

CREST OIL COMPANY #7 SANTA FE 204
SE NE 6-19N-27E APACHE COUNTY

P-W

S1

COUNTY Apache AREA 6 mi SE/Navajo LEASE NO. Santa Fe Fee

WELL NAME Eastern Petroleum
Crest Oil Company #7 Santa Fe

LOCATION SW NE SEC 6 TWP 19N RANGE 27E FOOTAGE 1650' FNL 1650' FEL S
ELEV 5840 GR KB SPUD DATE 8-31-62 STATUS LEPT TOTAL DEPTH 1060'
Elev 5812' from USGS 7 1/2 quad per JNC COMP. DATE 9-8-62
CONTRACTOR Myers Drilling Company PA 10/22/77 1050' Formation
PB 1056' Test

CASING SIZE DEPTH CEMENT LINER SIZE & DEPTH DRILLED BY ROTARY x
8 5/8" 97' 20 SX NA DRILLED BY CABLE TOOL _____
2 7/8" 1060' 28 SX PRODUCTIVE RESERVOIR _____
INITIAL PRODUCTION Shut-in 185
Helium Well MCF

FORMATION TOPS	DEPTHS	SOURCE		REMARKS
		L.L.	E.L.	
Tertiary	Surface		X	
Chinle	115'			
Shinarump	831			
Moenkopi	870			
Coconino	1044			
				<i>See Log File for Geol. Report, Core Analysis and DST</i>

ELECTRIC LOGS	PERFORATED INTERVALS	PROD. INTERVALS	SAMPLE LOG
Elec Log Core Analysis, S.P. Resistivity	1042-1052	1040-1056	SAMPLE DESCRP. <u>x</u> SAMPLE NO. _____ CORE ANALYSIS <u>x</u> DSTs <u>2</u>

REMARKS Gas analysis report in file. Complete geological report in file. Certificate of Compliance dated 11-1-65. (Navajo Springs Unit).
* never produced
APP. TO PLUG _____
PLUGGING REP. _____
COMP. REPORT x

WATER WELL ACCEPTED BY _____

BOND CO. Maryland Casualty Company BOND NO. 92-787379 with rider
DATE dated 5-29-69
BOND AMT. \$ 5,000 CANCELLED 2-17-78 ORGANIZATION REPORT 11-19-67
FILING RECEIPT 9308 LOC. PLAT x WELL BOOK x PLAT BOOK x
API NO. 02-001-05126 DATE ISSUED 8-7-62 DEDICATION All

PERMIT NUMBER 204

(over)

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

New Well Work-Over Deepen Plug Back Same Reservoir Different Reservoir Oil Gas Dry

DESCRIPTION OF WELL AND LEASE

Operator Crest Oil Company Address P. O. Box 57, Alton, Illinois

Lease Name Santa Fe Well Number 7 Field & Reservoir Wildcat

Location 1650'S of N line & 1650' W of E line Sec.-TWP-Range or Block & Survey 6 19N 27E

County Apache Permit number 204 Date issued 8-7-62 Previous permit number _____ Date issued _____

Date spudded August 31, 62 Date total depth reached September 8, 62 Date completed, ready to produce Sep. 11, 62 Elevation 5840 (Gr.) feet Elevation of casing hd. flange 1' above GL feet

Total depth 1060 P.B.T.D. 1056 Single, dual or triple completion? Single If this is a dual or triple completion, furnish separate report for each completion.

Producing interval (s) for this completion 1040 - 1056 Rotary tools used (interval) Surface to T.D. Cable tools used (interval) _____

Was this well directionally drilled? No Was directional survey made? No Was copy of directional survey filed? _____ Date filed _____

Type of electrical or other logs run (check logs filed with the commission) Electrical Induction Date filed _____

CASING RECORD

Casing (report all strings set in well—conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amt. pulled
Surface	11 5/8"	8 5/8"		97'	20	
Production	4 3/4"	2 7/8"		1060	28	

TUBING RECORD

LINER RECORD

Size	Depth set	Packer set at	Size	Top	Bottom	Sacks cement	Screen (ft.)
in.	ft.	ft.	in.	ft.	ft.		

PERFORATION RECORD

ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD

Number per ft.	Size & type	Depth Interval	Am't. & kind of material used	Depth Interval
4	3/8" Jet	1042 - 1052	42 gal MSA	1042 - 1052

INITIAL PRODUCTION

Date of first production Shut in Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:) Flwng

Date of test 9-5-62 Hrs. tested 4 Choke size None Oil prod. during test _____ bbls. Gas prod. during test _____ MCF Water prod. during test None bbls. Oil gravity _____ * API (Corr)

Tubing pressure _____ Casing pressure 115 Psig Cal'ed rate of Production per 24 hrs. _____ Oil _____ bbls. Gas 185 MCF Water _____ bbls. Gas-oil ratio _____

Disposition of gas (state whether vented, used for fuel or sold): Presently shut-in; during the test period the gas was vented

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the owner of the Crest Oil Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date 9-26-62

Signature C. F. Swain

STATE OF ARIZONA OIL & GAS
CONSERVATION COMMISSION
Well Completion or Recompletion Report and Well Log
Form No. P-7 File two copies

204

DETAIL OF FORMATIONS PENETRATED

Formation	Top	Bottom	Description*
Tertiary	0	115	<p style="text-align: center;">(831)</p> <p>Core No. 1, 1031 to 1045 ft. Cut 13½ ft. 5' Grey green, dense hard shale uniform ss, v/hard, becoming shaly in bottom 5' dark red shale to brown shale. v/hard dense to slightly sandy. 3' Medium brown shale to Coconino lt. tan, med, v/well sorted, w/rnded, porous, and permeable, friable ss w/vert. frac. Core No. 2 1045-50', recovered 4½' lt. tan, med. v/well sorted, well rnded, porous, permeable, friable ss with vertical frac. Core No. 3, 1050 to 56' recovered 6 ft. 2' As above but not vert frac 3' becoming tighter fair porosity, vert frac 1' fair porosity, vert, frac.</p> <p>DST No. 1; T.D. 1050; Tested from 1040 to 1050 Opened tool with good blow immediately; after 10 minutes, closed tool for initial shut in pressure for 30 min. Opened tool for 2 hours and 3 min.; good blow immediately, increased thr test. Swabbed small amount of mud thru tool and gas increased to 185 MCF. Shut in for 30 min. No recovery. Flow pressures initial 15 psi, final 28 psi; Shut in pressures; initial 120, final 120; Hydrostatic pressures; initial 485, final 485.</p> <p>DST No. 2; T.D. 1060; Tested 1039-60. opened tool with good blow immediately; after 10 minutes, closed tool for initial shut in pressure for 15 minutes. Opened tool for 2 hrs and 12 min; good blow immediately swabbed mud thru tool and gas increased to 182 MCF. Shut in for 15 min. Recovered 27 ft of muddy water. Flow pressure; initial 40, final 55; Shut in pressure; initial 125, final 125; Hydrostatic pressure; initial 525, final 515.</p>
Chinle	115	716	
Shinarump	716	870	
Moenkopi	870	1044	
Coconino	1044	T.D.	

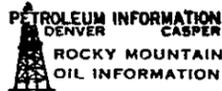
* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS:

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the State of Arizona Oil & Gas Conservation Commission not later than thirty days after project completion.

204
ARIZONA
APACHE CO.
PINTA DOME (D)



Twp 19n-27e
Section 6
sw ne
1650 s/n 1650 w/e

OPR: Crest Oil
ELEV: 5840 Gr.
TOPS: Log-Sample
Coconino 1044

WELL #: 7 Santa Fe

DSTS. & CORES:

SPUD: 8-31-62 COMPL: 9-27-62.
TD: 1060 PB: 1059
CSG: 8-5/8" @ 97 w/20
2-7/8" @ 1060 w/28.

PERF-

PROD. ZONE:

INIT. PROD: IPF 219 MCFGPD.

Contr: Myers

Ariz-1-266011

PLUGGING RECORD

Operator Eastern Petroleum Company		Address Box 291, Carmi, Illinois 62821			
Federal, State, or Indian Lease Number, or lessor's name if fee lease. Crest-Santa Fe		Well No. 7	Field & Reservoir Wildcat		
Location of Well 1650' SNL; 1650' WEL		Sec-Twp-Rge or Block & Survey 6-19N-27E	County Apache		
Application to drill this well was filed in name of Crest	Has this well ever produced oil or gas No	Character of well at completion (initial production): Oil (bbls/day) - Gas (MCF/day) 185 Dry? -			
Date plugged: 10/12/77	Total depth 1056	Amount well producing when plugged: Oil (bbls/day) - Gas (MCF/day) TSTM Water (bbls/day) -			
Name of each formation containing oil or gas. Indicate which formation open to well-bore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement		
Coconino	Water	1042-1052	Top to Bottom cement slurry with 7 bbls.		
CASING RECORD					
Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
8-5/8"	97	None	97	-	-
2-7/8"	1060	"	1060	-	-
Was well filled with mud-laden fluid, according to regulations?			Indicate deepest formation containing fresh water.		
NAMES AND ADDRESSES OF ADJACENT LEASE OPERATORS OR OWNERS OF THE SURFACE					
Name	Address		Direction from this well:		
Spurlock Ranches	Navajo, Arizona		Land Owner		
In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.					
Use reverse side for additional detail.					
CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the <u>Secretary</u> of the <u>Eastern Petroleum Company</u> (company) and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.					
Date 11/1/77		Signature <i>J. Williams</i>			
COPY			STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION Plugging Record File One Copy		
Permit No. 204			Form No. 10		

APPLICATION TO ABANDON AND PLUG

FIELD Navajo Springs Coconino Sand Unit

OPERATOR Eastern Petroleum Company ADDRESS Box 291, Carmi, Illinois 62821
 Federal, State, or Indian Lease Number or Lessor's Name if Fee Lease Santa Fe WELL NO. 7

LOCATION 1650' SNL; 1650' WEL Section 6-19N-27E, Apache County

TYPE OF WELL Gas-Helium TOTAL DEPTH 1056
(Oil, Gas or Dry Hole)

ALLOWABLE (If Assigned) _____

LAST PRODUCTION TEST OIL -- (Bbls.) WATER -- (Bbls.)
 GAS 185 (MCF) DATE OF TEST 9/5/62

PRODUCING HORIZON Coconino PRODUCING FROM 1042 TO 1052

1. COMPLETE CASING RECORD.

8 5/8" @ 97' w/20 sks.
 2 7/8" @ 1060' w/28 sks.

2. FULL DETAILS OF PROPOSED PLAN OF WORK.

Plug top to bottom w/cement slurry

DATE COMMENCING OPERATIONS 10/12/77

NAME OF PERSON DOING WORK Petroleum Consultants ADDRESS Denver, Colorado

Signature _____
 Title Secretary
 Address Box 291, Carmi, Illinois 62821
 Date November 1, 1977

Date Approved _____ STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION	STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION Application to Abandon and Plug File Two Copies Form No. 9
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COPY

SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator Eastern Petroleum Company

2. OIL WELL GAS WELL OTHER (Specify) _____

3. Well Name Crest-Santa Fe #7

Location SW NE

Sec. 6 Twp. 19N Rge. 27E County Apache Arizona.

4. Federal, State or Indian Lease Number, or lessor's name if fee lease _____
Santa Fe Pacific Railroad Co. fee

5. Field or Pool Name Navajo Springs Unit

6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:			SUBSEQUENT REPORT OF:		
TEST WATER SHUT-OFF	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>	WATER SHUT-OFF	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	DIRECTIONAL DRILL	<input type="checkbox"/>	FRACTURE TREATMENT	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	PERFORATE CASING	<input type="checkbox"/>	SHOOTING OR ACIDIZING	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	CHANGE PLANS	<input type="checkbox"/>	MONTHLY PROGRESS	<input type="checkbox"/>
(OTHER) _____	<input type="checkbox"/>			REPAIRING WELL	<input type="checkbox"/>
				ALTERING CASING	<input type="checkbox"/>
				ABANDONMENT	<input type="checkbox"/>
				(OTHER) <u>Shut-in</u>	<input checked="" type="checkbox"/>

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

7. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

This well is part of Navajo Springs Unit and production from this well is not required to maintain monthly allowable take.

RECEIVED

MAR 15 1974

O & G CON. COMM.

8. I hereby certify that the foregoing is true and correct.

Signed J. Edwards Title Secretary Date March 12, 1974

Permit No. 204

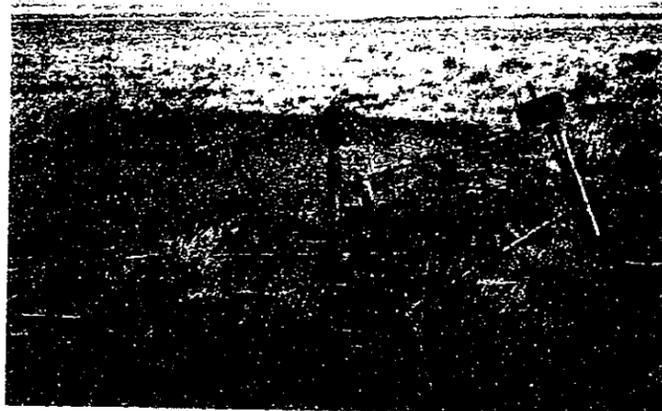
1 - State of Arizona
1 - File

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File Two Copies
Form No. 25

Permit No. 204, Crest No. 7

3-27-74

Well shut-in. There is good pressure on the rig. The fence around the well has broken apart. There is a leather sign at location.



Crest 7

204

(6) 6-19N-27E
1650' FNL-1650' FEL
Crest Oil Co
Santa Fe #7

10-19-62
10-19-62

WILDCAT, 6 mi Navajo; proposed 1500' test; C/W.T. Myers
Drig Co, Albuquerque; NT; elev 5840' GL; spud 9-4-62; set
csg 8 5/8" @ 97' w/20 sx; 5 7/8" @ 1060' w/28 sx; DST #1,
1040-50', op 2 hrs, ggd 185 MCF; FP 15-28#; FSIP 120#/30
min; DST #2, 1039-60', op 132 min, ggd 182 MCF; rec 27'
MCSW, FP 40/55#; FSIP 125#; perf 1042-52'; IP 185 MCF; SI/Helium well. FINAL REPORT.

CR [REDACTED] HELIUM WELL

Crest Oil Company of Alton, Illinois has announced the successful completion of their No. 7 Santa Fe in Apache County, Arizona. This brings to four the number of successful completions in the Navajo Springs Field located on the eastern flank of the Pinta Dome Field. The well potentialled for an absolute open flow of 185 cubic feet of gas daily from the Coconino Sandstone reservoir. The location of the new producer steps 1650 feet from the north and east lines of section 6, Township 19 North, Range 27 East. (For further details see drilling section.)

P.I. card

top Co Co 104A - 4796 EL.

TD - 1060

21# 204

Open Flow Test Record

Producers Name Crest Oil Company Date 10-10-63

Lease Name Santa Fe No. 7 Time 1:40 pm

Location Sec. 6-19N-27E Apache County, Arizona

Shut-In Pressure 106.8 psig Unloading Period 20 Min

Test Point	Time From	Time To	Flow Period	Orifice Size	Prover Press.	Wellhead Pressure	Flow Gas Temp.
1	2:00 pm	2:20 pm	20 min.	1"	1 1/4" H2O	91.0 psig	73°
2	2:20 pm	2:35 pm	15 min	1-1/4"	1 1/4" H2O	72.9 psig	72°
3	2:35 pm	2:55 pm	20 min	1-1/2"	7.2" H2O	49.8 psig	71°

Remarks: No moisture indicated in gas stream either during blow down or flow test.



Division of Helium
Resources

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
HELIUM ACTIVITY

September 26, 1962

514 BARFIELD BUILDING
AMARILLO, TEXAS

Dr. C. F. Swain
200 West Third Street
First National Bank Building
Alton, Illinois

Dear Dr. Swain:

Enclosed are two copies of a report on the analysis of a gas sample which was analyzed as a part of the Bureau of Mines survey for helium-bearing natural gases. This sample was obtained from your Santa Fe No. 7 well located in Section 6, Township 19 North, Range 27 East, Apache County, Arizona.

The Bureau of Mines plans to publish a series of papers on the analyses of gases from the various states and would like to obtain a release of the enclosed data for publication with similar data released by other operators. It will be appreciated if the owner of the well from which this sample was obtained, or his representative, will sign the "Permission for Publication" on one copy of the report and return it to us. A self-addressed stamped envelope is enclosed. If the owner desires permission to publish or circulate the analytical results, please communicate directly with the Director, Bureau of Mines, Washington, D.C.

To be sure that the well data are accurate, please check the information on the report of analysis and indicate in the appropriate square whether they are accurate without correction or as corrected on the sheet. If the data sheet is not complete, please supply the missing information.

We wish to thank you for your cooperation in furnishing us with samples of gas for analysis.

Sincerely yours,

R. D. Mummerlyn
Chief, Branch of Engineering

Enclosures 2

HA-1 Revised 6-26-58

REPORT OF ANALYSIS

State Arizona F.S. No. 8664
 County Apache Field Wildcat
 Well Owner Great Oil Company Name Santa Fe No. 7
 Location: Sec. 6 T. 19N R. 27E Date Completed 9/7/62
 Open Flow MCF/D 185 Wellhead Pressure p.s.i.g. 120
 Producing Stratum:
 Depth to (feet): 2044' Thickness (feet): _____
 Stratigraphic Position of Producing Formation Cocconino Sandstone

Sampled: Date: 9/5/62 By: H. A. Clement
 Mass Spectrometer Run No. 7761 Date of Run 9/24/62

Analysis:

Methane	<u>0.0</u>	<u>%</u>	Normal Pentane	<u>0.0</u>	<u>%</u>	Oxygen	<u>0.0</u>
Ethane	<u>0.0</u>	<u>%</u>	Isopentane	<u>0.0</u>	<u>%</u>	Argon	<u>0.5</u>
Propane	<u>0.0</u>	<u>%</u>	Cyclopentane	<u>0.0</u>	<u>%</u>	Helium	<u>8.03</u>
Normal Butane	<u>0.0</u>	<u>%</u>	Hexanes Plus	<u>0.0</u>	<u>%</u>	Hydrogen	<u>0.0</u>
Isobutane	<u>0.0</u>	<u>%</u>	Nitrogen	<u>90.6</u>	<u>%</u>	H ₂ S	<u>0.0</u>
						CO ₂	<u>0.8</u>

Calculated gross B. t. u./cu. ft., dry at 60°F. and 30" mercury _____ Total

CHECK OF DATA: The well data are accurate:
 Without correction As corrected above

PERMISSION FOR PUBLICATION:

Permission is hereby granted for the Bureau of Mines to publish the above data, together with similar data released by other operators, as part of a series of papers on analyses of gases from various fields, states, or regions.

Company _____
 By _____
 Title _____

CORE ANALYSIS RESULTS

Company CREST OIL COMPANY Formation COCONINO File RP-3-1672
Well SANTA FE # 7 Core Type DIAMOND CONV. Date Report 9/9/62
Field WILDCAT Drilling Fluid WATER BASE MUD Analysts DEPPE
County APACHE State ARIZONA Elev. 5840 GR Location SEC 6 T19N R27E

Lithological Abbreviations

SAND - SD DOLOMITE - DOL ANHYDRITE - ANHY SANDY - SDY FINE - FN CRYSTALLINE - XLN BROWN - BRN FRACTURED - FRAC SLIGHTLY - SL/
SHALE - SH CHERT - CH CONGLOMERATE - CONG SHALY - SHY MEDIUM - MED GRAIN - GRN GRAY - GR LAMINATION - LAM VERT. - V/
LIME - LM GYPSUM - GYP FOSSILIFEROUS - FOSS LIMY - LMY COARSE - CSE GRANULAR - GRNL VUGGY - VGY STYLOLITIC - STY WITH - W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
		Horiz.	Vert.		OIL	TOTAL WATER	
1	1044-1045	108	12	15.5			SANDSTONE VERTICAL FRACTURE
2	1045-1046	154	40	14.3			SANDSTONE VERTICAL FRACTURE
3	1046-1047	56	42	14.2			SANDSTONE VERTICAL FRACTURE
4	1047-1048	26	19	21.5			SANDSTONE VERTICAL FRACTURE
5	1048-1049	2.3	2.3	11.5			SANDSTONE VERTICAL FRACTURE
6	1049-1050	36	1.0	8.4			SANDSTONE VERTICAL FRACTURE
7	1050-1051	685	28	18.5			SANDSTONE
8	1051-1052	576	229	16.0			SANDSTONE
9	1052-1053	26	11	12.3			SANDSTONE
10	1053-1054	225	146	12.2			SANDSTONE VERTICAL FRACTURE
11	1054-1055	59	29	13.8			SANDSTONE
12	1055-1056	53	32	15.1			SANDSTONE

Service No. 8 No interpretation of results.

CORE ANALYSIS RESULTS

Company CREST OIL COMPANY Formation COCONINO File RP-3-1672
Well SANTA FE # 7 Core Type DIAMOND CONV. Date Report 9/9/62
Field WILDCAT Drilling Fluid WATER BASE MUD Analysts DEPPE
County APACHE State ARIZONA Elev. 5840 GR Location SEC 6 T19N R27E

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		LITHOLOGICAL ABBREVIATIONS	SAMPLE DESCRIPTION AND REMARKS
		Horiz.	Vert.		OIL	TOTAL WATER		
1	1044-1045	108	12	15.5			SANDSTONE	VERTICAL FRACTURE
2	1045-1046	154	40	14.3			SANDSTONE	VERTICAL FRACTURE
3	1046-1047	56	42	14.2			SANDSTONE	VERTICAL FRACTURE
4	1047-1048	26	19	21.5			SANDSTONE	VERTICAL FRACTURE
5	1048-1049	2.3	2.3	11.5			SANDSTONE	VERTICAL FRACTURE
6	1049-1050	36	1.0	8.4			SANDSTONE	VERTICAL FRACTURE
7	1050-1051	685	28	18.5			SANDSTONE	
8	1051-1052	576	229	16.0			SANDSTONE	
9	1052-1053	26	11	12.3			SANDSTONE	
10	1053-1054	225	146	12.2			SANDSTONE	VERTICAL FRACTURE
11	1054-1055	59	29	13.8			SANDSTONE	
12	1055-1056	53	32	15.1			SANDSTONE	

Service No. 8 No interpretation of results.

ENGINEERING REPORT

of

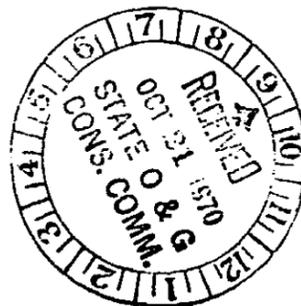
Well Tests and Gas Flow Calculations
Shut-in Gas Wells, Navajo Springs Area
Apache County, Arizona

For

Western Helium Corporation

by

John W. Heller



24

JOHN M. HELLER

REGISTERED ENGINEER

P. O. Box 1507
1727 Forest Ave
DURANGO, COLORADO
81301

September 22, 1970

Phone 247-3846
AREA CODE (303)

Western Helium Corporation
P. O. Box 1358
Scottsdale, Arizona 85252

Gentlemen:

Submitted herewith is an engineering report of well tests and flow rate calculations on shut-in gas wells in the Navajo Springs Unit area.

This report is made at the request of Mr. R. E. Lauth. I wish to express my appreciation to him and also Mr. Henry Fullop of Eastern Petroleum Corporation for their cooperation in obtaining the field information and the accommodations they furnished while obtaining the field information.

I believe the data shown herein is sufficient for your needs. Do not hesitate to contact me if there are any questions about this report.

Very truly yours,

John M. Heller
John M. Heller

Copies to:
Mr. Henry Fullop
Mr. R. E. Lauth



PURPOSE

To determine the productive capacity of shut-in gas wells in the Navajo Springs Unit and surrounding area, Apache County, Arizona.

To project flow rates at field gathering line pressures of 10, 20, 30, and 40 psig.

SUMMARY

Five wells, Santa Fe Nos. 14, 17, and 21-2; Reese No. 2; and Crest No. 7, were tested. These tests and calculated data indicate the wells are capable of producing at this time. A test was attempted on Santa Fe No. 35 but results are not valid because of fluid entry into the well bore during the flow periods. This well does have the capacity to produce some gas at limited rates before remedial work is necessary.

Calculated delivery rates at various back pressures are summarized by individual wells:

Lease and Well Number	Producing Zone	Delivery Rates - MCFD			
		10 psig.	20 psig.	30 psig.	40 psig.
Santa Fe No. 14	Coconino	935	940	845	725
Santa Fe No. 17	"	350	340	300	260
Santa Fe No. 21-2	Shinarump	525	510	510	490
Reese No. 2	Coconino	730	690	645	550
Crest No. 7	"	120	175	120	140
Total Volume - MCFD		2770	2655	2450	2165

Santa Fe No. 35 could possibly produce at a rate of 100 MCFD without such difficulty.

204

PROGRAM and PROCEDURE

Information and data required to make the flow rate projections were obtained by individual well tests. Gas flow measurements were taken through a 2" Critical Flow Prover and a 2" Critical Flow Tester at critical flow. Pressures were obtained by dead weight and test gauges to the nearest one pound increment. Assumptions were made on the gravity of the gas and the barometric pressure.

Calculations were made to a base pressure of 14.69 psia. The back pressure curves are drawn on values of P_0 and P_1 , surface shut-in and working pressures, corrected for flow deviation where it was significant.

The four point tests were satisfactorily completed and the shape of the back pressure curve on these wells was applied to the other wells where one point tests were taken.

The indicated delivery rates shown in this report were obtained by analyzing the back pressure curves, calculating the flow deviation and adjusting the flow volume.

DISCUSSION

Santa Fe Wells No. 14, 17, and 21-2; Nease No. 2; and Crest No. 7, were favorably tested. Nease No. 2 did show a slight amount of moisture at the end of the test period but does not appear to affect the delivery potential at this time. Santa Fe No. 31 test is not considered valid because of the fluid entry into the well bore during the test period. This well can be produced to some extent and could show a sizable cumulative production before it becomes necessary to recondition. It is suggested that this well be produced at a rate of about 100 MCF per day initially and checked closely for the fluid build up in the well bore, unloading by blowing full open to the atmosphere for only short periods of time when necessary.

Other wells in the Navajo Springs Unit were checked but flow tests were not taken. They would not test in a satisfactory manner. Details of these wells are shown on page number 14 of this report.

The total GOR of the five wells considered productive at this time is 3,173 MCFD. It would be prudent to start initial deliveries at approximately 25% of the GOR or about 794 MCFD. This does not include the 100 MCFD that may be produced from Santa Fe No. 31. That individual wells be checked closely for performance and the producing rates adjusted accordingly.

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

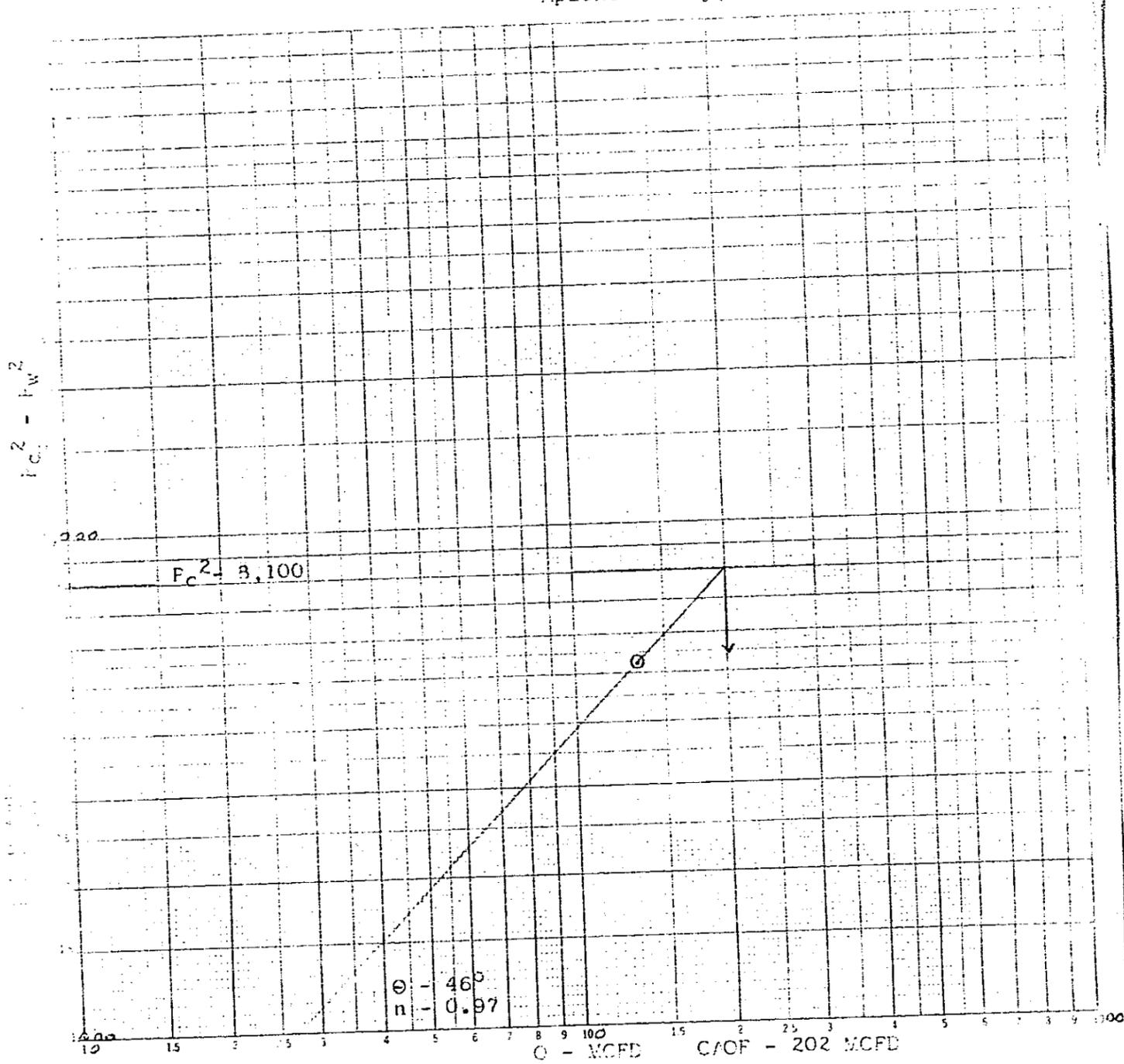
Form C-122
Revised 9-1-65

- 11 -

Type Test		<input type="checkbox"/> Initial		<input type="checkbox"/> Annual		<input checked="" type="checkbox"/> Special		Test Date		9/11/70	
Company				Connection				Unit			
Eastern Petroleum Co.				None							
Field				Formation				Unit			
Navajo Springs				Coconino							
Completion Date		Total Depth		Plug Back TD		Elevation		Farm or Lease Name			
1962		1060		1059		5840		Crest			
Well Size	Wt.	d	Set At	Perforations:		Well No.					
2-7/8"	6.5		1060	From - To -		7					
Trg. Size	Wt.	d	Set At	Perforations:		Unit		Sec.	Twp.	Rge.	
None				From To		NE/4 6 19N 27E					
Type Well - Single - Bradenhead - G.G. or G.O. Multiple				Packer Set At				County			
Single								Apache			
Producing Thru		Reservoir Temp. *F		Mean Annual Temp. *F		Baro. Press. - P _g		State			
Casing		89 a Est.		60 Est.		12.0 Est.		Arizona			
L	H	G _g	% CO ₂	% N ₂	% H ₂ S	Prover	Meter Run	Taps			
		0.910 Est.	-	-	-	2" OWT	-	-			
FLOW DATA			TUBING DATA			CASING DATA			Duration of Flow		
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. *F	Press. p.s.i.g.	Temp. *F	Press. p.s.i.g.	Temp. *F	Duration of Flow
1	Static								78		0
1.	2" OWT		3/8	41		91					2 hr.
2.											
3.											
4.											
5.											
RATE OF FLOW CALCULATIONS											
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Prover Pressure P _m psia	Flow Temp. Factor Ft.	Gravity Factor F _g	Super Compress. Factor F _{pv}	Rate of Flow Q, Mcfd				
1	3.142	-	53	0.9804	0.812	-	133				
2											
3											
4											
5											
NO.	P _r	Temp. *R	T _r	Z	Gas Liquid Hydrocarbon Ratio _____ Mcf/bbl.						
1	NA				A.P.L. Gravity of Liquid Hydrocarbons _____ Deg.						
2					Specific Gravity Separator Gas _____ X X X X X X X X X						
3					Specific Gravity Flowing Fluid _____ X X X X X						
4					Critical Pressure _____ P.S.I.A. _____ P.S.I.A.						
5					Critical Temperature _____ R _____ R						
P _r	90	P _c ²	8100								
NO.	P _r ²	P _w ²	R _w ²	P _c ² - R _w ²	(1) $\frac{P_c^2}{P_c^2 - R_w^2} = 202$ (2) $\left[\frac{P_c^2}{P_c^2 - R_w^2} \right]^n =$						
1	2809	53.3	2846	5254							
2					ACF = Q $\left[\frac{P_c^2}{P_c^2 - R_w^2} \right]^n =$						
3											
4											
5											
Absolute Open Flow		202		Mcf @ 15.025		Angle of Slope @ 46		Slope, n 0.97			
Remarks: Slope determined by four point test on Santa Fe No. 14 well. No fluid appearing during test.											
Approved By Commission:			Conducted By:			Calculated By:			Checked By:		
204											

- 12 -

EASTERN PETROLEUM COMPANY
Crest No. 7 Well
NE/4 Sec. 6-19N-27E
Apache County, Arizona



204

**OPERATOR'S CERTIFICATE OF COMPLIANCE AND AUTHORIZATION
TO TRANSPORT OIL OR GAS FROM LEASE**

Federal, State or Indian Lease Number, or lessor's name if fee lease Santa Fe fee & State	Field Navajo Springs	Reservoir Coconino
Survey or Sec-Twp-Rge Navajo Springs Unit	County Apache	State Arizona
Operator Eastern Petroleum Company		
ADDRESS ALL CORRESPONDENCE CONCERNING THIS FORM TO:		
Street Box 291	City Carmi	State Illinois
Above named operator authorizes (name of transporter) Kerr-McGee Oil Industries, Inc.		
Transporter's street address Kerr-McGee Building	City Oklahoma City	State Oklahoma
Field address Navajo, Arizona		
Oil, condensate, gas well gas, casinghead gas		
To transport 100	% of the	gas from the Navajo Springs Unit XXXXXXXXXX
OTHER GATHERERS TRANSPORTING FROM THIS LEASE ARE AS FOLLOWS:		
Name of gatherer	% transported	Product transported
Indicate whether or not this certificate is for a new lease. If not a new lease, indicate whether or not it is a change of operator, change of lease name, change of gatherer, or a consolidation or subdivision of leases and give effective date of change. Certificate is to allow for the hookup of an additional well to the Kerr-McGee transmission line. Effective September 7, 1965.		

The undersigned certifies that the rules and regulations of the State of Arizona Oil & Gas Conservation Commission have been complied with in drilling and producing operations on this lease, except as noted above, and that the above transporter is authorized to transport the above specified percentage of the allowable oil or gas produced from the above described property, and that this authorization will be valid until further notice or until cancelled by the State of Arizona Oil & Gas Conservation Commission.

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Secretary of the Eastern Petroleum Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date October 27, 1965

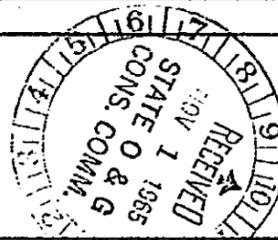
Signature *J. Edwards*

Date approved: Nov 1, 1965

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION

By: *John Bonmister*

Permit No. Navajo Springs Unit



STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Operator's Certificate of Compliance & Authorization to
Transport Oil or Gas from Lease
File Two Copies

3
206

FLOW RATES ON WELLS
IN NAVAJO SPRINGS FIELD, APACHE COUNTY, ARIZONA

PN 204

RATES WITH PRESSURE CLOSE TO 100#

SIP	WELL NAME	ORIFICE SIZE	WELL TUBING	2" PROVER PRESS - PSIG	HOURS TESTED	VOLUME MCFPD
106.7	Santa Fe 35	7/16		96.0	15 1/2	365
106.7	" " 31	3/16		95.9	17 1/2	68
106.6	" " 32	1/8"		105.7	17 1/2	39
133.8	" " 21	3/16		59.5	18 1/2	4
105.6	" " 13			99.8	15	980
105.4	" " 7	1/8"		99.9	15 1/4	4
105.4	" " 14	3/8		97.4	15 1/2	270
105.5	" " 17	3/16		98.5	16 3/4	70
201.5	" " 8			91 - 93	12 - 13 1/2	7 bbls. salt water/hr.
105.5	" " 2		Well pulled down 1/4" small vp. water & gas, slightly salty.			1800 MCFPD
	* Orifice well tester.					
	MAXIMUM RATE OF FLOW					
106.6	Santa Fe 35	3/4		80.1	2 1/2	668
106.6	" " 31	1/2		76	1 1/2	394
106.5	" " 32	1/2	Well tight pressure kept flat			39
133.9	" " 21		Same as No. 2 above.			1900
105.6	" " 13			94.1	4	28
105.4	" " 7	1/2		31.9	2 1/4	700
105.4	" " 14	7/8		71.6	3 1/4	435
105.5	" " 17	7/8		39.7	2	448
Not Taken	" " 8			91	18 1/4	
Not Taken	" " 2		Same as No. 2 above.			

R. B. Emond
August 13, 1964

Send it in similar copy to report. STATE.
 He Report analysis -

PHONES
 334-6580
 334-6624
 334-6314

Geoelectric, Inc.

P. O. Box 842 • AZTEC, NEW MEXICO

DELIVERABILITY CALCULATION

BASE ON

DATA FOR

10 of Base Production

12 of Production Correction

15.000 P01A Production Base

$$125 \frac{P_1 - P_2}{P_1 - P_2} \frac{P_1 - P_2}{P_1 - P_2} = .841$$

125 10770

P01A	125.0	P01A
P01B	135.0	P01B
P01C	75.0	P01C
P01D	85.0	P01D
P01E	125.0	P01E

Geoelectric Inc.

OPEN FLOW TEST DATA

Date: 6/11/53
 Operator: Onyx Oil Co. Lease: Santa Fe No. 7
 Location: 6-194 276 County: _____ State: _____
 Formation: _____ Pool: _____
 Casing: _____" Set @ _____' Tubing: _____" Set @ _____
 Pay Zone: _____' To: _____' Total Depth: _____
 Choke Size: 3/16 2nd Passes * Choke Constant = C = 2.1977
 Stimulation Method: _____ Flow Through: Casing X Tubing _____
 Shut-in Pressure Casing: 102.0 psig / 12 = 122.0 psia (Shut-in _____ days)
 Shut-in Pressure Tubing: _____ psig / 12 = _____ psia
 Flowing Pressure: P : _____ psig / 12 = _____ psia
 Working Pressure: P_w : 64.6 psig / 12 = 76.6 psia
 Temperature: T : 70 °F / 460 = _____ °Absolute
 F_{pv} (from tables) : 1.000 Gravity .80 n .85 ggr

Choke Volume = Q = C x P_t x P_t x F_g x F_{pv} 2.1977 x .80 x .85 x 1.000 x 76.6
 Q = _____ = 125 MCF/D

Open Flow - Aof = Q 125

$$Aof = \frac{\left[\frac{P_c^2 - P_w^2}{1.000} \right]^{.5} \times 1.000}{2.1977} = 1.000$$

Aof = _____ MCF/D @ 76.6 psia

Tested By: D. H. Stiles
 Witnessed By: _____

Geophysical Inc.
Beckley

Send to: *10 Report analysis* STATE
 PHONES
 334-6500
 334-6224
 334-6314

Geolectric, Inc.

P. O. Box 842 • AZTEC, NEW MEXICO

DELIVERABILITY CALCULATION

CREST OIL CO.
 SANTA FE No. 7

10 # Back Pressure
 10 # Frictional Correction
 15,000 PSIA Frictional Drop

$$125 \frac{P_1^2 - P_2^2}{P_2^2 - P_3^2} = \frac{7576 - 6532}{6532 - 4941}$$

123 (1270)

P ₁	120.0	PSIA
Q	135.0	SCF/D
P ₂	74.4	PSIA
P ₃	62.0	PSIA
D	123.0	SCF/D

Geolectric Inc.

304/v

OPEN FLOW TEST DATA

Date: 6/21/43
 Operator: Creary Oil Co. Lease: Santa Fe No. 7
 Location: 6-194 270 County: _____ State: _____
 Formation: _____ Pool: _____
 Casing: _____ " Set @ _____ ' Tubing: _____ " Set @ _____
 Pay Zone: _____ ' To: _____ ' Total Depth: _____
 Choke Size: 3/16 2" Proven " Choke Constant = C = 2.1977

Stimulation Method: _____ Flow Through: Casing X Tubing _____
 Shut-in Pressure Casing: 100.0 psig / 12 = 120.0 psia (Shut-in _____ days)
 Shut-in Pressure Tubing: _____ psig / 12 = _____ psia
 Flowing Pressure: P : _____ psig / 12 = _____ psia
 Working Pressure: P_w : 84.6 psig / 12 = 76.6 psia
 Temperature: T : 79 °F / 460 = _____ °Absolute
 F_{pv} (from tables) : 1.008 Gravity .90 n .50 827

Choke Volume = Q = C x P_t x F_t x F_g x F_{pv} 2.1977 x .9008 x .8169 x 1.008 x 76.6
 Q = _____ = 125 MCF/D

Open Flow - Aof = Q 125

Aof = 125

$$\left[\begin{array}{c} P_c^2 \\ P_c^2 - P_w^2 \end{array} \right] \frac{1}{1.5878} \frac{1}{.95} \frac{1}{1.0008}$$

Aof =

211

MCF/D @ 15.025 psia

Tested By: D.W. Stiles

Witnessed By: _____

Geolectric Inc.
W.H. King

204/n



CREST OIL CO. #7, SANTA FE Sec. 6-
T19N-R27E. Apache County, 6 miles
SE Navajo 1P 185,000 CFPD from
1042-52. A shut in helium well in
Navajo Springs Field. 10-1962

204/8

APPLICATION FOR PERMIT TO DRILL, DEEPEN OR PLUG BACK

APPLICATION TO DRILL DEEPEN PLUG BACK

NAME OF COMPANY OR OPERATOR

DATE

Crest Oil Company

July 31, 1962

Address

City

State

P. O. Box 57

Alton

Illinois

DESCRIPTION OF WELL AND LEASE

Name of lease

Well number

Elevation (ground)

Santa Fe

No. 7

5840'

Well location

(give footage from section lines)

Section--township--range or block & survey

1650' FNL 1650' FEL

6 19N 27E

Field & reservoir (if wildcat, so state)

County

Wildcat

Apache

Distance, in miles, and direction from nearest town or post office

Six Miles from Navajo, Arizona

Nearest distance from proposed location to property or lease line:

Distance from proposed location to nearest drilling, completed or applied--for well on the same lease:

1650'

feet

Estimated 3500

feet

Proposed depth:

1500 feet

Rotary or cable tools

Rotary

Approx. date work will start

Sept. 1, 1962

Number of acres in lease:

3,840

Number of wells on lease, including this well, completed in or drilling to this reservoir:

3

If lease, purchased with one or more wells drilled, from whom purchased:

Name

Address

Status of bond

Individual Well Bond will be sent direct from Phoenix Agent

Maryland Casualty Company. Bond applied for.

Remarks: (If this is an application to deepen or plug back, briefly describe work to be done, giving present producing zone and expected new producing zone)

* Fill in Proposed Casing Program on other side

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the.....owner.....of the
Crest Oil Company.....(company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

July 31, 1962

Date

Signature

C. F. Swain

Permit Number: 204

Approval Date: Aug. 7, 1962

Approved By: [Signature]

Notice: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

See Instruction on Reverse Side of Form

STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION

Application to Drill, Deepen or Plug Back

Form No. P-1

File two copies

Authorized by Order No. _____

Effective _____, 1962

204

INSTRUCTIONS

READ CAREFULLY AND COMPLY FULLY

For the purpose of this determination attach hereto a neat, accurate plat, map or sketch of this lease, section, block or lot locating thereon the proposed site for this location. Plat shall be drawn to a scale which will permit the facile observation of all pertinent data. Show distances of the proposed well from the two nearest lease and section lines, and from the nearest wells on the same lease completed in or drilling to the same reservoir. If the location requested is not in conformance with the applicable well-spacing rules, show all off-setting wells to the proposed well, and the names and addresses of all adjoining lease or property owners.

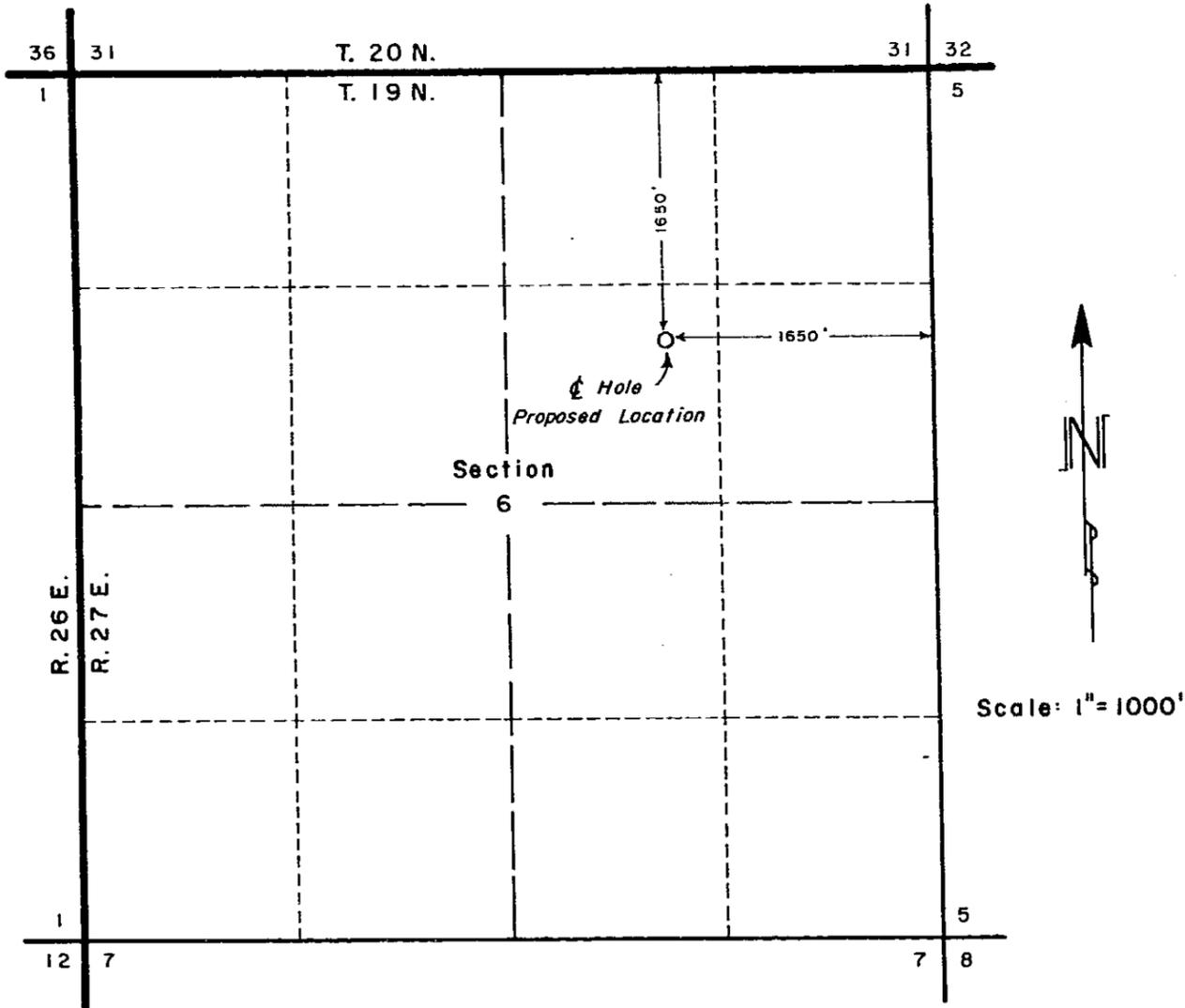
In event plat is filed for the purpose of designating the drilling and producing unit, or proration unit, on which the proposed well is to be drilled, the boundaries of such unit shall be shown, also the boundaries of all other such units attributed to other wells on the same lease completed in or drilling to the same reservoir. The acreage contained within each unit shall also be shown.

Do not confuse survey lines with lease lines. The sketch or plat should show your entire lease if possible. If it is not practical to show the entire lease and the plat shows only a section, block or lot out of your lease, you should clearly show that same is only a part of the lease.

Designate scale to which plat or sketch is drawn. Also designate northerly direction on the sketch or plat.

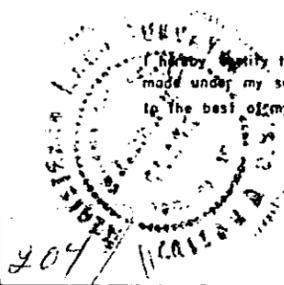
PROPOSED CASING PROGRAM

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement
8 5/8"	20lbs	J55	0	100'	0 to 100'	50



WELL LOCATION: Crest Oil Company — Santa Fe # 7

Located 1650 feet South of the North line and 1650 feet West of the East line of Section 6,
 Township 19 North, Range 27 East, Gila & Salt River Meridian.
 Apache Co., Arizona



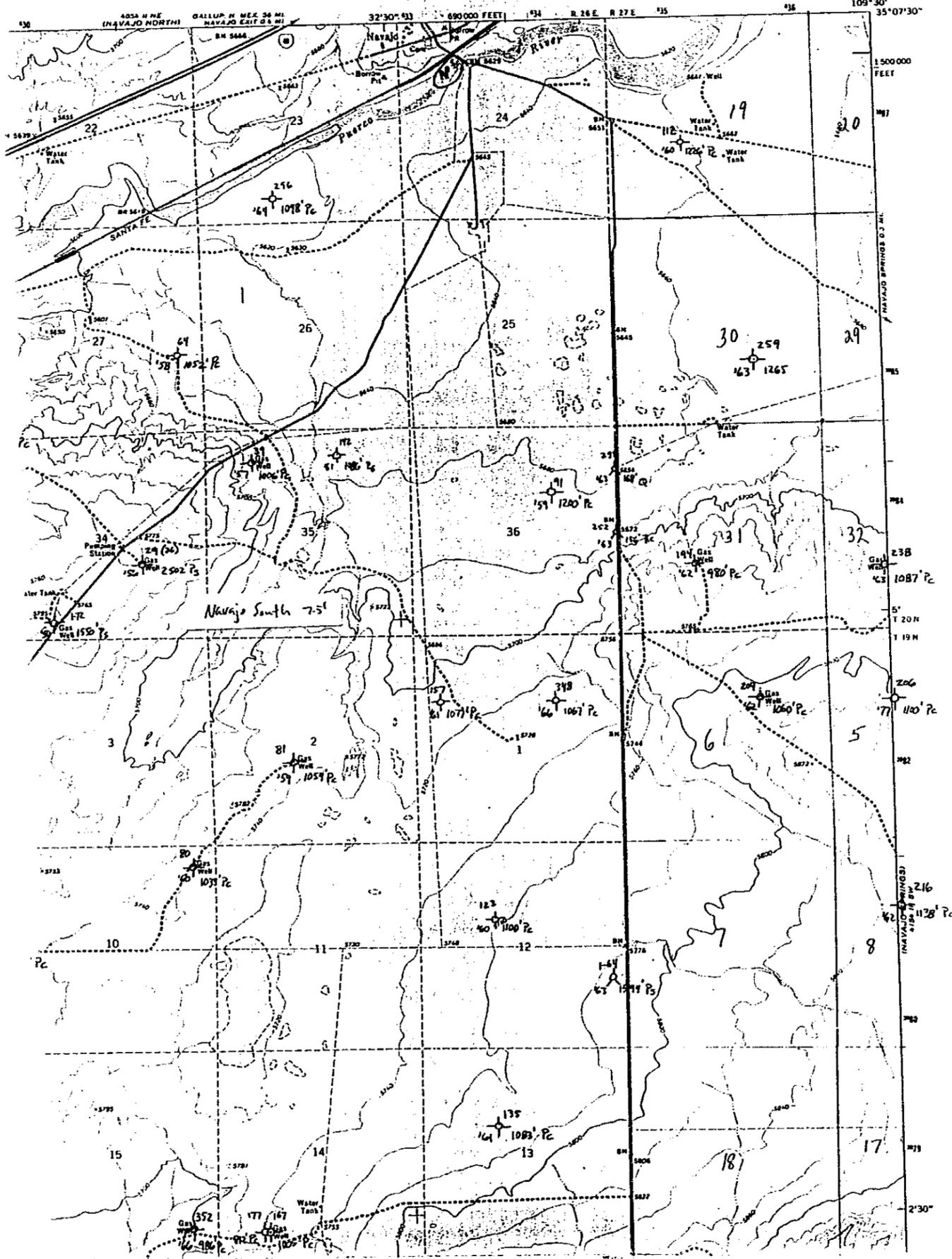
I hereby certify the above plat represents a survey made under my supervision and that it is accurate to the best of my knowledge and belief.

Elmer M. Clark

ELMER M. CLARK
 Registered Land Surveyor
 State of Arizona #4973

CREST OIL COMPANY	
WELL LOCATION PLAT Sec. 6, T.19 N., R.27 E. Apache Co., Arizona	
E.M. CLARK & ASSOC. Durango, Colorado	DATE: July 23, 1962 FILE NO: 62054

NAVAJO SOUTH QUADRANGLE
ARIZONA-APACHE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



204

Geological Report of
Chest Oil Co. Santa Fe No. 7
Sec. 6 - T. 19N., R. 27E.
Apache Co., Arizona

204

E. A. CLEMENT

Consulting Geologist

906 North Watson - Farmington, New Mexico - Davis 5-3337

September 10, 1962

GEOLOGICAL REPORT

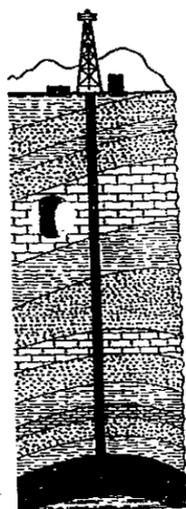
OF

CREST OIL COMPANY
SANTA FE NO. 7

Section 6 - T19N - R27E
Apache County, Arizona

Prepared for

Crest Oil Company
Alton, Illinois



E. A. CLEMENT
Consulting Geologist

906 North Watson - Farmington, New Mexico - Davis 53337

September 10, 1962

GEOLOGICAL REPORT

OF

CREST OIL COMPANY
SANTA FE NO. 7

Section 6 - T19N - R27E
Apache County, Arizona

Prepared for

Crest Oil Company
Alton, Illinois

DISCUSSION

The Crest Oil Co. Santa Fe No. 7 was drilled 1090' east and 3300' south of the Eastern Petroleum Co. Santa Fe No. 13 to further evaluate the helium bearing gas possibilities of the area. This well was drilled with a small, truck mounted, rotary rig by Myers Drilling Co. using conventional water base mud as a circulating medium.

The well was spudded and 97' of 8 5/8" surface casing was run and cemented with 20 sacks of cement on August 31, 1962. Drilling was started on September 1, 1962, after allowing 18 hours for the cement to harden. The well reached a T.D. of 1021 feet at 7 P.M. on September 3 without incident. Drilling was conducted for 12 hours daily during the day-light hours on September 1 and 2, but was put on a 24 hour basis on September 3 for the remainder of the work.

On reaching a depth of 1021 feet, circulation was lost, and it was assumed the top of the Coconino sandstone had been reached, as mud is usually lost in the top of this formation. Circulation was regained with little difficulty and as Coconino sandstone was not found in the samples, it was decided to drill further. The well was drilled 3 1/2 feet deeper and circulation was again lost at a depth of 1024 1/2'. After mixing mud and regaining circulation, the hole was drilled an additional 3 feet to a T.D. of 1027 1/2'. Repeated examination of all the samples circulated up during and after the drilling failed to reveal the presence of Coconino

sandstone. It was thought possible that most of the drill cuttings were being lost with the mud at the bottom of the hole and were not being circulated to the surface. It was decided to log the hole at this point in order to be sure the Coconino sand was not being drilled. On the attempt to run an electrical-induction log, on the morning of September 4, the sonde stopped at 1015' and the smaller electrical log sonde also stopped at this depth. The hole was conditioned and circulation again lost. After regaining circulation and cleaning up the bore hole, the large electric log sonde was run and stopped at 896 feet. The hole was re-conditioned and circulation was again lost and regained and an additional $3\frac{1}{2}$ feet of hole drilled, T.D. 1031. The samples were examined thoroughly and to some extent with no trace of Coconino sandstone being found. The electrical-induction sonde was run and stopped at a depth of 915 feet. The hole was again reconditioned, circulation lost and re-gained, and new mud mixed with a small amount of lost circulation material. The electrical induction log was run and the sonde stopped at 920'. The small electrical sonde was tried and also stopped at 920'. At this point, 2 7/8" tubing was run in the hole and the hole conditioned with new mud and lost circulation material. The small electrical log sonde was run thru the tubing and the bottom of the hole was logged from 1031 to 951 feet. On examination of the log, and by correlating it with the Eastern Petroleum Co. Santa Fe No. 13 well log, it was decided the top of the

Coconino sand would be found at least 7 feet deeper. The core barrel was run at 1 A.M. on September 5 and a total of 14 feet of core was out with $13\frac{1}{2}$ feet being recovered. The top of the Coconino sand was found at 1044 feet and the core barrel was re-run. After cutting 5 feet of the sandstone, the barrel jammed and was pulled with a recovery of $4\frac{1}{2}$ feet of Coconino sandstone. The hole was reamed and drill stem test No. 1 was run with the results as shown on page 2 of this report.

By correlating this well with the Eastern No. 13 well to the north, it was found that we were 26 feet lower on the structure. The Eastern well was drilled 14 feet into the Coconino sandstone and found it dry. With this information, and the fact that we did not have water on the first drill stem test, it was decided to core further into the sandstone and the core barrel was run again. Coring was resumed at 8:55 P.M. on September 5 and after coring 6 feet the barrel jammed and circulation was lost briefly. The core was pulled, recovering 6 feet of core, and the hole was reamed and an additional 4 feet of hole drilled.

Drill stem test No. 2 was run during the day of September 6 with the results as shown on page 2.

An electrical log was run from 1060 to 100 feet without difficulty. 1060 feet of $2\frac{7}{8}$ " tubing was run and cemented with 28 sacks of cement. The plug was followed with 1 barrel of MSA acid and pumped down with water. The plug was down at 1:45 A.M. September 7.

Cement was allowed to harden and at 8 A.M. on September 8, the casing was perforated by Jet Technical Services with 4 holes per foot from 1042 to 1052 feet, after running a gamma ray and collar counter log from 1057 to 750 feet. After waiting 10 minutes, it could be seen the hole was not taking the acid and a pressure of 600 psi was applied with the pump momentarily. Five minutes later approximately 1 barrel of water was pumped in at the surface under 250 psi pressure to displace the acid into the formation. Swabbing was started after approximately 1 hour and all water was swabbed from the hole. It was noted that the water was discolored with mud at the bottom, which indicated the mud was being dissolved from the formation by the acid. Water continued to come into the hole slowly; however, this was believed to be water from the mud lost in the hole and not formation water. At this point the gas gauged 90 MCF. It is believed the water will slowly come back into the hole and should be swabbed off intermittently for a few days for maximum gas production.

CONCLUSION:

After closely correlating the well log with that of the Eastern well to the north, it is concluded that the logs correlate closely with the exception of 2 zones.

(1) The Shinarump zone in the Crest well has apparently shaled up in the top leaving the lower part as shown on the log. It was first thought the loss of the top of the Shinarump was possibly due to cutting a south dipping normal fault which crossed the

bore hole at 860 feet. After closely correlating the logs, it cannot be found where a section is missing at the top of the Shinarump, which would be necessary evidence to prove a fault was out. It is therefore assumed the loss of the top of the Shinarump was due to a normal shaling up of the sandstone.

(2) The zone from the bottom of the Shinarump to the top of the Coconino was found to be 14 feet thicker in the Crest well than in the Eastern well. This is accounted for by a thickening of 6 feet in the bed from 989 to 1011 feet, and an 8 foot zone from 1035 to 1043, which was not present in the Eastern well.

The Crest well is 26 feet lower on the structure than the Eastern well at the Coconino horizon, which partially accounts for the smaller amount of gas on the initial test. It is apparent that there is a thicker section of dry sand on this structure than at any place drilled in the entire area. Should the water table in the Coconino be horizontal, it can be safely assumed that the Eastern No. 13 well will have a minimum of 42 feet of dry sand, as this depth in the Eastern well corresponds with the bottom of the hole in the Crest well.

As the gas-water contact was not reached in either well, the maximum thickness of dry sand cannot be estimated with any accuracy; however, salt water is found at approximately 4760' above sea level on the Pinta structure. The top of the Coconino on the Eastern No. 13 was found at plus 4822 with the bottom of the hole being plus 4808. The Crest well had the Coconino at

plus 4796 and the bottom of the hole at plus 4780. Should salt water be at the same level as found on the Pinta structure, it can be seen that the reservoir on this structure will be much greater than that of the Pinta structure when considered on a per acre basis. The lateral extent of this structure is unknown and will be proved only by drilling. It will also be necessary to drill a well into the salt water before accurate reserves can be calculated.

STRATIGRAPHY:

Formation tops were identified by sample examination and later adjusted to correspond with the electric log except in one instance. The top of the Coconino was found at 1044' in the core and at 1047' on the electric log. As the total depth was found to be at 1060 feet by both the driller and the electric log, it is assumed that some error occurred in the electric log. This was later verified by the gamma ray log which found the Coconino top at 1044 feet.

Formation tops and their thickness are presented below:

<u>FORMATION</u>	<u>DEPTH</u>	<u>THICKNESS</u>
Tertiary	0 to 115	115
Chinle	115	716
Shinarump	831	39
Moenkopi	870	174
Coconino	1044	
Total Depth	1060	

Drilling time was recorded at 10' intervals by the driller from 125' to 1031'. Coring time was recorded at 1' intervals

except during the first core from 1031 to 1045 when the driller inadvertently omitted the coring time. Drill cutting samples were taken at 10 foot intervals from 90' to 1031', where coring was started. No samples were caught during the coring. The well was cored from 1031' to 1056'. One foot samples of the core from 1044' (top of Coconino) to 1056' were taken to Core Laboratories for analysis.

All samples were microscopically examined at the well site and are being held for distribution in the event they are requested.

A complete description of the samples along with the drilling time and core analysis follows:

<u>DEPTH</u>	<u>DRILNG TIME</u>	<u>DESCRIPTION</u>
90-100		80% wh. grn. red, crse., hd. sand; 20% ppl. & red shale
100-10	24	100% wh. pink to clr., crse., w/cem., sub-rnd., w/srtd., v/limy ss
110-20	22	90% gry to red, crse, w/cem., prly. srtd., v/limy ss; 5% gry. ls; 5% red shale
TOP CHINLE 115'		
120-30	12	60% gry to red, crse. to med., dirty ss; 40% red shale
130-40	6	50% ss as above; 50% shale as above.
140-50	3	30% ss as above; 70% brick red shale
150-60	4	20% ss as above; 80% shale as above
160-70	4	100% brick red shale
170-80	5	Tr. fine, white sand; 100% shale as above
180-90	5	100% red to brown shale

190-200	5	100% red to brown shale
200-210	5	10% gry., fine, tight ss; 10% gry. ls; 80% red to brown very bentonitic shale
210-20	3	10% gry. to red; fine ss; 90% sh. as abv.
220-30	3	20% ss as above; 80% shale as above.
230-40	5	10% ss as above; 90% brown, bentonitic shale
240-50	8	20% gry. to olr., med. grained ss; 80% red & brn sh.
250-60	5	20% ss as above; 80% shale as above.
260-70	5	10% ss as above; 90% brown to lavender shale
270-80	6	as above
280-90	7	50% lavender shale, 50% grey to lav. bentonite
290-300	3	75% " " 25% " " " "
300-10	5	50% red sandy shale, 50% grey bentonite
310-20	5	As above
320-30	5	As above
330-40	5	As above
340-50	7	As above
350-60	4	50% grey, v/hd., tite, fine ss; 50% gry to red sh.
360-70	4	10% ss as above; 70% gry sh; 20% wh. bentonite
370-80	8	10% ss as above; 40% brn. sndy. sh; 40% greyshale
380-90	7	50% brn., fine, silty, v/shaly ss; 50% v/sdy, brn. sh.
390-400	8	60% ss as above; 20% brn. sh; 20% grey shale.
400-10	7	70% grey, med., friable, varicol. w/ black, green, brn. grains; 30% brown and red shale
410-20	3	50% ss as above; 50% green, black, grey shale
420-30	4	80% ss as above; 20% shale as above
430-40	8	70% ss as above, v/bentonitic; 30% shale as abv.

440-50	8	70% ss as above; 30% shale as above
450-60	6	As above
460-70	5	100% white bentonite
470-80	11	30% sand as abv.; 5% tan qtz. grns.; 5% crse. clear qtz. grns; 60% grey-green & red sh.
480-90	9	as above
490-500	8	as above
500-10	5	20% grey, med, friable, S&P ss; 80% grey to brown silty-sandy shale
510-20	7	10% grey ss as above; 90% grey to green sh.
520-30	10	as above
530-40	5	20% ss as abv; 80% shale as abv.
540-50	6	as above
550-60	6	as above
560-70	8	as above
570-80	7	as above
580-90	6	5% grey, fns, tite ss; 95% grey, brn. & red sh.
590-600	6	20% ss as abv; 80% shale as abv.
600-10	8	as above
610-20	8	5% ss as abv; 40% brn, 30% grey, 25% green shale
620-30	4	As above
630-40	5	5% ss as abv; 20% brn, 75% grey shale
640-50	4	as above
650-60	7	5% ss as abv; 25% brn, 70% grey shale
660-70	7	as above
670-80	11	as above

680-90	9	As above
690-700	5	As above
700-10	6	5% ss as abv; 30% brown, 65% gry-green shale
710-20	4	As above
720-30	4	5% clr. orse. ang. qtz grns; shale as above
730-40	6	Tr. qtz grns as abv; 30% brown, 70% gry-grn shale
740-50	5	as above
750-60	9	5% qtz grns as abv; 25% brown, 70% grey green sh.
760-70	9	5% " " " " ; 40% brown, 55% grey green sh.
770-80	6	20% orse, clear, ang. qtz grns; 40 gry 40 brn sh.
780-90	6	10% " " " " " ; 45 " 45 " "
790-800	13	As above
800-10	8	20% orse, clear, ang. qtz grns; 40 gry, 40 brn. sh.
810-20	8	As above
820-30	12	10% qtz grns as abv; 5% med-orse, consol., grey, s&p, friable ss; 45% grey 40% red shale.
830-40	16	10% med.-orse, clear, ang, qtz grns; 10% fine-med. dirty, hard, sand stone; 40% red, 40% grey sh.
SHINARUMP 831'		
840-50	37	10% qtz grns. as above; 45 red, 45 grey shale.
850-60	22	20% " " " " ; 40% " 40% " "
860-70	22	30% " " " " ; 35% " 35% " "
870-80	40	50% fine-med. w/rnded & orse ang. qtz grns;
MOENKOPI 870		20% grey, 20% red-brn., 10% lavender shale
880-90	56	50% qtz grns as abv; shale as above
890-900	70	20% " " " " ; 80% gry, grn, lav. brn, red sh.
900-10	40	5% " " " " ; 95% shale as abv.
910-20	60	20% " " " " ; 80% " " "

680-90	9	As above
690-700	5	As above
700-10	6	5% ss as abv; 30% brown, 65% gry-green shale
710-20	4	As above
720-30	4	5% clr. orse. ang. qtz grns; shale as above
730-40	6	Tr. qtz grns as abv; 30% brown, 70% gry-grn shale
740-50	5	as above
750-60	9	5% qtz grns as abv; 25% brown, 70% grey green sh.
760-70	9	5% " " " " ; 40% brown, 55% grey green sh.
770-80	6	20% orse, clear, ang. qtz grns; 40 gry 40 brn sh.
780-90	6	10% " " " " " ; 45 " 45 " "
790-800	13	As above
800-10	8	20% orse, clear, ang. qtz grns; 40 gry, 40 brn. sh.
810-20	8	As above
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830-40	16	10% med.-orse, clear, ang, qtz grns; 10% fine-med. dirty, hard, sand stone; 40% red, 40% grey sh.
SHINARUMP 831'		
840-50	37	10% qtz grns. as above; 45 red, 45 grey shale.
850-60	22	20% " " " " ; 40% " 40% " "
860-70	22	30% " " " " ; 35% " 35% " "
870-80	40	50% fine-med. w/rnded & orse ang. qtz grns;
MOENKOPI 870		20% grey, 20% red-brn., 10% lavender shale
880-90	56	50% qtz grns as abv; shale as above
890-900	70	20% " " " " ; 80% gry, grn, lav. brn, red sh.
900-10	40	5% " " " " ; 95% shale as abv.
910-20	60	20% " " " " ; 80% " " "

920-30	51	5% fine-med, w/rnded & orse ang. qtz grns; 95% grey, green, lavender, brown, red shale
930-40	67	100% shale as above
940-50	81	5% red-brn, fine silty ss; 95% sh. as abv.
950-60	85	10% red-brn " " " ; 10% lt. grey, med, S&P; 20% clr. qtz. grns; 60% shals as abv.
960-70	50	20% red brn, fine, silty ss; 80% sh. as abv.
970-80	49	20% SS as abv; 10% qtz grns; 70% sh as abv.
980-90	40	50% red-brn, fine, silty, friable ss; 50% sh as abv.
990-1000	45	75% brn, silty, fine ss; 5% dirty white, fine S&P ss; 20% shale as above
1000-05	24	30% ss as above; 70% shale as above
1005-10	23	10% vv/silty as above; 90% shale as above.
1010-15		As above
1015-20		" "
1020-25		20% lt. tan, fine, hard, tite ss; 75% sh. as abv.
1025-30		10% as above; 10% wh. fine ss; 80% sh. as above.

Care No. 1, 1031 to 1045 feet; recovered 13½ feet.

1031-33		Grey green, dense, hard shale
1033-34		Top 7" shale as abv. w/¼" streaks dk. red shale; Bottom 5", red-med-tite, uniform ss, v/hard, with clear qtz grns & occasional green grains.
1034-35		SS as above
1035-36		SS as above becoming shaly in bottom 2" (red shale)
1036-37		Thin laminae of ss as above interbedded with dark red shale.
1037-38		Very hard, dense brown shale
1038-39		As above, and slightly sandy
1039-40		As above " " "

1040-41 Brown shale as above, slightly sandy
 1041-42 Silty, softer, medium brown shale
 1042-43 As above with bottom 3" very sandy, brick red shale
 1043-44 Top 8" very sandy, brick red, soft shale;
 TOP COCONINO 1044' Bottom 4" lt. tan, med, v/well sorted, w/rnded,
 porous and permeable, friable ss w/ vert. frac.
 1044-45 Coconino sandstone as above, Porosity 15.5%,
 Horiz. perm. 108 mili.; Vert. perm. 12 mili.
 CORE NO. 2, 1045-50, recovered 4 $\frac{1}{2}$ '

Depth	CORNG. TIME	DESCRIPTION	POROS. %	HORZ. PERM.	VERT. PERM.
1045-46	9	lt. tan, med. v/well sorted, well rnded, porous, permeable, friable ss with vertical fracture.	14.3	154	40
1046-47	9	As above, somewhat smaller grained	14.2	56	42
1047-48	10	" " less permeable	21.5	26	19
1048-49	4	As above, less porous and permeable	11.5	2.3	2.3
1049-50	12	As above	8.4	36	1.0
CORE NO. 3, 1050 to 1056, recovered 6 feet					
1050-51	17	As above but not vert. fractured	18.5	685	28
1051-52	19	" "	16.0	576	229
1052-53	12	" " becoming tighter	12.3	26	11
1053-54	20	" " fair porosity, vert. frac.	12.2	225	146
1054-55	22	" " tighter	13.8	59	29
1055-56	18	" " fair porosity, vert. frac.	15.1	53	32

Respectfully submitted,

E. A. Clement

E. A. Clement
 Consulting Geologist

Farmington, New Mexico
 September 10, 1962

WELL DATA

Operator: Crest Oil Company
P. O. Box 57
Alton, Illinois

Well Name: Santa Fe No. 7

Location: 1650' from the north line &
1650' from the east line of
Section 6, T19N, R27E
Apache County, Arizona

Elevation: 5840' Ground

Contractor: Myers Drilling Co.
Box 615
Navajo, Arizona

Spud Date: August 31, 1962

Completion Date: September 8, 1962

Total Depth: 1060'

Hole Size: 11 5/8" surface to 97'
4 3/4" 97' to 1060'

Casing Program: Surface casing: 8 5/8" from surface to
97', cemented with 20 sacks of cement by
Myers Drilling Co.
Production casing: 2 7/8" external upset
J-55, 6.5 lb. tubing from surface to
1060', cemented with 28 sacks of cement by
Myers Drilling Co.

Gas Zones: 1044 to 1060'

Fresh Water Zones: None

Salt Water Zones: None

Lost Circulation
Zones: 1021', 1024', 1027', 1031', 1052', 1053'.

Cores: No. 1 1031 to 1045'; No. 2 1045 to 1050';
No. 3 1050 to 1058'. (Described in strat-
igraphy section.)

Drill Stem Tests: (By Halliburton Oil Well Cementing Co.)
DST No. 1; T.D. 1050; Tested from 1040
to 1050. Opened tool with good blow immediately; after 10
minutes, closed tool for initial shut in pressure for 30 min.
Opened tool for 2 hours and 3 minutes; good blow immediately,
increased thr test. Swabbed small amount of mud thru tool
and gas increased to 185 MCF. Shut in for 30 minutes. No
recovery. Flow pressures; initial 15 psi, final 28 psi;
Shut in pressures; initial 120, final 120; Hydrostatic
pressures; initial 485, final 485.

DST No. 2; T.D. 1060; Tested 1039-1060. Opened tool with good
blow immediately; after 10 minutes, closed tool for initial
shut in pressure for 15 minutes. Opened tool for 2 hrs and 12
minutes; good blow immediately, swabbed mud thru tool and gas
increased to 182 MCF. Shut in for 15 minutes. Recovered 27
feet of muddy water. Flow Pressure; initial 40, final 55;
Shut in pressure; initial 125, final 125; Hydrostatic
pressure; initial 525, final 515.

Logs: Schlumberger Well Surveying Corp.
electric-resistivity log from 100'
to 1060'.
Jet Technical Services gamma-ray
and collar locator log, 750 to 1057'

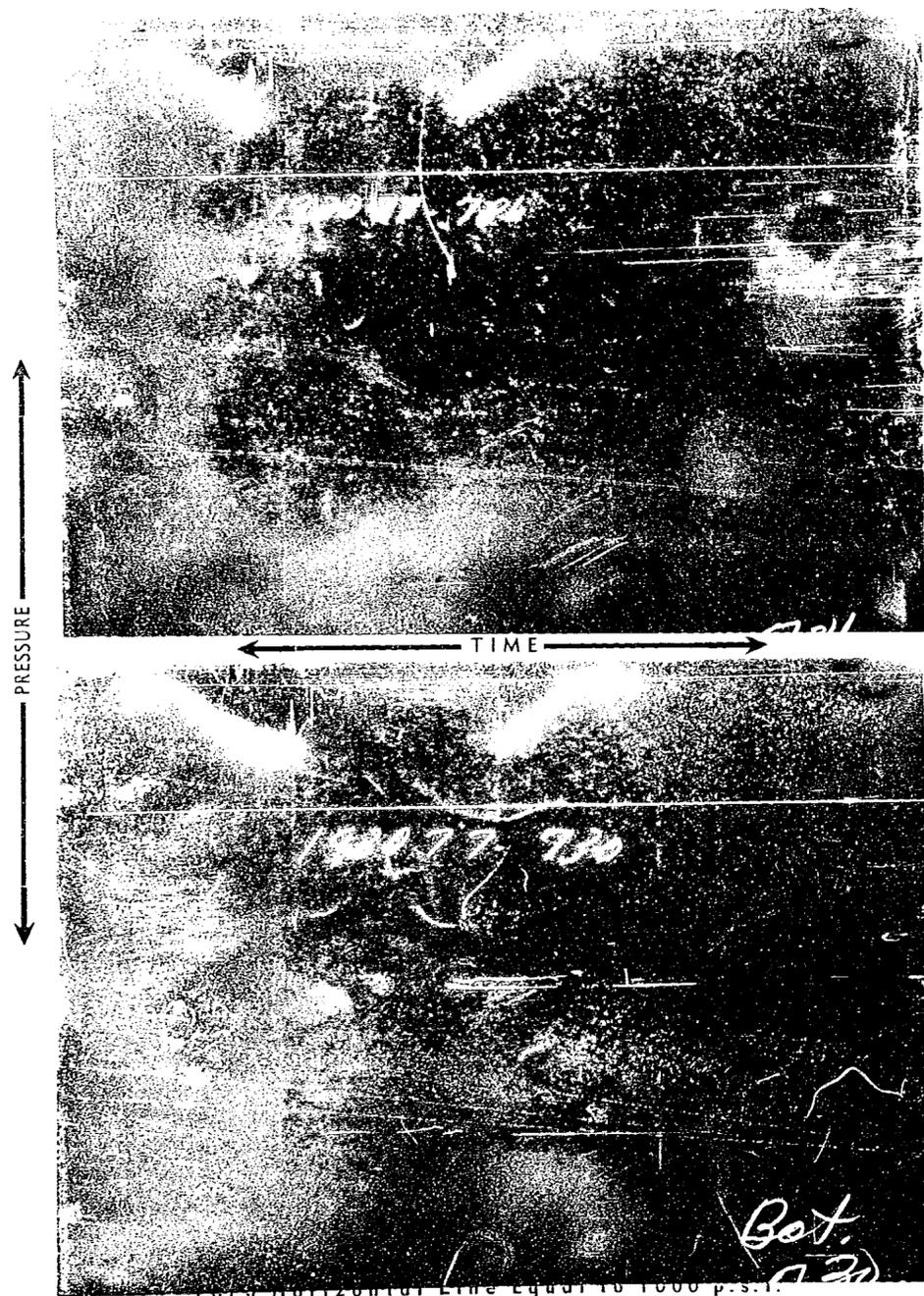
Completion Data: Perforated by Jet Technical Services,
4 holes per foot from 1042 to 1052 with
Jet Tech 2" Go-Winder gun.
Swabbed water from casing.
I.P.

Open Flow Test Record

Producers Name Crest Oil Company Date 10-10-63
Lease Name Santa Fe No. 7 Time 1:40 pm
Location Sec. 6-19N-27E Apache County, Arizona
Shut-In Pressure 106.8 psig Unloading Period 20 Min

Test Point	Time From	Time To	Flow Period	Orifice Size	Prover Press.	Wellhead Pressure	Flow Gas Temp.
1	2:00 pm	2:20 pm	20 min.	1"	1 1/4" H2O	91.0 psig	73°
2	2:20 pm	2:35 pm	15 min	1-1/4"	1 1/4" H2O	72.9 psig	72°
3	2:35 pm	2:55 pm	20 min	1-1/2"	7.2" H2O	49.8 psig	71°

Remarks: No moisture indicated in gas stream either during blow down or flow test.



NOMENCLATURE

- b = Approximate Radius of Investigation Feet
- b_1 = Approximate Radius of Investigation (Net Pay Zone h_1) Feet
- D.R. = Damage Ratio —
- EI = Elevation Feet
- GD = B.T. Gauge Depth (From Surface Reference) Feet
- h = Interval Tested Feet
- h_1 = Net Pay Thickness Feet
- K = Permeability md
- K_1 = Permeability (From Net Pay Zone h_1) md
- m = Slope Extrapolated Pressure Plot ($\text{Psi}^2/\text{cycle Gas}$) psi/cycle
- OF_1 = Maximum Indicated Flow Rate MCF/D
- OF_2 = Minimum Indicated Flow Rate MCF/D
- OF_3 = Theoretical Open Flow Potential with Damage Removed Max. MCF/D
- OF_4 = Theoretical Open Flow Potential with Damage Removed Min. MCF/D
- P_s = Extrapolated Static Pressure Psig.
- P_F = Final Flow Pressure Psig.
- P_{ot} = Potentiometric Surface (Fresh Water *) Feet
- Q = Average Adjusted Production Rate During Test bbls/day
- Q_1 = Theoretical Production w/Damage Removed bbls/day
- Q_g = Measured Gas Production Rate MCF/D
- R = Corrected Recovery bbls
- r_w = Radius of Well Bore Feet
- t = Flow Time Minutes
- t_o = Total Flow Time Minutes
- T = Temperature Rankine °R
- Z = Compressibility Factor —
- μ = Viscosity Gas or Liquid CP
- Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

204



Your.....

Formation Testing Service Report

204



Gauge No. 786		Depth 1028		Clock 12 hour		Ticket No. 193077					
First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure				
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.		
P ₀	.000	26	.000		45	.000	47	.000		46	
P ₁	.012	28	.0102		100	.0866	47	.0087		111	
P ₂	.024	30	.0204		108	.1732	30	.0174		114	
P ₃	.036	35	.0306		111	.2598	31	.0261		115	
P ₄	.048	38	.0408		111	.3464	31	.0348		115	
P ₅	.060	45	.0510		112	.4330	31	.0435		115	
P ₆			.0612		112	.5196	36	.0522		115	
P ₇			.0714		112	.6062	66	.0609		115	
P ₈			.0816		112	.6928	43	.0696		115	
P ₉			.0918		112	.7794	107	.0783		115	
P ₁₀			.1020		112	.8660	46	.0870		115	
Gauge No. 730		Depth 1057		Clock 12 hour							
P ₀	.000	51	.000		50	.000	55	.000		51	
P ₁	.0122	42	.0101		107	.0869	52	.0089		109	
P ₂	.0244	42	.0202		111	.1738	39	.0178		111	
P ₃	.0366	43	.0303		113	.2607	38	.0267		111	
P ₄	.0488	47	.0404		114	.3476	36	.0356		111	
P ₅	.0610	50	.0505		114	.4345	36	.0445		111	
P ₆			.0606		114	.5214	39	.0534		111	
P ₇			.0707		114	.6083	68	.0623		111	
P ₈			.0808		114	.6952	47	.0712		111	
P ₉			.0909		114	.7821	107	.0801		111	
P ₁₀			.1010		114	.8690	51	.0890		111	
Reading Interval 2		1.5		13.2		1.5				Minutes	
REMARKS: All readings on BT 786 Questionable due to split stylus											

SPECIAL PRESSURE DATA

Flow Time	1st Min. 10	2nd Min. 132	Date	9-6-62	Ticket Number	193077-S
Closed In Press. Time	1st Min. 15	2nd Min. 15	Kind of Job	Open Hole	Halliburton District	Farmington
Pressure Readings	Field	Office Corrected	Tester	Mr. Manchester	Witness	Bill Merers
Depth Top Gauge	1028 Ft.	no Blanked Off	Drilling Contractor	W T MEYERS DRILLING COMPANY		
BT. P.R.D. No.	786	12 Hour Clock	Elevation	-	Top Packer	1040'
Initial Hydro Mud Pressure	525	495	Total Depth	1060'	Bottom Packer	
Initial Closed in Pres.	125	112	Interval Tested	1040-1060'	Formation Tested	Conconino
Initial Flow Pres.	40	1 26 2 47	Casing or Hole Size		Casing } Top Perfs. } Bot.	
Final Flow Pres.	55	1 45 2 46	Surface Choke	1"	Bottom Choke	2/3"
Final Closed in Pres.	125	115	Size & Kind Drill Pipe	2 7/8" EUE	Drill Collars Above Tester	I.D. - LENGTH
Final Hydro Mud Pressure	55	493	Mud Weight	9.3	Mud Viscosity	55
Depth Cen. Gauge		Blanked Off	Temperature	100 °F Est. °F Actual	Anchor Size ID 1 1/2 X 20	OD 3 3/4
BT. P.R.D. No.		Hour Clock	Depths Mea. From	Rotary table	Depth of Tester Valve	1020 Ft.
Initial Hydro Mud Pres.			Cushion		Depth Back Pres. Valve	Ft.
Initial Closed in Pres.			Recovered	36 Feet of water not salty		
Initial Flow Pres.			Recovered	Feet of		
Final Flow Pres.			Recovered	Feet of		
Final Closed in Pres.			Recovered	Feet of		
Final Hydro Mud Pres.			Oil A.P.I. Gravity		Water Spec. Gravity	
Depth Bot. Gauge	1057 Ft.	yes Blanked Off	Gas Gravity		Surface Pressure	psi
BT. P.R.D. No.	730	12 Hour Clock	Tool Opened	9:05 AM A.M. P.M.	Tool Closed	11:55 AM A.M. P.M.
Initial Hydro Mud Pres.	530	507	Remarks Tool opened for a 10 minute first flow.			
Initial Closed in Pres.	1230	114	Rotated for a 15 minute initial closed in pressure.			
Initial Flow Pres.	40	1 51 2 55	Tool re-opened with a good blow - gas measured			
Final Flow Pres.	55	1 50 2 51	183 MCF. Took a 15 minute final closed in pressure			
Final Closed in Pres.	123	111				
Final Hydro Mud Pres.	520	466				

Legal Location Sec. - Twp. - Rng. **SANNA RE** **7** **2** **SEC 6 19N 27E**

Lease Name **CREST OIL COMPANY**

Field ID/CAT **APACHE**

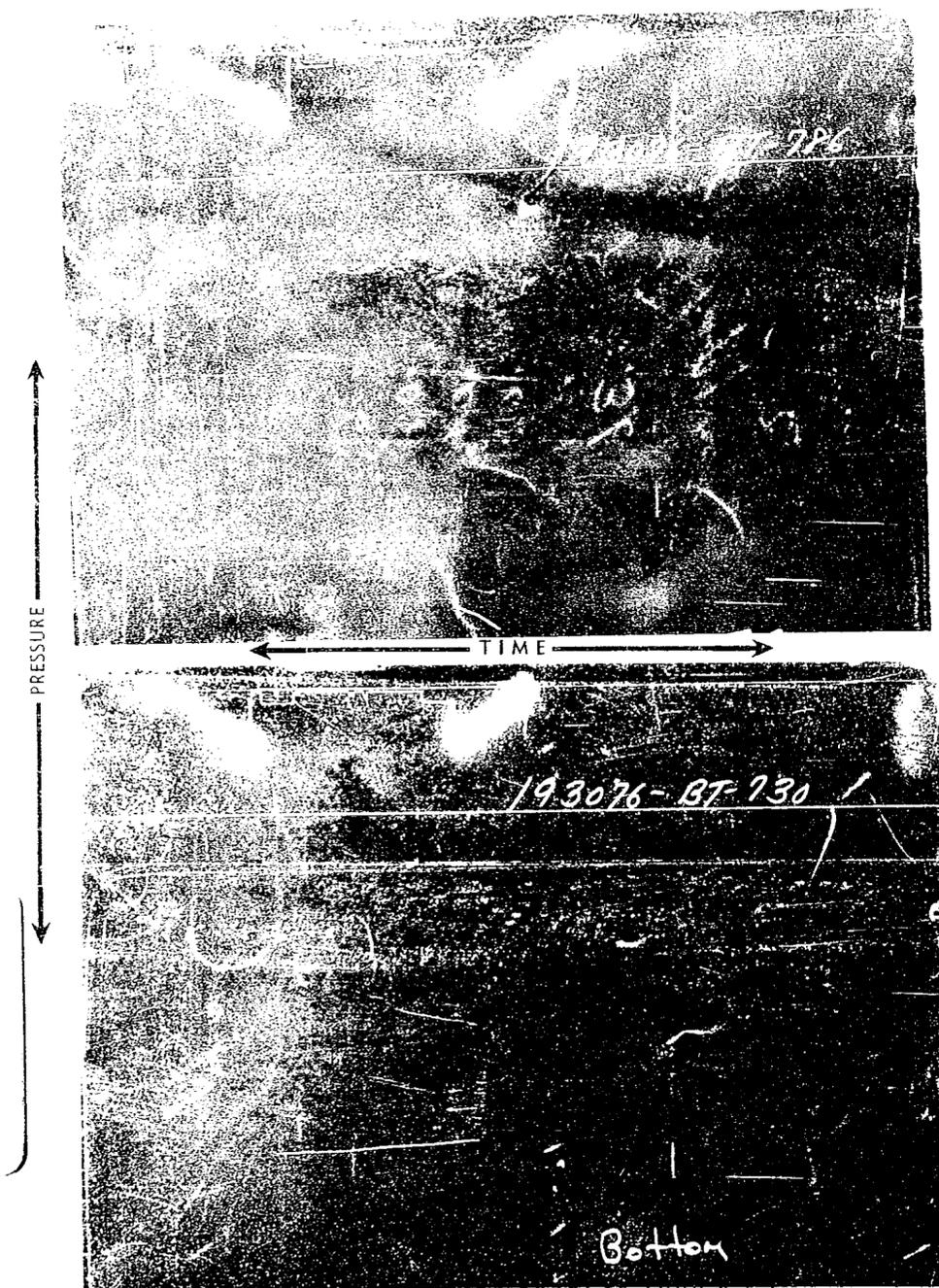
County **ALTON**

State **ARIZ**

Owner's District **ALTON**

FORMATION TEST DATA

5



Time	1st	Min.	2nd	Min.	Date	Ticker Number
Close in Press. Time	1st	Min.	2nd	Min.	Kind of Job	Houston District
Pressure					Office	
Readings					Corrected	
1st					Tester	
2nd					Drilling	
3rd					Operator	
4th					Hour	
5th					Check	
6th					Remarks	
7th					Time	
8th					Depth	
9th					Flow	
10th					Rate	
11th					Temp	
12th					Pressure	
13th					Remarks	
14th					Flow	
15th					Rate	
16th					Temp	
17th					Pressure	
18th					Remarks	
19th					Flow	
20th					Rate	
21st					Temp	
22nd					Pressure	
23rd					Remarks	
24th					Flow	
25th					Rate	
26th					Temp	
27th					Pressure	
28th					Remarks	
29th					Flow	
30th					Rate	
31st					Temp	
32nd					Pressure	
33rd					Remarks	
34th					Flow	
35th					Rate	
36th					Temp	
37th					Pressure	
38th					Remarks	
39th					Flow	
40th					Rate	
41st					Temp	
42nd					Pressure	
43rd					Remarks	
44th					Flow	
45th					Rate	
46th					Temp	
47th					Pressure	
48th					Remarks	
49th					Flow	
50th					Rate	
51st					Temp	
52nd					Pressure	
53rd					Remarks	
54th					Flow	
55th					Rate	
56th					Temp	
57th					Pressure	
58th					Remarks	
59th					Flow	
60th					Rate	
61st					Temp	
62nd					Pressure	
63rd					Remarks	
64th					Flow	
65th					Rate	
66th					Temp	
67th					Pressure	
68th					Remarks	
69th					Flow	
70th					Rate	
71st					Temp	
72nd					Pressure	
73rd					Remarks	
74th					Flow	
75th					Rate	
76th					Temp	
77th					Pressure	
78th					Remarks	
79th					Flow	
80th					Rate	
81st					Temp	
82nd					Pressure	
83rd					Remarks	
84th					Flow	
85th					Rate	
86th					Temp	
87th					Pressure	
88th					Remarks	
89th					Flow	
90th					Rate	
91st					Temp	
92nd					Pressure	
93rd					Remarks	
94th					Flow	
95th					Rate	
96th					Temp	
97th					Pressure	
98th					Remarks	
99th					Flow	
100th					Rate	

FORMATION TEST DATA
SPECIAL PRESSURE DATA



NOMENCLATURE

b	= Approximate Radius of Investigation	Feet
b_1	= Approximate Radius of Investigation (Net Pay Zone h_1)	Feet
D.R.	= Damage Ratio	—
EI	= Elevation	Feet
GD	= B.T. Gauge Depth (From Surface Reference)	Feet
h	= Interval Tested	Feet
h_1	= Net Pay Thickness	Feet
K	= Permeability	md
K_1	= Permeability (From Net Pay Zone h_1)	md
m	= Slope Extrapolated Pressure Plot (Psi ² cycle Gas)	psi/cycle
OF ₁	= Maximum Indicated Flow Rate	MCF/D
OF ₂	= Minimum Indicated Flow Rate	MCF/D
OF ₃	= Theoretical Open Flow Potential with Damage Removed Max.	MCF/D
OF ₄	= Theoretical Open Flow Potential with Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_F	= Final Flow Pressure	Psig.
P_{0f}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbbls/day
Q_1	= Theoretical Production w/ Damage Removed	bbbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_0	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Fresh Water Assumed to be at 62°F. Use 60°F when Elevation Not Given.
Fresh Water Temp. = 1.94 (T - 60) + 60

204



Your.....

Formation Testing Service Report

204

Flow Time	1st 10	Min.	2nd 120	Min.	Date	9-5-62	Ticket Number	193076 S
Closed In Press. Time	1st 30	Min.	2nd 30	Min.	Kind of Job	Open Hole	Halliburton District	Farmington
Pressure Readings	Field		Office Corrected		Tester	Mr. Shipard	Witness	W. T. Meyers
Depth Top Gauge	1030	Ft.	No	Blanked Off	Drilling Contractor	Meyers Drilling Co.		
BT. P.R.D. No.	786		12	Hour Clock	Elevation	-	Top Packer	1040'
Initial Hydro Mud Pressure	485		476		Total Depth	1050'	Bottom Packer	-
Initial Closed in Pres.	120		105		Interval Tested	1040-1050'	Formation Tested	Coconino
Initial Flow Pres.	-	1	12		Casing or Hole Size	-	Casing Perfs.	Top - Bot. -
Final Flow Pres.	-	1	12		Surface Choke	1"	Bottom Choke	2 3/4"
Final Closed in Pres.	120		114		Size & Kind Drill Pipe	2 7/8" EUE	Drill Collars Above Tester	I.D. - LENGTH
Final Hydro Mud Pressure	485		476		Mud Weight	9.3	Mud Viscosity	58
Depth Cen. Gauge	1042	Ft.	-	Blanked Off	Temperature	100	Anchor Size & Length	ID 1 1/2" X 10' OD 3 3/4" X 10'
BT. P.R.D. No.	730		12	Hour Clock	Depths Meas. From	Rotary Table	Depth of Tester Valve	10.29 Ft.
Initial Hydro Mud Pres.	430		496		Cushion	-	Depth Back Pres. Valve	- Ft.
Initial Closed in Pres.	120		115		Recovered	18	Feet of	Drilling mud
Initial Flow Pres.	-	1	21		Recovered		Feet of	
Final Flow Pres.	-	1	20		Recovered		Feet of	
Final Closed in Pres.	120		114		Recovered		Feet of	
Final Hydro Mud Pres.	470		479		Oil A.P.I. Gravity	-	Water Spec. Gravity	-
Depth Bot. Gauge		Ft.		Blanked Off	Gas Gravity	-	Surface Pressure	- psi
BT. P.R.D. No.				Hour Clock	Tool Opened	2:38	Tool Closed	5:45
Initial Hydro Mud Pres.					Remarks	Opened tool for 10 minute flow. Closed tool		
Initial Closed in Pres.						for a 30 minute Initial Closed in Pressure.		
Initial Flow Pres.		1				Reopened tool with a good blow - measured 185 MCF.		
Final Flow Pres.		1				Took a 30 minute Final Closed in Pressure.		
Final Closed in Pres.								
Final Hydro Mud Pres.								

Legal Location Sec. - Twp. - Rng. SEC. 6-19N-27E
 Lease Name SANTA FE
 Well No. 7
 Test No. 1
 Field Area PINE DOME
 County APACHE
 State ARIZONA
 CREST OIL COMPANY
 Lease Owner/Company Name
 ALTON, ILLINOIS
 Owner's District

FORMATION TEST DATA

Gauge No. 786		Depth 1030			Clock 12 hour		Ticket No. 193076			
First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure			
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
P ₀	.000	12	.000		12	.000	23	.000		19
P ₁	.057	12	.205		105	.795	19	.184		114
P ₂										
P ₃										
P ₄										
P ₅										
P ₆										
P ₇										
P ₈										
P ₉										
P ₁₀										
Gauge No. 730		Depth 1042			Clock 12 hour					
P ₀	.000	21	.000		20	.000	24	.000		27
P ₁	.055	20	.200		115	.781	27	.174		114
P ₂										
P ₃										
P ₄										
P ₅										
P ₆										
P ₇										
P ₈										
P ₉										
P ₁₀										
Reading Interval										Minutes
REMARKS:										

SPECIAL PRESSURE DATA

BOND

KNOW ALL MEN BY THESE PRESENTS

BOND SERIAL NO. 92-787379

That we: C. F. Swain, d/b/a Crest Oil Company P. O. Box 57 Alton, Ill.

of the County of: Madison in the State of: Illinois

as principal, and Maryland Casualty Company of Baltimore, Maryland

AUTHORIZED TO DO BUSINESS WITHIN the State of Arizona.

as surety, are held and firmly bound unto the State of Arizona in the penal sum as indicated, lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The conditions of this obligation is that whereas the above bounden principal proposes to drill a well or wells for oil, gas or stratigraphic purposes in and upon the following described land situated within the State, to wit:

Single Well Bond for below described location
(May be used as blanket bond or for single well)
Crest Santa Fe #7
1650' from North Line and 1650' from East Line of Section 6
Township 19 North, Range 27 East, Apache County, Arizona

NOW, THEREFORE, if the above bounden principal shall comply with all of the provisions of the laws of this State and the rules, regulations and orders of the Oil and Gas Conservation Commission, especially with reference to the requirements of A.R.S. 27-516, providing for the proper drilling, casing and plugging of said well or wells, and filing with the Oil & Gas Conservation Commission all notices and records required by said Commission, in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, then this obligation is void; otherwise, the same shall be and remain in full force and effect.

Penal sum of Twenty-five Hundred Dollars (\$2,500.00)

Witness our hands and seals, this 3rd day of August, 1962

C. F. Swain
C. F. Swain, d/b/a Crest Oil Company
Principal

Witness our hands and seals, this 3rd day of August, 1962

Maryland Casualty Company

By- Attorney-in-Fact Surety

(If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.)

Approved _____
Date

STATE OF ARIZONA
OIL AND GAS CONSERVATION COMMISSION

INCREASE RIDER

WHEREAS, the Arizona Oil and Gas Conservation Commission, has required C. F. SWAIN d/b/a CREST OIL COMPANY to increase the amount of their OIL WELL DRILLING bond, effective April 23, 1969.

NOW, THEREFORE, for and in consideration of an increase in premium, it is hereby stipulated and agreed that effective from April 23, 1969 that certain bond of which this rider shall form a part, in the amount of TWO THOUSAND, FIVE HUNDRED AND NO/100 Dollars, shall be and it is hereby increased to the amount of FIVE THOUSAND AND NO/100 Dollars, but in no event shall the aggregate liability of the MARYLAND CASUALTY COMPANY for any one or more defaults occurring prior to April 23, 1969, exceed TWO THOUSAND FIVE HUNDRED AND NO/100 Dollars, or for any one or more defaults occurring subsequent to April 23, 1969, exceed FIVE THOUSAND AND NO/100 Dollars, or in any event exceed the larger amount stated herein.

PROVIDED, HOWEVER, that nothing contained herein shall be construed to alter, amend or modify any of the terms and conditions and provisions of said bond as originally executed, except as herein expressly amended.

This rider shall become attached to and form a part of Bond No. 92-787379 issued by the MARYLAND CASUALTY COMPANY on August 3, 1962 in favor of the State of Arizona, and on behalf of C. F. SWAIN d/b/a CREST OIL COMPANY.

Signed, Sealed and Dated this 29th day of May, 1969.

MARYLAND CASUALTY COMPANY

BY: J. D. Hault
Attorney-in-Fact

C. F. SWAIN d/b/a
CREST OIL COMPANY

BY: C. F. Swain
Owner





OFFICE OF
Oil and Gas Conservation Commission
STATE OF ARIZONA
1645 WEST JEFFERSON, SUITE 420
PHOENIX, ARIZONA 85007
PHONE: (602) 271-5161

June 26, 1978

United States Fidelity and
Guaranty Company
Surety Department
Foster and Messick, Managers
456 N. Meridian Street
Indianapolis, Indiana 46204

Re: Eastern Petroleum Company, Carmi, Illinois
Bond No. 27716 13 3983 65; \$25,000

Gentlemen:

Eastern Petroleum Company has complied with the rules and regulations of the Oil and Gas Conservation Commission of the State of Arizona.

This letter is to authorize your release of Eastern Petroleum Company's above referenced bond.

Very truly yours,


W. E. Allen
Director
Enforcement Section

WEA/vb

cc - Mr. Henry Fullop

LIABILITY UNDER THIS BOND MAY NOT BE TERMINATED WITHOUT WRITTEN PERMISSION OF THIS COMMISSION.

KNOW ALL MEN BY THESE PRESENTS

BOND SERIAL NO. 27716-13 -
5983-65

That we: EASTERN PETROLEUM COMPANY

of the County of: White in the State of: Illinois

as principal, UNITED STATES FIDELITY AND GUARANTY COMPANY

and of Baltimore, Maryland

AUTHORIZED TO DO BUSINESS WITHIN the State of Arizona.

as surety, are held and firmly bound unto the State of Arizona in the penal sum as indicated, lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The conditions of this obligation is that whereas the above bounden principal proposes to drill a well or wells for oil, gas or stratigraphic purposes in and upon the following described land situated within the State, to wit:

(May be used as blanket bond or for single well)

CANCELLED

DATE 10-26-78

NOW, THEREFORE, if the above bounden principal shall comply with all of the provisions of the laws of this State and the rules, regulations and orders of the Oil and Gas Conservation Commission, especially with reference to the requirements of A.R.S. 27-516, providing for the proper drilling, casing and plugging of said well or wells, and filing with the Oil & Gas Conservation Commission all notices and records required by said Commission, in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, then this obligation is void; otherwise, the same shall be and remain in full force and effect.

Penal sum of TWENTY FIVE THOUSAND AND NO/100 DOLLARS (\$25,000.00)

ATTORNEY-IN-FACT AFFIDAVIT

STATE OR COMMONWEALTH OF Indiana
COUNTY OR CITY OF Marion } ss:

Before me, a Notary Public, personally came Gary R. Peterson known to me, and known to be the Attorney-in-Fact of United States Fidelity and Guaranty Company, a Maryland Corporation, which executed the attached bond as surety, who deposed and said that his signature and the corporate seal of said United States Fidelity and Guaranty Company were affixed by order and authority of said Company's Board of Directors, and that the execution of the attached bond is the free act and deed of United States Fidelity and Guaranty Company.

Given under my hand and seal this 2nd day of November, 1965

DONALD RAY FOWLER
My commission expires May 4, 1969

Donald R. Fowler
Notary Public.

My Commission expires _____

Jud. 876 (9-67)

By: Gordon L. Zimmerman

Form No. 2

File Two Copies

Permit No. _____

Operator Eastern Petroleum Co.

Bond Company U.S. F & G Co Amount \$25,000

Bond No. ~~not shown~~ 27716-13-3983-65 Date Approved 11-12-65

Permits covered by this bond:

48	348 shut-in	584
80 producing	365	586
88 producing	366 Not Drilled	587
107	464	592
108	504	594
109	505	595
150	523	596
152	536	599
155 <i>reworked by 5/1</i>	537	600
188	547	601
194 producing	561	
206 shut-in	560	
209	565	
218	567	
236 shut-in	568	
237	569	
238	570	
239	576	
234	577	
237		
268		
284		
276		
250		
282		
255 shut-in		
258 shut-in		
259		
273		
263 shut-in Prod		
264		
257		
284		
207		
207		
251		
252		
269		
81 producing		
296		

CANCELLED
DATE 6-26-78



OFFICE OF
Oil and Gas Conservation Commission
STATE OF ARIZONA
1645 WEST JEFFERSON, SUITE 420
PHOENIX, ARIZONA 85007
PHONE: (602) 271-5161

February 17, 1978

Doris Swift
Bond Department
The Maryland
Suite 270-10 Broadway
St. Louis, Missouri 63102

Re: Crest Oil Company Maryland Casualty Bonds
Nos. 9278739, 94174782 and 94174784

Dear Ms. Swift:

Crest Oil Company has complied with all the rules of the Oil and Gas Conservation Commission on wells covered by the above referenced bonds. This letter is your authorization to cancel these bonds.

Very truly yours,

W. E. Allen
Director
Enforcement Section

WEA/vb

cc - Froemling Agency, Inc.
Crest Oil Company

C. F. SWAIN

Crest
OIL COMPANY

P. O. BOX 57
ALTON, ILLINOIS 62002

AREA CODE 618-462-5346

RECEIVED

FEB 16 1978

O & G CONS. COMM.

February 11, 1978

W. E. Allen
Director Enforcement Section
Oil and Gas Conservation Commission
1645 W. Jefferson Suite 420
Phoenix, Arizona 95007

Dear Mr. Allen:

Re: Wells drilled by Crest Oil Company & or
Operator designee Eastern Petroleum Co.,
in Apache Co., Arizona. See your letter
dated 1/3/78 to Maryland Casualty Co.,
with copy and footnote to C. F. Swain

As suggested in footnote of your letter captioned
above, I would like to have bonds released (Maryland Casualty
Company) as shown below.:

1. Maryland Casualty Bond #94-174782, covering a well
drilled in SE-SE-25, 20N, 27E, Apache Co., Arizona.
Permit No. 471, dated 9/19/68. (Photocopy enclosed)
Plugged 1/20/75. (photocopy of plugging enclosed)
2. Maryland Casualty Bond #94-174784, covering a well
drilled in NW/4 of Section 25, 20, 27E, Apache Co.,
Ariz.;
Permit No. 473, dated 9/19/68. (Photocopy enclosed)
Plugged 1/5/72. (photocopy of plugging enclosed)
3. Maryland Casualty Bond #92-787379, covering a Navajo
Springs Unit well, Crest Santa Fe #7, Section 6,
19N-27E, Apache Co., Ariz. (NE/4)
Permit No. 204, dated 8/7/62. (Photocopy enclosed)
Plugged 10/12/77. (photocopy of plugging by Halliburton
as furnished to Crest by Unit Operator, Eastern Pet. Co.)

I also enclose a photocopy of a letter from my bonding
agent, Froemling Agency, Inc., verifying that their records
show the above bonds still active, and on which I have been
paying the annual premiums.

Will very much appreciate it if you will write the
Maryland Bond department as suggested in the Froemling letter
and authorize release of the above bonds.

Sincerely yours,

C. F. Swain

C. F. Swain
Crest Oil Company

204

Froemling Agency, Inc.



ALL LINES OF INSURANCE

3600 NAMEOKI ROAD - 2ND FLOOR
GRANITE CITY, ILLINOIS 62040
(618) 876-9090 OR 451-9902

January 24, 1978

C. F. Swain DBA
Crest Oil Company
P. O. Box 57
Alton, Illinois 62002

Dear Mr. Swain:

In regard to your letter of January 20, 1978, we show the following bonds are still in force

- 1) Maryland Casualty Bond #94-174782
Southeast Quarter of Section 25,
Township 20 N, Range 27 E, Apache County, Arizona
(9/16/77 to 9/16/78)
- 2) Maryland Casualty Bond #94-174784
Northwest Quarter of Section 25,
Township 20 N, Range 27 E, Apache County, Arizona
(9/16/77 to 9/16/78)
- 3) Maryland Casualty Bond #92-787379
Sante Fe #7, Apache County, Arizona

Would suggest you have the Oil and Gas Conservation Commission contact:

Doris Swift
Bond Department
The Maryland
Suite 270-10 Broadway
St. Louis, Missouri 63102

Sincerely,

Donald K. Jaffke
Donald K. Jaffke

DKJ:cc

204



OFFICE OF

Oil and Gas Conservation Commission

STATE OF ARIZONA

8686 NORTH CENTRAL, SUITE 106

PHOENIX, ARIZONA 85020

PHONE: (602) 271-5161

April 19, 1977

Mr. Warren E. Richardson
Kerr-McGee Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Dr. C. F. Swain
Crest Oil Company
Box 57
Alton, Illinois 62002

Mr. J. F. Schlafly
Crest Oil Company
Box 57
Alton, Illinois 62002

Re: Navajo Springs Unit, Apache County, Arizona

Gentlemen:

You are aware that Kerr-McGee Corporation suspended operations on their helium extraction plant located at Navajo, Arizona in February, 1976. This plant was supplied with raw helium from wells in the Pinta Dome Unit and also from two wells in the Navajo Springs Unit, namely: Eastern Petroleum Company's Santa Fe No. 13 located in the NE/4 SW/4 Section 31, T20N, R27E, and Kerr-McGee Barfoot No. 1 located in the NE/4 SW/4 Section 32, T20N, R27E.

Not only has Kerr-McGee Corporation suspended operations of its extraction plant, it has recently plugged all the remaining wells in the Pinta Dome Unit.

Records of the Oil and Gas Commission indicate there are ten wells in the Navajo Springs Unit that are classified as shut in helium wells. Only a few of these wells ever produced or were ever connected to the Kerr-McGee plant or the plant formerly operated by Western Helium.

Mr. Warren E. Richardson
Dr. C. F. Swain
Mr. J. F. Schlafly
April 19, 1977
Page 2

In order to protect the fresh water zones in this area from any possibility of contamination and because there is no market now or in the foreseeable future for any raw helium gas that may remain within the Navajo Springs Unit, Coconino Formation, it is the opinion of this Commission that all remaining unplugged wells in this unit be properly plugged and abandoned.

Mr. Henry Fullop with Eastern Petroleum Company, the operator of the Navajo Springs Unit, has been advised of the Commission's position on this matter. He was first notified by letter and, more recently, by long distance telephone. A response to the letter was never received. Mr. Fullop did indicate by telephone that, at the present time, it would pose a severe financial strain on him to plug these wells.

Unless the Commission can receive some positive assurance within 60 days from the date of this letter that the remaining shut in wells in the Navajo Springs Unit will be properly plugged and abandoned, the Commission will find it necessary to request the bonding company to fulfill their obligations and plug the subject wells.

This letter is addressed to you only for the purpose of acquainting you, as working interest owners in the unit, with the situation as it presently exists and also to inform you of the Commission's position.

Very truly yours,


William E. Allen
Director
Enforcement Section

WEA/vb

cc - Mr. Henry Fullop
Eastern Petroleum Company

Mr. Swain - Two of the wells in the Navajo Springs Unit - the Crest Santa Fe No. 2 and the Crest Oil Company No. 7 - are covered by Maryland Casualty's Bonds numbered 92-787-379 and 94-474782.



EASTERN PETROLEUM CO.
EASTERN DRILLING, INC.

TELEPHONE 618-2614 (AREA 4) P. O. BOX 8911 - CARMEL, ILLINOIS 62821

September 10, 1974

Mr. W. E. Allen
Oil & Gas Conservation Comm.
4515 North 7th Avenue
Phoenix, Arizona 85013

Re: Navajo Springs Unit

Dear Mr. Allen:

Your letter of September 9 requested that we submit Form 9 for two wells, Crest-Santa Fe #2, Sec. 33-20N-27E and Kiva #1, Sec. 13-20N-28E.

Yesterday in your office I pencilled in an application for Kiva #1.

Crest #2 is in the Navajo Springs Unit along with these shut-in wells:

Santa Fe #14	-	Section 5-19-27	206
Santa Fe #17	-	Section 4-19-27	236
Crest #7	-	Section 6-19-27	204
Santa Fe #31	-	Section 29-20-27	255
Santa Fe #32	-	Section 28-20-27	255
Santa Fe #35	-	Section 27-20-27	263

As Unit Operator we feel it our obligation to seek approval of the various unit owners before proceeding to plug. You will recall that Nos. 14, 17 and 35 produced about 154,000 MCF before Western Helium Corporation shut down. The best well is #17. At this time it is not known whether Kerr would want to produce it.

I am notifying the several owners today of the Commission's request.

Yours very truly,

EASTERN PETROLEUM COMPANY

J. N. Edwards
J. N. Edwards

JNE:sjn

cc: Mr. Harold E. Uhrig
Foster & Messick, Mgrs.
456 N. Meridian Street
Indianapolis, Indiana 46209

RECEIVED

SEP 18 1974



EASTERN PETROLEUM CO.
EASTERN DRILLING, INC.

TELEPHONE (818) 382-4104 - P. O. BOX 291 - CARM, ILLINOIS 62821

September 10, 1974

Kerr-McGee Corporation ✓
Kerr-McGee Center
Oklahoma City, Oklahoma 73102
Attn: John Fisher

Crest Oil Company
P. O. Box 57
Alton, Illinois 62002

Re: Navajo Springs Unit
Shut-in Wells

Mr. J. F. Schlafly
First Nat'l. Bank Bldg.
Alton, Illinois 62002

Estate of G. R. Barfoot
Ehmann, Olsen & Lane
2500 First Fed. Savings Bldg.
3003 N. Central Avenue
Phoenix, Arizona 85013

Gentlemen:

There are seven shut-in wells in the Unit; Eastern-Santa Fe Nos. 14, 17, 31, 32 and 35 and Crest-Santa Fe Nos. 2 and 7.

We have been advised by the Oil & Gas Conservation Commission that unless these wells are activated and produced the Commission will of necessity order all wells plugged and abandoned. The Commission is pressing this issue very hard. The best well, No. 17, produced around 70,000 MCF in 1972 and 1973.

On August 15 we notified the Commission that it was possible these wells may be required to sustain the normal take in the future. However, if arrangements are not made to produce it is our opinion that we will be forced to plug them.

Before proceeding further with the Commission we need to know your decision. Please give us your views or decision within seven days of receipt of this letter.

Yours very truly,

EASTERN PETROLEUM COMPANY
Unit Operator


Henry Fullóp

HF:sjn

RECEIVED

SEP 18 1974

O & G Cons. Comm.



OFFICE OF
Oil and Gas Conservation Commission

STATE OF ARIZONA
4515 NORTH 7TH AVE.
PHOENIX, ARIZONA 85013
PHONE: (602) 271-5161

June 21, 1974

CERTIFIED MAIL

Mr. Henry Fullop
Eastern Petroleum Company
P. O. Box 291
Carmi, Illinois 62821

Re: Navajo Springs Area

Dear Mr. Fullop:

This Commission has requested several times to be advised of your plans for further operations on your unplugged wells in the Navajo Springs area.

Mr. Edwards submitted some Sundry Notices and Reports on Wells, Form 25, indicating that you planned to plug some of the wells. Some others were to be transferred to Dan Schwetz. Still others, some of which have never produced commercially, apparently were to maintain their present status.

You are aware that several wells in this area have never indicated any ability to produce and others that are carried as shut-in helium wells have never produced commercially and no attempt to produce some of these wells was ever made.

At a meeting of the Commission on this date we were instructed to direct you to properly plug, by August 31, 1974, all wells in this area not now producing. Prior to plugging any well, the plugging program must be approved by the Commission and all operations relating to the plugging and abandonment will be witnessed by a member of the Commission staff.

Within this time frame, this Commission will consider any feasible plan that you might have to place whatever wells that are capable of producing back on production.

Very truly yours,


W. E. Allen, Director
Enforcement Section

WEA/rlb

cc - J. N. Edwards and U.S.F. & G.



OFFICE OF
Oil and Gas Conservation Commission

STATE OF ARIZONA
4515 NORTH 7TH AVE.
PHOENIX, ARIZONA 85013
PHONE: (602) 271-5161

April 12, 1974

CERTIFIED MAIL

Mr. Henry Fullop
Eastern Petroleum Company
P. O. Box 291
Carmi, Illinois 62821

Re: Navajo Springs Area

Dear Mr. Fullop:

We have received Mr. Edward's letter dated March 12, 1974 together with Form 25, Sundry Notice and Reports, on 16 wells in the Navajo Springs area. We are aware that a number of your wells are in the Navajo Springs Coconino Unit. According to our records, several of the wells that are in the Unit have never produced except during testing and are being carried as shut-in helium wells. A number of wells outside the Unit have never produced, and your completion reports indicate the production on the potential test to be zero or TSM. Other wells have been taken off production for various reasons.

The possibility of some of these wells ever being produced commercially again appears negligible. As you know, Western Helium has not taken gas from your wells since December 31, 1973. This company is now in the process of dismantling and moving their plant out of the area. There is a possibility that Kerr-McGee might arrange to take gas from some of the wells in the Navajo Springs Unit as they are now doing from your Santa Fe No. 13 and Barfoot.

It is the opinion of this Commission that all non-commercial wells in the Navajo Springs area, whether in the Unit or not, should be permanently plugged and abandoned as quickly as possible. These wells would include, within the Navajo Springs Coconino Unit, the Crest Santa Fe No. 2, Santa Fe Nos. 31 and 32, and the Reese No. 2. No production has been reported from any of these wells. Also to be plugged should be your Ancon Santa Fe Nos. 21 and 21-1A, Connelly KM State No. 1, Merde No. 1 and all the non-producers that have been drilled within the past three years. Your Merde No. 2 must be plugged immediately. The hole in the casing at approximately 750' has never been repaired and the well is flowing water. Also your Dreck No. 1 has been reported plugged and abandoned, a copy of your plugging report is attached. It is possible that this well has been partially plugged, however there is definitely no plug in the top of the casing and fluid is several hundred feet from the surface. The dry hole marker was never installed. It is on

204

Mr. Henry Fullop
April 12, 1974
Page 2

location but the casing had a bucket inverted over the open end. The hole you drilled on the original location for the Chambers No. 1 for a "water well" is open with wire line and other junk around the open hole. Mr. Tom Pelton, the owner or holder of the surface rights of the land on which the two Chamber holes are located has expressed the desire to assume responsibility of both the holes for water wells. Mr. Pelton's address is P. O. Box 7, Sanders, Arizona 86512, phone: (602) 688-2930. Our Form No. 24, when executed by Mr. Pelton, will satisfy our requirements. Also Wayne Wallace has some interest in some of the holes on his place for use as water wells.

Recently we found a well some 700' + in a northerly direction of the Merde No. 2, a copy of a photograph is attached. We have no records of a well being drilled at this location. Any information that you could give us on this well would be appreciated. It is being used as a water well.

Either Mr. Bannister or myself will be happy to discuss the above mentioned situation with you. However, we are determined to have the existing conditions in the area brought into complete compliance with the rules and regulations of the Oil and Gas Conservation Commission in the very near future.

We would appreciate your thoughts on the above.

Very truly yours,



W. E. Allen, Director
Enforcement Section

WEA/rlb

Encs.

cc John Fisher, Kerr-McGee, Oklahoma
Richard J. Gasdaska, Western Helium, Pennsylvania
C. F. Swain, Crest Oil, Illinois
Jess Edwards, Eastern, Illinois
U.S.F. &G., Indiana

204



OFFICE OF
Oil and Gas Conservation Commission
STATE OF ARIZONA
4515 NORTH 7TH AVE.
PHOENIX, ARIZONA 85013
PHONE: (602) 271-5161

January 8, 1974

Mr. Robert Fullop
Eastern Petroleum Company
P. O. Box 226
Farmington, New Mexico 87401

Re: Crest Oil Santa Fe No. 2
NE/SW Sec 33-20N-27E
Permit #110

Santa Fe Fee No. 24
SE/NW Sec 24-20N-27E
Permit #536

Ancon 21-1A
Sec 31-20N-28E
Permit #537

Santa Fe Fee Kiva No. 1
NE/SW Sec 13-20N-28E
Permit #560

Santa Fe Fee 6x-1
SE/NW Sec 25-20N-28E
Permit #565

Chambers Santa Fe No. 1
NE/SW Sec 21-21N-28E
Permit #567

Sanders No. 2 Santa Fe Fee
NE/SW Sec 15-21N-28E
Permit #568

Szar State No. 1
NE/NW Sec 36-20N-27E
Permit #578

Merde Indian #1
Sec 30-20N-28E
Permit #592

Merde No. 2
SW/SE Sec 30-20N-28E
Permit #596

Santa Fe Kiva #2
NE/SW Sec 24-20N-28E
Permit #599

Beacon No. 1
Sec 29-20N-29E
Permit #600

Santa Fe Fee No. 1-11
NW/SE Sec 11-20N-28E
Permit #601

Crest Oil Company #7 Santa Fe
SW/NE Sec 6-19N-27E
Permit #204
Santa Fe Fee #31
C N/2 SE/4 Sec 29-20N-27E
Permit #255

Santa Fe Fee #32
SW/NE/SW Sec 28-20N-27E
Permit #258

Dear Mr. Fullop:

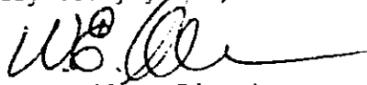
As we have previously advised, semi-annual status reports are required on the above referenced wells. This report was due in this office

Page 2
Mr. Robert Fullop
January 8, 1974

January 1, 1974. Please forward these reports as quickly as possible, and indicate any work that you anticipate performing on these wells within the next six months.

Please submit Completion Reports for your Indian Allotted Merde No. 1 and Santa Fe Beacon No. 1.

Very truly yours,


W. E. Allen, Director
Enforcement Section

WEA/rlb

Encs.

267

WA

C.F. SWAIN

Crest
OIL COMPANY

P. O. BOX 57
ALTON, ILLINOIS 62002

AREA CODE 618-462-5346

December 15, 1970

110
257
-171
473

W. E. Allen, Director Enforcement Section
Oil and Gas Conservation Commission
4515 North 7th Avenue
Phoenix, Arizona 85013

Re: Your letter December 9, 1970
Identifying Well Signs
Navajo Springs Area

Dear Mr. Allen:

In paragraph two of your letter of December 9, you state,
"A good number of your wells have no identifying signs."

Crest has four (4) gas wells in the Navajo Springs Area:

(All in Apache County)

- #2 Santa Fe.....Section 33-20N-27E, Unit Tract V, Navajo Springs Unit
- #7 Santa Fe.....Section 6-19N-27E, Unit Tract II, " " "
- Crest-Arizona Helium #1 Santa Fe...SE/4 SE/4 Section 25-20N-27E
- Crest-Arizona Helium #8-X Santa Fe...SE/4 NW/4 " "

In conjunction with a similar inspection with Eastern Petroleum Company personnel, these installations will be checked in the near future, and any obliterated or missing signs will be replaced.

Sincerely yours,



C. F. Swain
Crest Oil Company

cc: Eastern Petroleum Company
Attn: Henry Fullop, Pres.

RECEIVED

DEC 21 1970

O & G CONS. COMM.

204

C. F. SWAIN

Crest
OIL COMPANY

P. O. BOX 57
ALTON, ILLINOIS 62002

PHONE 462-5346

June 5, 1969

James A. Lambert, Adm Asst
Oil and Gas Conservation Commission
1624 W. Adams Rm 202
Phoenix, Arizona 85007

Dear Mr. Lambert:

9^v Enclosed herewith are the Riders received this date from Maryland Casualty Company, covering the Crest Santa Fe #2 and #7 wells, thereby increasing the respective bonds on each to the amount of \$5,000.00.

Sincerely yours,

C. F. Swain
C. F. Swain
Crest Oil Company

CFS:fs



110
204^v

X-Chrono
X-Sambert
X-Navajo Springs

- X- 194
- X- 206
- 236
- 255
- 258
- 263
- X- 234
- 348
- 238
- 110
- 204

June 5, 1969

Mr. J. N. Edwards
Eastern Petroleum Company
P. O. Box 291
Carmi, Illinois 62821

Re: Navajo Springs Unit Wells

Dear Mr. Edwards:

This letter constitutes permission from this Commission to suspend the annual testing for the captioned wells as provided by Rule 401 during June, 1969.

Sincerely,

John Bannister
Executive Secretary

JAL:jf

cc: Mr. Henry Fullop, Eastern Petroleum Company

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EASTERN PETROLEUM CO.
EASTERN DRILLING, INC.

TELEPHONE 38 2264 - P. O. BOX 201 - CAROLINE, ILLINOIS

X-Navajo Springs
See 6-5-69 Lambert
letter copy for all X's.

June 3, 1969

Mr. John Bannister
Oil & Gas Conservation Comm.
1624 West Adams, Room 202
Phoenix, Arizona 85007

Re: Capacity Tests of Gas Wells

Dear Mr. Bannister:

Reference is made to Mr. Lambert's letter of May 22 relative to annual testing of gas wells under Rule 401.

You will recall that last year this requirement was waived for Kerr-McGee's Pinta Dome Unit for various reasons and for Navajo Springs. Please refer to my letter of July 5, 1968 and yours of June 21.

Is there any particular reason why this cannot be waived this year. Please advise at an early date.

Didn't take long for you to get the Corporation Commission on the ball. Thanks.

Yours very truly,

EASTERN PETROLEUM COMPANY

J. N. Edwards
J. N. Edwards

JNE:sjn



C.F. SWAIN

Crest
OIL COMPANY

P. O. BOX 57
ALTON, ILLINOIS 62002

PHONE 462-5346

June 2, 1969

James A. Lambert, Adm Asst
Oil and Gas Conservation Commission
1624 W. Adams Rm 202
Phoenix, Arizona 85007

Re: Increased Bond requirement, Crest S. F. #2
and Crest S. F. #7, wells, Navajo Springs Unit
Apache County, Arizona

42 Dear Mr. Lambert:

Several phone calls today, ending with conversation with Mr. J. D. Hamlet, Bond Department Maryland Casualty Company, St. Louis, Missouri, brings out that riders were issued covering the above captioned wells increasing the principal amount on each well to \$5,000.00, effective as of April 23rd, 1969.

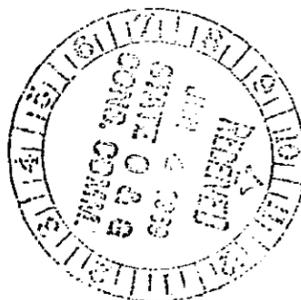
Mr. Hamlet could not understand why we had not received them.

If I do not have them in tomorrows mail he requests that I call him for further action. In the meantime be assured the requirements have been met, and I will hasten your receipt of the riders as much as possible.

Sincerely yours,

C. F. Swain
C. F. Swain
Crest Oil Company

CFS:fs



X-Lambert
X-Chrono

May 27, 1969

Dr. C. F. Swain
Crest Oil Company
P. O. Box 57
Alton, Illinois 62002

Re: Crest Oil Santa Fe #2
T20N, R27E, G & SRM
Sec. 33: NE/4 SW/4
Apache County
Permit #110 X

Crest Oil Santa Fe #7
T19N, R27E, G & SRM
Sec. 6: SE/4 NE/4
Apache County
Permit #204

Dear Dr. Swain:

We received your recent letter and the photocopy of your letter to your bonding company. We require immediate action on your part as to increasing the bonds pertaining to the two captioned wells. This matter has drug out more than a month.

Yours truly,

James A. Lambert
Administrative Assistant

JAL:jf

OFFICE OF
Oil and Gas Conservation Commission
STATE OF ARIZONA
ROOM 202
1624 WEST ADAMS
Phoenix, Arizona 85007
PHONE: 271-5161

X - Lambert
X - Chrono

May 22, 1969

Mr. Henry Fullop
Eastern Petroleum Company
P. O. Box 291
Carmi, Illinois 62821

Re: Eastern Santa Fe #13
Eastern Santa Fe #14
Eastern Santa Fe #17
Eastern Santa Fe #31
Eastern Santa Fe #32
Eastern Santa Fe #35
Eastern Ancón Santa Fe #21
Eastern Reese #2
Kerr-McGee Barfoot State #1
Crest Santa Fe #2
Crest Santa Fe #7

Permit #191
Permit #206
Permit #236
Permit #255
Permit #258
Permit #263
Permit #264
Permit #348
Permit #283
Permit #119
Permit #211

Dear Mr. Fullop:

In accordance with Rule 401 the Oil and Gas Conservation Commission, State of Arizona, has adopted procedures for the annual testing for all gas and/or helium wells.

The Commission's procedure is based upon and must be used in conjunction with the Manual of Back-pressure Testing of Gas Wells as issued by Interstate Oil Compact Commission, P. O. Box 8127, Oklahoma City, Oklahoma 73105.

The Commission has prepared, in addition, a supplement to the IOCC manual inasmuch as that manual is based upon a pressure base other than the 15.025 required by the State of Arizona. The supplement to the IOCC manual has made all necessary corrections to the IOCC manual to reflect the 15.025 pressure base.

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Page 2
Mr. Henry Fullop
May 22, 1969

The tests as required by Rule 401 shall be conducted during the month of June each year and reported in duplicate by July 10th of each year. Forms 18 and 20 will be used for this purpose.

Yours truly,

James A. Lambert
Administrative Assistant

JB:jf
Enc.
copy to Mr. J. N. Edwards

C. F. SWAIN

POST
OIL COMPANY
P. O. BOX 57
ALTON, ILLINOIS 62002

PHONE 452-5346

May 16, 1969

James A. Lambert, Adm Asst
Oil and Gas Conservation Commission
1624 West Adams Rm 202
Phoenix, Arizona 85007

Re: Increased Bond requirement, Crest Santa #2
and Crest Santa Fe #7, Apache Co., Arizona

Dear Mr. Lambert:

94
In response to your letter written May 15, please be advised I am proceeding as fast as I can to increase the bonds on the captioned wells to \$5,000.00.

I first wrote the insurance company (who have provided all my bonds for the past ten years) relative to the increased requirements on May 5th. Enclosed is copy of my follow up letter sent this date.

Should I fail to get prompt response, I will get on the long distance phone routine and resolve the matter as quickly as possible.

Sincerely yours,

C. F. Swain

C. F. Swain
Crest Oil Company

CFS:fs



110
204✓

C. F. SWAIN

Crest
OIL COMPANY
P. O. BOX 5
ALTON, ILLINOIS 62002

PHONE 462-5346

May 16, 1969

Illinois Mercantile Agency, Inc.
5210 Nameeki Road
Granite City, Illinois 62040

Attention: Lois M. Bowers

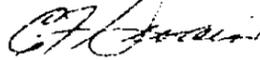
Dear Mrs. Bowers:

42 Please refer to my letter written to you dated 5 5 69 concerning increasing the principal amount of the bonds on Crest Santa Fe #2 and #7 wells from \$2,500.00 each to \$5,000.00 each.

I have received another letter from the Arizona Oil and Gas Conservation Commission requesting that I bring myself "into compliance" with Commission rules, and that they will expect to hear from me within ten days (From May 15).

Will you please do what you can to expedite and advise.

Sincerely yours,



C. F. Swain
Crest Oil Company

CFS:fs



110
2044

X-Lambert
X-Chrono

May 13, 1969

Dr. C. F. Swain
Crest Oil Company
P. O. Box 57
Alton, Illinois 62002

Re: Crest Oil Santa Fe #2
T20N, R27E, G & SRM
Sec. 33: NE/4 SW/4
Apache County
Permit #110

Crest Oil Santa Fe #7
T19N, R27E, G & SRM
Sec. 6: SE/4 NE/4
Apache County
Permit #204

Dear Dr. Swain:

Please bring yourself into compliance with the Rules and Regulations of the Oil & Gas Conservation Commission of the State of Arizona. Rule 101-A allows you to furnish a blanket bond in the principal sum of \$25,000 or individual bonds in the amount of \$5,000 for each well. The bonds covering the captioned wells are in the principal amount of \$2,500 each. We will expect to hear from you within ten days.

Yours truly,

James A. Lambert
Administrative Assistant

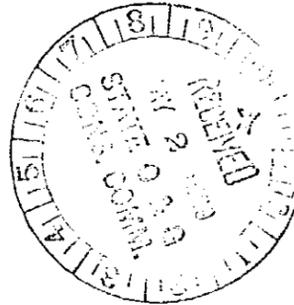
JAL:ff

C.F. SWAIN

Crest
OIL COMPANY
P. O. BOX 57
ALTON, ILLINOIS 62002

PHONE 462-5346

April 29, 1969



James A. Lambert, Adm Asst
Oil and Gas Conservation Commission
1624 West Adams Room 202
Phoenix, Arizona 85007

110-1
204
Re: Increase in Bond requirement, Crest
Santa Fe #2 well, Sec 33-20N-27E, &
Crest Santa Fe #7 well, Sec 6-19N-27E,
Apache County, Arizona

Dear Mr. Lambert:

42
Wish to acknowledge receipt of your letter written April 23,
1969 relative to increasing the Bond on above captioned wells to the
principal amount of \$5,000.00 each.

Thank you for your suggestion concerning the Blanket Bond.
I will consider all angles, and contact my bonding company as soon
as possible.

Sincerely yours,

C. F. Swain

C. F. Swain
Crest Oil Company

CFS:fs

X - Chrono
X - Lambert

April 23, 1969

Dr. C. F. Swain
Crest Oil Company
P. O. Box 57
Alton, Illinois 62002

Re: Crest Oil Santa Fe #2
T20N, R27E, G & SRM
Sec. 33: NE/4 SW/4
Apache County
Permit #110 X

Crest Oil Co. Santa Fe #7
T19N, R27E, G & SRM
Sec. 6: SW/4 NE/4
Apache County
Permit #204

Dear Dr. Swain:

In reviewing our files we find that each of the two captioned wells are covered by bonds in the principal amount of \$2,500. This no longer fills the bonding requirements of the Commission. Each well must be covered with a bond in the principal amount of \$5,000.

Rule 101-A allows you to furnish a blanket bond to cover all wells in the principal sum of \$25,000. At the present time we have four bonds, each in the principal amount of \$5,000, covering Permits 471, 472, 473, and 442. Perhaps you would prefer to substitute the blanket bond for these four wells plus the bonds that we are asking you to replace in the larger amount of \$5,000 each.

Please advise this office of your wishes. We are willing to release the four aforementioned bonds and the two captioned bonds on evidence that a new blanket bond in the principal

Page 2
Dr. C. F. Swain
4-23-69

sum of \$25,000 payable to the Oil & Gas Conservation Commission, State of Arizona, is in effect.

Yours truly,

James A. Lambert
Administrative Assistant

JAL:jf

June 21, 1968

Mr. J. N. Edwards
Eastern Petroleum Company
P. O. Box 291
Carmi, Illinois

Dear Mr. Edwards:

In reponse to your request of June 10, 1968, this letter constitutes permission from this commission to exempt annual gas Capacity Test on the Ancon Santa Fe #21 well and the following shut-in helium wells in Navajo Springs Unit:

<u>Well No.</u>	<u>Tract No.</u>	<u>Location</u>
Santa Fe #14	III	5-19-27
Santa Fe #17	IV	4-19-27
Santa Fe #31	X	29-20-27
Santa Fe #32	XI	28-20-27
Santa Fe #35	XII	27-20-27
Reese #2	VII	1-19-26
Crest S.F. #7	II	7-19-27
Crest S.F. #2	V	33-20-27

Very truly yours,

John Bannister
Executive Secretary
ir

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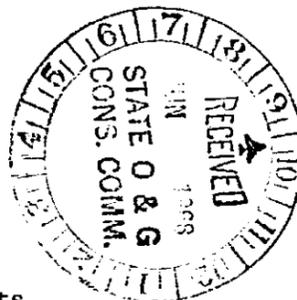


EASTERN PETROLEUM CO.
EASTERN DRILLING, INC.

TELEPHONE 38-24104 • P. O. BOX 291 • CARMEL, ILLINOIS

June 10, 1968

Mr. John Bannister
Executive Secretary
Oil & Gas Conservation Comm.
Room 202, 1624 West Adams
Phoenix, Arizona 85007



Re: Back-Pressure Tests

Dear Mr. Bannister:

In accordance with your letter of June 6, 1968, we are applying for exemption from testing requirements for the following shut-in helium wells in Navajo Springs Unit:

<u>Well No.</u>	<u>Tract No.</u>	<u>Location</u>
Santa Fe #14	III	5-19-27
Santa Fe #17	IV	4-19-27
Santa Fe #31	X	29-20-27
Santa Fe #32	XI	28-20-27
Santa Fe #35	XII	27-20-27
Reese #2	VII	1-19-26
Crest S.F. #7	II	7-19-27
Crest S.F. #2	V	33-20-27

also,

Ancon S.F. #21

31-20-28

Inasmuch as we have no plans at present to produce any of these wells we feel no useful purpose would result from such tests.

Test results of Santa Fe #13, Sec. 30-20-27 and Barfoot-State #1, Sec. 31-20-27 will be forwarded within the prescribed time.

Yours very truly,

EASTERN PETROLEUM COMPANY

J. N. Edwards
J. N. Edwards

OK

JNE:sjn

2047

June 6, 1968

Eastern Petroleum Company
P.O. Box 291
Carmi, Illinois

Attention: Mr. Henry Fullop

Gentlemen:

Your attention is referred to our letter of May 13, 1968 and Directive D-2-68 dated May 1, 1968, concerning capacity testing of all gas and/or helium wells.

As you are aware, you as operator of the Navajo Springs Unit are responsible for compliance on all wells in the Unit, both producing and non-producing (shut-in).

Should good and sufficient reasons be stated for deferment of this testing on specified wells, this Commission would give due consideration.

Very truly yours,

John Bannister
Executive Secretary
mr
enc

2047

June 21, 1965

Maryland Casualty Company
Suite 1201 Pierce Building
St. Louis, Mo. 63102

Attention: Mr. Richard A. White, Bond Department

Re: Crest Oil Company, Alton, Illinois

Gentlemen:

This will acknowledge receipt of your letter of June 15, 1965 in which you mention a letter dated June 9, 1965 addressed to this Commission at its old address. Please be advised that this letter has not been received by this office.

Below listed, please find a breakdown of each well drilled by Crest Oil and the necessary requirements to be met:

Santa Fe Well #1, NE/4SW/4 19-T20-R27E, Apache County.
Your Bond 92-676130. Our File 112

Our records reveal that captioned bond was released January 23, 1965 and that all necessary reports have been filed.

Santa Fe Well #2, NE/4SW/4 33-T20N-R27E, Apache County.
Your Bond 92-676089. Our File 110

This well is in the Navajo Springs Unit and consequently the bond must remain in force. Would you please send us a copy of this bond?

Santa Fe Well #3, SW/4NE/4 3-T19N-R27E, Apache County.
Your Bond 92-677167. Our File 124

This well was completed as a dry hole and all our requirements have been met. This bond was released May 16, 1961.

2047

June 21, 1965

Santa Fe Fee #4, NE/4SW/4 27-T20N-R27E, Apache County
Our File 131

This particular location was never drilled and our file does not reveal that it was ever bonded.

Santa Fe Fee #5, NE/4SW/4 26-T20N-R27E, Apache County
Our File 129

The bond covering this location was executed August 25, 1960 by Mr. J.M. Johnson on behalf of Maryland Casualty Company. The number of the bond is not known.

Our file does not reveal that this bond has been released, and, further, the Well Completion Report must be filed with this office before this bond may be released.

Santa Fe Fee #5A, NE/4SW/4 26-T20N-R27E, Apache County
Our File 131

The bond number is not known. Our file reveals this bond was released May 22, 1962.

Santa Fe Fee #6, NE/4NE/4 35-T20N-R27E, Apache County
File 132. Bond number unknown.

Our file reveals this bond was released May 22, 1962.

Santa Fe Fee #7, SW/4NE/4 6-T19N-R27E, Apache County
Your Bond 92-787378. Our File 204

Our records reveal that this well is in the Pinta Dome Unit. Consequently this bond must be kept in force and we request that you furnish us with a copy of same.

Santa Fe Fee #8, NE/4NW/4 25-T20N-R27E, Apache County
Our File 134. Bond number unknown.

Our records reveal that this is a split-in-hole well and consequently this bond must be kept in force. You are requested to furnish us with copy of same.

Santa Fe Fee #9, NE/4SW/4 24-T20N-R27E, Apache County
Our File 203. Your Bond 92-787378

This bond was released November 7, 1962. However the necessary Well Completion Report has not been filed with this office.

Santa Fe Fee #10, NE/4SW/4 11-T20N-R27E, Apache County
Our File 170. Your Bond 92-785149

Our file indicates that this location was not drilled by Crest under Permit 170, but apparently taken over by Eastern Petroleum and drilled as their Santa Fe Fee #12. However,

204

Maryland Casualty Company Page 3

June 21, 1965

until such time as Crest files with us a Well Completion Report showing that this well was not drilled under Permit 170, this bond may not be cancelled.

Santa Fe Fee #11, SW/4NE/4 26-T10N-R27E, Apache County
Our File 182. Your Bond 92-786510

Our file reveals that this well has been completed and this bond released May 22, 1962.

Should you have any further questions concerning the Crest Oil Company bonds, please advise.

Yours very truly,

John Bannister
Executive Secretary

cc: Crest Oil Company, P.O. Box 57, Alton, Ill.

204/

C
O
P
Y

ARKANSAS LOUISIANA GAS COMPANY

Shreveport, Louisiana

August 14, 1964

Arizona Oil and Gas Commission
1624 West Adams
Phoenix, Arizona

Attention: Mr. John Bannister

Gentlemen:

In accordance with your request to receive the test results on the wells in the Navajo Springs Field, Apache County, Arizona, we are enclosing herewith, in duplicate, the results of these tests.

Each well was tested at what we speak of as a maximum rate of flow - that is, the maximum rate at which we produced the well; and the rates of flow where the wellhead pressure approached 100 pounds. This is indicated under Column 2 where it says, "Well Tubing Pressure-PSIG." You will note that a volume of 1800 MCFPD was measured from eight wells, testing these wells from 15 to 18 1/2 hours each. These are our field calculations, and there may be a slight change in the total volume when the final calculations are determined. The volumes of gas in MCFPD have

been corrected to indicate the standard conditions of measuring gas at 15.025 pressure base.

I would like to take this opportunity to express to you how much I appreciate you and your staff turning over the records of the Conservation Office and the assistance which was given to me on my two trips to Phoenix. If the volumes are any different on our final calculations, I will forward a copy to your office.

Yours very truly,

ARKANSAS LOUISIANA GAS COMPANY

(Signature)
P. E. ...
Production Engineer

PRE:kc
Enclosures

204

September 11, 1963

Dr. C. F. Swain, President
Crest Oil Company
P. O. Box 57
Alton, Illinois

Re: Navajo Springs Wells, Apache County, Arizona

Dear Dr. Swain:

I surely enjoyed conversing with you a few days ago.

In view of the Unitization Hearing, September 25, I am checking our "haves" and have notes" on the Apache County wells involved and find the following items lacking in the commission files.

Crest #2 Santa Fe, Sec. 33, T20N, R27E - we lack the electrical and micro logs, any other logs run, core analysis, any back pressure or other tests not shown on Completion form, and gas analysis. If possible, I would like a copy of fracing or acidizing details. A copy of the fracing or acidizing company's report to you, if possible.

Crest #7 Santa Fe, Sec. 6, T19N, R27E - we lack the micro log, core analysis, any back pressure or other tests not shown on the completion form and the gas analysis. Frac or acidizing information as above will be appreciated.

Any other information you would care to send; i.e., sample description, drilling time, etc. will be appreciated.

Dr. Swain, I will cooperate with you to the fullest extent on any problems you may have or anticipate having on any of your wells, and the information I receive from you will be filed in the well records. I am doing my best to have complete information in each file.

Thanking you for the above information as soon as you can reasonably send it as the Unitization Hearing will be very soon, I am

Yours truly,

John E. Petty
Acting Executive Secretary

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CREST OIL CO. #7, SANTA FE Sec. 6-
T19N-R27E. Apache County. 6 miles
SE Navajo. 1P 185,000 CFPD from
1042-52. A shut in helium well in
Navajo Springs Field.

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10-1962

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C. F. SWAIN

Crest
OIL COMPANY

BOX 57
ALTON, ILLINOIS

PHONE HO 2-5346

DON C. WALLACE

September 26, 1962

Executive Secretary
Oil and Gas Conservation Commission
State of Arizona
3500 N. Central
Phoenix, Arizona

Dear Sir:

Enclosed you will find Form No. P-7 Well
Completion Report and Electrical Induction
Log for Crest Oil-Santa Fe #7, Sec. 6,
T19N, R27E, Apache County Arizona. This
well has recently been completed as a
commercial Helium producer.

If any other information is desired or
required, please advise.

Sincerely yours,

Edwin L. Siess

Edwin L. Siess
Crest Oil Company

August 7, 1962

Dr. C. F. Swain
Crest Oil Company
Box 57
Alton, Illinois

Re: Crest Oil Santa Fe No. 9 - Sec. 24, T20N, R27E &
Crest Oil Santa Fe No. 7 - Sec. 6, T19N, R27E, both
in Apache County, Arizona

Dear Dr. Swain:

Enclosed are your approved copies of application for permit to drill the above named tests as well as your receipt for the permit fees.

As per your recent request, we are forwarding to you via parcel post, 25 copies each of the following forms:

Bond Application
Application to Drill
Application to Plug and Abandon
Plugging Record
Well Completion Record

We are also enclosing two copies of our new rules which you may not have.

Presumably you have not heard, but Mr. Jerome is no longer with this commission. He has gone into private business as a Petroleum Consultant and will work out of Scottsdale, Arizona. In case you would ever want to contact him, his telephone No. is Whitney 6-2954 and P. O. Box No. is 701, Scottsdale, Arizona.

We wish you the best of success in your Arizona ventures.

Yours very truly,

Helen M. Eremie
secretary

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C. F. SWAIN

Crest
OIL COMPANY
BOX 57
ALTON, ILLINOIS
PHONE HO 2-5346

DON C. WALLACE

July 31, 1962

Mr. D. A. Jerome, Executive Secretary
Oil and Gas Conservation Commission
State Of Arizona
3500 N. Central
Phoenix, Arizona

Dear Mr. Jerome:

Enclosed are two forms, No. P-1, Application For Permit to Drill, Deepen or Plug Back, with one copy of each. These forms relate to Crest Oil-Santa Fe No. 7 and No. 9. There is also included, two Well Location Plats for each of the above mentioned wells.

Bond has been applied for and will be sent directly to you, by the Phoenix Agent of the Maryland Casualty Company. *Ref 7-4711-Mr Hart*

Drilling operations should commence on these locations on or before September 1st, and therefore we will appreciate again receiving the promptness of processing of application that you have always so courteously given us in the past.

Sincerely yours,
C. F. Swain
C. F. Swain
Crest Oil Company

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