#### UIL GUNDERTYA I IUN DIVISIUN POST OFFICE BOX 2088 STATE LAND OFFICE BUXDING GANTA FE NEW MEXICO 87501

rukm L-108 Revised 7-1-81

ARCH PETROLEUM INC.

APPLICA	ATION FOR AUTHORIZATION TO INJECT  C. E. LAMUNYON NO. 41
✓ 1.	Purpose: Secondary Recovery Pressure Maintenance XXDisposal Storage Application qualifies for administrative approval? XX yes no
· II.	Operator: ARCH PETROLEUM INC.
	Address: P. O. Box 10340. Midland. Texas 79702
	Contact party: Richard L. Wright Phone: 915/685-8100
m.	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
<b>∨ V.</b>	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:
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and</li> <li>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.).</li> </ol>
VIIL	Ittach appropriate geological labour 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.
х.	Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)
XI.	Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
XII.	Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
XIII.	Applicants must complete the "Proof of Notice" section on the reverse side of this form.
XIV.	Certification
	I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
	Name: Bill F. Halepeska  Signature: Date: 08-09-99
	Signature: Dille Halipest Date: 08-09-99
submi	te information required under Sections VI. VIII. A, and XI above has been previously tted, it need not be duplicated and resubmitted. Please show the date and circumstance see earlier submittal.

#### III. WELL DATA

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

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

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

- B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.
  - (1) The name of the injection formation and, if applicable, the field or pool name.
  - (2) The injection interval and whether it is perforated or open-hole.
  - (3) State if the well was drilled for injection or, if not, the original purpose of the well.
  - (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
  - (5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

#### XIV. PROOF OF NOTICE

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

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

- (1) The name, address, phone number, and contact party for the applicant;
- (2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) the formation name and depth with expected maximum injection rates and pressuces; 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.

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ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

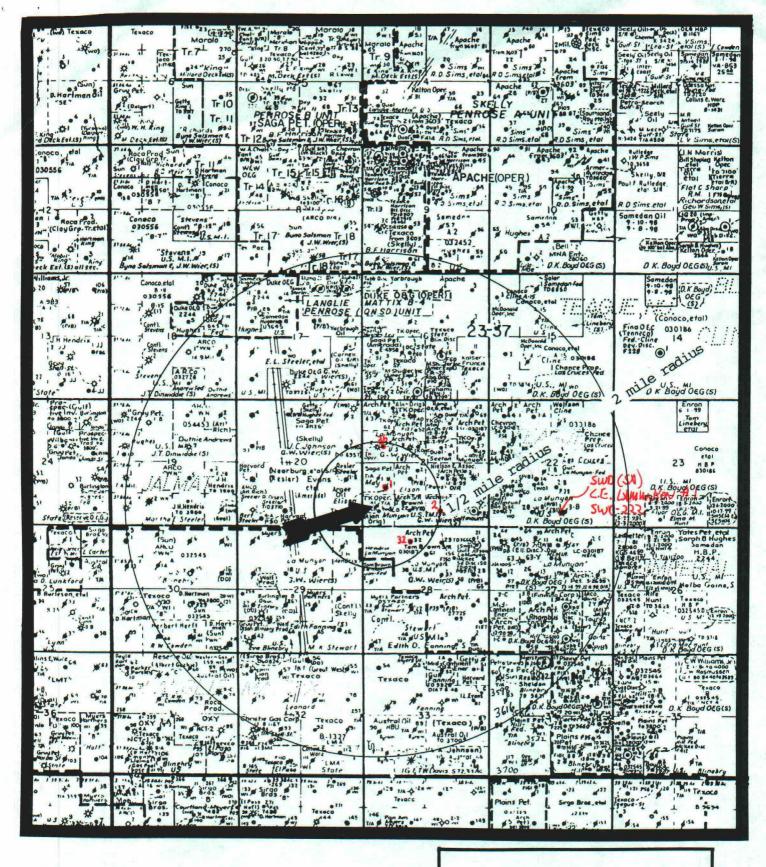
INJECTION WELL DATA SHEET

TABULAR DATA	-(1). LEASE:C. E. Laminyon	LOCATION: Sec. 21 TWP 23S Range 37E		(2). CASING STRINGS:		Size 8-5/8 Depth 906' Cemented w/ 350 sx. TOC <u>surface Determined by circulated</u>	Hole size 11"	Intermediate Casing	Size Depth Cemented w/sx.	TOC Determined by	Hole size	Lang String	Size <u>5-1/2"</u> Depth <u>6300'</u> Cemented w/ <u>510</u> sx.	TOC 3350' Determined by CBL	Hole size 7-7/8"	[3]. INJECTION TUBING STRING:	Size 2-7/8 in., coated/lined with plastic	Setting depth 3785 ft.	4) INJECTION PACKER:	Size 5-1/2 im.; Make/Model Baker Loc Set (or equiv.)	Setting depth <u>3785</u> ft.	
SCHEMATIC	* 1.3	- c	cem w/350 sx, TCC surf		internally plastic coated		TOC 5-1/2" csg @ 3350; CBL			X			Con Induce Injection interes	3835' - 4987'			Glorieta perfs 5052' - 77'	Paddock perfs 5136' - 48'	20 sk ant	Blinebry perfs 5427' - 5814' squeezed w/200 sx	CIBP @ 6000' w/10 sx cmt cap  [5] Tubb/Drinkard perfs 6052' - 6216'	W #2

# ITEM III-B

# INJECTION WELL DATA

(1).	Injection formation: San Alares Field/Pool: Teague						
(2).	Injection interval; from <u>3835</u> ft. to <u>4987</u> ft. Perforated <u>XX</u> Open Hole						
(3).	Original purpose well drilled <u>drilled as Blinebry prod.</u>						
(4).	Other perforated intervals;XXYesNo Squeezed withsx., or isolated by Tubb/Drinkard 6052' - 6216'; CIBP @ 6000' wlo sx cmt cap; Blinebry 5427' - 5814'; sq w/200 sx; CIBP @ 5370' w/20 sx cap;						
(5).	continued below Oil or gas productive zone(s): Next higher <u>Grayburg 3300' to 3800'</u> Next lower <u>Glorieta/Paddock 5160' to 5190'</u>						
	#4 continued						
	Paddock 5136' - 48'; CIBP @ 5132'						
	Glorieta 5052' - 5077'; CIBP @ 5000'						



FORM C-108, ITEM V

LOCATION MAP

ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

Section 21-23S-37E Lea County, New Mexico

## C. E. LAMUNYON NO. 41

ITEM VI

## WELL DATA - AREA OF REVIEW

<b>ú</b> .	). Location: 1980' FNL & 860' FWL, Sec. 21, 23S - 37E, Lea Co.
	Operator: Arch Petroleum inc. Lease: C. E. Lamunyon Well # 36
	Well type: Oil XX Gas DSA Total depth 6289 ft.
, :	Date drilled:Spud 4-22-68;comp 5-18-68
of January	mpletion Data: 8-5/8" @ 900! w350 sx, circ; 5-1/2" @ 6289! w/
~IQ!	i10 sx; perf 5465'-5853'; A/500 gal; F/35,000gal GW & 45,000# 20/40 sd; IPF 270 BO + 285 BW & 451 MCFG; add Blinebry perfs
, EGID	5418'-5839'; A/2100 gal; F/25,600 gal + 50% CO2 & 51,094# sd
LEGIB	Plugged Date: (Schematic attached)
<b>6</b> .	). Location: 1980' FSI, & 660' FEI, Sec. 20, 23S - 37E, Lea County
	Operator: Resler & Sheldon Lease: Steeler "B" Well #1
	Well Type: Oil XX Gas DGA Total Depth: 3690 _ ft.
	Date Drilled:5-16-57
	Completion Data: Grayburg completion; did not penetrate the
	-intended injection zone
	PluggedDate(Schematic attached)
Ç	F). Location: 1980' FNL & 660' FWL, Sec. 21 -23S - 37E, Lea Co.
	Operator: TK Operating Lease: Lamunyon Federal Well # 2
	Well Type; Oil Gas_XX_ DSA Total Depth: 3618_ft.
	Date Drilled: 4-24-59
	Completion Data: Queen/Penrose completion; did not penetrate
	- intended injection zone
	PluggedDate(Schematic attached)
4	). Location: 1980' FN & WL, Sec. 21 - 23S - 37E, lea County
	Operator: <u>TK Operating</u> Lease: Lamunyon Federal Well # 3
	Well type: Oil Gas XX DGA Total depth 3610 ft.
	Date drilled: 4-24-59
	Completion Data: Queen/Penrose completion; did not penetrate
	the intended injection zone
	Plugged Date: (Schematic attached)

# WELL DATA - AREA OF REVIEW

(5).	Location: 1980' FNL & 2130' FWL, Sec. 21 - 23S - 37E, Lea Co									
	Operator: Arch Petroleum Inc.									
=	Lease: C. E. Lamunyon Well No. 27									
	Well type: Oil xx Gas T.D. 5900:									
	Date drilled:spud 2-11-68; _comp 3-01-68									
	Completion data: 8-5/8" @ 890' W/370 sx circ; 5-1/2" @									
	5900' w/440 sx, TOC 2310', temp sur : perf 5294'-5783':									
	A/4500 gal; F/18,000 gal + 21,000# sd; IPF 209 BO + 28 BW									
	& 324 MCFG; 03/93 add Blinebry perfs 5407'-5814'; A/5800									
	qal; F/99,000 qal + 50-60% CO2 & 251,900# sd									
	Plugged Date (diagram att.)									
(6).	Location: 660' FSL & 1980' FWL, Sec. 21-23S-37E, Lea Co.									
	Operator: Arch Petroleum Inc.									
	Lease: C. E. Lamunyon Well No. 22									
	Well type: 0il XX Gas T.D. 5900'									
	Date drilled: spud 1-02-68; comp 2-04-68									
	Completion data: 9-5/8" @ 904' w/460 sx, circ; 7" @ 5900'									
	w/540 sx, TOC 2285', temp sur; perf 5399'-5760'; A/4000 gal; F/14,000 gal + 18,000# sd; IPP 100 BO + 7 BW & 115 MCFG;									
	03/1983, set CIBP @ 5340'; perf Grayburg 3804'-3984' &									
	3648'-3763'; A/3000 gal; 07/83 PB w/40 sx cmt & CIBP @									
	3630'; perf Queen/Penrose 3333'-3486'; A/2000 gal; F/									
	25,000 gal + 21,000# sd; Tst 163 MCFG									
	Plugged Date (diagram att.)									
(7).	Location: 660' FS & WL, Sec. 21-23S-37E, Lea County									
	Operator: TK Operating									
	Lease: Lamunyon Federal Well No.!									
	Well type: Oil Gas <u>xx</u> T.D. <u>3757'</u>									
	Date drilled: 11-23-58									
	Completion data: Oueen/Penrose completion: did not									
	penetrate the intended injection zone									
	Plugged Date (diagram att.)									

# WELL DATA - AREA OF REVIEW

( <sub>8</sub> ).	Location: 660' FSI, & 1980' FEI, Sec. 21-23S-37E, Lea Co.	
	Operator: Arch Petroleum Inc.	
=	Lease: Saltmount Well No. 2	
	Well type: Oil XX Gas T.D. 6396'	I" WELL
,	Date drilled: spud 9-14-67; comp 12-22-67	/ 10 1
ブ	Completion data: $9-5/8$ " @ 1066' w/450 sx. TOC surf (topout); 7" @ 6396' w/ 400 sx, TOC 3586'; perf 6153'-6321';	_
	Acid Drinkard w/1500 gal: F/15,000 gal + 18,000# sd; Tubb perfs A/1100 gal; F/15,000 gal + 18,000# sd; Blinebry	18.7%
	<pre>perfs5356'-5894'; A/3000 gal; F/30,000 gal + 47,000# sd; IPF (T/D) 864 BO + 1598 MCFG; (B) 312 BO + 131 BW &amp; 543</pre>	
	MCFG; 1975, CIBP @ 5300'; Paddock 5160'-90' F/11,500 gal	
/	Plugged Date (diagram att.)	
√(9).	Location: 1980' FS & WL, Sec. 21-23S-37E, Lea Co.	
	Operator: Arch Petroleum Inc.	
	Lease: W. H. Elson Well No. 1	
	Well type: 0il XX Gas T.D. 9685'	
	Date drilled: 11-08-48	) /
rein!	Completion data: 13-3/8" @ 288' w/300 sx; 9-5/8" @ 2900	r
SWAY =	w/1300 sx, TOC 1140'; 7" @ 3855' w/180 sx; perf Grayburg 3675'-3765'; set ret @ 3625' sq Grbg w/50 sx, top ret w/	No som
. <b>N</b> 2 €.	5 sx:perf 3300'-3375'; AOF 2490 MCFG; P & A Langlie- Mattix 09/67; CO to 6034', run 5" lnr 3051'-5998', cmt w/	~ 226
	625 sx, circ; perf 5367'-5832'; A/2000 gal; F/62,000 gal + 52,000# sd; IPP 156 BO + 83 BW & 131 MCFG	
	Plugged Date (diagram att.)	
/ (10).	Location: 2310' FS & WL, Sec. 21-23S-37E, Lea Co.	
•	Operator: Arch Petroleum Inc.	
	Lease: W. H. Elson Well No. 2	
	Well type: Oil XX Gas T.D. 5980'	
	Date drilled: spud 12-02-97; comp 1-10-98	
	Completion data: 8-5/8" @ 1090' w/ 750 sx, circ; 5-1/2"	
	@ 5980' w/1125 sx, circ; perf 5428'-5827'; A/2000, gal; F/25,284 gal + 54,000# sd; IPP 34 BO + 48 BW & 83 MCFG	
	Plugged Date (diagram att.)	

ILLEGIBLE STATES

# WELL DATA - AREA OF REVIEW

(11).	Location: 1980' FNI, & 660'FEL, Sec. 20-23S-37E, Lea County	I
	Operator: Penroc  Lease: Johnson Well No. 3	NEW WY NORTH
	Well type: Oil XX Gas T.D. 6957'	- WC. SVF
	Date drilled: 1 12 40 D 5 3 Ds 12/1054	
	Completion data: 8-5/8" @ 1066' w/300 sx; 7" @ 3591' w/200 sx; plg 6464'-6957' w/100 sx; 6306'-6464' w/50 sx;	1-1.8% plt.
	3440'-3570' w/45 sx; 0-50' w/50 sx; 1954 DO to 3700'; perf 3378'-3425'; F/10,000 gal; IPP 13 BO + 385 MCFG; 01/	
	1974, CO to 3952' run 5" lnr 3274'-3952'; cmt w/150 sx; perf 3592'-3798'; F/40,000 gal + 40,000# sd; pump 3 BO +	
	210 BW & 61 MCFG Plugged Date (diagram att.)	
○ √(12)•	Location: 1650' FSI & 990' FWL, Sec. 21-23S-37E, Lea Co.  Operator: Argee Oil  Lease: Elson Well No. 1	
	Well type: Oil XX Gas T.D. 6400'	, , , <b>?</b> , .
- 12 J. 3418	Date drilled: spud 7-28-68; comp 9-28-68	CIRC.
	Completion data: 9-5/8" @ 1054' w/400 sx; 7" @ 6400' w/525 sx; perf 5835'-5967'; A/1500 gal; F/30,000 gal +	- 3515 CALC.
CIBL	50,000# sd; eprf 5416'-5512'; A/1000 qal; F/25,000 qal + 30,000# sd; IPP 185 BO + 33BW , GOR 1342-1	
(K)		
	Plugged XX Date 8-27-88 (diagram att.) EXHIBIT I	
	Location: 660' FNL & 1940' FWL, Sec. 28-23S-37E, Lea Co.	
	Operator: Arch Petroleum Inc.	
	Lease:C. E. LamunyonWell No. 32Well type:Oil XX Gas T.D. 6308'	
,	Date drilled: cond 3-12-68: comp 4-05-68	/
tof SA 3820	Completion data: 8-5/8" @ 884' w/340 sx, circ; 5-1/2"	- MC. 3916
	@ 6300' w/ 500 sx; perf 5447'-5772'; A/6500 gal; F/42,000	
	gal + 54,000# sd; IPP 233 BO + 38 BW & 336 MCFG	
	Plugged Date(diagram att.)	
	(dragitall acc.)	

ITEM V1

## WELL DATA - AREA OF REVIEW

(14	). Location: <u>820'</u>	FNL & 815' I	EL. Sec. 29-2	3S-37E, Lea	Co.									
	Operator: _John	Hendrix	Lease:Lamu	<u>inyon Federal</u>	Well # 2									
	Well type: Oi	1 _XX_ Gas _	D&A	Total dep	th <u>3635'</u> ft									
=	Date drilled:	1-15-58												
	Completion Dat	a:Oueen/I	Penrose comple	etion; did no	ot									
	penetrate th	e intended in	jection zone											
					·									
	Plugged	Date:	(Sch	ematic attac	hed)									
fi.s	).location: 199	Location: 1980' FSL & 660' FWL, Sec. 21-23S-37E, Lea County												
, <b>U</b> O	Operator:War		-		_									
	Well Type: Oi			_										
		Date Drilled: 9-04-57  Completion Data: Grayburg completion; did not penetrate the												
	intended in	njection zone	_											
	·													
	Plugged	Date	(Sche	matic attach	ed)									
_														
ι	<pre>F). Location:</pre> Operator:													
	Well Type ; C													
		Date Drilled:												
	completion bac	.d.												
	Plugged	Oate	(Sche	amatic attach	ned)									
(	). Location:			······································										
	Operator:	· · · · · · · · · · · · · · · · · · ·	Lease:		Well #									
	Well type: Oi	.1 Gas _	DGA	Total dep	thft									
	Date drilled:													
	Completion Dat	а:												
			en rekonomiente de la											
	Pluoged	Date	(5~+	ematic attac	hedl									

# FORM C-108

# ITEM VII

0	PI	<u>e r</u>	A	T	<u>I</u>	0	<u>n /</u>	<u>\L</u>	DA	<u>.T</u>	A

(1).	Average expected injection rate: 3000 BWPD; maximum anticipated rate: 5000 BWPD
(2).	Closed system
(3).	Estimated average injection pressure: <u>500</u> psi. Estimated maximum pressure: <u>767</u> psi.
(4).	Source of injection water: nearby leases/wells operated by Arch Petroleum Inc.
(5).	Analysis of waters attached; EXHIBITS II, III, IV, V, VI and VII  Analysis of injection zone water attached; EXHIBIT VIII
(3).	Data source: Roswell Geological Symposium, 1956; water
	chacteristics checked with Martin Water Labs and found
	to be consistent with other San Andres sources in the  Eunice area. source in Hobbs Field
ITEM V	VIII
	GEOLOGICAL DATA
INJEC	TION ZONE
	ithological description: <u>dolomite, fx-xl, some grn, tan</u> to gray, anhydritic
	eological name: <u>San Andres</u> one thickness: <u>1152</u> ft; Depth: <u>3835</u> ft
FRESH	WATER SOURCE(S)
-	eological name of aquifer: <u>major source, Santa Rosa (570'</u> +) and minor source Quaternary alluvium (90'+/-) epth to bottom of zone 800'

FORM C-108

ITEM IX

## STIMULATION PROGRAM

ACIDIZE PROPOSED
-Volume:
Rate: 5+/- BPM; Misc.: ball sealers
FRACTURE NONE PLANNED
Fluid volume:gal.; Type:
Prop type: Volume (1b):
Rate:BPM; Conductor:
Misc:
ITEM X
LOGGING PROGRAM
Logging program included: <u>GR- Comp Acs, CBL</u>
Copy of <u>GR-ACS</u> log(s) included with attachments
ITEM XI
FRESH WATER DATA
Fresh water well within 1 mile radius: XX YesN
Chemical analysis from well located: <u>Sec. 21-23S-37E</u>
Date sampled: 8-02-99 EXHIBIT IX shallow source
Chemical analysis from well located: <u>sec. 35-235-37E</u>
Date sampled: 1-05-98 Santa Rosa
EXHIBIT X
TTEM YII

# HYDROLOGY

Engineering data and area well logs reveal no evidence that hydrologic connection might exist between intended disposal zone and fresh water zone(s) above 800'.

FORM C-108 ITEM XIII

#### COMMERCIAL INTENT

Initially, only water from properties operated by Arch Petroleum Inc. will be disposed of into subject well. Eventually, Arch Petroleum Inc. could take water from other leases in the area operated by someone else, but in which Arch Petroleum Inc. has a working interest. Only piped water will be taken into the system.

ARGEE OIL - ELSON NO. 1 Section 21 - 23S - 37E, Lea County 5 sx surface plug 85 sx plug, 900'-1180' 9-5/8\* @ 1054 cem w/400 sx TOC 7", calc 2400' 133% wash-out factor 50 sx plug, 2860'-3000' 25 sx plug, 3700'-3800' - CIBP @ 5400' w/35' cmt cap perfs 5416'-5512' perfs 5835'-5967' PBTD 6060' 7" csg @ 6400' cem w/525 sxTD 6400'

P & A DIAGRAM

FORM C-108, ITEM VII(4)

ANALYSIS OF INJECTION WATER
LANGLIE-MATTIX, 7-RIVERS/QUEEN

ARCH PETROLEUM INC.
C. E. LAMUNYON NO. 41

Section 21-23S-37E
Lea County, New Mexico

26-97
Endura Rep JOHN SOLANSKY
Point/Date WELL HEAD 1-25-97

EXHIBIT II

Lexas 79706

x (915) 684-4277

Code W-9858

State NEW MEXICO

Date 11-26-97 Endura Rep JOHN SOLANSKY Code W-9858
Sampling Point/Date WELL HEAD 1-25-97 State NEW MEXIC
Company ARCH PETROLEUM
Field Lease C.E. LAMUNYON Well #39

#### DISSOLVED SOLIDS

TURBIDITY

CATIONS	mg/1	me/1
Sodium, Na+ (Calc.)	21,942	954
Total Hardness as Ca-	8,000	0
Calcium, Ca-	880	44
Magnesium, Mg↔	4,341	362
Barium, Ba++	0	0
Iron (Total) Fe	1	0
ANIONS		
Chlorides, COl-	27,500	775
Sulfate, SO4-	14,000	292
Carbonate, CO3-	0	0
Bicarbonate, HCO3-	4,880	80
Sulfide, S-	3 <b>,4</b> 00 ′	213
Total Dissolved Solids (Calc.)	76,944	
	•	
OTHER PROPERTIES	•	•
pH*	7.800	
Specific Gravity, 60°/60 F	1.054	

#### SCALING INDICIES

TEMP, F	CA CO3	CASO4*2H2O	CA SO4	BA SO4
80	1.6565	0.0783	-0.1225	-29.1181
120	1.9703	0.0734	0.0631	-29.3450
160	2.4537	0.0645	0.2269	-29.5706

FORM C-108, ITEM VII(4)

cts Corp.

ANALYSIS OF INJECTION WATER GLORIETA

ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

Section 21-23S-37E Lea County, New Mexico liand, Texas 79702 Fax (915) 684-4277

YSIS

Date 1-8-99 Endura Rep GREG ARCHER Sampling Point/Date WELL HEAD / 1-8-99

Sampling Point/Date WELL HEAD / 1-8-99 Company ARCH PETROLEUM INC. Field Lease C

Lease CE LAMUNYON

Code W-14432
State NEW MEXICO

EXHIBIT III

County LEA Well #68

#### DISSOLVED SOLIDS

CATIONS	mg/1	me/1
Sodium, Na' (Calc.)	11,615	505
Total Hardness as Ca"	2,360	0
Calcium, Ca"	2,000	100
Magnesium, Mg''	220	18
Barium, Ba''	0	0
Iron (Total) Fe'''	1	0
ANIONS		
Chlorides, Cl-	17,500	493
Sulfate, SON	2,750	57
Carbonate, CO3	0	0
Bicarbonate, HCO3	2,129	35
Sulfide, S <sup>:</sup>	600	38
Total Dissolved Solids (Calc.)	36,815	
OTHER PROPERTIES		
pH <sup>*</sup>	7.500	
Specific Gravity, 60°/60 F	1.022	
TURBIDITY	605	•

#### SCALING INDICIES

BA SOL	CA SOL	CASO4*2H2O	CA CO3	TEMP. F
-28.8535	-0.1537	0.0177	1.4733	80
-29.0876	0.0350	0.0160	1.7656	120
-29.2894	0.2317	0.0400	2.1945	160

FORM C-108, ITEM VII(4)

ANALYSIS OF INJECTION WATER PADDOCK

ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

Section 21-23S-37E

Lea County, New Mexico

ANALYSIS

ducts Corp. Hidland, Texas 79702

233 \* Fax (915) 684-4277

G ARCHER

Lease CE LAMUNYON

Code W-14969 State NEW MEXICO

County LEA Well 53

Company ARCH PETROLEUM INC

Field

### DISSOLVED SOLIDS

CATIONS	mg/1	me/1
Sodium, Na- (Calc.) Total Hardness as Ca- Calcium, Ca- Magnesium, Mg- Barium, Ba- Iron (Total) Fe	24,127 4,760 3,280 902 0 1	1,049 0 164 75 0
ANIONS  Chlorides, Cl- Sulfate, SO4- Carbonate, CO3- Bicarbonate, HCO3- Sulfide, S- Total Dissolved Solids (Calc.)	42,500 3,800 0 488 64 75,162	1,197 79 0 8 4
OTHER PROPERTIES  pH* Specific Gravity, 60-/60 F TURBIDITY	6 <del>:90</del> 0 1.050 342	

#### SCALING INDICIES

TEMP, F	CA CO3	CASO4*2H2O	CA SO4	BA SO4
80	0.3199	0.1516	-0.0442	-29.0843
120	0.6297	0.1524	0.1470	<b>-29.</b> 3133
160	1.1053	0.1612	0.3285	-29.5369

#### DISSOLVED SOLIDS

CATIONS	mg/1	me/1
Sodium, Na' (Calc.)	31,326	1,362
Total Hardness as Ca''	5,000	0
Calcium, Ca''	3,320	166
Magnesium, Mg''	1,024	85
Barium, Ba <sup>++</sup>	0	0
Iron (Total) Fe'''	1 .	0
ANIONS		
Chlorides, Cl-	55,000	1,549
Sulfate, SOI	2,400	50
Carbonate, CO3	O	. 0
Bicarbonate, HCO3	683	11
Sulfide, S:	48	3
Total Dissolved Solids (Calc.)	93,802	•
OTHER PROPERTIES	•••• .	
pH'	7.100	,
Specific Gravity, 60°/60 F	1.056	
TURBIDITY	1267	

#### SCALING INDICIES

BA SOI	CA SOL	CASO4*2H2O	CA COJ	TEMP, F
-29.1439	-0.2890	-0.0920	0.6965	80
-29.3680	-0.1116	-0.0950	1.0150	120
-29.5954	0.0721	-0.0940	1.5069	160

FORM C-108, ITEM VII(4)

**EXHIBIT VI** 

ANALYSIS OF INJECTION WATER TUBB/DRINKARD

ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

Section 21-23S-37E Lea County, New Mexico ducts Corp.

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

ANALYSIS

Date 11-26-97 Endura Rep JOHN SOLANSKY

Sampling Point/Date WELL HEAD / 11-25-97

Company ARCH PETROLEUM

Field

Lease C.E.LAMUNYON

Code W-9836 State NEW MEXICO

County LEA Well #46

#### DISSOLVED SOLIDS

CATIONS	mg/1	me/1
Sodium, Na+ (Calc.)	42,596	1,852
Total Hardness as Ca↔	8,800	0
Calcium, Ca-	5,440	272
Magnesium, Mg↔	2,049	171
Barium, Ba	0	0
Iron (Total) Fe	1	0
ANIONS		
Chlorides, COl-	80,000	2,254
Sulfate, SO4-	1,250	. 26
Carbonate, CO3-	0	0
Bicarbonate, HCO3-	<b>7</b> 56	12
Sulfide, S-	40	3
Total Dissolved Solids (Calc.)	132,132	
	**************************************	
OTHER PROPERTIES		
pH-	7.000	
Specific Gravity, 60-/60 F	1.082	
TURBIDITY	200	

#### SCALING INDICIES

TEMP, F	CA CO3	CASO4*2H2O	CA SO4	BA SO4
80	1.0254	-0.2197	-0.4457	-29.2535
120	1.3722	-0.2269	-0.2725	-29.4630
160	1.9091	-0.2410	-0.1139	-29.6931

FORM C-108, ITEM VII(4)

ANALYSIS OF INJECTION WATER DEVONIAN

ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

Section 21-23S-37E Lea County, New Mexico

# Water Analysis Report from Petrolite Corporation

#### **ARCH PETROLEUM**

LAMUNION WELL #47 WELLHEAD

Summary	Analysis: 61960						
Anion/Cation Ratio	1.00	Anions	mg/L	meq/L	Cations	mg/L	meq/L
		Chloride	38,328	1,081	Sodium	20,495	891
TDS (mg/L or g/m³)	67,119	Bicarbonate	261	4.28	Magnesium	878	72.2
Density (g/cm³ or tonne/m³)	1.046	Carbonate	0.00	0.00	Calcium	3,444	172
		Sulfate	3,136	65.3	Strontium	76.0	1.73
Chemical Treatment		Phosphate	N/A	N/A	Barium	0.30	0.00
Sample Condition		Borate	N/A	N/A	iron	51.0	1.83
		Silicate	N/A	N/A	Potassium	450	11.5
Sampling Date	11/5/97				Aluminum	N/A	N/A
Sampled by		Hydrogen Sulfide			Chromium	N/A	N/A
Submitted by	<b>BOB WILSON</b>	1			Copper	N/A	N/A
		pH at time of sam	pling		Lead	N/A	N/A
Analysis Date	11/11/97	pH at time of anal	ysis	7.77	Manganese	N/A	N/A
Sample analysis number	61960	pH used in Calcul	ations	7.77	Nickel	N/A	N/A

	Predictions of Saturation Index and Amount of Scale in lb/1000bbl											
Press (psi	i	Temp.	Calc CaC		Gyp CaSO4		Anhy CaS	drite 604	Cele SrS		Bas Bas	
CO2	Total	°F	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0.04	0.00	80	1.34	27.2	0.15	469	0.11	282	0.28	24.8	0.99	0.15
0.06	0.00	100	1.31	30.1	0.12	372	0.14	351	0.27	24.4	0.82	0.14
0.10	0.00	120	1.30	33.3	0.10	305	0.20	467	0.27	24.7	0.67	0.13
0.15	0.00	140	1.30	36.7	0.08	265	0.28	610	0.29	25.6	0.55	0.12

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: CO2 Pressure is absolute pressure. Total Pressure is gauge pressure.

FORM C-108, ITEM VII(5)

ANALYSIS OF INJECTION ZONE WATER - SAN ANDRES

ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41

Section 21-23S-37E Lea County, New Mexico

#### ROSWELL GEOLOGICAL SOCIETY SYMPOSIUM

207

Data prepared by: K.D. McPeters, J.M. Kelly

Affiliation: John M. Kelly

Date: 8-7-56

, ----

Field Name: Hobbs (Grayburg-San Andres)
Location: T. 18 S., R. 37 E.; Tps. 18,19 S., R.38E.

County & State: Lea County, New Mexico

DISCOVERY WEll:Stanolind Oil & Gas, State A Tr 5 #1

COMPLETION DATE: 6-13-28

PAY ZONE: The "Sandy Section", Grayburg, consists of sandy dolomite with interbedded dolomitic sands. The Grayburg produces on the west and northwest flanks of the field. The "White Lime", San Andres, is the main pay in the Hobbs Field and is a very porous white limestone containing cavernous porosity on the crest of the structure. There are two zones of porosity on crest of the structure and three zones on the flanks.

#### TYPICAL CORE ANALYSIS OF A PAY INTERVAL IN THIS FIELD:

Perm. in n	nillidarcys	% Porosity	Liquid Saturation (%	of pore space)
Horizontal	Vertical		Water	Oil
50	NA	15%	15%	

OTHER SHOWS ENCOUNTERED IN THIS FIELD: The Bowers, lower Seven Rivers, at a depth of 3,200 feet produces oil on the Hobbs high. The Byers ("Big Gas"), upper Queen, at a depth of 3,700 feet is gas productive.

TRAP TYPE: Anticline

NATURE OF OIL: Gravity 34° A.P.I. at 60° NATURE OF GAS: Sour SG-1.05 H<sub>2</sub>S-1%

NATUR	E OF PRODUCING	ZONE V	VAIER:			Resi	stivity: 0	<u>.33 of</u>	<u>im-meters</u>	@ 125	*F
	Total Solids	Na≠K	Ca	Mg	Fe	SO 4	C1	CO <sub>2</sub>	HCO <sub>3</sub>	ОН	H2S
ppm	21,566	7,352	411	179		699	10.800		2.125		

INITIAL FIELD PRESSURE: 1,525 psi at a depth of 400 feet below sea level.

TYPE OF DRIVE: Water drive.

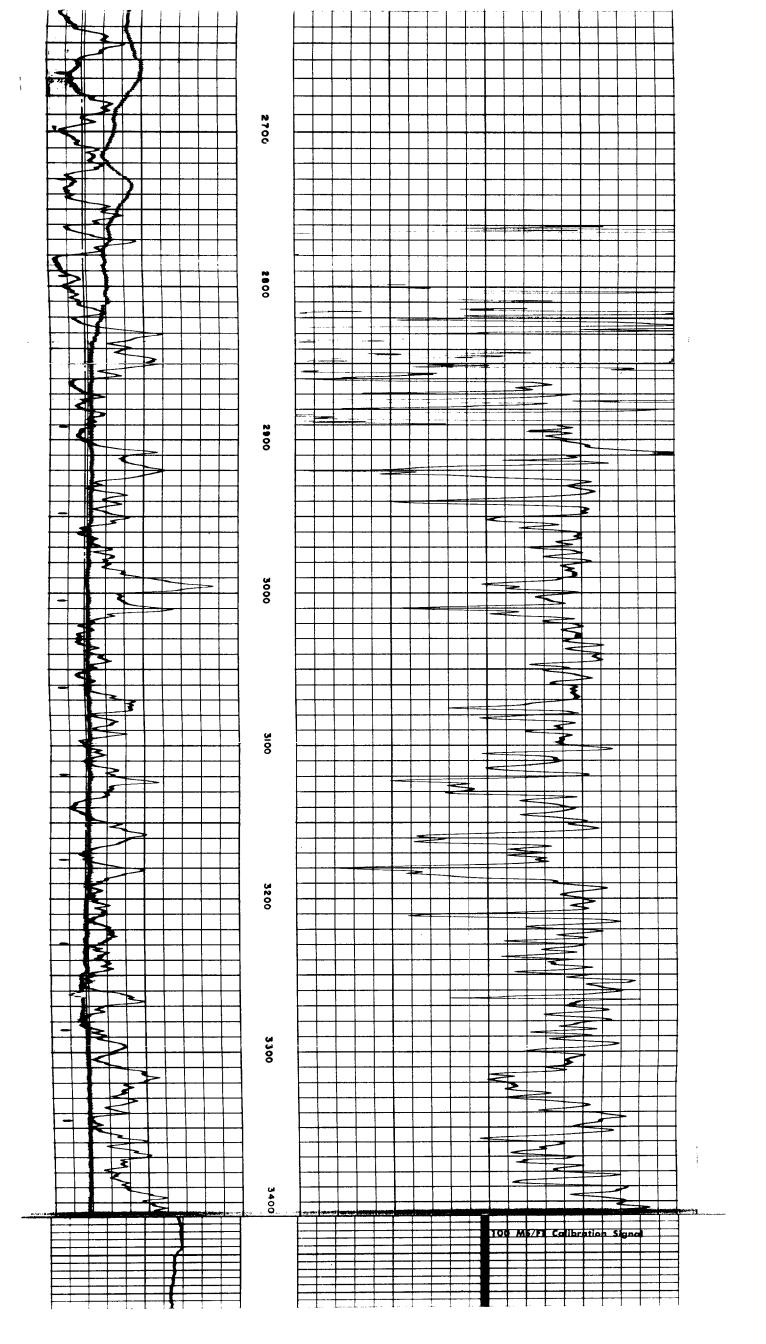
NORMAL COMPLETION PRACTICES: Initial wells were completed "openhole" with the oil string set in the "sandy section". Excessive water and gas was controlled by setting formation packers. The pay was completed natural or shot with nitroglycerin. Later acidizing became the stimulation practice. Recent wells have been "set through" completions which make control of the different zones more practical.

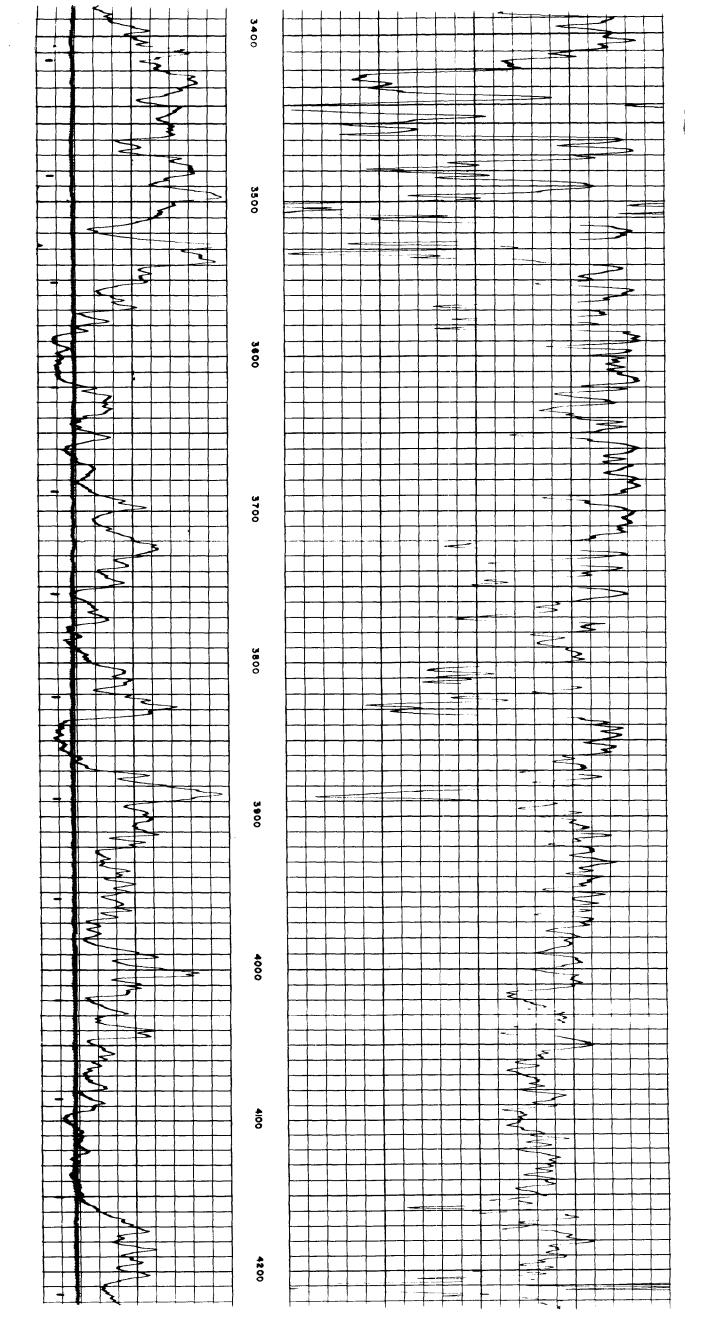
FORM C-108, ITEM XI			
FRESH WATER ANALYSIS SANTA ROSA			
ARCH PETROLEUM INC. C. E. LAMUNYON NO. 41		LAB. NO.	
Section 21-23S-37E		DATE REC	1-5-98
Lea County, New Mexico	79701	RR E. C. Hill Fed	11 47
FIELD	_D.	E. C. mili rec	ierai #/
SEC 35 B-LK-23S-37ESURVEY	eague	CO.	Lea, NM
NO. 1 Santa Rosa water - taken from E. (	C Hill Endami ±		
NO. 2	C. Hill I cuciai s	er (water supply	well wellicad). 1-1-90
NO. 3.			
NO. 4			
REMARKS:			
Specific Gravity @ 60°F.	1.0035		
pH When Sampled			
pH When Received	7.60		
Bicarbonate, as HC03	176		
Supersaturated, as CaC03			
Undersaturated, as CaC03			
Total Hardness, as CaC03	320		
Calcium, as Ca	41		
Magnesium, as Mg	53		
Sodium and/or Potassium	524		
Sulfate, as SO4	717		
Chloride, as Cl	405		
Iron, as Fe	3.9		
Barium, as Ba			
Turbidity			
Color			
Total Solids, Calc.	1915		
Temperature, °F.			
Carbon Dioxide			
Oxygen			
Hydrogen Sulfide	0.0		
Resistivity, ohms/m @ 77°F.	3.47		
Suspended Oil			
Filtrable Solids			

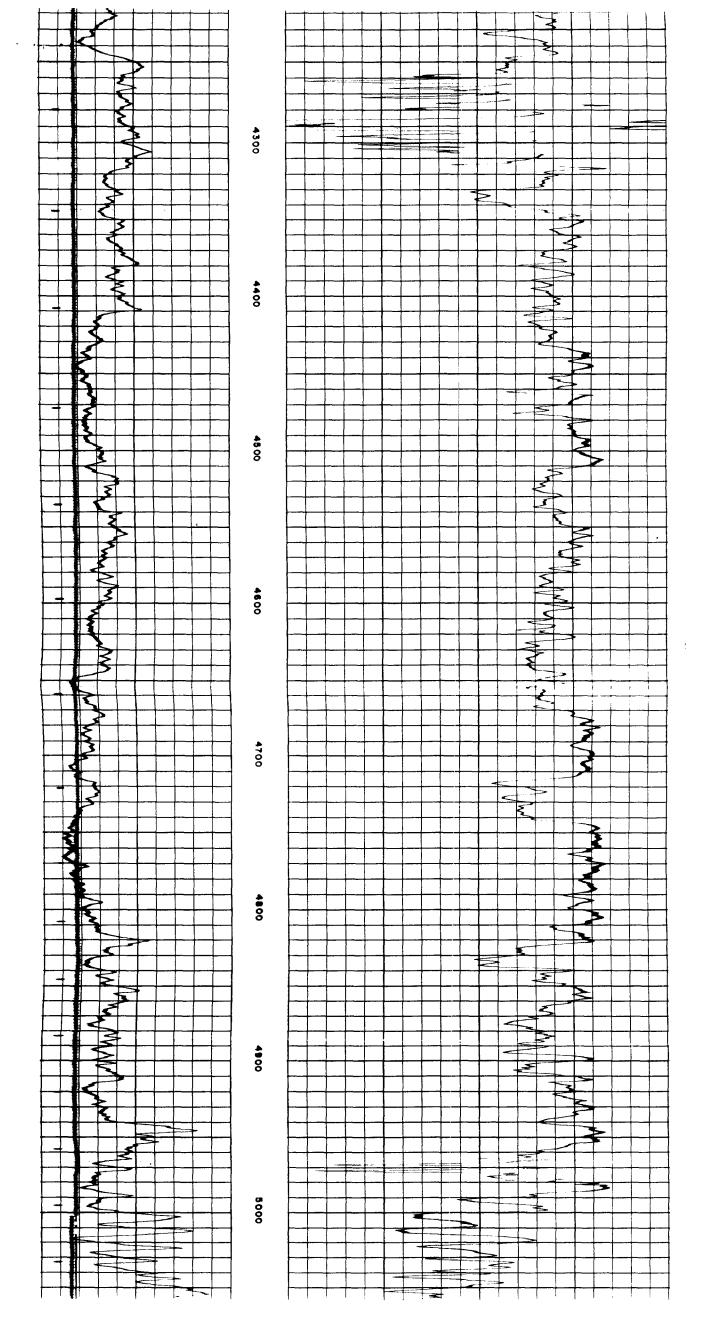
Remarks: Please feel free to contact us if we can be of any assistance in interpreting these results.

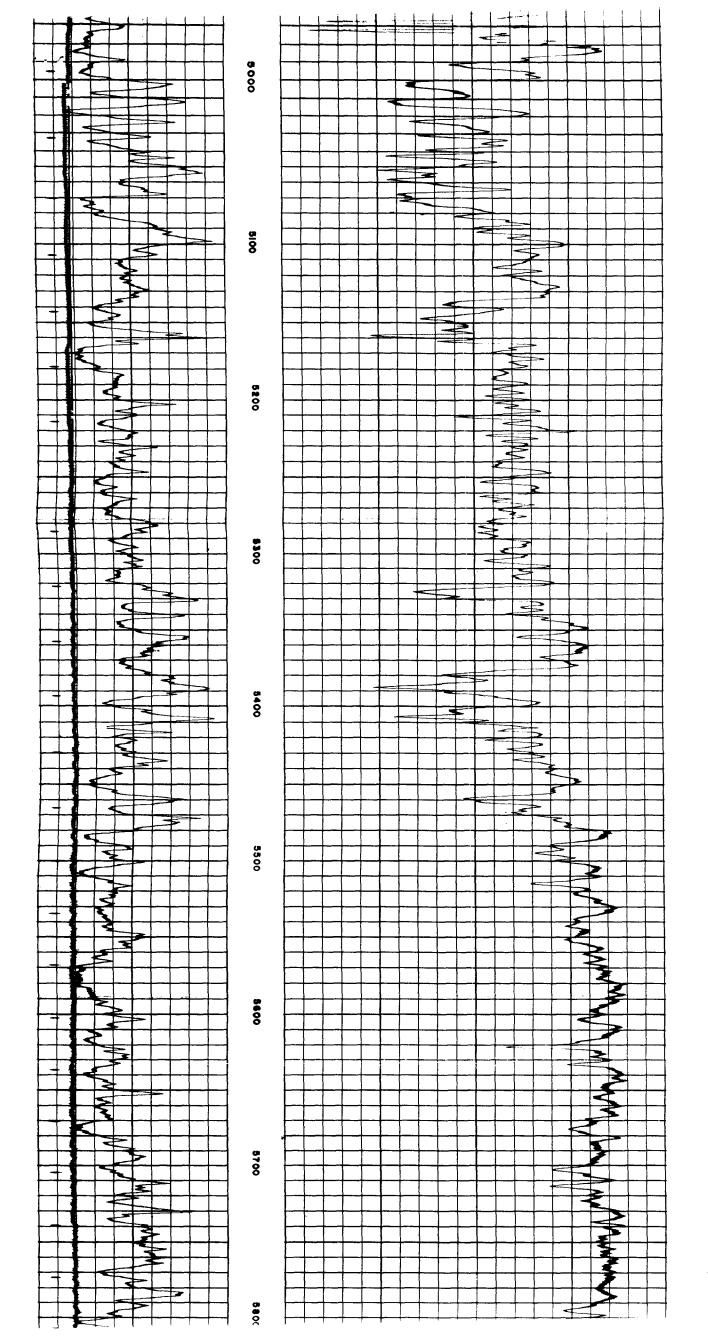
Volume Filtered, ml

COMPANY GULF 01 WELL LA MUN FIELD TEAGUE COUNTY LEA TOCATION: 860'FSL & 660' 87.7/8"' SALT MUD 90.6 32 6 10 cc CIRCULATED 04 @ 90.5 @ 04 @ 90.5 @ 04 @ 113F 11272 H0BBS ELMORE FLMORE FLMORE FROLTZ	Witnessed By	Recorded By		Max. Rec. Temp. Dea. F.	Time Since Circ.	Rm @ BHT	Source of Rmf and Rmc MEAS.	Rmc @ Meas. Temp.		1		ì	Density and Viscosity	Type Fluid in Hole	Bit Size	Casing—Logger	Casing—Driller		Bottom Logged Interval	Loader	Diller	Rim No		Drilling Measured from	b†um													. OF DRE		
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# STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

# OIL CONSERVATION DIVISION HOBBS DISTRICT OFFICE

GOVERNOR

8/18/99

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

IL CONSERVATION DIVISION
. O. BOX 2088 ANTA FE, NEW MEXICO 87501
Proposed:  MC DHC NSL NSP SWD WFX PMX
entlemen:
have examined the application for the:
have examined the application for the:  Arch Petroleum Inc (E Lamunyon #41-M 21.23s-37e  Derator Lease & Well No. Unit S-T-R API 30.025-22609
id my recommendations are as follows: $714 30.025.22609$
8 K.
ours very truly,

Chris Williams

Supervisor, District 1



August 12, 1999

Hobbs News Sun P.O. Box 850 Hobbs, New Mexico 88240 Attn: Brenda

**VIA FAX 505-393-2123** 

DEE.

REF: Teague Prospect

Lea County New Mexico

Legal Notice of Application for Saltwater

Disposal Well

C. E. LaMunyon Well No. 41 Arch Lease No. 723.001

#### Gentlemen:

Please find enclosed a Public Notice pertaining to the subject well which we hereby request that you publish in your newspaper on Sunday, August 15, 1999. In addition, please send an Affidavit of Publication to the undersigned as soon as possible.

Thank you for your help in this matter and if you have any questions, please contact the undersigned at 915-685-8126.

Yours very truly,

Arch Petroleum Inc.

Garland H. Lang III Consulting Landman

**Enclosure** 

#### **Public Notice**

# Application for Authorization to Inject Saltwater

Arch Petroleum Inc., P.O. Box 10340, Midland, Texas 79702-7340 (Contact- Richard L. Wright at 915/685-8100) has applied to the New Mexico Oil Conservation Division for Administrative Approval for Authorization to inject saltwater into its C. E. LaMunyon Well No. 41, located 860' FSL & 660' FWL of Section 21, T-23-S, R-37-E, N.M.P.M., Lea County, New Mexico. The purpose of such well will be to dispose of saltwater produced from Arch's nearby wells. The injection interval will be in the San Andres formation between 3,835'-4,987' beneath the surface, with an expected maximum injection rate of approximately 5,000 BWPD within an expected maximum injection pressure of approximately 767 psi. Any interested parties must file objections or requests for a hearing with the New Mexico Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505 within fifteen (15) days from the date of this publication.



#### CERTIFIED MAIL-RETURN RECIEPT REQUESTED

August 12, 1999

To: Offset Leasehold Operators and Surface Owner (See Attached List)

REF: Teague Prospect

Lea County New Mexico

Application for Administrative Approval to Inject Saltwater into the C. E. LaMunyon Well No. 41 located 860' FSL & 660' FWL of Section 21, T-23-S, R-37-E, N.M.P.M.

Arch Lease No. 723.001

#### Gentlemen:

Arch Petroleum Inc. has applied to the New Mexico Oil Conservation Division for Administrative Approval to inject saltwater into the captioned well.

A copy of the Form C-108 submitted by Arch to the Division is enclosed.

If you object to and/or request that a hearing be held pertaining to this Application, you must notify the Division within fifteen (15) days form the date of this letter.

If you have any questions, please contact the undersigned or Arch's Mr. Richard L. Wright.

Yours very truly,

Arch Petroleum Inc.

Garland H. Lang III Consulting Landman

Enclosure

cc: New Mexico Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505

# Attached to Notification Letter dated August 12, 1999 regarding Arch's Application for Administrative Approval to Inject Saltwater into the C. E. LaMunyon Well No. 41

#### Surface Owner

Mr. George W. Weir 28 Inwood Heights Drive North San Antonio, Texas 78248-2315

#### Offset Leasehold Operators

Saga Petroleum Corporation 415 W. Wall St., Suite 835 Midland, Texas 79701

Resler & Sheldon P.O. Box 2053 South Padre Island, Texas 78578

Mid-Continent Energy Operating 100 West 5<sup>th</sup> St., Suite 450 Tulsa, Oklahoma 74103-4287

Penroc Oil Corporation P.O. Box 5970 Hobbs, New Mexico 88241

Tom Brown, Inc. P.O. Box 2608 Midland, Texas 79702

John H. Hendrix Corporation 110 N. Marienfeld, Suite 400 Midland, Texas 79701

OXY USA, Inc. P.O. Box 50250 Midland, Texas 79710

T K Operating P.O. Box 5275 Hobbs, New Mexico 88241



# Arch Petroleum Inc.

#### **OVERNIGHT MAIL**

August 12, 1999

New Mexico Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505 Attn: Mr. David R. Catanach

REF: Teague Prospect

Lea County New Mexico

Application for Administrative Approval to Inject Saltwater into the C. E. LaMunyon Well No. 41 located 860' FSL & 660' FWL of Section 21, T-23-S, R-37-E, N.M.P.M.

Arch Lease No. 723.001

#### Gentlemen:

Arch hereby respectfully submits two (2) original Applications for Authorization to Inject (Form C-108) pertaining to the captioned well and requests that same be given Administrative Approval.

Pursuant thereto, enclosed are the following:

- (1) Copy of Notification Letter sent on this date to all Offset Leasehold Operators within a one-half (1/2) mile radius of the proposed injection well and to the surface owner of the land upon which the well is located, along with copies of proof of mailing (copy of Return Receipts will be forwarded to your attention when same are available); and
- (2) Copy of letter concerning publication of legal notice, which was sent to the Hobbs News Sun on this date (proof of legal publication will be forwarded to your attention when same is available).

If you have any questions regarding this Application, please contact the undersigned or Arch's Richard L. Wright.

NMOCD Letter August 12, 1999 Page Two

Yours very truly,

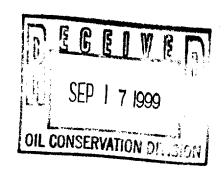
Arch Petroleum Inc.

Garland H. Lang III Consulting Landman

#### **Enclosures**

cc: New Mexico Oil Conservation Division(w/enclosures)
District I Office
P.O. Box 1980
Hobbs, New Mexico 88240





#### **OVERNIGHT MAIL**

September 16, 1999

New Mexico Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505 Attn: Mr. David R. Catanach

REF: Teague Prospect

Lea County New Mexico

Application for Administrative Approval to Inject Saltwater into the C. E. LaMunyon Well No. 41 located 860' FSL & 660' FWL of Section 21, T-23-S, R-37-E, N.M.P.M.

Arch Lease No. 723.001

#### Gentlemen:

In accordance with our application by letter to your office dated August 12, 1999 concerning the subject well, please find enclosed copies of Return Receipts from Offset Leasehold Operators and the surface owner, along with an Affidavit of Publication from the Hobbs News Sun.

Please proceed with our request and if you have any questions, contact the undersigned or Arch's Richard L. Wright.

Yours very truly,

Arch Petroleum Inc.

Contraction of the

Garland H. Lang III Consulting Landman

#### Enclosures

cc: New Mexico Oil Conservation Division(w/enclosures)
District I Office
P.O. Box 1980
Hobbs, New Mexico 88240

JOHN H. HENDRIX CORPORATION P.O. BOX 3040 MIDLAND, TEXAS 79702  5. Received By: (Print Name) 6. Signatule: (Addressee or Agent)  SENDER: Complete items 1 and/or 2 for additional services. Complete items 3. 4a. and 4b. Complete items 3. 4a. and 4b. Complete items 1 and/or 2 for additional services of this form so the card to you.  I complete items 1 and/or 2 for additional services. Complete items 1. 4a. and 4b. Complete items 3. 4a. and 4b. Complete items 1. 4b. and 4b. Complete items 3. 4a. and 4b. Complete items 3. 4a. and 4b. Complete items 1. 4b. and 4b. Complete items 3. 4a. and 4b. Complete items 1. 4b. and 4b. Complete items 1. 5b. and 5b. Complete it
Is your <u>RETURN ADDRESS</u> completed on the reverse side?
4a. Article P 389  4b. Service  Registe Express Return F 7. Date of  7. Date of  4a. Article number of and the date 4a. Article number of P 3  4b. Service P 3  4b. Service P 3  4b. Service Registe Registe And fee  8. Address And fee And fee Board fee And Service And fee And fee

102595-98-B-0229 Domestic Return Receipt

LAM 41 SWD

8. Addressee's Address (Only if requested

and fee is paid)

☐ Registered
☐ Express Mail
☐ Return Receipt for Merchandise ☐

000 COB

Certified
Insured

4b. Service Type

4a. Article Number P 389 493 809

Consult postmaster for fee.

2. ☐ Restricted Delivery Addressee's Address extra fee):

I also wish to receive the following services (for an

7. Date of Delivery

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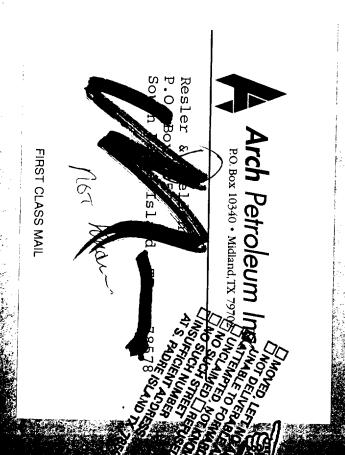
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#### AFFIDAVIT OF PUBLICATION

State of New Mexico, County of Lea.

#### I, KATHI BEARDEN

#### **Publisher**

of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not a supplement thereof for a period.

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Beginning with the issue da	ted
August 15	_ 1999
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JOGU DUNDON

Notary Public.

My Commission expires October 18, 2000 (Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.

LEGAL NOTICE
August 15, 1999
Public Notice
Application for
Authorization to Inject
Saltwater

Arch Petroleum Inc., P.O. Box 10340, Midland, Texas 79702-7340 (Contact-Richard L. Wright at 915/685-8100) has applied to the New Mexico Oil Conservation Division for Administrative Approval for Authorization to Inject saltwater into its C.E. LaMunyon Well No. 41, located 860' FSL & 660' FWL of Section 21, T-23-S, R-37-E, N.M.P.M., Lea County, New Mexico. The purpose of such well will be to dispose of saltwater produced from Arch's nearby wells. The injection interval will be an expected maximum injection rate of approximately 5,000 BWPD within an expected maximum injection pressure of approximately 767 psi. Any interested parties must file objections or requests for a hearing with the New Mexico Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505 within fifteen (15) days from the date of this publication. #16812

02103851000 02530094 Arch Petroleum P.O. Box 10340 MIDLAND, TX 79702

#### HALEPESKA ENTERPRISES, INC.

# PETROLEUM ENGINEER Total #58052

GEOLOGIST Cust #2941

August: 24, 1999

Mr. Mark Ashley New Mexico Energy & Minerals Department Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87504

> RE: Arch Petroleum Inc. - C. E. Lamunyon No. 41; Application for Water Disposal Permit

Dear Sir:

Per our conversation regarding referenced application as it pertains to wells within area of review, I have obtained additional information to assist in your determinations. Cement tops in the three (3) wells (Lamunyon #32 and 36, and Saltmount #2) have been further investigated with the following information noted.

With respect to the Saltmount No. 2, a CBL was run during workover operations in June 1983. Cement top for the 7" oil string was noted at 3360'. This will be a correction to the calculated top reported in the original application.

Open hole logs on the Lamunyon No. 32 were reviewed and caliper information noted. Claiper curve was without significant anomalies, with most of the measured diameter at 8". Only an occasional deflection (short) to  $8\frac{1}{2}$  and  $8\frac{1}{2}$  inch from TD up to about 3420'. No significant change in caliper was noted until reaching the base of the saltat 2400'. Cement program for the  $5\frac{1}{2}$ " used 330 sks Incor Hi Gel (Dowell) and 180 sks Incor Neat with respective yields of 2.5 and 1.32 cu. ft. per sack. Using an average hole diameter of  $8\frac{1}{2}$ " and these slurry yields, a cement top of 1662' results. With the larger wash-out beginning at the base of the salt, I would put the top nearer to 2200'.

Similar caliper log information was noted for the Lamunyon #36, with somewhat less anomaly noted from the 8" measurement than with the #32. Using similar data for calculations here, cement top was at 1650'. Again, the significant wash-out beginning at the salt would justify a correction to about 2200'.

I hope this information will prove helpful in your determinations. If I can be of further assistance, please call me here in Midland at 915/683-0913.

P. O. Box 80064 Midland, Texas 79708

915/683-0913

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MA PAGE 02

312-684-8337 BEN WISEMAN