STATE OF NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT 2040 Pacheco St. JWD Santa Fe, NM 87505

PUBLIN C-100 Revised 7-1-81

5|14|99 744

Submitted by: <u>MEWBOURNE OIL COMPANY</u> Hearing Date: <u>September 29, 2016</u>

APPLICATION FUR AUTHURIZATION TO INJECT	PPLICATION	FOR AUTHORIZ	ZATION TO INJECT
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т	PURPOSE: Secondary Recovery Pressure Maintenance XX Disposal Storage
24	Application qualifies for administrative approval? XXYes No
IJ.	OPERATOR: Griffin Petroleum Company
	ADDRESS: 550 W. Texas Suite 1240 Midland. TX 79701
	CONTACT PARTY: PHONE: (915) 687-104
Ш.	WELL DATA: Complete the data required on the reverse side of this form for each well processed for injection. Additional sheets may be attached if necessary.
IV.	Is this an expansion of an existing project: Yes XX No 29
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 ponetrate 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 of 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 (squifers containing waters with total dissolved solids concentrations of 10,000 mg/1 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.
ХЦ.	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.
хш.	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: Eric Griffin TTTLE: Vice President
	SIGNATURE: The DATE: 4-27-99
*	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 circumstance of the earlier submittalBEFORE THE OIL CONSERVATION DIVISION Santa Fe, New Mexico Exhibit No. 3

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

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Griffin Detroleum Company

Form C-108 Supplement Application for Authorization to Inject Willow Lake Com #1 Eddy County, New Mexico

- III. See attached data sheets.
- IV. This is not an expansion of an existing project.
- V. See attached map.
- VI. See attached table.
- VII. Data on the proposed operation:
 - 1. The proposed average daily injection rate is 2000 barrels of water per day. The proposed maximum daily injection rate is 3000 barrels of water per day.
 - The injection station for the gathering and processing of water to be injected will be a closed system.
 - The proposed average injection pressure is 1100 psig. The proposed maximum injection pressure is 1436 psig.
 - 4. See attached water and compatibility analyses. All injection waters will be produced waters from Permian aged sandstone horizons and injected into the Lower Bone Spring, which is a Permian aged sandstone horizon. The attached compatibility analysis of the injection waters with the receiving formation waters indicate a potential scaling tendency, however, the same scaling tendency is present in the individual waters by themselves before mixing. In discussions with field personnel in this area, they indicate that no scale can be found on or in subsurface pumps when wells are pulled. If at a later date we find we have substantial excess capacity, we may open this well for commercial disposal.
 - 5. Water injection will be into a zone not productive of oil or gas. The Pardue well 1 mile to the west produces out of an Upper Bone Spring Sand horizon 800' higher than the proposed injection interval. This water was inferred to be close in composition to the proposed injection zone waters and was analyzed as such. See attached disposal zone water analysis.
- VIII. The Bone Spring formation is a primarily a fine to very fine grained sandstone, subrounded to subangular, unconsolidated to friable, with porosities up to 26%. Sandstones are separated by dolomitic siltstones and shales. This formation occurs at a depth of 7150' in the Willow Lake Com #1 well and has a gross thickness of 1900'. The Rustler formation is the fresh water aquifer in this area. The average depth to the bottom of this aquifer in this area is 93' from surface.
- IX. The injection completion interval will be perforated, acidized, and fracture stimulated if needed.

- X. The well logs have been filed with the Division. The well is currently shut-in and uneconomic.
- XI. See attached water analysis statement from the Office of the State Engineer.
- XII. We have examined available geologic and engineering data and found no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. A copy of the Newspaper notice run on Sunday, April 25, 1999 in the Carlsbad Current Argus and Registered Mail receipts will be forwarded to the OCD when received.

3

Willow Lake Com #1 Conversion to Injection Form C-108 Section III Well Data Part A

Lease: Willow Lake Com
 Well No. 1
 Location: 660' FNL & 1980' FWL, Sec 22, TWP 24S, RNG 28E, Eddy County, NM

Hole Size	Casing Size	Weight	Setting Depth	Sacks of Cement	Estimated TOC	TOC Method	Comments
17-1/2"	13-3/8"	54.5#	633'	600	Surface	Circulated	
12-1/4"	9-5/8"	47#	9825'	4500	Surface	Circulated	
8-1/2"	7-5/8* Liner	33.7#	11,725'	350	9505'	Calculated	Top of liner @ 9505'
6-1/2"	5" Liner	18#	13,205	230	11,567'	Calculated	Top of liner @ 11,598'
8-1/2"	7-5/8" Tie Back	33.7#	9505'	900	Surface	Calculated	Tie 7-5/8" to surface

4

3. Injection tubing: 7140', 2-7/8", J-55, PVC Lined.

2.

4. Injection Packer: Baker Lock-Set. Set at Approx. 7140'.

Willow Lake Com #1 Conversion to Injection Form C-108 Section III Well Data Part B

Other Well Information

4.

I .	Injection Formation: Bone Spring
	Field: Malaga, East

- 2. Initial Perfs: 7184' 7192', 7198' 7204', 7258' 7282', 7308' 7316' 7354' - 7380', 7524' - 7536', 7543' - 7555', 8590' - 8636' 8794' - 8800', 8805' - 8813', 8815' - 8822', 8838' - 8850'
- 3. The well was originally drilled as a Morrow and Atoka Gas Producer.

Zone	Perís	Isolation
Morrow	12,390' - 12,674'	Packer w/blanking plug at 12,200' with 15 sacks cement on top.
Atoka Sand	≱1,680' - 11,700'	CIBP @ 11,590' with 35 sacks cement on top.
Atoka Lime	11,410' - 11,512'	CIBP @ 9400' with 35 sacks cement on top. Approved by OCD due to lower casing leaks.

5. Within this wellbore there are no upper zones commercially productive of oil & gas. The next lower productive horizon is the Atoka Lime at 11,410', however it is uneconomic to produce.

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Willow Lake Com #1 Eddy County, New Mexico 660' FNL & 1980 FWL, Sec 22

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Willow Lake Com #1 Conversion to Injection Form C-108 Section VI - Wells Within 1/2 Mile Radius

Lease: Willow Lake 15 Well No. 1 Location: 660' FSL & 1980' FEL, Sec 15, TWP 24S, RNG 28E, Eddy County, NM Operator: Kaiser-Francis Well Type: Atoka Gas Producer Date Drilled: Spud 8/20/89, Completed 10/17/89 TD/PBTD: 11,829'/11,746' Completion: Atoka Perfs: 11,664' - 11,675'

	Hole Size	Casing Size	Weight	Setting Depth	Sacks of Cement	Estimated TOC	TOC Method	Comments
	17-1/2"	13-3/8"	48# & 54.5#	604'	650	Surface	Circulated	
	12-1/4"	9-5/8"	36#	2492'	985	Surface	Circulated	
	8-3/4"	7"	26#	10,476'	650			
۱	6-1/8"	4-1/2" Liner		11,828'	294			Top of liner @ 10,184'
1								

Lease: Willow Lake 15

Well No. 3

Location: 660' FSL & 1980' FEL, Sec 15, TWP 24S, RNG 28E, Eddy County, NM

Operator: Aminoil

Well Type: Atoka Gas Producer

Date Drilled: Spud 12/28/77, Completed 3/19/78

TD/PBTD: 12,805'/11,746'

Completion: Morrow Perfs: 12,274' - 12,582', Currently Plugged & Abandoned

Hole Size	Casing Size	Weight	Setting Depth	Sacks of Cement	Estimated TOC	TOC Method	Comments
17-1/2"	13-3/8"	54.5#	640'	650	Surface	Circulated	
12-1/4"	9-5/8"	43.5#	9805'	3665	2600'	Temp. Surv.	2 Stage Cmt/DV @ 4796'
6-1/2" est	4-1/2" Liner	13.04#	12,805'	1600	9608'	Calc	Top of liner @ 9,608'

Plugging Detail: CIBP @ 12,100' with 4 sx cement on top. Cut 9-5/8" casing at 3487' and pull out of hole.

Spot cement plugs from : 9656' - 9556', 4840' - 4740', 3495' - 3395', 2559' - 2459', 720' - 620', 50' - Surface.



FW01W305

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W305

ARTESIA LAB

GENERAL INFORMATION

OPERATOR: GRIFFIN PETROLEUM WELL: WILLOW LAKE 2-22 FIELD: SUBMITTED BY:REX GLENN WORKED BY :KEITH JACKSON PHONE NUMBER: DEPTH: +/- 6025' DATE SAMPLED: 03/25/99 DATE RECEIVED:03/25/99 COUNTY:EDDY STATE:NM FORMATION: DELEWARE

	SAMPLE DESCRIPTION								
SED	INJE	cnor	WAT	EE_					
PHYSICAL AND CHEMICAL DETERMINATIONS									
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010278

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W278

ARTESIA LAB

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GENERAL INFORMATION

OPERATOR: CHI ENERGY WELL: GUMBY #1 FIELD: SUBMITTED BY: WORKED BY :BRETT DEMPSEY PHONE NUMBER: DEPTH: DATE SAMPLED: 01/21/99 DATE RECEIVED:01/21/99 COUNTY:EDDY STATE:NM FORMATION: BRUSHY CANYON

SAMPLE	DESCRIPTION
PROPOSED INJECTION WAT	ER
PHYSICAL AND	CHEMICAL DETERMINATIONS
SPECIFIC GRAVITY:1.205RESISTIVITY (CALCULATED):0.025IRON (FE++):150 ppmCALCIUM:26,583 ppmMAGNESIUM:6,050 ppmCHLORIDE:167,597 ppmSODIUM+PCTASS:90,363 ppmIODINE:	@ 71°F PH: 6.05 ohms @ 75°F SULFATE: 249 ppm TOTAL HARONESS 91,341 ppm BICARBONATE: 162 ppm SODIUM CHLORIDE(Calc) 275,697 ppm TOT. DISSOLVED SOLIDS: 349,733 ppm POTASSIUM CHLORIDE:
<u>R</u>	emarks
<u>en por ser a composition de la composition de</u>	
STIFF TYP	E PLOT (IN MEQ/L) 0 30 60 90 120 150

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** 10100 5003 **

FW01W321

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W321

ARTESIA LAB

GENER	AL INFORMATION
OPERATOR: GRIFFIN PETROLEUM WELL: PROPOSED INJECTIO FIELD: SUBMITTED BY: WORKED BY :BRETT DEMPSEY PHONE NUMBER:	DEPTH: N INTERVDATE SAMPLED: 01/21/99 DATE RECEIVED:01/21/99 COUNTY:EDDY STATE:NM FORMATION: BONE SPRINGS

SAMPLE DESCRIPTION Original sample taken from Chi Pardue well							
PROPOSED INJECTION WATER &	DISPOSAL ZONE WATER						
PHYSICAL AND CHEMICAL DETERMINATIONS							
SPECIFIC GRAVITY:1.125RESISTIVITY (CALCULATED):0.025IRON (FE++):500 ppmCALCIUM:3,559 ppmMAGNESIUM:2,160 ppmCHLORIDE:97,756 ppmSODIUM+POTASS:75,009 ppmIODINE:1000000000000000000000000000000000000	<pre>@ 75°F PH: 6.27 ohms @ 75°F SULFATE: 356 ppm TOTAL HARDNESS 17,788 ppm BICARBONATE: 434 ppm SODIUM CHLORIDE(Calc) 160,808 ppm TOT. DISSOLVED SOLIDS: 191,343 ppm POTASSIUM CHLORIDE:</pre>						
REMARKS							





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FW01W32Z

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W322

ARTESIA LAB

GENERAL INFORMATION					
OPERATOR: WELL: FIELD: SUBMITTED BY WORKED BY PHONE NUMBER	GRIFFIN PETROLEUM PROPOSED INJECTION : :BRETT DEMPSEY	DEPTH: INTERVDATE SAMPLED: 01/21/99 DATE RECEIVED:01/21/99 COUNTY:EDDY STATE: FORMATION: BONE SPRINGS DELE	NM WAR		





** TOTAL PAGE.05 **

FW01W323

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W323

ARTESIA LAB

GENERAL INFORMATION				
OPERATOR: GRIFFI WELL: PROPOS FIELD: SUBMITTED BY: WORKED BY :BRETT PHONE NUMBER:	N PETROLEUM ED INJECTION DEMPSEY	DEPTH: INTERVDATE SAMPLED: 01 DATE RECEIVED:01 COUNTY:EDDY FORMATION: BONE	L/21/99 1/21/99 STATE:NM SPRINGS AND 22-	

SAMPL Results from mixing Pardue wate:	r DESCRIPTION r with Willow Lake 22-2 water					
PHYSICAL AND CHEMICAL DETERMINATIONS						
SPECIFIC GRAVITY:1.169RESISTIVITY (CALCULATED):0.029IRON (FE++):254 ppmCALCIUM:17,700 ppmMAGNESIUM:4,172 ppmCHLORIDE:127,439 ppmSODIUM+POTASS:73,783 ppmIODINE:100	5@75°FPH:5.865ohms @75°F245 ppmSULFATE:245 ppmTOTAL HARDNESS61,410 ppmBICARBONATE:236 ppmSODIUM CHLORIDE(Calc)209,637 ppmTOT. DISSOLVED SOLIDS:263,113 ppmFOTASSIUM CHLORIDE:					
REMARKS						



15

Office of the State Engineer

1900 W. Second St. Roswell, NM 88201 (505) 622-6521 Fax: (505) 623-8559

FAX TRANSMISSION COVER SHEET

Date: April 21, 1999

To; Eric Griffin

Fax: 1-915-687-2504

Re: water well info

Sender: Eric C. Milstead

YOU SHOULD RECEIVE 13 PAGE(S), INCLUDING THIS COVER SHEET. IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL (505) 622-6521

The chloride information for the area of interest is:

Location	<u>Chloride Level</u>	Date Sampled
24S.28E.15.21224*	630	3/26/92
24S.28E.15.21224*	308	8/20/97
24S.28E.16.33111	1039	5/28/81
245.28E.21.443113	785	7/13/55

*same well

I hope this information is helpful to you in your endeavors. Also, the well location system is based upon the quarter system rather than the letter system used in the oilfield. The OSE has assigned the following:

1=Northwest
2=Northeast
3=Southwest
4=Southeast

If you have any questions, please, call.

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Griffin Letroleum Company

Form C-108 Application for Authorization to Inject

Mailing List

BLM 2909 W. Second Street Roswell, NM 88201

Kaiser-Francis Oil Company P. O. Box 21468 Tulsa, OK 74121-1468

Dinero Operating Company P. O. Box 10505 Midland, TX 79702-7505

Chi Energy, Inc. P. O. Box 1799 Midland, TX 79702-1799

OCD P. O. Box 2088 Santa Fe, NM 87504-2088

OCD – District II 811 South First Artesia, NM 88210



Exhibit No. 4 Submitted by: MEWBOURNE OIL COMPANY

Hearing Date: September 29, 2016





Hearing Date: September 29, 2016

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