5/21/96
SWD-629

Blaine Hess
Oil Properties
Post Office Box 326
Roswell, New Mexico 88202-0326
(505) 623-5400

April 30, 1996

Oil Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Ben Stone

Re: **Form C-108**
Application for Authorization to Inject
Barbados State No. 1 Well
1980' FSL & 660' FEL of
Section 32, T-23-S, R-26-E, N.M.P.M.
Eddy County, New Mexico

Dear Mr. Stone:

Find enclosed Form C-108, Application for Authorization to Inject covering the captioned well. Please review said form and either contact Mr. Kent Sams at Louis Dreyfus Natural Gas Corp. at (405) 749-1300, or me at the captioned telephone number should you have any questions or comments.

Thank you for all your help in this matter.

Sincerely,

Blaine Hess

BH/arh

cc: Oil Conservation Division - Artesia

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

MAY - 6 1996

CONSERVATION DIVISION

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Louis Dreyfus Natural Gas Corp

Address: 14000 Quail Springs Pkwy, Ste 600 Oklahoma City, OK 73134

Contact party: Kent Sams Phone: (405) 749-1300

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 City of Carlsbad Requirements
~~XIV~~ XV. Certification

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

Name: Kent Sams Title Production Engineer

Signature: Kent Sams Date: 4-15-96

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

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

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 we

(4) Give the depths of any other perforated intervals and detail on the sacks of cement o 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.

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
Louis Dreyfus Natural Gas Corp	Barbados State			
WELL NO.	**FOOTAGE LOCATION**	**SECTION**	**TOWNSHIP**	**RANGE**
# 1	1980'FSL & 660' FEL	32	T22S	R26E

Schematic

Tabular Data

Surface Casing

Size 13 3/8" " Cemented with 400 sx.

TOC Surface feet determined by Inspection

Hole size 17 1/2"

Intermediate Casing

Size 8 5/8" " Cemented with 625 sx.

TOC Surface feet determined by Inspection

Hole size 12 1/4"

Long string

Size 5 1/2" " Cemented with 1200 sx.

TOC Surface feet determined by Inspection

Hole size 7 7/8"

Total depth 5040'

Injection interval

3166' feet to 4450' feet

(perforated or open-hole, indicate which)

Tubing size 2 3/8" lined with TK-7 from (Tuboscope) (material) set in a

Baker Lok-Set (brand and model) packer at 3060' feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Delaware

2. Name of Field or Pool (if applicable) Happy Valley Delaware

3. Is this a new well drilled for injection? ☐ Yes ☒ No

   If no, for what purpose was the well originally drilled? To Test the Delaware

   Tested but no commercial pay was found.

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

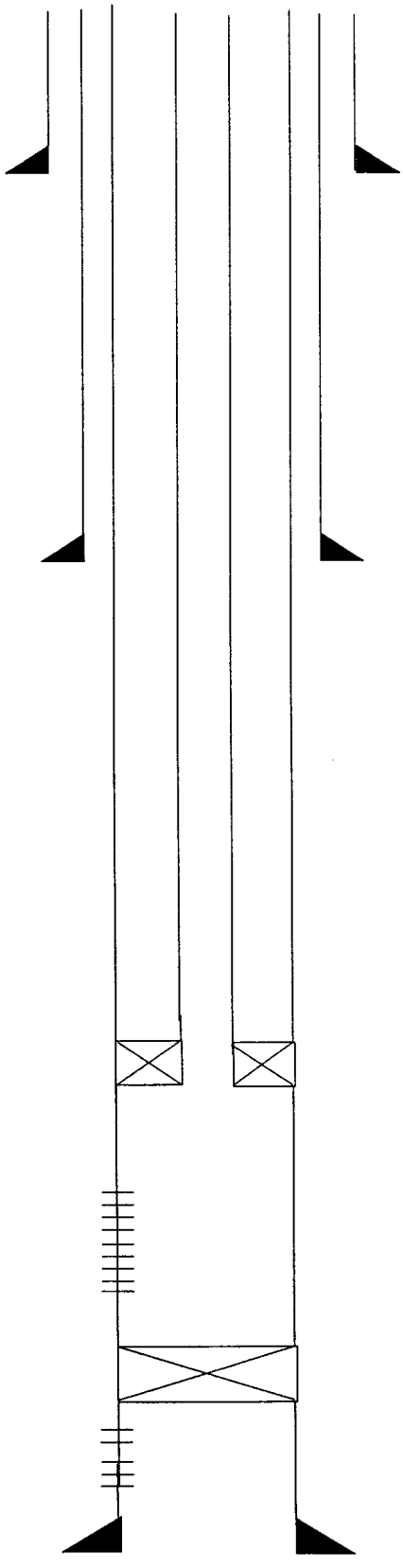
   Delaware 4712-4783' 72 holes. CIBP @ 4665'

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

   Overlay: None

   Underlay: Bone Springs 5045'

LOUIS DREYFUS NATURAL GAS CORPORATION
BARBADOS STATE # 1
SEC. 32-T22S-R26E
EDDY CO., NM



9 jts, 13-3/8" 54.5# K-55 ST&C
Surf Csg Set @ 358' in 17-1/2"
hole. Cmt w/ 400 sx

TOC Surface

48 jts, 8-5/8" 24# K-55
ST&C Csg Set @ 1643'in
12-1/4" hole. Cmt w/ 625 sx

Injection String
2-7/8" Tbg
Baker Lok-Set Pkr @ 3060'

Delaware Perfs:
3166-4450'

DV Tool @ 3320'

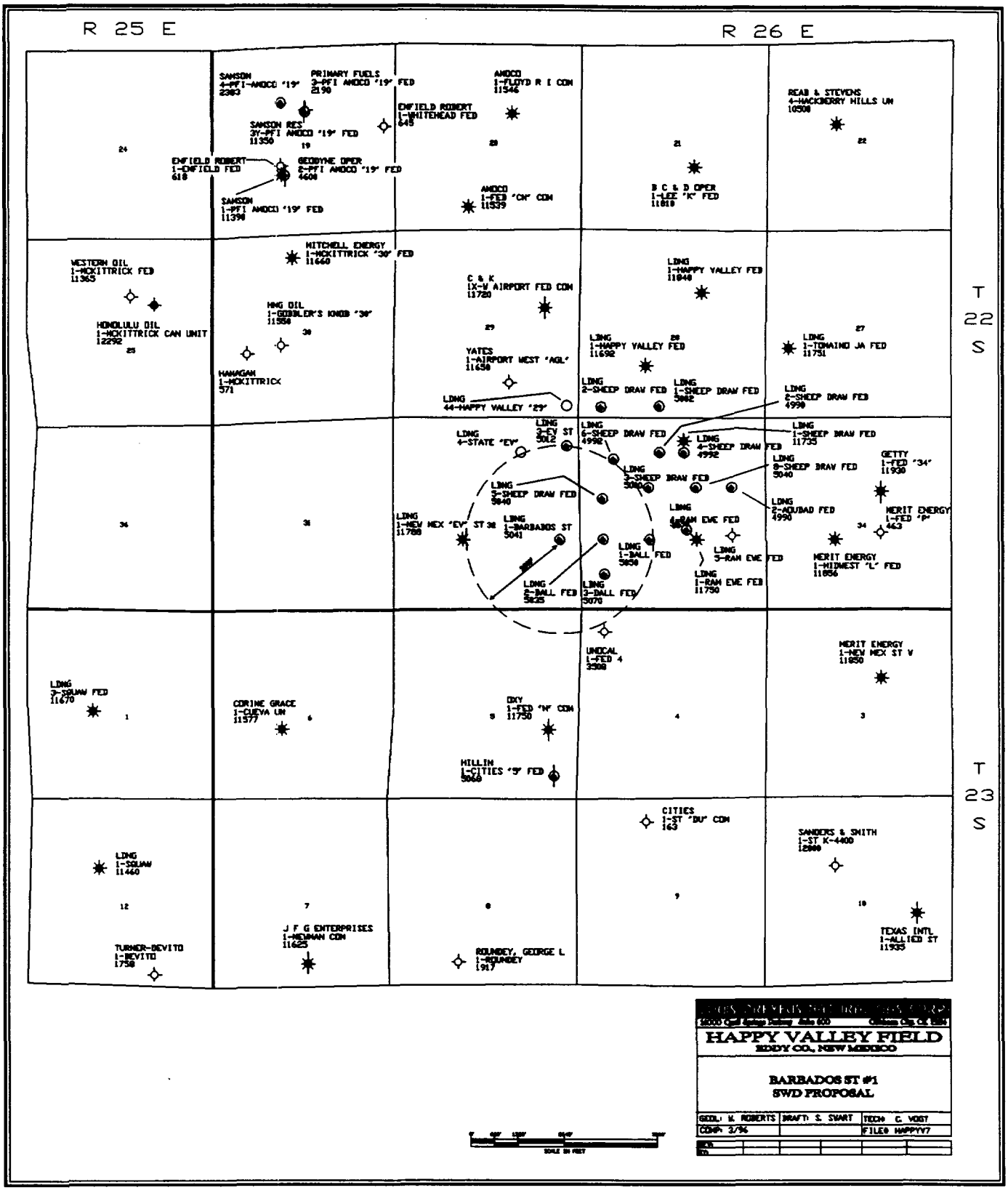
CIBP @ 4665'

Delaware Perfs:
4712-4724' (25 holes)
4760-4783' (47 holes)

112 jts, 5-1/2" 15.5# K-55
LT&C Csg @ 5040'
Cmt w/ 1200 sx

KS/CL 3/04/96

TD @ 5,040'


R 25 E
R 26 E
T 22 S
T 23 S
SAMSON 4-PFI-AMOCO '19' 2383
PRIMARY FUELS 3-PFI AMOCO '19' FED 2190
SAMSON RES 3Y-PFI AMOCO '19' FED 11350
ENFIELD ROBERT 1-ENFIELD FED 618
GEODYNE OPER 2-PFI AMOCO '19' FED 4608
SAMSON 1-PFI AMOCO '19' FED 11398
ENFIELD ROBERT 1-WHITEHEAD FED 645
AMOCO 1-FLOYD R E COM 11546
AMOCO 1-FED 'CH' COM 11539
B C & D OPER 1-LEE 'K' FED 11818
REAB & STEVENS 4-HACKBERRY HILLS UN 10508
WESTERN OIL 1-MCKITTRICK FED 11365
HONOLULU OIL 1-MCKITTRICK CAN UNIT 12292
MITCHELL ENERGY 1-MCKITTRICK '30' FED 11660
MNG OIL 1-GOBBLER'S KNOB '30' 11550
HANAGAN 1-MCKITTRICK 571
C & K 1X-W AIRPORT FED COM 11720
YATES 1-AIRPORT WEST 'AGL' 11650
LING 44-HAPPY VALLEY '29'
LING 1-HAPPY VALLEY FED 11848
LING 1-HAPPY VALLEY FED 11692
LING 2-SHEEP DRAW FED
LING 1-SHEEP DRAW FED 5082
LING 2-SHEEP DRAW FED 4990
LING 1-TOMAINO JA FED 11751
LING 4-STATE 'EV'
LING 2-EV ST 3012
LING 6-SHEEP DRAW FED 4992
LING 4-SHEEP DRAW FED 4992
LING 1-SHEEP DRAW FED 11735
LING 8-SHEEP DRAW FED 5040
GETTY 1-FED '34' 11930
LING 3-SHEEP DRAW FED 5082
LING 3-SHEEP DRAW FED 5040
LING 1-NEW MEX 'EV' ST 36 11788
LING 1-BARBADOS ST 5041
LING 4-RAM EVE FED 4990
LING 2-AQUBAD FED 4990
MERIT ENERGY 1-FED 'P' 463
LING 1-BALL FED 5650
LING 5-RAM EVE FED
LING 1-RAM EVE FED 11750
LING 2-BALL FED 5635
LING 3-BALL FED 5070
MERIT ENERGY 1-MIDWEST 'L' FED 11856
UNOCAL 1-FED 4 3308
MERIT ENERGY 1-NEW MEX ST V 11850
LING 2-SQUAW FED 11670
CORINE GRACE 1-CUEVA UN 11577
OXY 1-FED 'M' COM 11750
HILLIN 1-CITIES 'S' FED 3068
CITIES 1-ST 'BU' COM 163
SANDERS & SMITH 1-ST K-4400 12800
LING 1-SQUAW 11460
TURNER-DEVITO 1-DEVITO 1758
J F G ENTERPRISES 1-NEUMAN COM 11625
ROUNDEY, GEORGE L 1-ROUNDEY 1917
TEXAS INTL 1-ALLIED ST 11935
HAPPY VALLEY FIELD
EDDY CO., NEW MEXICO
BARBADOS ST #1
SWD PROPOSAL
GEOL: M. ROBERTS
DRAFT: S. SWART
TECH: C. VOGT
COMP: 3/96
FILE: HAPPY97

ITEM VI OF NEW MEXICO OCD FORM C-108

OPERATOR	WELL NAME	LOCATION	COUNTY	STATE	TYPE	TD	PBTD	CASING PROGRAM							TBG		PROD	PROD	PROD	TOP	BTM	NET	ACID	FRACTURE	COMP	
								Surface		Intermediate		Production		Liner	TOC	SIZE	SEAT	Pkr/TA	TYPE	ZONE	STATUS	PERF	PERF	PAY	STIMULATION	STIMULATION	DATE	COMMENTS
Louis Dreyfus Natural Gas Corp	BARBADOS STATE # 1	I Sec 32-T22S-R26E	EDDY	NM	Oil	5,040	4,993	13 3/8	358	8 5/8	1643	5 1/2	5,040		Surf.	2 7/8			Pump	Delaware	TA	4,712	4,783	35	1500 gal 7 1/2% HCL	15,300 gal 30# gel, No Stimulation	11/23/95	CIBP @ 4665
																2 7/8	4,301		Pump	Delaware	TA	4,342	4,426	26	1200 gal 7 1/2% HCL	17500 gals 30# gel, 53,000 # 16/30 sand	02/10/96	tested wet
Louis Dreyfus Natural Gas Corp	DALL FEDERAL #1	K Sec 33-T22S-R26E	EDDY	NM	Oil	5,050	2,800	13 3/8	345	8 5/8	1600	5 1/2	2,800		1,000	2 7/8	2,428		Pump	Delaware	PR	2,544	2,579	35	1500 gal 7 1/2% HCL	15,300 gal 30# gel, 44,500 # 12/20 sand	10/6/93	
Louis Dreyfus Natural Gas Corp	DALL FEDERAL #2	L Sec 33-T22S-R26E	EDDY	NM	Oil	5,030	4,986	13 3/8	370	8 5/8	1582	5 1/2	5,030		Surf.	2 7/8	4,700		Pump	Delaware	TA	4,708	4,720	12	1000 gal 7 1/2% HCL	14,000 gal 30# gel, 18,900 # 16/30 sand	08/09/95	CIBP @ 4660'
					Oil											2 7/8	2,589		Pump	Delawar	PR	2,558	2,568	10	1000 gal 7 1/2% HCL	23,000 gal 30# gel, 64,000 # 16/30 sand	08/22/95	
Louis Dreyfus Natural Gas Corp	DALL FEDERAL #3	M Sec 33-T22S-R26E	EDDY	NM	Oil	5,070	5,058	13 3/8	361	8 5/8	1665	5 1/2	5,070		Surf.	2 7/8	2,638		Pump	Delaware	PR	2,550	2,563	13	1000 gal 7 1/2% NE FE	14,500 gal 30# gel, 37,000 # 16/30 sand	11/22/95	
Louis Dreyfus Natural Gas Corp	NEW MEXICO EV STATE #1	K Sec 32-T22S-R26E	EDDY	NM	Gas	11,788	10,785	13 3/8	1,725	9 5/8	2,603	5	11,788		1,900	2 7/8	9,820	9,820	Flow	U. Morrow	TA	10,962	11,355	393	3600 gals 7 1/2% KCL	53,000 gals foam 32,000 int bauxite	12/08/85	BP @ 10,780'
					Gas														Flow	Strawn	PR	10,001	10,391	390	9156 gals 15% FE HCL	12,264 gals 15% foamed MS acid	2/19/86	
Louis Dreyfus Natural Gas Corp	"EV" STATE #3	A Sec 32-T22S-R26E	EDDY	NM	Oil	5,010	4,951	13 3/8	356	8 5/8	1,620	5 1/2	5,010			2 7/8	4,259		Pump	Delaware	PR	4,190	4,210	20	1000 gals 7 1/2% HCL	17,500 gals 30# gel 65,000 # 16/30 sand	02/06/96	
Louis Dreyfus Natural Gas Corp	SHEEP DRAW FEDERAL #5	K Sec 33-T22S-R26E	EDDY	NM	Oil	5,040	2,750	13 3/8	339	8 5/8	1,610	5 1/2	2,750			2 7/8	2,506		Pump	Delaware	PR	2,537	2,565	18	2000 gals 7 1/2% NEFE acid	17,000 gals 30# gel 42,000 20/40 sand	10/1/93	
					Oil														Pump	Delaware	PR	2,416	2,434	18	2000 gals 7 1/2% NEFE acid	NO STIM	10/16/93	
Louis Dreyfus Natural Gas Corp	SHEEP DRAW FEDERAL #6	D Sec 33-T22S-R26E	EDDY	NM	Oil	4,987	4,943	13 3/8	357	8 5/8	1,642	5 1/2	4,987			2 7/8	4,868		Pump	Delaware	TA	4,868	4,876	8	1000 gals 7 1/2% NEFE acid	14,000 gals 30# gel 12,100 # 16/30 sand	07/10/95	CIBP @ 4830'
					Oil											2 7/8	2,789		Pump	Delaware	PR	2,540	2,700	48	3250 gals 7 1/2% NEFE acid	15,000 gals 30# gel 42,300 # 16/30 sand	07/20/95	

ITEM VII of NEW MEXICO OCD Form C-108

DATA on PROPOSED OPERATIONS

BARBADOS STATE # 1

1. The proposed average and maximum daily injection rate is expected to be 1000 BWPD and 1800 BWPD, respectively.

2. The injection system will be operated as a closed system. With tank level monitoring to prevent over flow of tanks.

3. The average injection pressure is expected to be 1200 psi. The maximum injection pressure should not be over 1600 psi.

4. The source for the disposal water will be all wells that Louis Dreyfus Natural Gas Corp operates or owns an interest in :
Sections 27, 28, 29, 32, 33, 34 of T22S-R26E and Sections 3, 4, 5 of T23S-R26E Eddy County New Mexico.
Water analysis for the Delaware water in the Dall Federal # 2 is attached as Exhibit VII 4a. Water analysis for the Strawn water in the NM "EV" State # 1 is attached as Exhibit VII 4b.

5. Water analysis of the disposal zone formation water in the Barbados State # 1 is attached as Exhibit 5a.

EXHIBIT VII 4a

CAPROCK LABORATORIES, INC.

3312 Bankhead Hwy.
Midland, Texas 79701
(915) 689-7252
FAX # (915) 689-0130

WATER ANALYSIS REPORT

SAMPLE

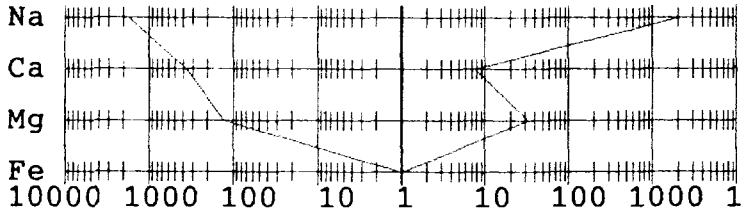
Oil Co. : Louis Dreyfus Natural Gas
Lease : Dall Federal #2
Well No.: Sec 32, T-225, R-26 E
Job No. : 9604024

Sample Loc. : 1980' FSL & 660' FWL
Date Analyzed: 04-April-1996
Date Sampled :
Analysis No. : 3

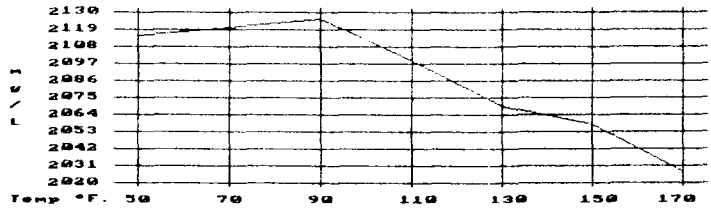
ANALYSIS

1.	pH		6.650		
2.	Specific Gravity 60/60 F.		1.082		
3.	$CaCO_3$ Saturation Index	@ 80 F.	+0.559		
		@ 140 F.	+1.449		
	Dissolved Gasses		**MG/L**	**EQ. WT.**	***MEQ/L**
4.	Hydrogen Sulfide		101		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium	(Ca^{++})	6,854	/ 20.1 =	341.00
8.	Magnesium	(Mg^{++})	1,532	/ 12.2 =	125.57
9.	Sodium	(Na^{+}) (Calculated)	39,121	/ 23.0 =	1,700.91
10.	Barium	(Ba^{++})	Not Determined		
	Anions				
11.	Hydroxyl	(OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate	($CO_3^{=}$)	0	/ 30.0 =	0.00
13.	Bicarbonate	(HCO_3^{-})	439	/ 61.1 =	7.18
14.	Sulfate	($SO_4^{=}$)	1,561	/ 48.8 =	31.99
15.	Chloride	(Cl^{-})	75,515	/ 35.5 =	2,127.18
16.	Total Dissolved Solids		125,022		
17.	Total Iron (Fe)		0	/ 18.2 =	0.03
18.	Total Hardness As $CaCO_3$		23,421		
19.	Resistivity @ 75 F. (Calculated)		0.062 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L	= mg/L.
$Ca(HCO_3)_2$	81.04	7.18	582
$CaSO_4$	68.07	31.99	2,177
$CaCl_2$	55.50	301.82	16,751
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	125.57	5,980
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	1,699.79	99,370

*Milli Equivalents per Liter

Analyst

EXHIBIT VII 4b

CAPROCK LABORATORIES, INC.

3312 Bankhead Hwy.
Midland, Texas 79701
(915) 689-7252
FAX # (915) 689-0130

WATER ANALYSIS REPORT

SAMPLE

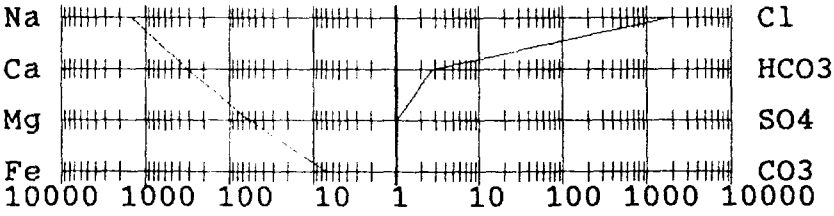
Oil Co. : **Louis Dreyfus Natural Gas**
Lease : **New Mexico 'EV' State #1**
Well No.: **Sec 32, T-225, R-26 E**
Job No. : **9604024**

Sample Loc. : **1980' FSL & 1980' FWL**
Date Analyzed: **04-April-1996**
Date Sampled :
Analysis No. : **1**

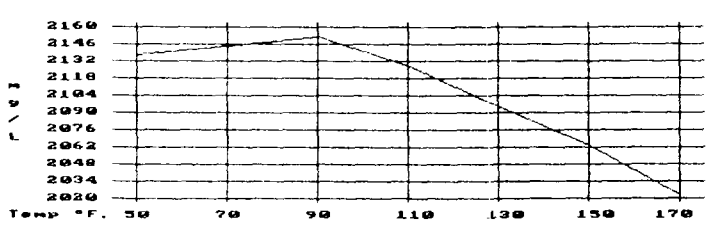
ANALYSIS

1.	pH		5.550		
2.	Specific Gravity 60/60 F.		1.068		
3.	$CaCO_3$ Saturation Index	@ 80 F.	-1.170		
		@ 140 F.	-0.235		
	Dissolved Gasses		MG/L	EQ. WT.	*MEQ/L
4.	Hydrogen Sulfide		Not Present		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium (Ca^{++})		5,972	/ 20.1 =	297.11
8.	Magnesium (Mg^{++})		681	/ 12.2 =	55.82
9.	Sodium (Na^{+})	(Calculated)	32,383	/ 23.0 =	1,407.96
10.	Barium (Ba^{++})		Not Determined		
	Anions				
11.	Hydroxyl (OH^{-})		0	/ 17.0 =	0.00
12.	Carbonate ($CO_3^{=}$)		0	/ 30.0 =	0.00
13.	Bicarbonate (HCO_3^{-})		159	/ 61.1 =	2.60
14.	Sulfate ($SO_4^{=}$)		0	/ 48.8 =	0.00
15.	Chloride (Cl^{-})		62,397	/ 35.5 =	1,757.66
16.	Total Dissolved Solids		101,592		
17.	Total Iron (Fe)		124	/ 18.2 =	6.81
18.	Total Hardness As $CaCO_3$		17,716		
19.	Resistivity @ 75 F. (Calculated)		0.089 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	2.60	211
$CaSO_4$	68.07	0.00	0
$CaCl_2$	55.50	294.51	16,345
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	55.82	2,658
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	1,407.33	82,273

*Milli Equivalents per Liter

James L. Pritchard
Analyst

EXHIBIT VII 5a

CAPROCK LABORATORIES, INC.

3312 Bankhead Hwy.
Midland, Texas 79701
(915) 689-7252
FAX # (915) 689-0130

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : **Louis Dreyfus Natural Gas**
Lease : **Barbados State #1**
Well No.: **Sec 32, T-225, R-26 E**
Job No. : **9604024**

Sample Loc. : **1980' FSL & 660' FEL**
Date Analyzed: **04-April-1996**
Date Sampled :
Analysis No. : **2**

ANALYSIS

1.	pH	4.500	
2.	Specific Gravity 60/60 F.	1.166	
3.	$CaCO_3$ Saturation Index @ 80 F.	-0.293	
	@ 140 F.	-0.293	

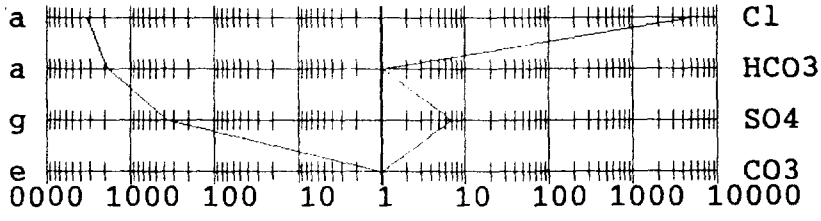
	Dissolved Gasses	MG/L	EQ. WT.	*MEQ/L
4.	Hydrogen Sulfide	Not Present		
5.	Carbon Dioxide	Not Determined		
6.	Dissolved Oxygen	Not Determined		

	Cations			MG/L	EQ. WT.	*MEQ/L
7.	Calcium	(Ca^{++})		35,270	/ 20.1 =	1,754.73
8.	Magnesium	(Mg^{++})		4,255	/ 12.2 =	348.77
9.	Sodium	(Na^{+})	(Calculated)	73,495	/ 23.0 =	3,195.43
10.	Barium	(Ba^{++})		Not Determined		

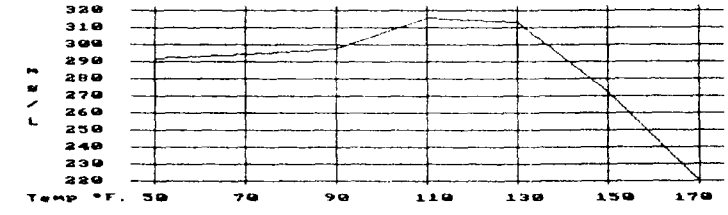
	Anions		MG/L	EQ. WT.	*MEQ/L
11.	Hydroxyl	(OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate	($CO_3^{=}$)	0	/ 30.0 =	0.00
13.	Bicarbonate	(HCO_3^{-})	0	/ 61.1 =	0.00
14.	Sulfate	($SO_4^{=}$)	330	/ 48.8 =	6.76
15.	Chloride	(Cl^{-})	187,901	/ 35.5 =	5,292.99

16.	Total Dissolved Solids	301,251		
17.	Total Iron (Fe)	3	/ 18.2 =	0.15
18.	Total Hardness As $CaCO_3$	105594		
19.	Resistivity @ 75 F. (Calculated)	0.001 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	0.00	0
$CaSO_4$	68.07	6.76	460
$CaCl_2$	55.50	1,747.96	97,012
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	0.00	0
$MgCL_2$	47.62	348.77	16,608
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	3,196.25	186,853

*Milli Equivalents per Liter

Analyst

ITEM VIII of NEW MEXICO OCD Form C-108

Geologic Data of the Injection Zone & Underground Drinking Water

Barbados State # 1

The proposed interval for salt water disposal is the Delaware between the depth of 3166' and 4450' in the Barbados State # 1. The Delaware is a sequence of well consolidated sandstone, siltstone and shale strata of Permian age.

The proposed Delaware disposal zones had the following stimulation and production test results.

Interval	Holes Perforated	Stimulation	Results
4712-4783'	72 holes	1500 gal 7 1/2%	Swab dry 1/2 bbl entry/ hr 1% oil cut. Non-Commercial **Set CIBP at 4665'**
4342-4426'	58 holes	1200 gal 7 1/2% 17500 gal 30 # gel w/ 53000 # 16/30 sand	Pump well prod 180 BWPD No oil cut. Non-Commercial
3166-4450'	290 holes of additional Delaware perforations for disposal. Calculates wet from open hole logs with no economical shows from mud log.		

No commercial pay in the Delaware has been found in the Barbados State #1.

Based on information from the New Mexico State Engineers office in Roswell, the nearest fresh water well is 1/2 mile from the proposed saltwater disposal well. This water well has a total depth of 150' and is located in the NE NE NE/4 of Section 32-T22S-R26E. The fresh water zone in this well is the Alluvium found at a depth of 80' to 250' from surface. The City of Carlsbad has fresh water wells producing from the Capitan Acquifer at a depth range of 600' to 1500'. The City of Carlsbad wells are 2.2 miles from the proposed salt water injection well. The location of the wells are in the SE SE of Section 1-T23S-R25E.

There are no known fresh water strata underlying the Delaware formation.

ITEMS IX through XIII

New Mexico OCD From C-108

Barbados State # 1

Item IX. The proposed Delaware disposal zones from 3166' to 4450' will be acidized with 7 1/2% acid solution and if needed stimulated with 30 # gel w/ 16/30 sand. Volumes to be determined at later date.

Item X. There is no test data on this well other than what is out lined in the schematic and that given in Item VIII of this application.

All logs for this well are attached and included with the original completion form for the well.

Item XI. The Alluvium water aquifer produces water from a depth range of 80 to 250'. No contamination of this water should occur since the proposed disposal well has surface casing set at 358' from surface with cement circulated to surface. The Capitan Acquifer produces fresh water from 600' to 1500'. No contamination of this aquifer should occur since the proposed disposal well has intermediate casing set at 1643' with cement circulated to surface.

A water analysis of the fresh water well in the NE NE NE of Section 32-T22S-R26E is attached as Exhibit XI A..

A water analysis of the City of Carlsbad fresh water well in the SE SE Section 1-T23S-R25E is attached as Exhibit XI B..

Item XII. Louis Dreyfus Natural Gas Corp. has examined all applicable geological and engineering data in the surrounding area of the proposed disposal well and finds no evidence of open faults or any other hydraulic connection between the disposal zone and any underground source of drinking water.

Item XIII. Proof of notice is attached. See Exhibits XIII A and B.

EXHIBIT XI A

CAPROCK
LABORATORIES, INC.

3312 Bankhead Hwy.
Midland, Texas 79701
(915) 689-7252
FAX # (915) 689-0130

WATER ANALYSIS REPORT

SAMPLE

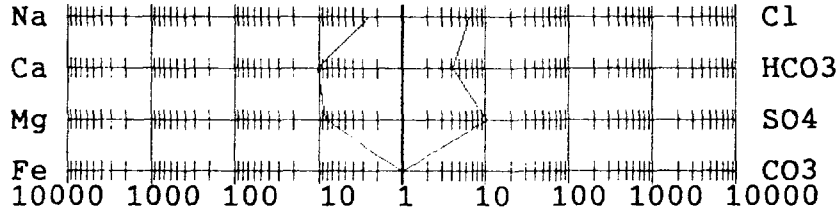
Oil Co. : **Louis Dreyfus Natural Gas**
Lease : **Well Near 'EV' State #4**
Well No.: **Sec 32, T-225, R-26 E**
Job No. : **9604024**

Sample Loc. : **990' FNL & 1750' FEL**
Date Analyzed: **04-April-1996**
Date Sampled :
Analysis No. : **4**

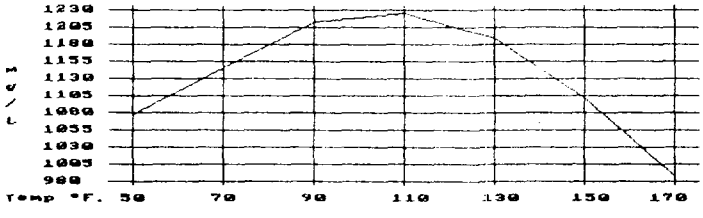
ANALYSIS

1.	pH		6.750		
2.	Specific Gravity 60/60 F.		1.002		
3.	$CaCO_3$ Saturation Index	@ 80 F.	-0.198		
		@ 140 F.	+0.502		
	Dissolved Gasses		**MG/L**	**EQ. WT.**	***MEQ/L**
4.	Hydrogen Sulfide		Not Present		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium	(Ca^{++})	200	/ 20.1 =	9.95
8.	Magnesium	(Mg^{++})	97	/ 12.2 =	7.95
9.	Sodium	(Na^{+}) (Calculated)	54	/ 23.0 =	2.35
10.	Barium	(Ba^{++})	Not Determined		
	Anions				
11.	Hydroxyl	(OH^{-})	0	/ 17.0 =	0.00
12.	Carbonate	($CO_3^{=}$)	0	/ 30.0 =	0.00
13	Bicarbonate	(HCO_3^{-})	244	/ 61.1 =	3.99
14.	Sulfate	($SO_4^{=}$)	494	/ 48.8 =	10.12
15.	Chloride	(Cl^{-})	213	/ 35.5 =	6.00
16.	Total Dissolved Solids		1,302		
17.	Total Iron (Fe)		0	/ 18.2 =	0.01
18.	Total Hardness As $CaCO_3$		901		
19.	Resistivity @ 75 F. (Calculated)		2.984 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	3.99	324
$CaSO_4$	68.07	5.96	405
$CaCl_2$	55.50	0.00	0
$Mg(HCO_3)_2$	73.17	0.00	0
$MgSO_4$	60.19	4.17	251
$MgCL_2$	47.62	3.78	180
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	2.22	130

***Milli Equivalents per Liter**

Analyst

EXHIBIT XI B

CAPROCK
LABORATORIES, INC.

3312 Bankhead Hwy.
Midland, Texas 79701
(915) 689-7252
FAX # (915) 689-0130

WATER ANALYSIS REPORT

SAMPLE

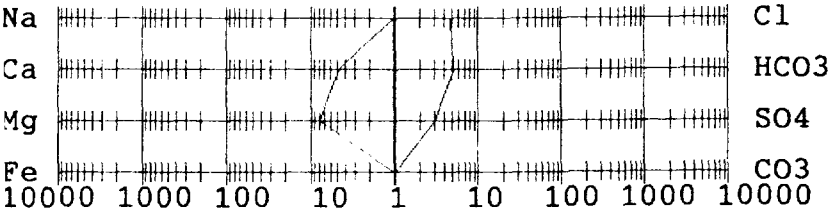
Oil Co. : **Louis Dreyfus Natural Gas**
Lease : **City of Carlsbad**
Well No.: **Well #1**
Job No. : **9604024**

Sample Loc. :
Date Analyzed: **04-April-1996**
Date Sampled :
Analysis No. : **5**

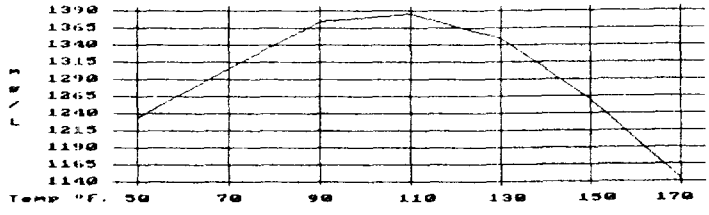
ANALYSIS

1.	pH		7.150		
2.	Specific Gravity 60/60 F.		0.999		
3.	$CaCO_3$ Saturation Index	@ 80 F.	+0.534		
		@ 140 F.	+1.134		
	Dissolved Gasses		MG/L	EQ. WT.	*MEQ/L
4.	Hydrogen Sulfide		Not Present		
5.	Carbon Dioxide		Not Determined		
6.	Dissolved Oxygen		Not Determined		
	Cations				
7.	Calcium (Ca^{++})		88	/ 20.1 =	4.38
8.	Magnesium (Mg^{++})		92	/ 12.2 =	7.54
9.	Sodium (Na^{+})	(Calculated)	12	/ 23.0 =	0.52
10.	Barium (Ba^{++})		Not Determined		
	Anions				
11.	Hydroxyl (OH^{-})		0	/ 17.0 =	0.00
12.	Carbonate ($CO_3^{=}$)		0	/ 30.0 =	0.00
13.	Bicarbonate (HCO_3^{-})		305	/ 61.1 =	4.99
14.	Sulfate ($SO_4^{=}$)		143	/ 48.8 =	2.93
15.	Chloride (Cl^{-})		160	/ 35.5 =	4.51
16.	Total Dissolved Solids		800		
17.	Total Iron (Fe)		0	/ 18.2 =	0.01
18.	Total Hardness As $CaCO_3$		601		
19.	Resistivity @ 75 F. (Calculated)		2.773 /cm.		

LOGARITHMIC WATER PATTERN
*meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT.	X *meq/L =	mg/L.
$Ca(HCO_3)_2$	81.04	4.38	355
$CaSO_4$	68.07	0.00	0
$CaCl_2$	55.50	0.00	0
$Mg(HCO_3)_2$	73.17	0.61	45
$MgSO_4$	60.19	2.93	176
$MgCL_2$	47.62	4.00	190
$NaHCO_3$	84.00	0.00	0
$NaSO_4$	71.03	0.00	0
NaCl	58.46	0.51	30

*Milli Equivalents per Liter

Analyst

EXHIBIT XIII A

LOUIS DREYFUS NATURAL GAS CORP.
APPLICATION FOR AUTHORIZATION TO INJECT
BARBADOS STATE #1
EDDY COUNTY, NEW MEXICO

CERTIFICATE OF SERVICE

I, Kent Sams, Engineer, Louis Dreyfus Natural Gas Corp., Operator of the Barbados State #1, have on this 23rd day of April, 1996, mailed or caused to be mailed, postage prepaid, a copy of the Application for Authorization to Inject to the following persons:

Land Owner

State of New Mexico
P.O. Box 1148
Santa Fe, NM 87504-1148

Grazing Lessee

Fech Land and Cattle Company
353 Dark Canyon Road
Carlsbad, NM 88220

Offset Operators

None

ITEM XIV

CITY of CARLSBAD REQUIREMENTS

I. Louis Dreyfus Natural Gas Corp. (LDNG) agrees that the proposed Barbados State #1 - Water Disposal well and related facilities will be subject to the following:

(a) The water disposal well and related facilities will only be used for the disposal of water from currently producing oil and/ or gas wells and any future producing oil and/ or gas wells located in the following Sections:

Sections 27, 28, 29, 32, 33, and 34 of T22S-R26E Eddy County, New Mexico
Sections 3, 4, and 5 of T23S-R26E Eddy County, New Mexico

(b) The water disposal well and related facilities will be limited to the disposal of water from producing oil and/ or gas wells which are either operated by LDNG or in which LDNG owns an interest. In no event will the disposal well and related facilities become a commercial facility. This condition shall be applicable to the successors and assigns of LDNG.

(c) At all times during the operation of the disposal well and related facilities, the City of Carlsbad, its employees and agents shall have access, at its individual risk and expense, to inspect the facility. The City of Carlsbad, its employees and agents, agree to indemnify and hold harmless LDNG, its employees and agents from and against any and all liens, judgments, and claims of any kind or character resulting from or arising out of its right to inspect the disposal well and related facilities, including without limitation any injuries resulting from such inspection.

EXHIBIT XIII B

Affidavit of Publication

№ 17957

State of New Mexico,
County of Eddy, ss.

Amy McKay,
being first duly sworn, on oath says:

That she is Business Manager of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the state wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

April 26, 1996
_____, 19___
_____, 19___
_____, 19___
_____, 19___
_____, 19___

That the cost of publication is $ 19.86, and that payment thereof has been made and will be assessed as court costs.

Amy McKay

Subscribed and sworn to before me this

30th day of April, 1996

Donna Crump

My commission expires 08/01/98
Notary Public

April 26, 1996

NEWSPAPER RELEASE
(Eddy County, New Mexico)

Louis Dreyfus Natural Gas Corp., 14000 Quail Springs Parkway, Suite 600, Oklahoma City, Oklahoma 73134-2600, Attention: Mr. Kent Sams, Production Engineer (405) 749-1300, proposes to convert the Barbados State #1 well from a temporarily abandoned well to a water disposal well. The Barbados State #1 well is located 1980' FSL & 660' FEL of Section 32, Township 22 South, Range 26 East, N.M.P.M., Eddy County, New Mexico.

1,800 barrels of water per day maximum shall be injected at 1,600 psi into the Delaware formation at a depth of 3,166' to 4,450'.

Interested parties must file objections or request a hearing with the New Mexico Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Jon Tully
City Administrator
P.O. Box 1569
Carlsbad, NM 88221-1569

4a. Article Number
P 144 846 621

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
4/24/96

5. Signature (Addressee)
Becky Smith

6. Signature (Agent)
Becky Smith

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

State of New Mexico
Oil & Gas Division
P.O. Box 1148
Santa Fe, NM 87504-1148

4a. Article Number
P 144 846 656

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
APR 25 96

5. Signature (Addressee)

6. Signature (Agent)
John R Romero

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Fech Land and Cattle Co.
353 Dark Canyon Road
Carlsbad, NM 88220

4a. Article Number
P 144 846 655

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
APR 26 1996

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Blaine Hess
Oil Properties
Post Office Box 326
Roswell, New Mexico 88202-0326
(505) 623-5400

May 3, 1996

Oil Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Ben Stone

Re: **Application for Authorization to Inject**
Barbados State No. 1 Well
1980' FSL & 660' FEL of
Section 32, T-23-S, R-26-E, N.M.P.M.
Eddy County, New Mexico

Dear Mr. Stone:

Enclosed are copies of the return receipts whereby notification was given to offset leasehold operators, surface owners and grazing lessees of the proposal to convert the above well to a salt water disposal well.

If you need any further information, please do not hesitate to call.

Very truly yours,

Blaine Hess

BH/arh

Jodie Waters - City of Carlsbad Environ Dept
~~885-9623~~
887 1191

May 14, 19

New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

Dear Sirs,

Enclosed find a letter sent to you in regards to an injection well proposed by Louis Dryphus(sp?). See the original letter for the complete description and our original statements.

The address published with the news release was an out-of-date address. We feel this means this should be republished with the correct address for comments to be sent and an extended deadline should be set.

Sincerely,

Jesse & Ann Rayroux

Jesse and Ann Rayroux
P.O. Box 644, 230 McKittrick Road
Carlsbad, NM 88221-0644
(505)887-1472

May 6, 1996

New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501

Dear Sirs,

RE: Barbados State #1,Section 32, T 22S, R 26E, NMPM,Eddy Co.

OBJECTION TO INJECTION WELL- Barbados State #1 well located 1980' FSL and 660' FEL of section 32, Township 22 South, Range 26 East, N.M.P.M.

I have reservations about making this an injection well for brine water as this well is located just three miles east of the City of Carlsbad water well field. Also there are other residential wells located within sight of this well.

It might be all right if the brine water is injected at the greatest depth of 4450' and close monitoring is done DAILY to ensure the casing isn't leaking into the fresh water zones. I would rather see injections wells put in East of the Pecos River as all our fresh water theoretically moves from the west to east in this area.

I would also stress that ONLY water produced within this field be injected. I object strongly to the injection of fluids produced outside and trucked into this site.

Sincerely,

Jesse and Ann Rayroux
230 McKittrick Road
P.O. Box 644
Carlsbad, NM 88221-0644
(505)887-1472

Jesse F. Rayroux
Ann Rayroux

629

Louis Dreyfus Natural Gas Corp. 14000 Quail Springs Parkway, Suite 600, Oklahoma City, OK 73134 405-749-1300

Louis Dreyfus Natural Gas
Operations Department

FAX

Date: 6/18/96

Number of pages including cover sheet: 2

To: Ben Stone NM-OCD
John Waters - City of Carlsbad Environ Dept
Blaine Hess

Phone: 505 827-8177
505-885-1101
505-623-5400

From: Kent Sams

Phone: 405-749-5259

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please Comment

Mr Stone
Sections (d) & (e) of the attached document are the changes the City of Carlsbad wanted to make. Please include this new Item XIV in the SWD permit package.
If you need add. info please let me know

Kent Sams
LDNG

ITEM XIV

CITY of CARLSBAD REQUIREMENTS

I. Louis Dreyfus Natural Gas Corp. (LDNG) agrees that the proposed Barbados State #1 - Water Disposal well and related facilities will be subject to the following:

(a) The water disposal well and related facilities will only be used for the disposal of water from currently producing oil and/ or gas wells and any future producing oil and/ or gas wells located in the following Sections:

Sections 27, 28, 29, 32, 33, and 34 of T22S-R26E Eddy County, New Mexico
Sections 3, 4, and 5 of T23S-R26E Eddy County, New Mexico

(b) The water disposal well and related facilities will be limited to the disposal of water from producing oil and/ or gas wells which are either operated by LDNG or in which LDNG owns an interest. In no event will the disposal well and related facilities become a commercial facility. This condition shall be applicable to the successors and assigns of LDNG.

(c) At all times during the operation of the disposal well and related facilities, the City of Carlsbad, its employees and agents shall have access, at its individual risk and expense, to inspect the facility. The City of Carlsbad, its employees and agents, agree to indemnify and hold harmless LDNG, its employees and agents from and against any and all liens, judgments, and claims of any kind or character resulting from or arising out of its right to inspect the disposal well and related facilities, including without limitation any injuries resulting from such inspection.

(d) The City of Carlsbad reserves the right to report any and all results obtained from said sampling of the permitted well to the proper authorities (i.e. the New Mexico Oil Conservation Division and/or the New Mexico Environment Department) at any time.

(e) The City of Carlsbad also requires that the permit holder submit a report stating the quantity injected at the SWD for each month to the Environmental Services Department of the City of Carlsbad. This report will be sent at the same time as required by the Oil Conservation Division.

City of Carlsbad
New Mexico
Fax Transmission Cover Sheet
Environmental Services Dept.

TO: Ben Stone, NMOCD Fax Number: (505) 827-8177

FROM: John P. Waters, Environmental & Laboratory Services Manager

DATE: June 18, 1996

NUMBER OF PAGES (incl. cover): 1

RE: Dreyfus Oil-Proposed SWD (Barbados State #1 Well)

The City of Carlsbad wishes to amend the application to state the following on the final page under section XIV: City Requirements:

"The City of Carlsbad reserves the right to report any and all results obtained from said sampling of the permitted well to the proper state authorities (i.e. the New Mexico Oil Conservation Division and/or the New Mexico Environment Department) at any time."

"The City also requires that the permit holder submit a report stating the total quantity injected at the SWD for each month to the Environmental Services Department of the City of Carlsbad. This report will be sent at the same time as that required by the Oil Conservation Division."

If you have any problems with this transmission or need additional information, please give me a call at (505) 887-1191, extension 115.

Louis Dreyfus Natural Gas Corp. 14000 Quail Springs Parkway, Suite 600, Oklahoma City, OK 73134 405-749-1300

Louis Dreyfus Natural Gas
Operations Department

FAX

Date: _____

Number of pages including cover sheet: _____

To: Ben Stone
NM OCD

Phone: _____

Fax 505 827 8177

From: Kent Sams

Phone: 405-749-5259

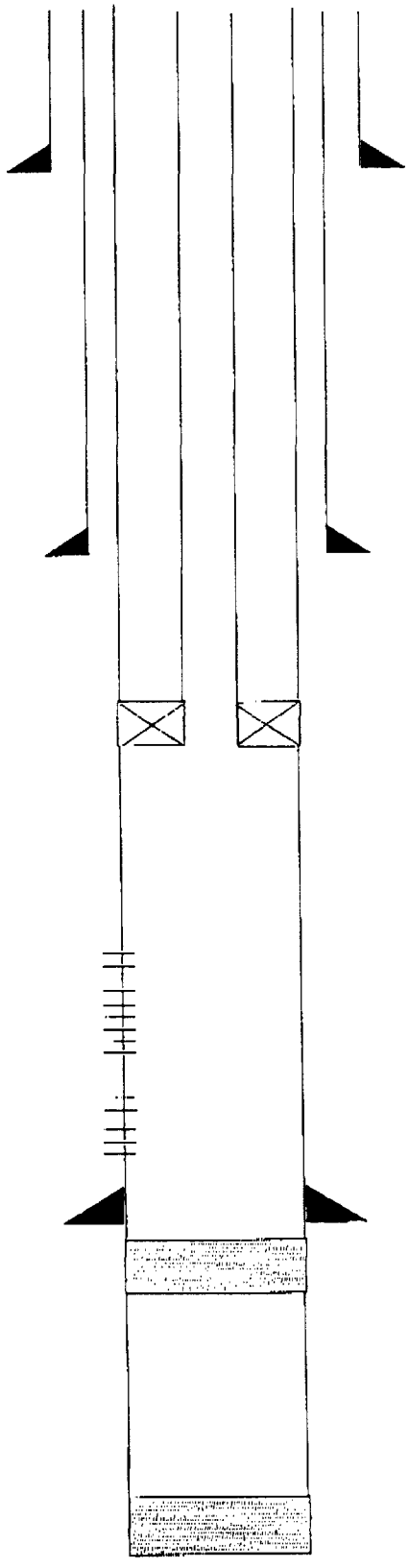
REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please Comment

Ben

Pursuant to your conversation w/ Blaine Hess Please find attached well schematics for the Sheep Draw Fed #5 & 6 and the EV state #3. Should you need additional info. please let me know.

Kent

LOUIS DREYFUS NATURAL GAS CORPORATION
SHEEP DRAW FEDERAL # 5
SEC. 33-T22S-R26E
EDDY CO., NM



12 jts, 13-3/8" 54.5# K-55 ST&C
Surf Csg Set @ 339' in 17-1/2"
hole. Cmt w/ 400 sx

51 jts, 8-5/8" 24# K-55
ST&C Csg Set @ 1610'in
12-1/4" hole. Cmt w/ 525 sx

TOC 150'

Production String
83 jts 2-7/8" Tbg
1 25/32" SSN 2604'
4' perf'd sub 2641'
25' mud anchor
Bottom of Tbg 2675'

Pump & Rods
101-7/8" Rods
2" x 1-1/2" x 16' Pump
1" x 6' Gas Anchor

ID Delaware Perfs:
2416-2434' 2 SPF

Delaware Perfs:
2537-2550
2560-2565

100 sx Class "C" plug @
2925-2750'

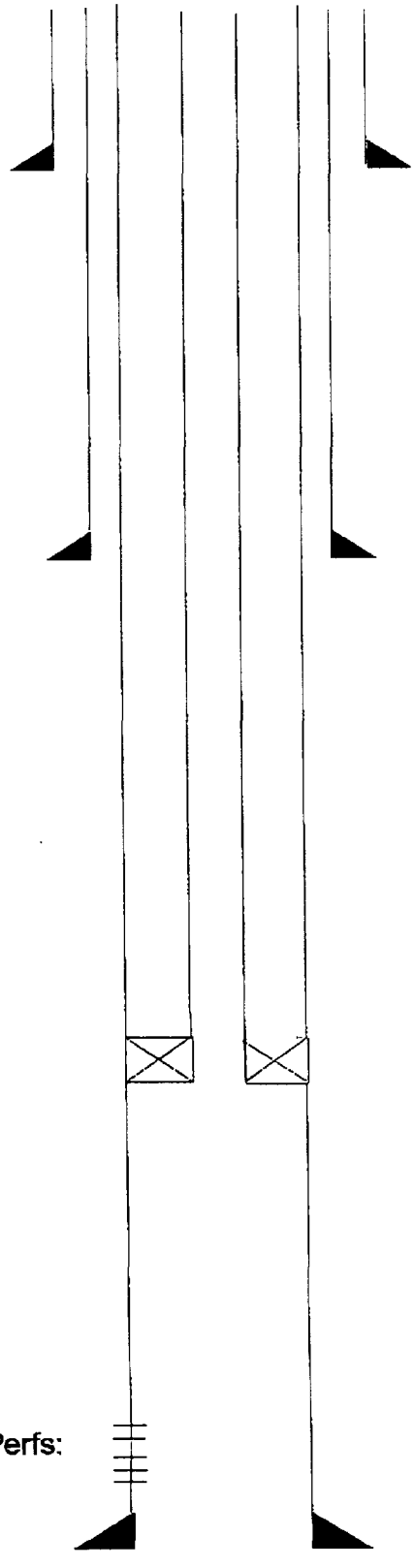
75 sx Class "C" Plug
5007-4715'

81 jts, 5-1/2" 15.5# K-55
LT&C Csg @ 2750'
Cmt w/ 385 sx

KS/CL 6/18/96

TD @ 5,040'

LOUIS DREYFUS NATURAL GAS CORPORATION
EV STATE # 3
SEC. 32-T22S-R26E
EDDY CO., NM



9 jts, 13-3/8" 54.5# K-55 ST&C
Surf Csg Set @ 356' in 17-1/2"
hole. Cmt w/ 900 sx

TOC 150'

36 jts, 8-5/8" 24# K-55
ST&C Csg Set @ 1620'in
12-1/4" hole. Cmt w/ 625 sx

Production String

127 jts 2-7/8" Tbg	
TAC	4078'
5 jts 2 7/8 tbg	
2 1/4" SSN	4227'
4' perf'd sub	4228'
28.5' mud anchor	4232'
Bottom of Tbg	4259'

Pump & Rods
62-7/8" Rods
96-3/4" Rods
9-7/8" Rods
2 1/2"x1 3/4"x16' RHBC Pump
1"x10' Gas Anchor

DV Tool @ 3320'

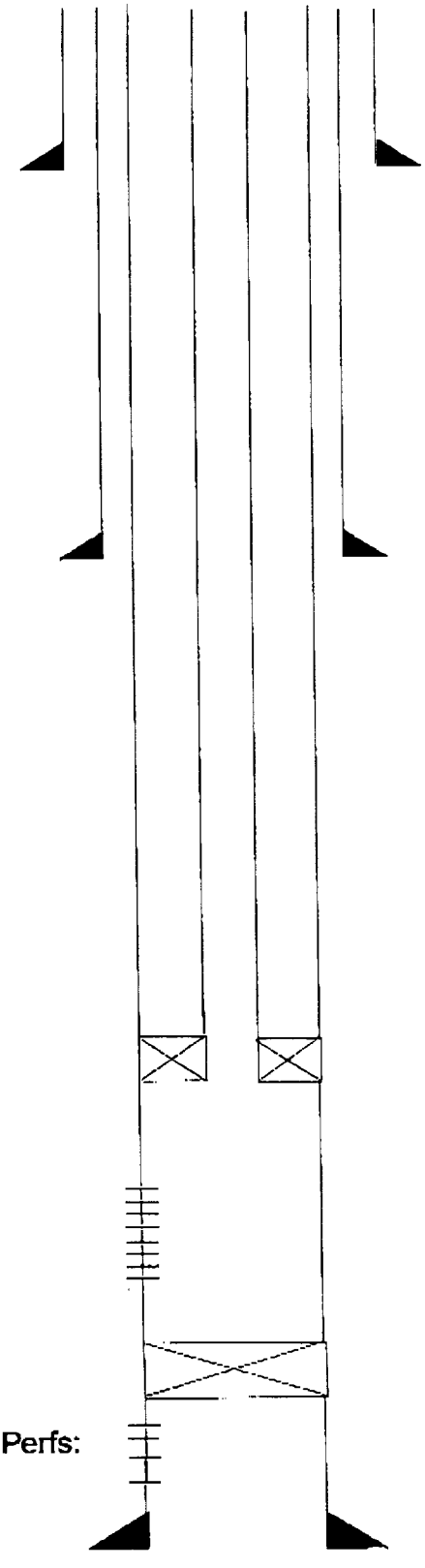
Cherry Canyon Delaware Perfs:
4190-4210' 41 holes

103 jts, 5-1/2" 15.5# K-55
LT&C Csg @ 5010'
Cmt w/ 930 sx

KS/CL 3/04/96

TD @ 5,010'

LOUIS DREYFUS NATURAL GAS CORPORATION
SHEEP DRAW FEDERAL # 6
SEC. 33-T22S-R26E
EDDY CO., NM



8 jts, 13-3/8" 54.5# K-55 ST&C
Surf Csg Set @ 357' in 17-1/2"
hole. Cmt w/ 400 sx

TOC 250'

37 jts, 8-5/8" 24# K-55
ST&C Csg Set @ 1642'in
12-1/4" hole. Cmt w/ 625 sx

Production String

74 jts 2-7/8" Tbg	
TAC	2422'
10 jts 2 7/8 tbg	
2 1/4" SSN	2757'
4' perf'd sub	2759'
25' mud anchor	2763'
Bottom of Tbg	2788'

Pump & Rods
45-7/8" Rods
64-3/4" Rods
2 1/2"x2"x20' BHD Pump
1"x6' Gas Anchor

ID Delaware Perfs:
2540-2560' 41 holes
2672-2700 57 holes

CIBP @ 4830'

DV Tool @ 3320'

Brushy Canyon Delaware Perfs:
4868-4876' 17 holes

115 jts, 5-1/2" 15.5# K-55
LT&C Csg @ 4987'
Cmt w/ 995 sx

KS/CL 3/04/96

TD @ 4,987'