEIPT REQUESTED

Permian Resources Inc. P. O. Box 590 Midland, Texas 79702-0590

> Re: Convert to Salt Water Disposal Well Yates Petroleum Gramma ZM State #1 1650' FNL & 330' FWL Section 16-7S-34E Roosevelt County, New Mexico

Gentlemen:

Strata Production Company has filed a Form C-108 Application For Authorization to Inject with the New Mexico Oil Conservation Division for authority to re-inject water produced from the Chaveroo, NE field into the San Andres formation.

As an operator of an oil and gas lease within one-half mile of the above referenced well and pursuant to the rules and regulations of the NMOCD, enclosed please find a copy of the Application.

All interested parties opposing the Application must file objections or requests for hearing with the Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505 within 15 days. Additional information can be obtained by contacting Mr. Frank Morgan, Strata Production Company, P. O. Box 1030, Roswell, New Mexico 88202-1030 or 505-622-1127.

If you have no opposition to the Application, please so indicate by executing one copy of this letter in the space provided and return it to the undersigned.

Sincerely,

STRATA PRODUCTION COMPANY

Carol 4.7

Carol J. Garcia Production Records Manager

PERMIAN RESOURCES INC. has no opposition

By:_____ Dated:_____ STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL SECTION 16-7S-34E ROOSEVELT COUNTY, NEW MEXICO ATTACHMENT "L-2"



TELEPHONE (505) 622-1127 FACSIMILE (505) 623-3533

200 WEST FIRST STREET, ROSWELL PETROLEUM BUILDING SUITE 700 ROSWELL, NEW MEXICO 88201

March 2, 2000

CERTIFIED/RETURN RECEIPT REQUESTED

Yates Petroleum Corporation 105 South Fourth Street Artesia, New Mexico 88210

> Re: Convert to Salt Water Disposal Well Yates Petroleum Gramma ZM State #1 1650' FNL & 330' FWL Section 16-7S-34E Roosevelt County, New Mexico

Gentlemen:

Strata Production Company has filed a Form C-108 Application For Authorization to Inject with the New Mexico Oil Conservation Division for authority to re-inject water produced from the Chaveroo, NE field into the San Andres formation.

As an operator of an oil and gas lease within one-half mile of the above referenced well and pursuant to the rules and regulations of the NMOCD, enclosed please find a copy of the Application.

All interested parties opposing the Application must file objections or requests for hearing with the Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505 within 15 days. Additional information can be obtained by contacting Mr. Frank Morgan, Strata Production Company, P. O. Box 1030, Roswell, New Mexico 88202-1030 or 505-622-1127.

If you have no opposition to the Application, please so indicate by executing one copy of this letter in the space provided and return it to the undersigned.

Sincerely,

STRATA PRODUCTION COMPANY

Carol J. Saua

Carol J. Garcia Production Records Manager

YATES PETROLEUM CORPORATION has no opp

By:_____ Dated:_____ STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL SECTION 16-7S-34E ROOSEVELT COUNTY, NEW MEXICO ATTACHMENT "L-3"



TELEPHONE (505) 622-1127 FACSIMILE (505) 623-3533

200 WEST FIRST STREET, ROSWELL PETROLEUM BUILDING SUITE 700 ROSWELL, NEW MEXICO 88201

March 2, 2000

CERTIFIED/RETURN RECEIPT REQUESTED

New Mexico State Land Office P. O. Box 1148 Santa Fe, New Mexico 87504-1148

> Re: Convert to Salt Water Disposal Well Yates Petroleum Gramma ZM State #1 1650' FNL & 330' FWL Section 16-7S-34E Roosevelt County, New Mexico

Gentlemen:

Strata Production Company has filed a Form C-108 App ication For Authorization to Inject with the New Mexico Oil Conservation Division for authority to re-inject water produced from the Chaveroo, NE field into the San Andre's formation.

As the mineral owner within one-half mile of the above referenced well and pursuant to the rules and regulations of the NMOCD, enclosed please find a copy of the Application.

All interested parties opposing the Application must file objections or requests for hearing with the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505 within 15 days. Additional information can be obtained by contacting Mr. Frank Morgan, Strata Production Company, P. O. Box 1030, Roswell, New Mexico 88202-1030 or 505-622-1127.

If you have no opposition to the Application, please so indicate by executing one copy of this letter in the space provided and return it to the undersigned.

Sincerely,

STRATA PRODUCTION COMPANY

Caral J. Sarca

Carol J. García Production Records Manager

NEW MEXICO STATE LAND OFFICE has no or

By:_____ Dated:_____ STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL SECTION 16-7S-34E ROOSEVELT COUNTY, NEW MEXICO ATTACHMENT "L-4"

STRATA PRODUCTION COMPANY YATES PETROLEUM GRAMMA ZM STATE #1 1650' FNL & 330' FWL SECTION 16-7S-34E ROOSEVELT COUNTY, NEW MEXICO ATTACHMENT "L-5"

LEGAL NOTICE

Strata Production Company has filed Form C-108 Application For Authorization to Inject with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well is the Yates Petroleum Gramma ZM State #1 located 1650' FNL and 330' FWL, Section 16, Township 7 South, Range 34 East, NMPM, Roosevelt County, New Mexico. Disposal water will be sourced from area wells producing from the San Andres formation. The disposal water will be injected into the San Andres formation at a depth of 4436' to 4486', a maximum surface pressure of 500 PSI and a maximum rate of 200 BWPD.

All interested parties opposing the action must file objections or requests for hearing with the Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505 within 15 days. Additional information can be obtained by contacting Frank Morgan, Vice President, P. O. Box 1030, Roswell, New Mexico 88202-1030 or 505-622-1127.



TELEPHONE (505) 622-1127 FACSIMILE (505) 623-3533

200 WEST FIRST STREET, ROSWELL PETROLEUM BUILDING, SUITE 700 ROSWELL, NEW MEXICO 88201

March 2, 2000

Portales News Tribune P. O. Box 848 Portales, New Mexico 88131-0848

Re: Legal Publications

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Gentlemen:

Enclosed herewith please find a Legal Notice to be published one (1) time only in your newspaper at the earliest possible date.

Please forward an Affidavit of Publication along with your invoice to:

Strata Production Company ATTN: Carol J. Garcia P. O. Box 1030 Roswell, New Mexico 88202-1030

Should you have any questions regarding this matter, please contact this office. Thank you for your cooperation.

Sincerely,

STRATA PRODUCTION COMPANY

Carol D. Salai

Carol J. Garcia Production Records Manager

CJG:ms Enclosure