

JRAL RESOURCES AGENCY OF CALIFORNIA  
DEPARTMENT OF CONSERVATION  
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES  
1000 S. Hill Rd, Suite 116 Ventura, CA 93003-4458  
Phone:(805) 654-4761 Fax:(805) 654-4765

No. T 216-0257

## REPORT ON OPERATIONS

GAS STORAGE PROJECT  
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation

Amy Kitson  
Southern California Gas Company (S4700)  
12801 Tampa Ave., SC9382  
Northridge, CA 91326

Ventura, California  
July 13, 2016

Your operations at well "Frew" 5, A.P.I. No. 037-00668, Sec. 29, T. 03N, R. 16W, SB B.&M., Aliso Canyon field, in Los Angeles County, were witnessed on 6/30/2016, by Mike Woods, a representative of the supervisor.

The operations were performed for the purpose of **determining casing integrity.**

DECISION:

**DEFERRED PENDING REVIEW BY THE DIVISION'S SAFETY TEAM.**

MW/TKC

Kenneth A. Harris Jr.  
\_\_\_\_\_  
State Oil and Gas Supervisor

By   
\_\_\_\_\_  
Patricia A. Abel, District Deputy

EB76.

State of California  
Department of Conservation  
Division of Oil, Gas, and Geothermal Resources

216-0257  
#16,3

No. T \_\_\_\_\_

### MECHANICAL INTEGRITY TEST (MIT)

Operator: <b>Southern California Gas Company</b>				Well: <b>"Frew" 5</b>	
Sec. <b>29</b>	T. <b>3N</b>	R. <b>16W</b>	<b>SB B.&amp;M.</b>	API No.: <b>037-00668</b>	Field: <b>Aliso Canyon</b>
County: <b>Los Angeles</b>				<input checked="" type="checkbox"/> Witnessed <input type="checkbox"/> Reviewed on: <b>6/30/2016</b>	
<b>M. Woods</b>				, representative of the supervisor, was present from <b>9:30<sup>am</sup> Per M. Woods</b> to <b>1030</b> <b>7/14/16</b>	
Also present were: <b>Mike Giuliani, Consultant</b>					
Casing record of the well: <b>2 7/8" landed on packer @ 8270', tubing plug @ 8237', empty gas mandril @ 8193'.</b>					
The MIT was performed for the purpose of demonstrating the mechanical integrity of the <b>7"</b> casing.					
<input type="checkbox"/> The MIT is approved since the R/A tracer survey indicates that all of the injection fluid is confined to formations below _____ at this time.					
<input checked="" type="checkbox"/> The MIT is approved because the <b>7"</b> casing held a pressure of <b>1100 psi</b> for <b>60</b> minutes.					
<input type="checkbox"/> The MIT is approved since the temperature survey indicates no fluid migration between _____ and the surface.					
<input type="checkbox"/> The MIT is not approved due to the following reasons:					
Comments:					
Deficiencies Corrected:					
Deficiencies to be Corrected:					
Uncorrectable Deficiencies:					
Contractor: <b>Premier Oilfield Service and Oryx Oil Service</b>					

**DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES**

**CHECK LIST-RECORDS RECEIVED AND WELL STATUS**

Operator: Southern California Gas Company WELL DESIGNATION "Frew" 5

API No. 03700668 SE 29 T: 3N R.: 16W , SB B. and M.

County: Los Angeles FIELD: Aliso Canyon

Type of Notice: Rework Date 6/16/2016 Report Number: P216-0088

**RECORDS RECEIVED (ATTACH PAGES IF REQUIRED)**

**NEW STATUS**

	Date	OK	NEED	Remarks
Well Summary (OG100)				
History (OG103)				
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				
<i>Press. Test</i>	<i>6/30/16</i>	<i>✓</i>		<i>Date indicator pass</i>

DATE: \_\_\_\_\_

**NOTICE OF RECORDS DUE**

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

**WELL STATUS INQUIRY**

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

**Well Stat**

Change Required: \_\_\_\_\_

Change Done: \_\_\_\_\_

**ABANDONMENTS/REABANDONMENTS/DRILLS/REDRILLS**

CalWims Abandonment Form: \_\_\_\_\_ SURFACE INSPECTION NEEDED \_\_\_\_\_ COMPLETED \_\_\_\_\_

Date and Inspector

FINAL LETTER NEEDED \_\_\_\_\_ COMPLETED \_\_\_\_\_ Calwims DRILL/REDRILL Form \_\_\_\_\_

(Date)

**ENGINEER'S CHECK LIST**

T-REPORT(S) ✓ OPERATOR'S NAME ✓ WELL DESIGNATION ✓ SIGNATURE ✓

Calwims Location \_\_\_\_\_ Calwims ELEVATION: \_\_\_\_\_ CONFIDENTIAL RELEASE DATE: \_\_\_\_\_ PERMIT REQUIREMENTS MET \_\_\_\_\_

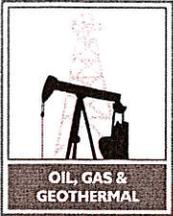
**CLERICAL CHECK LIST**

LOCATION CHANGE (OG165) \_\_\_\_\_ ELEVATION CHANGE (OG165) \_\_\_\_\_ RELEASE OF BOND (OG150) \_\_\_\_\_

**REMARKS**

RECORDS SCANNED: \_\_\_\_\_  
(Date)

RECORDS APPROVED: \_\_\_\_\_  
(Date and Engineer)



STATE NATURAL RESOURCES AGENCY OF CALIFORNIA  
 DEPARTMENT OF CONSERVATION  
 DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES  
 1000 S. Hill Rd, Suite 116 Ventura, CA 93003 - 4458

No. P 216-0088

<u>Old</u>	<u>New</u>
010	010
FIELD CODE	
00	00
AREA CODE	
30	30
POOL CODE	

**PERMIT TO CONDUCT WELL OPERATIONS**

Corrected Copy

Gas Storage

"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation  
 Plugback and Suspend for One Year

Ventura, California  
 June 30, 2016

Amy Kitson, Agent  
 Southern California Gas Company (S4700)  
 12801 Tampa Ave., SC9382  
 Northridge, CA 91326

Your proposal to **Rework** well "Frew" 5, A.P.I. No. **037-00668**, Section **29**, T. **03N**, R. **16W**, **SB B. & M.**, **Aliso Canyon** field, **Any** area, **Sesnon-Frew** pool, **Los Angeles** County, dated **6/16/2016**, received **6/17/2016** has been examined in conjunction with records filed in this office. (Lat: **34.312596** Long: **-118.576510** Datum: **83**)

**THE PROPOSAL IS APPROVED PROVIDED:**

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
2. a. **Class I Note: work to be completed without the removal of the injection assembly.**
3. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
4. Prior to commencing downhole operations, a pressure test is conducted to demonstrate the mechanical integrity of the 7" casing.
5. Injection shall be through tubing and packer only. Injection or withdrawal through the casing is not permitted.
6. This well is to be taken out of service and isolated from the storage reservoir. The well shall be re-evaluated or abandoned within 1 year of the completion of the pressure testing pursuant to Order #1109 and its amendments.
7. In all other respects, the provisions of Division Order #1109 shall remain in effect.
8. This office shall be contacted by phone prior to making any program changes and no changes are made without Division approval.
9. **THIS DIVISION SHALL BE NOTIFIED TO:**
  - a. Witness a pressure test on the 7" casing and tubing plug.

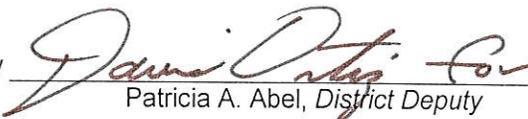
Continued on Next Page

Blanket Bond Dated: 7/6/1999  
 UIC Project No. 0100006  
 cc:

Engineer Clifford R. Knight  
 Office (805) 654-4761

CRK/crk

Kenneth A. Harris Jr.  
 State Oil and Gas Supervisor

By   
 Patricia A. Abel, District Deputy

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

Well #: "Frew" 5

API #: 037-00668

Permit : P 216-0088

Date: June 30, 2016

**NOTE:**

1. The base of the freshwater zone is at **800'±**.
2. No operation shall be undertaken or continued that will contaminate or otherwise damage the environment.
3. This permit is being issued as part of Division Order No. 1109 dated March 4, 2016. Any well that fails any of the testing must be taken out of service and isolated from the storage reservoir pursuant to the Safety Review Testing Regime.
4. The required History of Oil or Gas Well (OG103) shall include a complete description of the required pressure testing. **An updated casing and tubing diagram shall be included with the well history.**
5. **A Well Summary Report (Form OG 100)** and **Well History (Form OG 103)** shall to be submitted to the Division within 60 days after the well is drilled, reworked, plugged and abandoned, or if the work is suspended. Any additional well work will require an additional notice to be submitted to this office prior to resuming well operations.

**Enclosure: Attachment 1 to DOGGR Order 1109. Safety Review Testing Regime for the Aliso Canyon Natural Gas Storage Facility**

**ATTACHMENT 1  
TO DOGGR ORDER 1109**

**SAFETY REVIEW TESTING REGIME  
FOR THE ALISO CANYON NATURAL GAS STORAGE FACILITY**

This document identifies the requirements of this comprehensive safety review that shall be completed by the Southern California Gas Company (Operator) and verified by the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (Division). The Operator shall use accepted industry practices and procedures.

The Division has consulted with independent technical experts from the Lawrence Berkeley, Lawrence Livermore, and Sandia National Laboratories ("National Laboratories") to develop the requirements of this facility safety review. The National Laboratories experts independently reviewed and concurred with the testing requirements for the safety review detailed below.

This comprehensive safety review requires that each of the active injection wells in the Aliso Canyon Storage facility either pass a thorough battery of tests in order to resume gas injection or be taken out of operation and isolated from the underground gas storage reservoir. Several steps, detailed below, are required in this safety review. Documentation of all testing required under this comprehensive safety review shall be provided electronically to the Division within 72 hours of completion of a test in digital (i.e. LAS) and printed (i.e. pdf) form. All pressure tests required under this comprehensive safety review shall be witnessed by Division staff. A well that is properly plugged and abandoned in accordance with Public Resources Code section 3208 is not subject to testing under this comprehensive safety review. A well that does not pass all tests must be repaired, retested, and pass all tests, or be plug and abandoned.

**REQUIRED TESTS FOR EACH WELL IN THE FACILITY**

- Step 1:** The Operator shall perform an initial casing assessment on the well consisting of temperature and noise logs.
- a. Temperature Log:  
A temperature survey shall be run from the surface to the packer to measure the temperature within the wellbore. A temperature survey that demonstrates no unexplained anomalous temperature changes in the well is one indication of casing integrity.
  - b. Noise Log:  
An acoustic sensor survey capable of detecting the sound of fluid flow will be conducted the length of the well above the packer to the surface. The survey will include stops at least every 250 feet and at the midpoint of any anomaly detected by the temperature survey. The absence of anomalous sound above the packer is an indication of well integrity

- Step 2:** The results of the Temperature Logs and Noise Logs will be independently reviewed by Division engineers. Any unexplained abnormal findings in this set of tests shall be addressed by the Operator in one of the following ways:
- Conduct further investigation and demonstrate to the Division's satisfaction that the abnormal finding is not an indicator of a lack mechanical integrity;
  - Remediate the well to the Division's satisfaction; or
  - With Division review and approval, remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

Necessary actions to remediate any abnormalities revealed by these tests will be reviewed by Division engineers. Once repairs or mitigations are completed, the Temperature Log and Noise Log must then be repeated on the well and reviewed by Division engineers to ensure that there are no additional abnormal test results and to confirm the issue was repaired.

- Step 3:** After these tests are completed on the well, and all required action has been completed, the operator shall either:
- Conduct the additional tests and evaluations on the well, outlined in Steps 4a through 7a below, in order to gain approval for injecting gas through that well; or
  - Remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

#### **REQUIRED TESTS IF A WELL IS INTENDED TO RESUME OPERATIONS**

If Temperature and Noise Logs have been completed on a well and they indicate well integrity, and the Operator designates the well to return to injection operations, then the Operator shall perform the additional testing outlined in Steps 4a through 7a. The results of these tests will be independently reviewed by Division engineers and posted publicly. Each of the following tests requires that the production tubing be removed from the well.

**Step 4a:** The Operator shall conduct a **Casing Inspection log**.

The Operator shall conduct a Casing Inspection log of the well that measures the thickness of the production casing, from the surface to the bottom of the gas storage reservoir cap rock. If the inspection reveals a reduction in wall thickness, the current minimum strength of the casing will be calculated. If the current minimum strength of the casing has diminished to the point that it cannot withstand authorized operating pressures for the well plus a built-in additional safety factor of pressure, the well has failed this test. *A passing test for a casing inspection log would show no thinning of the casing that diminishes the casing's ability to contain at least 115% of the well's maximum allowable operating pressure as authorized in the current Project Approval Letter.*

**Step 5a:** The Operator shall conduct a **Cement Bond Log** for the well.

The Operator shall conduct a Cement Bond Log (CBL) that measures the bonding between cement and the production casing of the well, and also the bonding between the annular cement and the formation. Cement should be solidly bonded to both the well's production casing and the geologic formation to ensure a seal that prevents fluids from migrating up or down the outside of the well. *A passing test for a cement bond log shows definitive bond, as demonstrated by sonic waveform,*

*between cement and casing and between cement and the gas storage formation and/or cap rock for at least 100 feet above the top of the gas storage reservoir.*

**Step 6a:** The Operator shall conduct a **Multi-Arm Caliper Inspection** of the well.

The operator shall conduct an inspection that measures any internal degradation or significant changes to the well's geometry from the surface to the top of the gas storage reservoir, using a minimum 32-arm caliper tool. If the inspection reveals a thinning or deformity of the casing, the current strength of the casing will be calculated. If the current strength of the casing has diminished, such that it cannot withstand authorized operating pressures plus a built-in safety factor of additional pressure, the well fails this inspection. *A passing test for a Multi-Arm Caliper Inspection would show no deformation or thinning of the casing that diminishes the casing from being able to properly contain at least 115% of each well's maximum operating pressure.*

**Step 7a:** The Operator will conduct a **Pressure Test** of the production casing and of the well once the production tubing has been reinstalled. The Operator may conduct the casing pressure test prior to reinstalling the production tubing. Using a digital recorder, the operator will conduct a liquid-filled positive pressure test within the production tubing of the well, and in the annular space between the production tubing and the casing, to determine the well's ability to withstand normal operating pressures. The production tubing will be isolated and then pressure tested. The annular space between tubing and casing will be pressure tested. This testing also evaluates the integrity of any packers, which seal the annular space between the tubing and casing. The pressure test will be one hour and begin at a pressure of 115% of the maximum operating pressure or the minimum yield strength of the casing and tubing, whichever is less. *A passing pressure test is a pressure loss not exceeding 10% for any 30 minute period during the hour long test.*

After conducting the above tests, the Operator will conduct any indicated remediation so that the well can pass these tests. All remediation will be subject to the review of Division engineers. The well would then be required to undergo the tests once again to demonstrate well integrity.

If the well passes the Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper inspection and the Pressure Test to the Division's satisfaction, then the Division may clear the well for use for gas injections and withdrawal, once the Division has authorized resumption of injection into the gas storage reservoir. As noted below, wells approved for operation will only be permitted to inject or withdraw gas through the production tubing.

#### **REQUIRED ACTIONS IF THE WELL IS TO BE TAKEN OUT OF OPERATION AND ISOLATED FROM THE GAS STORAGE RESERVOIR:**

If the operator elects to take a well out of service, then the following steps shall be taken to isolate the well from the gas storage reservoir:

**Step 4b:** The Operator shall confirm the presence of cement outside the well's external casing in the section of the well that prevents the movement of gas from the underground gas storage reservoir to shallower geologic zones above the gas storage reservoir. Existing cement bond logs and well construction

records may be used to make this confirmation. This confirmation requires concurrence from Division engineers.

- Step 5b:** The Operator shall install a mechanical seal or “packer” within the well’s production casing and install a mechanical plug within the well’s production tubing, if applicable. These seals shall be set in place near the bottom of the well, within the portion of the well surrounded by cement. This kind of seal is an industry standard practice for isolating a well from reservoir gases or fluids and will further protect the casing from internal gas pressure.
- Step 6b:** The Operator shall fill the well with fluid to the well’s surface in order to create appropriate downward hydrostatic pressure in the well that further contributes to the integrity of the well seal.

These measures will isolate a well from the underground gas reservoir, as confirmed by National Laboratory experts. Each of the above actions is subject to review and approval by Division Engineers.

- Step 7b:** Once the Operator has completed steps 4b, 5b, and 6b, and the seal is in place at the bottom of the well and the well is filled with fluid above the seal, the operator shall:
- a. Conduct daily gas monitoring at the surface of the non-operational well, including monitoring the area around the well perimeter and in the annular space between the plugged casing string and the outmost casing;
  - b. Conduct noise log, temperature log and positive pressure test every six months;
  - c. Conduct weekly monitoring of fluid levels in the well or, install and operate real-time pressure monitors that provide immediate notification to the operator when pressures deviate from normal in the well’s interior tubing and its annular space.

The above monitoring shall be reported to Division engineers and maintained as a part of the well file. Division engineers will review all submitted information for evaluation on a regular basis to ensure that the well taken out of service has maintained safety, and the operator shall take all necessary steps maintain the safety of the well.

Any well taken out of operation cannot be approved to resume operations and gas injection until the successful completion of the battery of tests outlined above in Steps 4a through 7a (Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper Extension and the Pressure Test) is completed. Those tests must be successfully completed within one year of completing step 6b. If a well cannot successfully complete all necessary steps required in this safety review after one year of completing step 6b, then the well shall be properly plugged and abandoned in accordance with Public Resources Code section 3208.

#### **REQUIREMENTS FOR WELLS RESUMING OPERATIONS IN ALISO CANYON**

The Division’s authorization to resume injection in the Aliso Canyon Storage Facility will be contingent on the successful completion of this comprehensive safety review. The State Oil and Gas Supervisor must confirm in writing that all wells in the facility have either completed and passed the full battery of tests required in the safety review, been taken out of service and isolated from the underground gas storage reservoir, or been properly plugged and abandoned in accordance with Public Resources Code Section 3208.

**Ortiz, David@DOC**

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**From:** Michael Giuliani <mike.giuliani@interactprojects.com>  
**Sent:** Friday, June 17, 2016 4:56 PM  
**To:** Ortiz, David@DOC  
**Cc:** Neville, Dan; McMahon, Thomas D.; McGurk, Scott@DOC  
**Subject:** Casing Pressure Test Spreadsheet  
**Attachments:** Test Pressure Safety Check Spreadsheet.xlsx

David,

SCGC submitted NOI's on seven wells today: FF-33, Frew 5, P-38, P-46, SS-04, SS-11 and SS-24. The attached spreadsheet demonstrates bottom-hole pressure based on the proposed 1000 psi test pressure for each well is uniformly below 85% of the burst pressure as taken from the Haliburton Red Book. In fact, pressures at the deepest point of each casing grade range from 669 psi to 3687 psi below the 85% of burst limit.

Although the analysis assumes the pipe is new, at a 1000 psi test pressure, there is a fairly large safety factor even beyond the 85% burst limit assumption in that it is also assumed the pipe is hanging in air (zero formation pressure). As you go deeper into the well, and the external casing pressure increases, so does the "hanging in air" safety factor.

Let me know if you have any questions or concerns.

Regards,

**Mike Giuliani**  
Sr. Petroleum Engineer

**We plan. We engineer. We Deliver. *You succeed.***

**InterAct**

an **ACTEON** company

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NATURAL RESOURCES AGENCY OF CALIFORNIA  
 DEPARTMENT OF CONSERVATION  
 DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

FOR DIVISION USE ONLY		
Bond	Forms	
		<del>000114</del>
	CAL WINS	1151

P216-0088

## NOTICE OF INTENTION TO REWORK / REDRILL WELL

Detailed instructions can be found at: [www.conservation.ca.gov/dog/](http://www.conservation.ca.gov/dog/)

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework  / redrill  well Frew 5, API No. 037-00668,  
 (Check one)

Sec. 29, T. 3N, R. 16W, S.B. B&M, Aliso Canyon Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)

See attached wellbore schematic

The total depth is: 8678 feet. The effective depth is: 8675 feet.  
 Present completion zone(s): Seson (Name) Anticipated completion zone(s): Same (Name)  
 Present zone pressure: storage psi. Anticipated/existing new zone pressure: storage psi.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes  No

For redrilling or deepening only, is a California Environmental Quality Act (CEQA) document required by a local agency? Yes  No  If yes, see next page.

The proposed work is as follows: (A complete program is preferred and may be attached.)

The SCGC plans to take this well out of operation and isolate from the gas storage reservoir as per the First Amended Safety Review Testing Regime: Steps 4b-7b.

- 4b - Theo. TOC at 7477' as per attached wellbore mechanical.
- 5b - Packer set at 8270' and plug set in No-Go nipple at 8237'.
- 6b - Well was circulated full with 257 Bbls. 8.5 ppg kill fluid on 2/2/16.
- 7b - With tubing valve closed, pressure test anulus to 1000 psi. for 1 hour.

If well is to be redrilled or deepened, show proposed coordinates (from surface location) and true vertical depth at total depth: \_\_\_\_\_ feet and \_\_\_\_\_ feet Estimated true vertical depth: \_\_\_\_\_  
 (Direction) (Direction)

Will the Field and/or Area change? Yes  No  If yes, specify New Field: \_\_\_\_\_ New Area: \_\_\_\_\_

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator Southern California Gas Company			
Address P. O. Box 2300		City/State Chatsworth	Zip Code 91313-2300
Name of Person Filing Notice Mike Giuliani	Telephone Number: (805) 290-2074	Signature	Date 6/16/16
Individual to contact for technical questions: Mike Giuliani	Telephone Number: (805) 290-2074	E-Mail Address: mike.giuliani@interactprojects.com	

This notice and an indemnity or cash bond must be filed, and approval given, before the workover begins. (See the reverse side for bonding information.) If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

## INFORMATION FOR COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA)

If an environmental document has been prepared by the lead agency, submit a copy of the *Notice of Determination* or *Notice of Exemption* with this notice. Please note that a CEQA determination by a local jurisdiction, if required, must be complete, or the Division may not issue a permit.

### CRITICAL WELL DEFINITION

As defined in the California Code of Regulations, Title 14, Section 1720 (a), "Critical well" means a well within:

- (1) 300 feet of the following:
  - (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
  - (B) Any airport runway.
- (2) 100 feet of the following:
  - (A) Any dedicated public street, highway or the nearest rail of an operating railway that is in general use;
  - (B) Any navigable body of water or watercourse perennially covered by water;
  - (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground or any other area of periodic high-density population; or
  - (D) Any officially recognized wildlife preserve.

### WELL OPERATIONS REQUIRING BONDING

1. Drilling, re-drilling, or deepening any well.
2. Milling out or removing a casing or liner.
3. Running and cementing casing or tubing.
4. Running and cementing liners and inner liners.
5. Perforating casing in a previously unperforated interval for production, injection, testing, observation, or cementing purposes.
6. Drilling out any type of permanent plug.
7. Reentering an abandoned well having no bond.

This form may be printed from the DOGGR website at [www.conservation.ca.gov/dog/](http://www.conservation.ca.gov/dog/)

# Well Frew 5

API #: 04-037-00668-00  
Sec 29, T3N, R16W

Operator: So. California Gas Co.

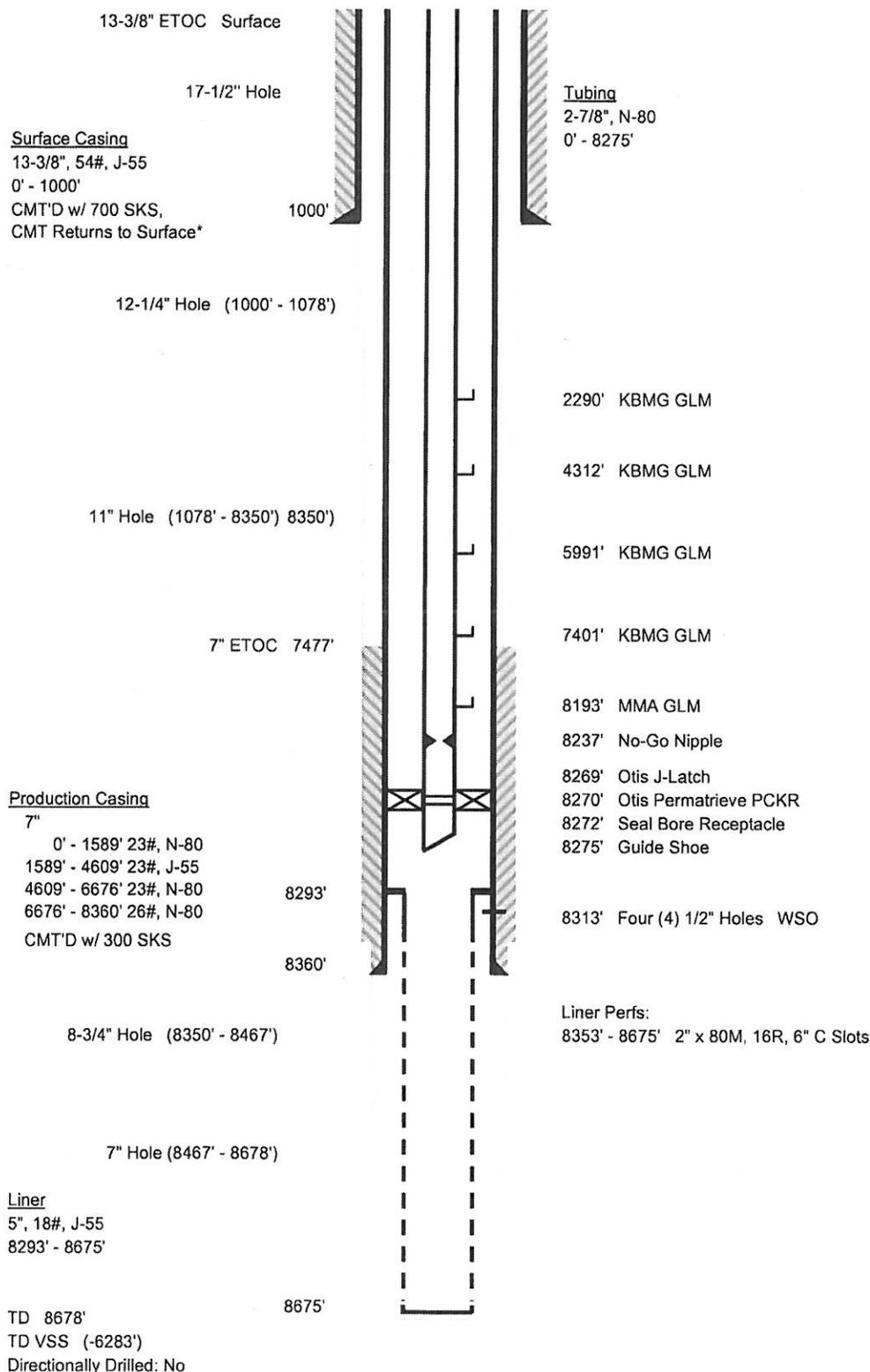
Lease: Frew  
Field: Aliso Canyon  
Status: Active Gas Storage  
BFW:  
USDW:

Ground Elevation: 2386.75' asl  
Datum to Ground: 8.3' KB

Spud Date: 5/16/1948  
Completion Date: 7/28/1948

Junk: None

Notes
*Per DOGGR report dated 6/9/1948.



Top of Zone Markers	
PEupth	1560' (835')
FREWupth	2548' (-153')
CRupth	2740' (-345')
K1upth	2887' (-492')
MDA	6870' (-4475')
MP	8088' (-5693')
S1	8332' (-5937')
S4	8403' (-6008')
S8	8505' (-6110')

Prepared by: MAM (2/19/2016)

Casing Pressure Test Safety Check (1000 psi)

Well	Packer Depth MD/TVD	Casing Size/Grade/Weight	Depth MD	Burst PSI	85% of Burst PSI	Pressure at Depth w/1000 psi Surface Pressure	Press < 85% of Burst
Fernando Fee 33	7485'/7484'	7", 23#, J-55	4122	4360	3706	2822	Yes
		7", 23#, N-80	5913	6340	5389	3614	Yes
		7", 26#, N-80	7630	7240	6154	4372	Yes
Frew 5	8270'/8270'	7", 23#, N-80	1589	6340	5389	1702	Yes
		7", 23#, J-55	4609	4360	3706	3037	Yes
		7", 23#, N-80	6676	6340	5389	3951	Yes
Porter 38	8257'/8257'	7", 26#, N-80	8360	7240	6154	4695	Yes
		7", 29#, N-80	3383	4360	3706	2495	Yes
		7", 23#, N-80	5059	6340	5389	3236	Yes
Porter 46	7660'/7660'	7", 26#, N-80	6692	7240	6154	3958	Yes
		7", 29#, N-80	8465	8160	6936	4742	Yes
		7", 23#, J-55	3381	4360	3706	2494	Yes
Standard Sesnon 04	8471'/8470'	7", 23#, N-80	5166	6340	5389	3283	Yes
		7", 26#, N-80	6717	7240	6154	3969	Yes
		7", 29#, N-80	7710	8160	6936	4408	Yes
Standard Sesnon 11	8640'/8639'	7", 23#, J-55	3463	4360	3706	2531	Yes
		7", 23#, N-80	5161	6340	5389	3281	Yes
		7", 26#, N-80	6847	7240	6154	4026	Yes
Standard Sesnon 24	8690'/8690'	7", 29#, N-80	8498	8160	6936	4756	Yes
		7", 23#, J-55	3723	4360	3706	2646	Yes
		7", 23#, N-80	5397	6340	5389	3385	Yes
Standard Sesnon 24	8690'/8690'	7", 26#, N-80	7019	7240	6154	4102	Yes
		7", 29#, N-80	8767	8160	6936	4875	Yes
		7", 23#, N-80	1807	6340	5389	1799	Yes
Standard Sesnon 24	8690'/8690'	7", 23#, J-55	4346	4360	3706	2921	Yes
		7", 23#, N-80	6479	6340	5389	3864	Yes
		7", 26#, N-80	8414	7240	6154	4719	Yes
Standard Sesnon 24	8690'/8690'	7", 29#, N-80	8920	8160	6936	4943	Yes

OPERATOR So. California Co.  
 LSE & NO 5570 F-5  
 MAP \_\_\_\_\_

	( )	( )	( )	( )	( )
INTENTION	<u>Acquire gas storage</u>				
NOTICE DATED	<u>8-4-77</u>				
P-REPORT NUMBER	<u>277-285</u>				
CHECKED BY/DATE					
MAP LETTER DATED					
SYMBOL	<u>MC</u>				

	REC'D	NEED	REC'D	NEED	REC'D	NEED	REC'D	NEED	REC'D	NEED
NOTICE	<u>8-9-77</u>	<u>+</u>								
HISTORY	<u>9-19-77</u>	<u>+</u>								
SUMMARY										
IES/ELECTRIC LOG										
DIRECTIONAL SURV										
CORE/SWS DESCRIP										
OTHER	<u>DUAL SPACING</u>	<u>3-22-79</u>								
	<u>THERMAL</u>	<u>ROPE</u>								
	<u>NEUTRON</u>	<u>8-16-77</u>								
RECORDS COMPLETE	<u>7-27-77</u>	<u>TMC</u>								

**ENGINEERING CHECK**

T-REPORTS	_____
OPERATOR'S NAME	_____
WELL DESIGNATION	_____
LOC & ELEV	_____
SIGNATURE	_____
SURFACE INSPECTION	_____
FINAL LETTER OK	_____

**CLERICAL CHECK**

POSTED TO 121 _____	170 MAILED _____	FINAL LETTER MAILED _____
_____	_____	RELEASED BOND _____
_____	_____	_____
_____	_____	_____

REMARKS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SUBMIT IN DUPLICATE  
RESOURCES AGENCY OF CALIFORNIA  
DEPARTMENT OF CONSERVATION  
DIVISION OF OIL AND GAS

DIVISION OF OIL AND GAS  
RECEIVED

SEP 10 1977

History of Oil or Gas Well

SANTA PAULA, CALIFORNIA

Operator Southern California Gas Company..... Field or County Aliso Canyon  
Well name and No. Frew #5....., Sec. 29, T 3N, R 16W S.B.B. & M.  
A.P.I. well No. 037-00668 Name P. S. Magruder, Jr. Title Agent  
Date September 10, 1977 (Person submitting report) (President, Secretary or Agent)

Signature *P. S. Magruder, Jr.*

P.O. BOX 3249 TERMINAL ANNEX, LOS ANGELES, CA., 90051 (213) 689-3561  
(Address) (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
8-9-77	Killed well with 325 barrels of 75#/cu.ft. brine polymer drilling fluid with HOWCO Services.
8-13-77	Move in and rigged up (Oilwell Service Rig #1) on Frew #5.
8-14-77	Rig and crew idle.
8-15-77	Rekilled Frew #5 with 75#/cu.ft. drilling fluid. Removed Xmas tree and installed B.O.P.E. Tested B.O.P.E. with water using Dowell blind rams 4000 psi 20 minutes (O.K.) Pipe rams 4000 psi 20 minutes (O.K.) Hydril rams 3000 psi 20 minutes (O.K.)
8-16-77	Rigged up and tested B.O.P.E. with NOWSCO, as follows:  Blind rams at 4000 psi for 20 minutes - O.K. Pipe " " 4000 psi " 20 " O.K. Hydril bag " 3000 psi " 20 " O.K. Released Otis Permalatch packer and circulated out gas cut drilling fluid. Pulling out of hole.
8-17-77	Pulled out of well with Otis packer. Made up 6 1/8" bit and casing scraper. Ran in and cleaned out to top of liner at 8293'. Made up 4 1/8" bit and scraper. Running in well.
8-18-77	Finished running in hole with 4 1/8" bit and casing scraper. Cleaned out firm fill from 8655' to 8676' (21'). Circulated bottoms up and pulled out of hole. Made up Johnston bridge plug (Bobcat). Ran in well and set bridge plug at 8280'. Pressure tested bridge plug to 1000 psi for 15 minutes. Changed over from polymer drilling fluid to fresh water with surfactant. Started pulling out of well.
8-19-77	Made up Johnston retainer. Ran in to 4500' and set tool. Tested 7" casing from 4500' to 8280' under 2300 psi. 1 hour (O.K.). Surface to 4500' under 2500 psi (O.K.). Surface to 4000' 2700 psi. O.K. 3500' to surface 2900 psi (O.K.). Testing at 3000 ft. and pipe rams failed.

8-20-77 Changed pipe rams. Using retrievable retainer and cement truck, pressure tested casing as follows:

3000'	to Surface	at 3100 psi	for 60 minutes
2500'	"	"	3300 psi " 60 "
2000'	"	"	3500 psi " 60 "
1500'	"	"	4000 psi " 60 "

Pulled out and laid down fullbore. Ran in hole and changed over to polymer drilling fluid. Worked over bridge plug and circulated gas cut drilling fluid. Pulling out of well.

8-21-77 Rig and crew idle.

8-22-77 Circulated bottoms up and pulled out of hole with Johnston bridge plug. Rigged up GO wireline, ran in hole and set Otis permatrieve packer at 8270'. Made up Otis safety system and tested same. Rigged up hydrotest tools and hydrotested in hole at 5000 psi for one minute.

8-23-77 Changed collars, cleaned pins, applied Baker Seal and hydrotested 2 7/8" tubing to 5000 psi - each test for one minute.

8-24-77 Finished hydrotesting tubing in well. Stabbed into packer at 8270'. Released from packer and spaced out. Relatched into packer. Pulled 25,000# over weight of tubing to check latch. Landed tubing with 10,000# on packer. Hook weight of tubing 40,000#. Removed B.O.P.E. and installed Christmas tree.

8-25-77 Tested Christmas tree to 5000 psi. Changed over from polymer drilling fluid to lease salt water. Rigged up Otis and pulled separation tool. Ran in and set PX plug. Tested seals and packer to 1500 psi - O.K. Pulled PX plug. Installed blind flanges, closed all valves. Released rig at 3:00 P.M. 8-25-77.

nd.

Frew #5 (Continued)  
Page 2

1974

- 5-11 Set Baker Model "C" bridge plug at 7020'. Removed BOPE and old tubing head. Installed reconditioned tubing head and reinstalled BOPE. Tested tubing head to 2800 psi for 20 minutes.
- 5-12 Idle.
- 5-13 Pulled bridge plug. Ran 2-7/8" tubing hydrotesting to 5000 psi. Set Guiberson K-V 30 L.H. Set packer at 8234' with 12000#. Tubing landed at 8265' (details attached). Set tubing plug in X nipple at 1005'. Removed BOPE and installed reconditioned Xmas tree. Tested Xmas tree to 3500 psi for 25 minutes. Pulled tubing plug.
- 5-14 Circulated drilling fluid out of hole with lease waste salt water. Rig and crew moved to Frew #9.

STATE OF CALIFORNIA  
DEPARTMENT OF CONSERVATION  
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

Ventura \_\_\_\_\_, California

November 12, 1991

R. D. Phillips, Agent  
SOUTHERN CALIFORNIA GAS COMPANY  
P.O. Drawer 3249 Mail Location 22GO  
Los Angeles, CA 90051-1249

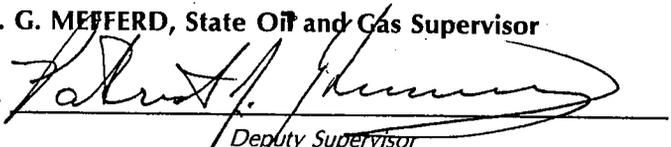
Your request, dated July 24, 1991, proposing to change the designation of well(s) in Sec. 29, T. 3N, R. 16W, S.B. B. & M., Aliso Canyon field, Los Angeles County, District No. 2, has been received.

The proposed change in designation, in accordance with Section 3203, Public Resources Code, is authorized as follows:

<u>FROM</u>	<u>TO</u>
"SFZU" F-2 (037-00665)	"Frew" 2 (037-00665)
"SFZU" F-3 (037-00666)	"Frew" 3 (037-00666)
"SFZU" F-4 (037-00667)	"Frew" 4 (037-00667)
"SFZU" F-5 (037-00668)	"Frew" 5 (037-00668)
"SFZU" F-6 (037-00669)	"Frew" 6 (037-00669)
"SFZU" F-7 (037-00670)	"Frew" 7 (037-00670)
"SFZU" F-8 (037-00671)	"Frew" 8 (037-00671)
"SFZU" F-9 (037-00672)	"Frew" 9 (037-00672)
"SFZU" SS-4 (037-00757)	"Standard Sesnon" 4 (037-00757)
"SFZU" SS-12 (037-00764)	"Standard Sesnon" 12 (037-00764)
"SFZU" SS-4-0 (037-22063)	"Standard Sesnon" 4-0 (037-22063)
"SFZU" SS-10 (037-00040)	"Standard Sesnon" 10 (037-00040)

M. G. MEFFERD, State Oil and Gas Supervisor

By

  
Deputy Supervisor

PATRICK J. KINNEAR

RESOURCES AGENCY OF CALIFORNIA  
DEPARTMENT OF CONSERVATION  
**DIVISION OF OIL AND GAS**

**Report on Operations**

No. T 277-213

Mr. P. S. Magruder, Jr., Agent  
So. California Gas Co.  
P.O. Box 54790 Terminal Annex  
Los Angeles, Calif. 90054

Santa Paula, Calif.  
Aug. 26, 1977

DEAR SIR:

Operations at well No. "SFZII" F-5, API No. 037-00668, Sec. 29, T. 3N, R. 16W,  
SB, B & M. Aliso Canyon Field, in Los Angeles County, were witnessed  
on 8/16/77. Mr. P.R. Wygle, representative of the supervisor was  
present from 0700 to 0900. There were also present R. Barton, foreman

Present condition of well: No additions to the casing record since proposal dated 8/4/77.

The operations were performed for the purpose of testing the blowout prevention equipment  
and installation.

DECISION:

**THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.**

b

M. G. MEFFERD  
~~JOHN F. MATTHEWS, JR.~~  
Acting, State Oil and Gas Supervisor

By John L. [Signature] Deputy

REPORT ON PROPOSED OPERATIONS

Santa Paula, California

Aug. 10, 1977

P.S. Magruder, Jr., Agent  
Southern Calif. Gas Co.  
P.O. Box 54790 Terminal Annex  
Los Angeles, Calif. 90054

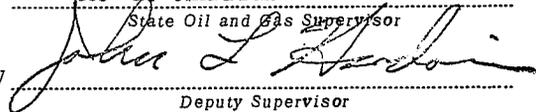
Your proposal to rework gas storage well "SFZU" F-5  
(Name and number)  
A.P.I. No. 037-00668, Section 29, T. 3N, R. 16W  
S.B. B. & M., Aliso Canyon field, Los Angeles County,  
dated 8-4-77, received 8-9-77, has been examined in conjunction  
with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. The drilling fluid used shall be of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts; and a reserve supply of this material shall be kept on hand to meet any emergency.
2. Blowout prevention equipment, at least of the Division of Oil and Gas Class III, 3M rating, shall be installed and maintained in operating condition at all times.
3. THIS DIVISION SHALL BE NOTIFIED TO WITNESS A PRESSURE TEST OF THE BLOWOUT PREVENTION EQUIPMENT BEFORE COMMENCING DOWNHOLE OPERATIONS.

Blanket Bond  
MD:b

NOTE: A COPY OF THIS APPROVAL SHALL BE POSTED AT THE WELL SITE PRIOR TO COMMENCING OPERATIONS.

M. G. MEFFERD  
State Oil and Gas Supervisor  
By   
Deputy Supervisor  
John L. Hardoin

AUG 9 1977

DIVISION OF OIL AND GAS

Notice of Intention to Rework Well

SANTA PAULA, CALIFORNIA

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	FORMS	
	114	121
BB	✓	2 ✓

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework well No. FREW 5, API No. \_\_\_\_\_, Sec. 29, T. 3N, R. 16W, S.B. B. & M., Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

- Total depth. 8678'
- Complete casing record, including plugs and perforations:
  - 13 3/8" cemented 1000'
  - 7" cemented 8360', WSO 8313'
  - 382' 5" landed 8675', top 8293'  
slotted 8353'-8675'

- Present producing zone name SESNON Zone in which well is to be recompleted -
- Present zone pressure 3600 psi New zone pressure -
- Last produced Gas Storage Well  
(Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)  
or
- Last injected \_\_\_\_\_  
(Date) (Water, B/D) (Gas, Mcf) (Surface pressure, psig.)

The proposed work is as follows:

- Move in rig. Kill well. Install B.O.P.E. and pressure test.
- Pull tubing and packer. Clean out to 8675'.
- Pressure test 7" casing. Perform any remedial work indicated by pressure testing.
- Run packer and tubing with down-hole safety system.
- Return well to Gas Storage operation.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address P. O. Box 3249, Terminal Annex  
(Street)  
Los Angeles, California 90051  
(City) (State) (Zip)  
Telephone Number (213) 689-3561

SOUTHERN CALIFORNIA GAS COMPANY  
(Name of Operator)  
By P. S. Magruder, Jr.  
(Name) (Date) 8-4-77  
Type of Organization Corporation  
(Corporation, Partnership, Individual, etc.)

FREW #5 - ALISO CANYON

Program to install new packer, pressure test casing and install down hole safety valve.

TUBING OR CASING WITHDRAWAL

Take all measurements from original derrick floor 8.3' above ground.

PRESENT CONDITIONS:

13 3/8" cemented 1000' 54.5# J-55  
7" cemented 8360', WSO 8313'  
382' 5" landed 8675', top 8293' slotted  
8353'-8675'  
18# J-55

7" CASING DETAIL

			100% Safety Factor	
			Burst	Collapse
0-1589'	23#	N-80	6340	4300
1589'-4609'	23#	J-55	4360	3290
4609'-6676'	23#	N-80	6340	4300
6676'-8360'	26#	N-80	8160	5320

TUBING DETAIL:

2 7/8" 8rd EUE J-55 landed 8263'  
2 7/8" "XN" nipple 8231'  
Otis Perma latch packer 8230'  
Otis "X" nipples 8194' and 8161'  
Otis sliding sleeve 8128' (open)

PROGRAM

1. Move in and rig up. Pressure test wellhead seals to 4000 psi.
2. Kill well with 75#/cu.ft. brine polymer drilling fluid. Check bottom hole pressures before moving in rig. Well volume=350 barrels
3. Set back pressure valve in doughnut. Remove Christmas tree. Install class III 5000 psi B.O.P.E. Pressure test complete shut-off rams and pipe rams to 4000 psi with water and nitrogen. Also pressure test Hydril bag to 3000 psi with water and nitrogen.
4. Unseat packer and pull tubing.
5. Run 6 1/8" bit and casing scraper. Clean out to top of 5" liner at 8293'. Run 4 1/8" bit and casing scraper. Clean out to bottom of 5" liner, 8675'. Note: fill and type.

Program to Install New Packer, Pressure Test Casing and Install Down Hole Safety Valve.

6. Set bridge plug at 8280'. Pressure test plug with rig pump. Circulate polymer fluid out of well with fresh water treated with surface tension agent. Pressure test casing using cement retainer and cement pump truck equipped with calibrated pressure chart and pressure gauge, as follows:

4500'	to	8280'	with	2300 psi	for	60 minutes
Surface	"	4500'	"	2500 psi	"	60 "
"	"	4000'	"	2700 psi	"	60 "
"	"	3500'	"	2900 psi	"	60 "
"	"	3000'	"	3100 psi	"	60 "
"	"	2500'	"	3300 psi	"	60 "
"	"	2000'	"	3500 psi	"	60 "
"	"	1500'	"	4000 psi	"	60 "

Change to polymer fluid.

7. Perform any remedial work indicated by pressure testing. Recover bridge plug.
- 
8. Run Otis Permatrieve packer on wire line and using reference collars set near 8270'. DO NOT set packer in a collar.
  9. Run 2 7/8" tubing, change collars, clean pins and apply Baker seal and hydrotest to 5000 psi holding each test for one minute.  
Tubing to include:
    - Otis production tube
    - Otis four seals
    - Otis Latch-in-locator
    - Otis 10' heavy wall tube
    - Otis 1.79" "XN" "NO GO" nipple with 2 7/8" threads
    - Otis 20' heavy wall tube
    - Otis annular flow safety system

FREW #5 - Aliso Canyon

PROGRAM (Continued)

10. Land tubing on packer with up to a maximum of 10,000 pounds on packer-pull 25,000 pounds over weight of tubing to check latch.
11. Install back pressure valve in doughnut. Remove B.O.P.E. and reinstall Christmas tree. Pressure test Christmas tree to 5000 psi.
12. Circulate drilling fluid out of well with waste salt water. Set tubing plug in "NO GO" nipple. Pressure test seals and packer to 1500 psi. Pull tubing plug and release rig.

G. C. ABRAHAMSON  
August 4, 1977

cc: Rig Supervisor  
Contract pusher (2)  
Relief Rig Supervisor  
Book Copy  
  
Division Oil & Gas

B. Jones  
D. Smiley  
J. Melton  
D. Justice )  
M. Grijalva)

Well File  
Spare Copy

DEPARTMENT OF THE MINES  
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER Gas Storage Well		5. LEASE DESIGNATION AND SERIAL NO. FREW
2. NAME OF OPERATOR SOUTHERN CALIFORNIA GAS COMPANY		6. IF INDIAN, ALLOTTEE OR TRIBE NAME N/A
3. ADDRESS OF OPERATOR P.O. Box 3249, Terminal Annex, Los Angeles, California 90051		7. UNIT AGREEMENT NAME SFZU
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface  Aliso Canyon, Los Angeles County  SANTA PAULA, CALIFORNIA		8. FARM OR LEASE NAME FREW
14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.)	9. WELL NO. 5
		10. FIELD AND POOL, OR WILDCAT SESNON
		11. SEC. T., R., M., OR BLM. AND SURVEY OR AREA 29 - 3N - 16W - S.B.
		12. COUNTY OR PARISH Los Angeles
		13. STATE California

DIVISION OF OIL AND GAS  
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AUG 10 1977

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF   
FRACTURE TREAT   
SHOOT OR ACIDIZE   
REPAIR WELL

PULL OR ALTER CASING   
MULTIPLE COMPLETE   
ABANDON\*   
CHANGE PLANS

WATER SHUT-OFF   
FRACTURE TREATMENT   
SHOOTING OR ACIDIZING   
(Other)

REPAIRING WELL   
ALTERING CASING   
ABANDONMENT\*

(Other) Pressure Test & Install Safety System

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

17. 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.)\*

PRESENT CONDITIONS:

13 3/8" cemented 1000'  
7" cemented 8360', WSO 8313'  
382' 5" landed 8675', top 8293'  
slotted 8353'-8675'

1. Move in rig. Kill well. Install B.O.P.E. and pressure test.
2. Pull tubing and packer. Clean out to 8675'.
3. Pressure test 7" casing. Perform any remedial work indicated by pressure testing.
4. Run packer and tubing with down-hole safety system.
5. Return well to Gas Storage operations.

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

SIGNED Guy C. Abrahamson

TITLE Consulting Petroleum Engr. DATE 8-4-77

(This space for Federal or State office use)

APPROVED BY John P. Wagner J.P. Wagner

Acting District Engineer

August 8, 1977

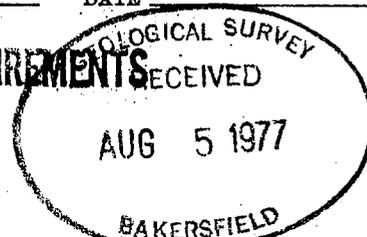
CONDITIONS OF APPROVAL, IF ANY:

DATE

cc: Santa Paula (DOG)

SEE ATTACHED CONDITIONS AND REQUIREMENTS

\*See Instructions on Reverse Side





STATE OF CALIFORNIA  
DEPARTMENT OF CONSERVATION  
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

830 North La Brea Avenue  
Inglewood, California

September 24, 1968

Mr. Mr. C. G. Nelson, Agent  
Getty Oil Co., Operator  
P. O. Box 811  
Agent for Ventura, California 93001

DEAR SIR:

Your request dated letter dated August 26, 1968, relative to change in designation of well(s) in Sec. 29, T. 3 N., R. 16 W., S. B. B. & M., Aliso Canyon field, Los Angeles County, District No. 1, has been received;

and in accordance with Section 3203, Public Resources Code, reading in part as follows:

"\* \* \* The number or designation by which any well heretofore drilled has been known, and the number or designation specified for any well in a notice filed as required by Section 3203, shall not be changed without first obtaining a written consent of the Supervisor."

the proposed change in designation is hereby authorized as follows: (formerly owned by Standard Oil Co. of Calif.)

Old Designation

"Frew 1" 2  
" 3  
" 4  
" 5  
" 6  
" 7  
" 8  
" 9

New Designation

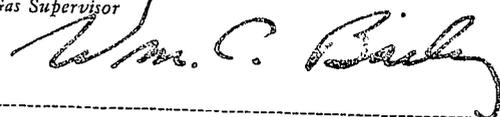
"SFZU" F-2 (037-00665)  
" F-3 (037-00666)  
" F-4 (037-00667)  
" F-5 (037-00668)  
" F-6 (037-00669)  
" F-7 (037-00670)  
" F-8 (037-00671)  
" F-9 (037-00672)

ag

cc: F. E. Kasline  
Production Dept.  
Conservation Committee

F. E. KASLINE  
~~E. R. MURRAY-AARON~~  
State Oil and Gas Supervisor

By



Deputy Supervisor

DIVISION OF OIL AND GAS  
**RECEIVED**  
 DEC 20 1948  
 JHT  
 M.C. FILE

COMPLETION REPORT—NEW W. PRO-18  
 LOS ANGELES, CALIFORNIA COMPANY

FIELD ALISO CANYON

STANDARD OIL COMPANY OF CALIFORNIA

PROPERTY FREW 1

WELL NO. 5

SEC. 29

T. 3-N., R. 16-W., S. B. B & M

From Point 19 on boundary line of Rancho Ex-Mission San Fernando, 1525.21' S. 5° 00' 39" W. along the Wily Rancho line and Eoly line of Frew 1 Lease; thence 76.72' S. 5° 04' 42" W. along lease line; thence 916.99' Wily at right angles ELEV. 2395.05' D.F. U.S.G.S.

FOLLOWING IS COMPLETE AND CORRECT RECORD OF ALL WORK DONE ON THIS WELL:

COMMENCED RIGGING UP May 15, 1948  
 COMPLETED RIGGING UP May 16, 1948  
 COMMENCED DRILLING May 16, 1948  
 COMPLETED DRILLING July 28, 1948  
 DEPTH 8678'  
 (Pro 20) Aug. 1, 1948  
 PLUGGED TO Not  
 DATE OF INITIAL PRODUCTION July 28, 1948  
 PRODUCTION (Daily Average 1st 30 Days) 262  
 FLOWING PERMANENT  
 BBL. OIL: 17  
 BBL. WATER 21.4  
 GAS PRODUCTION (Daily Average 1st 30 Days) 261  
 M. CU. FT. —  
 GAL. GASOLINE PER M. CUBIC FEET —  
 TUBING PRESS. — CASINGHEAD PRESS. — FLOW NIPPLE —

CASING RECORD

SIZE OF CASING	LENGTH OF CASING	DEPTH LANDED	CEMENTED (Depth if thru perf)	WEIGHT PER FOOT	THREADS PER INCH	MAKE OF CASING	SEAMLESS OR LAPWELDED	MAKE OF SHOE
18-5/8"	28	40	Yes	96.5#	P.E.	Western (New)	E.W.	Welded
13-3/8"	988	1000	"	54#	8-rnd.	Ygstn., Nat'l.	Smls. &	Baker
7"	8348	8360	"	23&26#	8-rnd.	Nat'l., J&L., & Ygstn. (New)	E.W.	Baker
5"	382	8675	No	18#	8-rnd.	Spang (New)	Smls.	Baker

CEMENTING OR OTHER SHUT OFF RECORD

SIZE OF CASING	DEPTH LANDED	DEPTH CEMENTED	No. SACKS USED	No. SACKS TREATED	KIND OF CEMENT	METHOD	TIME SET DAYS	RESULT OF TEST
18-5/8"	40	40	55	None	Constr.	Outside Csg.	1	Not tested.
13-3/8"	1000	1000	700	"	Vic. cons.	Plug	2	Not tested.
7"	8360	8360	300	"	Colt. sl.	Plug	4	W.S.O. on holes at 8313'.

PERFORATION RECORD

SIZE OF CASING	FROM	TO	SIZE OF HOLES OR SLOTS	NUMBER OF ROWS	SPACING (INCHES)	HOW PERFORATED
7" 5"	At 8353	8313 8675	Four 1/2" holes 2" x 80 mesh	16	6	Johnston gun. 6° undercut Kobe torch-cut slots.

PLUG: None KIND — LENGTH — SET AT —  
 ADAPTER: Yes KIND Burns lead seal liner SIZE 3' x 5" x 7" TOP AT 8293'.  
 ROTARY TOOLS: FROM C TO 8678 FEET CABLE TOOLS: FROM — TO — FEET

SIDETRACKED PIPE AND LOST TOOL RECORD

NONE

MAP	MAP BOOK	CARDS	BOND	FORMS	
				114	121

DRILLERS NAMES ON LAST SHEET

DATE December 13, 1948

STANDARD OIL COMPANY OF CALIFORNIA

BY *J. H. Zacher*  
 J. H. ZACHER, Mgr., Prod. Dept. (400-10-46)



Frew 1-5  
Alsio Canyon

Standard Oil Company of California  
LOS ANGELES, CALIFORNIA

From            To            Feet            Formation Drilled and Cored

-----  
 May 23, 1948, cemented 13-3/8" casing at 1000' (where same froze) with 700 sacks of type "O" Victor construction cement, mixed to an average slurry of 110#/cu.ft. Used 1 top plug, a 4" x 6' x 6' spacer, and 1 bottom plug. Displaced cement with 840 cu.ft. of mud. Good circulation throughout job. Obtained good returns to surface after pumping 350 sacks out of shoe of casing. Plugs did not bump under 200% working and 300% final pressure. Left an estimated 230 sacks cement in 13-3/8" casing. Casing froze at 1000'. Eighty-five minutes mixing and pumping cement to place. Used Halliburton power equipment and bulk cement.

Casing Detail: All 26 joints, or 1000', are 13-3/8", 51#, J-55, range 2 and 3 short 8-round thread, new Youngstown, National, and Western Pipe and Steel, seamless and electric weld casing, fitted on bottom, or at 1000', with a 3' x 13-3/8" Baker cement guide shoe, at 995' and 970' with two Stepp centralizers, and at 997', 987', and 977' with three B & W scratchers.

-----  
Cut and recovered 12' of 18-5/8" casing all of which was below the derrick floor.

Cut and recovered 20' of 13-3/8" casing, 12' of which was below the derrick floor.

May 25-26, 1948, drilled out plugs and cement from 652-1000' with a 12-1/4" bit.

Drilled 12-1/4" hole:

1000	1061	61	gray sand and shale
1061	1078	17	sand and shale

Drilled 11" hole:

1078	1150	72	sand and shale
1150	1228	78	no formation logged
1228	1300	72	gray sand
1300	1317	17	shale
1317	1404	87	shale and sand
1404	1543	139	sand and shale
1543	1884	341	shale
1884	2041	157	shale and sand
2041	2307	266	sand and shale
2307	2423	116	shale
2423	2668	245	hard shale
2668	2773	65	hard shale and sandstone
2773	2835	102	sand and shale with thin shells
2835	2951	116	sandy shale
2951	3251	300	sand and shale
3251	3308	57	sandy shale

DIVISION OF OIL AND GAS  
 RECEIVED  
 DEC 20 1933

Fract 1-5  
 Aliso Canyon

LOS ANGELES, CALIFORNIA  
 Standard Oil Company of California

From	To	Feet	Formation Drilled and Cored
			<u>Drilled</u> 11" hole: (Cont'd.)
3308	3498	190	sand and shale
3498	3606	108	sandy shale
3606	3939	333	sand and shale
3939	4012	73	hard shale
4012	4093	81	hard shale and shells
4093	4186	93	hard shale
4186	4286	100	shale, streaks hard shale
4286	4361	75	hard sand
4361	4395	34	hard sand and shale
4395	5311	916	hard shale
5311	5405	94	hard shale, streaks thin shells
5405	5549	144	hard shale
5549	5693	144	shale
5693	5761	68	gray sand
5761	5856	95	hard sand
5856	5936	80	hard sand and shale
5936	6009	73	hard sand
6009	6081	72	hard sand and shale
6081	6148	67	sand and shale
6148	6261	113	hard shale, sandy shale, streaks hard sand
6261	6321	60	hard shale and sand
6321	6422	101	tough shale
6422	6535	113	shale
6535	6568	33	hard sand
6568	6597	29	tough shale
6597	6626	29	no formation logged
6626	6666	40	hard shale, streaks sand
6666	6688	22	hard sand and tough shale
6688	6709	21	no formation logged
6709	6821	112	hard sand
6821	6848	27	hard sand and shale
6848	6944	96	sand and shale
6944	6967	23	hard shale
6967	7011	44	hard sand
7011	7025	14	hard sand and shale
7025	7078	53	hard sand and shale
7078	7081	3	hard sand
7081	7101	20	hard sand, streaks shale
7101	7480	379	hard sand
			Lost and regained circulation at 7136'.
7480	7495	15	shale
7495	7510	15	hard sand
7510	7551	41	hard sand and streaks of shale
7551	7586	35	sand and shale

DIVISION OF OIL AND GAS  
 RECEIVED  
 DEC 20 1948

Frew 1-5  
 Aliso Canyon

LOS ANGELES, CALIFORNIA.  
 Standard Oil Company of California

From	To	Feet	Formation Drilled and Cored
<u>Drilled 11" hole: (Cont'd.)</u>			
7586	7619	63	shale
7619	7691	42	hard sand, streaks shale
7691	7698	7	hard sand and shale
7698	7728	30	hard sand and shale
7728	7743	15	hard sand
7743	7771	28	hard shale
7771	7781	10	hard shale and sand
7781	7898	117	hard shale
7898	7933	35	hard shale and sand
7933	7973	40	sand, streaks hard shale
7973	8069	96	sandy shale
8069	8121	52	hard sand and shale
8121	8148	27	hard sand
8148	8169	21	hard shale
8169	8214	45	brown OILY shale
8214	8229	15	hard shale
8229	8285	56	brown shale
8285	8339	54	hard shale
8339	8350	11	brown shale

July 13, 1948, ran Schlumberger electric log and recorded from 1000-8350'.

July 14, 1948, took Homco sidewall cores as follows:

- 8060' - recovered 4" fine, friable, light gray sand, no odor
- 7875' - recovered 2" brown silty shale
- 7690' - recovered 1" soft green-brown shale
- 7100' - recovered 3" hard dark brown silty shale
- 6860' - recovered 5" friable gray brown silty shaly sand, no odor
- 6770' - recovered 4" soft brown silty shale
- 6700' - recovered 4" same as above
- 6525' - recovered 3" fine to medium-grained friable light gray sand, no odor
- 6380' - recovered 3" medium hard gray shale
- 4750' - recovered 3" silty gray shale, thin streaks gray sand
- 4420' - recovered 1" same as above

From 1-5  
 Aliso Canyon

LOS ANGELES, CALIFORNIA 6.

Standard Oil Company of California

From To Feet Formation Drilled and Cored

July 14, 1948, took Monco sidewall cores as follows: (Cont'd.)

4275' - recovered 1" brown shale

2715' - recovered 2" fine to coarse-grained crushed conglomeritic sand, no odor.

Drilled 8-3/4" holes:

8350	8398	48	brown shale, streaks hard shale
8398	8419	21	sandy shale
8419	8467	48	sand and shale

July 15, 1948, ran Schlumberger electric log and recorded from 8350-8467'.

-----  
 July 16, 1948, cemented 7" casing at 8360' with 300 sacks of type "S" Colton slow cement, mixed to an average 118#/cu.ft. slurry. Used 1 top plug. Displaced cement with mud. Plug bumped under 400# working and 1400# final pressure. Moved casing between 8355' and 8365' while cement was being displaced around shoe. Pipe sluggish but good circulation throughout. Forty-five minutes mixing and pumping cement to place. Used International Cementers power equipment and bulk cement.

Casing Detail:

Bottom	38 joints, or 1684'	are 7", 26#, N-30, range 3, long 8-round thread, new National seamless casing, fitted at 8360' with a 2' x 7" Baker cement guide shoe and at 8313' with a Baker cement float collar. Fitted at 8355' and 8330' with 2 Stepp centralizers, and at 8357', 8347', and 8337', with 3 B & W scratchers.
Next	55 joints, or 2067'	are 7", 23#, N-30, range 3, long 8-round thread, new Jones and Laughlin seamless casing.
Next	71 joints, or 3020'	are 7", 23#, J-55, range 3, long 8-round thread, new Jones and Laughlin, Youngstown, and National seamless casing.
Top	42 joints, or 1589'	are 7", 23#, N-30, range 1 and 3, long 8-round thread, new Jones and Laughlin seamless casing.
Total	206 joints, or 8360'.	

-----  
Cut and recovered 21' of 7" casing, 12' of which was below the derrick floor.

July 20, 1948, drilled out cement from 8315-8325' with a 6-1/8" bit.

July 21, 1948, Johnston Water Shut-Off Test on Gun Holes in 7" Casing at 8313': Ran combination gun and tester and shot four 1/2" holes at 8313'. Set packer at 8277'; 1000' water cushion. Packer slipped. Reset same at 8274'; tail to 8296'. Open sixty minutes. Light blow for one and one-half minute, then dead for balance of test. Recovered 60' net rise in 3 3/4" drill pipe all heavy drilling fluid.

DIVISION OF OIL AND GAS  
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DEC 20 1948

From 1-5  
Aliso Canyon

LOS ANGELES, CALIFORNIA 7.  
Standard Oil Company of California

From      To      Feet      Formation Drilled and Cored

Test witnessed and water shut-off approved by Inspector J. L. White of the Division of Oil and Gas.

Tool Assembly: 3/8" bean, 7" Olympic packer, 2-7/8" x 22' tail (top 7' blank, next 7' perforated, bottom 8' blank) two pressure recorders and gun perforator.

July 21, 1948, drilled out cement from 8325-8372' and cleaned out to 8467' with a 6-1/8" bit.

Changed mud in hole to emulsion mud and drilled 6-1/8" hole:

8467	8638	171	sand
8638	8678	40	sand and conglomerate

July 24, 1948, ran Schlumberger electric log and recorded from 8467-8678'.

Underreamed 6-1/8" hole to 7" from 8467-8678'.

-----  
July 25, 1948, landed 382' of 5" liner at 8675'. Perforated from 8353-8675'.

Liner and Perforation Detail:

Bottom 10 joints, or 322',	are 5", 18#, J-55, range 2, short 3-round thread, new Spang seamless liner, perforated from 8353' to 8675' with 16 rows, 2" x 80 mesh, 6" centers, 6" undercut Kobe torch-cut slots, fitted at 8675' with a Baker closed cement bull plug shoe.
Top 2 joints, or 60',	are 5", 18#, J-55, range 2, short 8-round thread, new Spang seamless blank liner fitted at 8293' with a 3" x 5" x 7" Burns lead seal liner hanger.
<u>Total 12 joints, or 382'.</u>	

-----  
July 27, 1948, hung 2 1/2" tubing (including 367' of 2" on bottom) at 8614'.

Tubing Detail:

Bottom 12 joints, or 367',	are 2", 4.7#, H-40, range 2, 8-round thread, new Youngstown seamless tubing, fitted from 8612' to 8614' with a 2" x 2" perforated bull plug.
Top 266 joints, or 8247',	are 2 1/2", 6.5#, J-55, range 2, 8-round thread, new Spang seamless tubing, fitted from 8246' to 8247' with a 2" x 2 1/2" crossover
<u>Total 278 joints, or 8614'.</u>	

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DIVISION OF OIL AND GAS  
 RECEIVED  
 DEC 20 1948

LOS ANGELES, CALIFORNIA 8.

Crew 1-5  
 Aliso Canyon

Standard Oil Company of California

Displaced mud in hole with oil.

Crew released at 10:00 a.m., July 28, 1948.

1948 Date	Hrs. Flng.	B/D Oil	PRODUCTION TREND			%	# T.P.	# C.P.	MCF/D Gas
			B/D Wtr.	°API Grav.	Cut				
7-27	10	140*	-	-	-	-	-	-	
28	24	(206* 624)	15	20.3	1.8	400	1700	310	
29	24	901	8	19.8	0.9	375	1750	295	
30	24	825	1	19.7	0.1	325	2000	346	
31	24	862	1	21.0	0.1	350	2000	377	
8- 1	24	673	1	20.7	0.1	750	2100	362	
2	24	673	1	21.6	0.1	-	-	456	
3	24	429	0	-	-	-	-	258	
4	24	261	0	-	-	1000	2400	271	

Note: Well on gas lift first 12 hours. \*Recovered 346 bbls. circ. oil

During July, 1948, well averaged 773 B/D oil, 6 B/D water, 332 MCF/D gas, gravity 21.0°, for 4 days. (Pro 20 figures)

During August, 1948, well averaged 262 B/D oil, 17 B/D water, 261 MCF/D gas, gravity 21.4°, for 29 days. (Pro 20 figures)

DIVISION OF OIL AND GAS  
RECEIVED  
DEC 20 1948

Frew 1-5  
Aliso Canyon

LOS ANGELES, CALIFORNIA  
Standard Oil Company of California

9.

S U M M A R Y

Total Depth: 8678'.

Plugs: None.

<u>Casing:</u> 18-5/8" cemented	40'.	Not tested.
13-3/8" froze & cmtd.	1000'.	Not tested.
7" cemented	8360'.	W.S.O. on holes at 8313'.
382' 5" landed	8675'.	Perforated 8353-8675'.

Junk: None.

Electric Log Markers: None.

Perforation Detail:

7" - At 8313' - four 1/2" holes (Johnston gun) W.S.O. by D.O.G.  
5" - 8353-8675', 16 rows, 2"x80 mesh, 6" centers, 6" undercut  
Kobe torch-cut slots.

Contractor: Rocky Mountain Drilling Company.

Contractor's Drillers:

E. L. Walton  
W. T. Hayes  
Oliver Haws  
B. E. Nutter

B. RICHARDS

HR:ba  
December 13, 1948

MAP	MAP BOOK	CARDS	BOND	FORMS	
				114	121

DIVISION OF OIL AND GAS JUN 25 1975

History of Oil or Gas Well SANTA PAULA, CALIFORNIA

OPERATOR Pacific Lighting Service Co. FIELD Aliso CanyonWell No. Frew #5, Sec. 29, T. 3N, R. 16W, S.B. B. & M.Date May 19, 19 74

Signed

P. S. Magruder, Jr.  
P. S. Magruder, Jr.P. O. Box 54790, Terminal Annex  
Los Angeles, California 90054Title Agent

(Address)

(Telephone Number)  
(213) 689-3561

(President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date	Description
1974	The following report is for the well file only, not required by the Division of Oil & Gas.
5-4	Moved California Production Service rig and mud pump to well.
5-6	On April 30th, pumped 50 bbls. of hot oil down tubing and pulled valve from gas lift mandrel at 8216'. Pumped 340 barrels of polymer drilling fluid down tubing and obtained drilling fluid returns in annulus. Circulated 2 hours to remove gas from drilling fluid. Set tubing plug at 283'. Removed Xmas tree and installed BOPE.
5-7	Filled well with 20 barrels of drilling fluid. Pulled tubing, measuring. Ran 6-1/8" bit and casing scraper to 8293'. Ran 4-1/8" bit, casing scraper and wire brush. Stuck at 8648' (27' from bottom). Attempted to free with pulls up to 90,000# with no success.
5-8	Ran McCullough free point. Stopped on fill at 8630'. Made chemical cut in 2-3/8" tubing at 8620'. Pulled tubing. Ran socket, bumper sub and jars on 60' of 3-1/8" drill collars. Jarred three times and pulled loose. Pulled out of well recovering tools. Reran 4-1/8" bit, casing scraper and wire brush.
5-9	Cleaned out with difficulty 8648'-8675'. Cleaned perforations 8675'-8353', circulating and reciprocating.
5-10	Ran Dresser Atlas cement bond log and recorded 8360'-6980'. Ran Dresser Atlas neutron lifetime log and recorded 8657'-7310'.

Frew #5 (Continued)

Page 2

1974

- 5-11 Set Baker Model "C" bridge plug at 7020'. Removed BOPE and old tubing head. Installed reconditioned tubing head and reinstalled BOPE. Tested tubing head to 2800 psi for 20 minutes.
- 5-12 Idle.
- 5-13 Pulled bridge plug. Ran 2-7/8" tubing hydrotesting to 5000 psi. Set Guiberson K-V 30 L.H. Set packer at 8234' with 12000#. Tubing landed at 8265' (details attached). Set tubing plug in X nipple at 1005'. Removed BOPE and installed reconditioned Xmas tree. Tested Xmas tree to 3500 psi for 25 minutes. Pulled tubing plug.
- 5-14 Circulated drilling fluid out of hole with lease waste salt water. Rig and crew moved to Frew #9.

Tubing Detail  
Frew # 5  
5-13-74

<u>ITEM</u>	<u>LENGTH</u>	<u>DEPTH</u>
Below K.B.	12.30	
2-7/8" EUE 8 thread doughnut & fatigue nipple	.61	
32 jts 2-7/8" EUE 8 thread J-55 tubing	991.38	1004.29
2-1/2" Otis type X Storm choke nipple (2-5/16" I.D.)	.88	1005.17
26 jts 2-7/8" EUE 8 thread J-55 tubing	804.88	1810.05
2-1/2" Camco, J-20W/ 5/16 port Pressure 1040# valve	4.06	1814.11
41 jts 2-7/8" EUE 8 thread J-55 tubing	1262.35	3076.46
2-1/2" Camco J-20 W/ 5/16 port Pressure 1020# valve	4.07	3080.53
36 Jts 2-7/8" EUE 8 thread J-55 tubing	1109.57	4190.10
2-1/2" Camco J-20 W/ 5/16 port Pressure 1000# valve	4.09	4194.19
32 Jts 2-7/8" EUE 8 thread J-55 tubing	995.66	5189.85
2-1/2" Camco J-20 W/ 5/16 port Pressure 980# valve	4.06	5193.91
30 Jts 2-7/8" EUE 8 thread J-55 tubing	927.87	6121.78
2-1/2" Camco J-20 W/ 5/16 port Pressure 960# valve	4.10	6125.88
26 Jts 2-7/8" EUE 8 thread J-55 tubing	812.68	6938.56
2-1/2" Camco J-20 W/ 5/16 port Pressure 940# valve	4.12	6942.68
24 Jts 2-7/8" EUE 8 thread J-55 tubing	741.26	7683.94
2-1/2" Camco J-20 W/ 5/16 port Pressure 920# valve	4.10	7688.04
16 Jts 2-7/8" EUE 8 thread J-55 tubing	489.84	8177.88
2-7/8" EUE 8 thread N-80 pup jt.	4.00	8181.88
2-1/2" MM mandrel W/ Camco R-20 5/16 port 995# valve	9.00	8190.88
1 Jt 2-7/8" EUE 8 thread J-55 tubing	30.88	8221.76
2-7/8" EUE 8 thread N-80 pup jt.	4.00	8225.76
2-1/2" x 7" 22-26# Guiberson KV-30 packer L.H. set	8.22	8233.98
1 Jt 2-7/8" EUE 8 thread J-55 tubing W/ 45deg. angel collar on bottom	30.89	8264.87

Total Jts 265

Packer set at 8233.98 W/ 12,000# weight on same.

3 Jts 2-7/8" EUE 8 thread J-55 tubing from rack to well	94.12
13 Jts 2-3/8" EUE 8 thread J-55 tubing from well to rack	396.72
3 Jts 2-7/8" EUE 8 thread J-55 tubing from well to junk	94.52
1 Jt 2-3/8" EUE 8 thread J-55 tubing from well to junk	31.53

JUN 25 1975

## DIVISION OF OIL AND GAS

SANTA ANA, CALIFORNIA

## History of Oil or Gas Well

OPERATOR PACIFIC LIGHTING SERVICE CO., FIELD Aliso CanyonWell No. Frew #5, Sec. 29, T. 3N, R. 16W, S.B. B. & M.Date January 15, 19 75

Signed

P. S. Magruder, Jr.  
P. S. Magruder, Jr.P. O. Box 54790, Terminal Annex  
Los Angeles, California 90054Title Agent

(Address)

(Telephone Number)

(President, Secretary or Agent)

(213) 689-3561

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date

12-26-74

Moved in California Production Service rig and rigged up same. Archer-Reed rigged up lubricator. Ran in and pulled bottom gas mandrel at 8191'. Rigged up Halliburton pump truck to kill well. Pumped in 78#-79# rbine-polymer workover fluid and bled off gas to Getty trap. Had 2500# on tubing and 2400# on annulus. Pumped in 240 barrels and got gas cut mud returns. Continued circulating gas cut fluid in suction tank. Hauled away 120 barrels of gas cut fluid. Continued circulating to 9:00 P.M. Fluid returns still very gassy and will continue circulating in the morning. Used approximately 360 barrels. Shut rig down at 10:00 P.M.

12-27-74

Circulated gas cut fluid until returns came back at 76#/cu.ft. Ran in with Otis circulating plug and set in X-storm choke nipple at 1005'. Removed Christmas tree and installed Class III B.O.P.E. Tested 2 7/8" rams with water at 3000 psi for 20 minutes. Tested Hydril bag to 2500 psi for 20 minutes. All tests O.K. Pulled Guiberson K-V-30 packer loose. Circulated and circulating plug plugged. Pulled 16 stands and removed circulating plug and X-storm choke. Hooked up and circulated 1-1/2 hours. Closed well in at 10:00 P.M.

12-28-74

California Production Service rig light plant shorted out and was unable to start equipment. Borrowed light plant from C.P.S. rig that finished their job. Started equipment at 10:00 A.M. and circulated bottoms up, 78#/cu.ft. going in and 77#/cu.ft. returns. Pulled out 2 7/8" production string and laid down seven 2 1/2" Camco, J-20, twenty 5/16" port gas valves and 2 1/2" x 7" 22#-26# Guiberson KV-30 packer. Made up 6 1/8" bit and 7" casing scraper on 2 7/8" tubing. Ran in 20 stands (1240') and closed well in at 8:00 P.M. due to bad weather.

12-29-74

Rig idle.

12-30-74

Ran in with 6 1/8" bit and 7" casing scraper to top of 5" liner at 8293'. Circulated bottoms up and free of gas cut fluid. Pulled out and ran in with Baker 7" Lok-Set retrievable bridge plug on 2 7/8" tubing and set at 8273', 20' above liner. Attempted to test bridge plug, but pop-off valve on rig pump leaked and was unable to make test. Will test with cement truck. Pulled tubing and closed well in at 12 midnight.

12-31-74

Made up Baker full-bore squeeze tool on 2 7/8" tubing. Ran in to the following depths and tested 7" 23#-26# casing from retainer to surface:

<u>DEPTH</u>	<u>PRESSURE</u>	<u>MINS.</u>
1531'	3400	20
3017'	2800	20
4751'	2600	20
6018	2400	20
6018' - 8273'	2200	20

All tests O.K. Tested with Halliburton pump truck. Shut rig down at 2:00 P.M. (12-31-74).

1-1-75

Idle.

1-2-75

Pulled out Baker full-bore squeeze tool. Removed Class III B.O.P.E. Rigged up and jack hammered out cellar floor and lowered 15". Closed well down at 8:00 P.M.

1-3-75

Rig and crew idle. Pumped in 60 barrels of salvage mud in 13 3/8" x 7" annulus. Waiting on hydraulic casing jacks.

1-4-75

Rig and crew idle. Waiting on hydraulic casing jacks.

1-5-75

Idle.

1-6-75

Filled 13 3/8" x 7" annulus with salvage mud, used 72 barrels. Removed tubing head. Rigged up casing jacks and Midway 7" casing spear. Took hold of 7" casing and removed pack off. Welder split 13 3/8" casing head to release casing slips and unland 7" casing. Cut off 20" conductor pipe and 13 3/8" casing head. Welded on new Cameron 5000# 13 3/8" casing head and wrapped same. Shut rig down at 10:00 P.M.

1-7-75

Boothe Mobile Inspection Service x-rayed 13 3/8" 5000# casing head weld - O.K. Rigged up hydraulic jacks and Midway 7" casing spear. Landed 7" casing in 13 3/8" casing head with 175,000# weight. Tore out jacks and laid down spear. Installed 13 3/8" x 7" 5000# Cameron tubing head and tested seals and flange at 3500 psi for 20 minutes. Reinstalled Class III B.O.P.E. Tested 2 7/8" rams with water at 3400 psi for 20 minutes. Tested Hydril bag at 2500 psi for 20 minutes. Tests O.K. (NOTE: NOWSCO nitrogen truck left the location to make a telephone call and went back to Bakersfield without notifying the rig. Ventura NOWSCO truck broke down and will be repaired by 10:30 A.M., 1-8-75). Made up Baker bridge plug retrieving tool and ran in approximately 5000'.

1-8-75

Continued running in hole with Baker bridge plug retrieving tool. Latched on to bridge plug at 8273' and released same. Circulated bottoms up and free

of gas cut mud. Pulled out. Left bridge plug in hole. Re-ran retrieving tool and latched on to bridge plug on top of 5" liner. Pulled 97 stands and closed well in at 10:00 P.M.

1-9-75

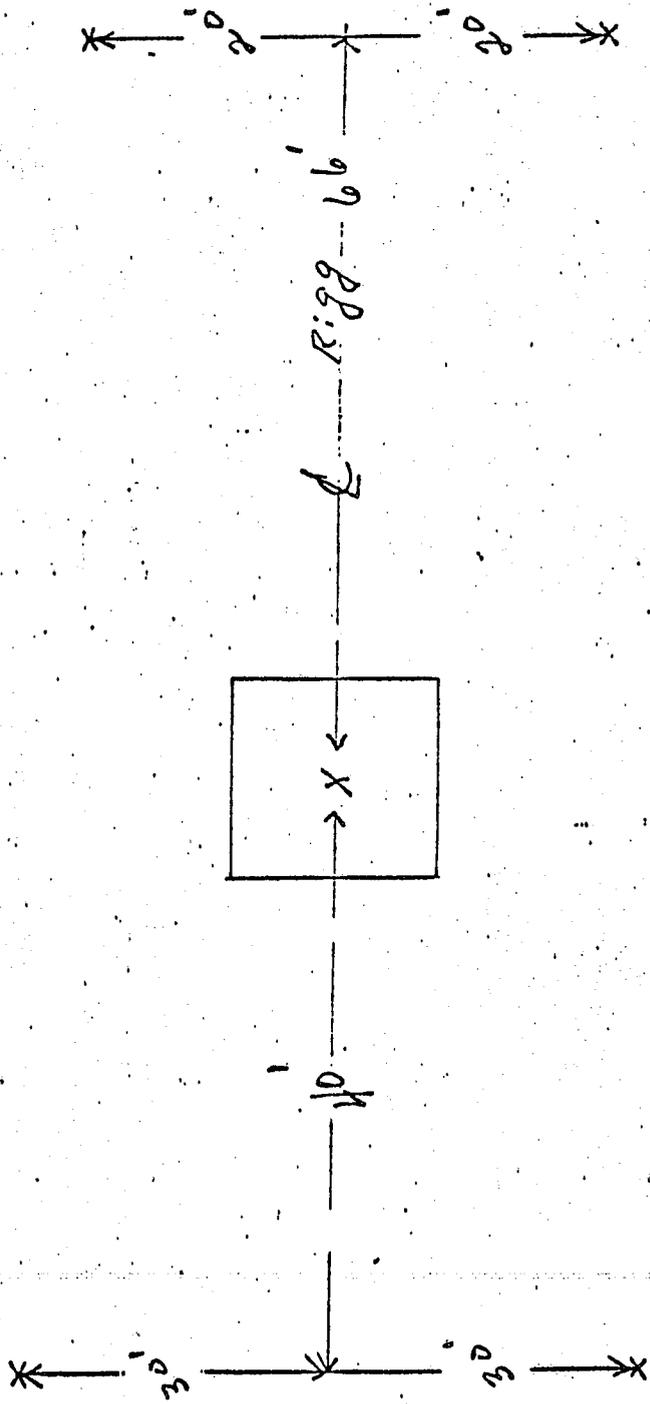
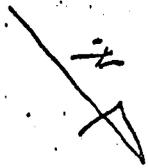
Pulled out 37 stands and recovered Baker bridge plug. Ran in 4 1/8" bit and 5" casing scraper on 2 3/8" and 2 7/8" tubing to 8673'. Circulated bottoms up and free from gas cut mud. Pulled up to 1500'.

1-10-75

Finished pulling out and laid down 4 1/8" bit and 5" casing scraper. Made up 2 7/8" tubing string with Otis XN NO-GO nipple, perma latch packer, two X-nipples and sliding sleeve. Hydrotested tubing at 5000 psi. Set perma latch packer at 8229.95' with 14,000# on packer. Bottom of tubing string at 8262.45'. Removed B.O.P.E. and installed 5000# Christmas tree. Tested seals and tree at 4500 psi for 20 minutes each. Rigged up and displaced brine-polymer fluid with lease salt water. Used 310 barrels to change over. Rig released at 10:00 P.M.



ANCHORS  
FREW 5



037-00668

original  
not square

well

To: M. W. Morris  
From: M. B. Standing

CORE ANALYSIS RESULTS  
WELL FREW 1-5 ALISO CANYON

California Research Corporation  
La Habra, Calif., July 22, 1948

This report presents the results of analyses of cores from Well Frew 1-5 Aliso Canyon. This work was authorized under your GO-113, 17687.

Permeability, porosity and fluid content are reported in Table I. Formation factor determinations will be found in Table II.

cc: J. E. Foussaint (2)  
J. H. Thacher  
M. C. Office (3)  
L. A. Office (1)  
E. G. Gaylord (2)  
File (2)

TABLE I

WELL FREW 1-5 ALISO CANYON  
ROUTINE CORE ANALYSIS RESULTS

Depth Ft.	Flu.	Perm. Md.	Porosity %	Water Sat. %	Oil Sat. %	Oil-Water Ratio
			23.4	73	0	0.00
2715	Neg.	54	22.3	79	0	0.00
6525	Neg.	18	23.1	85	1	0.01
6860	*Neg.	12	19.5	92	0	0.00
8060	Neg.	42				

\* This sample fluoresced a slight positive in CCl<sub>4</sub>.  
These cores taken with a HONCO sidewall sampler.

Analysts:  
R. R. Reese  
H. I. Shaffer

TABLE II

WELL FREN 1-5 ALISO CANYON  
FORMATION FACTOR DETERMINATIONS

<u>Depth Ft.</u>	<u>Permeability Md.</u>	<u>Porosity %</u>	<u>"F" Factor</u>
2715	54	23.4	5.8 ?
6525	18	22.3	8.5 - Cretaceous
6860	12	23.1	9.1 Pliocene
8060	42	19.5	10.4 - Eocene above fru

Analyst:  
M. R. Sanchez

11) Std - Frow 5 (29, 3N, 16W) Highest sample is SWC at 4275' which contains Cretaceous Mang 930.

H-6 ✓  
H-8

Re-log correlation would place the Tertiary (Frow zone) / Cretaceous contact at 2740' ±

IBM

TO

194

FROM

SUBJECT: FREW #1-5

SIDEWALL SAMPLE

OUR FILE DESCRIPTION

S.O.Co.

YOUR FILE

Sec. 29, 3-IV, 16-V Alliso Canyon

Core No	Depth	Rec	Description	Age
12	4275	1"	Co silty shale - streak light gy silt. R. Haplo. crushed. white - & other Aren. indet. Cretaceous	
11	4420	1"	Part firm <u>gy siltstone</u> . Part <u>fine grained</u> light gy sd - C Bronze mica.	
10	4750	1 1/2"	<u>Siltstone</u> & fine <u>gy sd</u> as above.	
9	6380	2"	Lithology as above - Bronze mica - fine Cret. reddish br. mica	
8	6525	2"	SAND - gray poorly sorted, grains up to 1/2 mm. firm. Cret.	
7	6700	3"	Rather soft, <u>olive brn</u> sdy siltstone - broken - frags mixed w/ mud. Pliocene	
6	6770	2"	Frags siltstone - as above - mixed w/ mud. Pliocene	
5	6860	2 1/4"	SAND <u>br. gy argill.</u> fine firm but easily friable. Plioc.	
4	7100	2"	Hd., slickensided dk brn phosphatic, foraminiferal shale. Re fish Rums, forams crushed & granulated. Miocene - Mottled	
3	7690	1/2"	Small frags brn siltstone & gy argillaceous siltstone part of latter w/ greenish mottling - from Glauconite scattered aggregates of finely divided <u>pyrite</u> - whole w/ sd grains scattered thruout & mixed w/ mud. - Largely (?) or All (?) well calc? Eocene?	
2	7875	1 1/2"	Steel gy (when dry) siltstone - x Mollusc frag - smooth re fine pyrite - No forams noted. Eocene	
1	8060		(1) Sand - light greenish gy. - numerous white crushed grains (2) Argill. silt grayish green, crushed against sand. Eocene fine pyrite.	

(8090-8140 base of Frew fault zone) Te/Tm



6325 - top of  
free fault zone  
Kupf  
176

Free fault  
zone

8090 - 8140  
Base of free fault zone  
Tef  
Tm

← Cretaceous  
6525  
← Eocene  
6700  
← Pliocene  
← Pliocene  
← Eocene  
6800

7100  
MICHIGAN SHALE

7690  
← Eocene 2  
7875  
← Eocene  
8060  
← Eocene

Def. Michigan forams  
RED 19

No diagnostic forams  
Spore coated forams (fine)  
Clay grey silt.  
Eocene 1.5 ft. No forams  
Grey muddy silt.  
No forams. Little indeterminate

Well Frew No 1-5  
 Company S.O.  
 Sec 29 T3-N R. 16-W  
 District Aliso Canyon

Elevation  
 Date Spudded  
 Date Finished  
 Date of Report

Casing	Log	Oil Zones	Depth FOO CORE	Faunal Zones	Remarks
			2		
			3		
			4		
			5		
			6		
			7		
			8		
			9		
			10		
			11		
			12		
			13		
			14		
			15		
			16		
			17		
			18		
			19		
			20		
			21		
			22		
			23		
			24		
			25		
			26		



STATE OF CALIFORNIA  
DEPARTMENT OF NATURAL RESOURCES

## DIVISION OF OIL AND GAS

Report on Test of Water Shut-off  
(FORMATION TESTER)

No. T 1-48508

Mr. W. C. Johnson  
Los Angeles 15, Calif. July 28, 19 48  
Los Angeles 54, Calif.  
Agent for STANDARD OIL COMPANY OF CALIFORNIA

DEAR SIR:

Your well No. "Frew 1" 5, Sec. 29, T. 3 N., R. 16 W., S. E. B & M.  
Aliso Canyon Field, in Los Angeles County, was tested for water shut-off  
on July 21, 1948. Mr. J. L. White, Inspector, designated by the supervisor,  
was present as prescribed in Secs. 3222 and 3223, Ch. 93, Stat. 1939; there were also present  
George Collins and Herbert Dye, Drilling Foremen.

Shut-off data: 7 in. 23 & 26 lb. casing was cemented ~~xxxx~~ at 8360 ft.  
on July 17, 1948 in 11 in. hole with 300 sacks of cement  
~~xxxx~~ of which 8 sacks was left in casing.  
Casing record of well: 13-3/8" cem. 1000'; 7" cem. 8360'; four 1/2" test holes 8313', W.S.O.

Present depth 8467 ft. Bridged with cement from 8360 ft. to 8325 ft. Cleaned out to 8325 ft. for test.  
A pressure of 1000 lb. was applied to the inside of casing for 15 min. without loss after cleaning out to 8315 ft.  
A Johnston gun and tester was run into the hole on 3-1/2 in. drill pipe ~~xxxx~~  
with 1000 ft. of water-mud cushion, and packer set at 8277 ft. with tailpiece to 8302 ft.  
Tester valve, with 3/8 in. bean, was opened at 1:08 a.m. and remained  
open for 1 hr. and ~~xxx~~ min. During this interval there was a light, steady blow for 1.5  
min., and no blow thereafter.

THE INSPECTOR ARRIVED AT THE WELL AT 4:20 A. M. AND MR. COLLINS REPORTED:

1. An 11" rotary hole was drilled from 1000' to 8360'; an 8-3/4" rotary hole, from 8360' to 8467'.
2. Electrical core readings showed the top of Sesnon oil zone at 8360'.
3. The 7" casing was shot-perforated with four 1/2" holes at 8313' for this test, and the test was made as noted above.

THE INSPECTOR NOTED:

1. When the drill pipe was removed, 60' (net) of heavy, cement-cut, drilling fluid was found in the drill pipe above the tester, equivalent to 0.4 bbl.
2. The recording pressure bomb chart showed that the tester valve was open 1 hr.

The test was completed at 6:30 a.m.

THE WATER SHUT-OFF ABOVE THE PERFORATIONS AT 8313' IS APPROVED.

JLW:OH

cc- J. E. Toussaint  
M. W. Morris *S/*

R. D. BUSH, State Oil and Gas Supervisor

By *R. D. Bush*, Deputy

STATE OF CALIFORNIA  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF OIL AND GAS**

**Special Report on Operations Witnessed**

No. T 1-48281

Los Angeles 15, Calif.

June 9, 1948

Mr. W. C. Johnson

Los Angeles 54, Calif.

Agent for STANDARD OIL COMPANY OF CALIFORNIA

DEAR SIR:

Operations at your well No. "Frew 1" 5 Sec. 29, T. 3 N., R. 16 W., S. B. B. & M.,  
Aliso Canyon Field, in Los Angeles County, were witnessed by  
Paul Betts, Inspector, representative of the supervisor,  
on May 25, 1948. There was also present W. T. Hayes, Driller;  
L. O. Rankin, Derrickman.

Casing Record	<u>18-5/8" cem. 40'; 13-3/8" cem. 1000'.</u>	Junk	<u>XXXX</u>
	<u>T. D. 1002'.</u>		

The operations were performed for the purpose of inspecting blowout prevention equipment and installation.

The inspector arrived at the well at 9:45 p.m. and Mr. Hayes reported:

1. A 17-1/2" rotary hole was drilled from the surface to 1002'.
2. On May 23, 1948, 13-3/8", 54 lb. casing was cemented at 1000' with 700 sacks of cement plus 2% gel.
3. Cement returned to the surface.

THE INSPECTOR NOTED THAT THE WELL WAS EQUIPPED WITH THE FOLLOWING BLOWOUT PREVENTION EQUIPMENT:

1. A Shaffer double cellar control gate for closing in the well with the drill pipe out of the hole, and for closing around the 4-1/2" drill pipe.
2. A Hydrill blowout preventer for closing around the 4-1/2" drill pipe.
3. The controls for the above equipment were located outside the derrick.
4. A 2" mud fill-up line with a 2" high pressure Nordstrom valve into the 13-3/8" casing below the above equipment.

The inspection was completed at 10:00 p.m.

THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

PWB:OH

cc- J. E. Toussaint  
M. W. Morris

*5/AM*

R. D. BUSH

State Oil and Gas Supervisor

By *[Signature]* Deputy

STATE OF CALIFORNIA  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF OIL AND GAS**

**Report on Proposed Operations**

No. P 1-44957

Los Angeles 15, Calif. May 12, 19 48

Mr. W. C. Johnson

Los Angeles 54, Calif.

Agent for STANDARD OIL COMPANY OF CALIFORNIA

DEAR SIR:

Your proposal to drill Well No. "Frew 1" 5  
Section 29, T. 3 N., R. 16 W., S. B. B. & M., Aliso Canyon Field, Los Angeles County,  
dated May 4, 19 48, received May 6, 19 48, has been examined in conjunction with records filed in this office.

Present conditions as shown by the records and the proposal are as follows:

**THE NOTICE STATES:**

"The well is From Point 19 on boundary line of Rancho Ex-Mission San Fernando, 1525.21' S 5° 00' 39" W along the Westerly Rancho line and Easterly line of Frew 1 Lease, thence 76.72' S 5°-04'-42" W along the Easterly line of Frew 1 Lease (Westerly Rancho line), thence 916.99' westerly at right angles. (Final)  
Elevation of Derrick Floor above sea level 2395.05 feet. (Final)  
All depth measurements taken from top of Derrick Floor, which is 8.30 feet above ground. We estimate that the first productive oil or gas sand should be encountered at a depth of about -- feet."

**PROPOSAL:**

"We propose to use the following strings of casing, either cementing or landing them as herein indicated:

Size of Casing	Weight	Grade and Type	Depth	Landed or Cemented
18-5/8"	Conductor	--	40'	Cemented
13-3/8"	54.5	J-55	1000±	"
7"	23 & 26	J-55 & N-80	8350±	"
5-1/2"	20	J-55	8650±	Landed, Liner.

Well is to be drilled with rotary tools.

NOTE: Derrick may be removed and well serviced with a portable mast if necessary. It is understood that if changes in this plan become necessary we are to notify you before cementing or landing casing."

**DECISION:**

**THE PROPOSAL IS APPROVED PROVIDED THAT**

1. Mud fluid consistent with good drilling practice shall be used and the column of mud fluid maintained at all times to the surface, particularly while pulling the drill pipe.
2. Blowout prevention equipment, sufficient to provide a complete close-in of the well under pressure at any time, shall be installed.
3. Any hole to be sidetracked in any oil or gas zone shall be filled with cement, if possible.
4. THIS DIVISION SHALL BE NOTIFIED AS FOLLOWS
  - (a) To inspect the installed blowout prevention equipment before drilling below 1500'.
  - (b) To witness a test of the effectiveness of the 7" shut-off.

cc - J. E. Toussaint  
M. W. Morris  
United States Geological Survey

R. D. BUSH  
State Oil and Gas Supervisor

CLB:ES

By E. H. Musser Deputy

Blanket bond.

03700668

DIVISION OF OIL AND GAS  
RECEIVED  
MAY 6 - 1948  
15  
LOS ANGELES, CALIFORNIA

STATE OF CALIFORNIA  
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Notice of Intention to Drill New Well

This notice must be given and surety bond filed before drilling begins

Los Angeles Calif. May 4, 1948

DIVISION OF OIL AND GAS

Los Angeles Calif.

In compliance with Section 3203, Chapter 93, Statutes of 1939, notice is hereby given that it is our intention to commence the work of drilling well No. "Frew 1" - #5, Sec. 29, T. 3N, R. 16W

S.B. B. & M., Aliso Canyon Field, Los Angeles County.

Location: From Point 19 on boundary line of Rancho Ex-Mission San Fernando, 1525.21' ~~Legal description of lease~~ S 5° 00' 39" W along the Westerly Rancho line and Easterly line of Frew 1 Lease, thence 76.72' S 5° 04' 42" W along the Easterly line of Frew 1 Lease ~~The well is~~ feet North and feet East from (Westerly Rancho line), thence 916.99' westerly at right angles.

Derrick Floor (Give location in distance from section corners or other corners of legal subdivision) Elevation of ground above sea level 2395.05 feet. (Final)

All depth measurements taken from top of Derrick Floor (Final) 8.30 feet above ground.

We estimate that the first productive oil or gas sand should be encountered at a depth of about -- feet.

We propose to use the following strings of casing, either cementing or landing them as herein indicated:

Size of Casing, Inches	Weight, Lb. Per Foot	Grade and Type	Depth	Landed or Cemented
18 5/8"	Conductor	--	40'	Cemented
13 3/8"	54.5	J-55	1000±	"
7"	23 & 26	J-55 & N-80	8350±	"
5 1/2"	20	J-55	8650±	Landed, Liner.

NOTE: Derrick may be removed and well serviced with a portable mast if necessary.

Well is to be drilled with rotary tools.

It is understood that if changes in this plan become necessary we will notify you before cementing or landing casing.

MAP MAP CARDS BOND FORMS  
18A JLV M JLV  
Standard Oil Company of California

Address 605 W. Olympic Blvd.  
Los Angeles 20, California

Telephone number Michigan 2711

(Name of Operator)  
By J. A. Rocher  
Mgr. Prod. Dept., So. District

DOG ADDRESS NOTICE TO DIVISION OF OIL AND GAS IN DISTRICT WHERE WELL IS LOCATED

JET  
JHT  
MC

614  
Approx 1260' N 1300' W fr  
SE 1/4 Sec 29