

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company

Well: Fernando Fee 38 A

A.P.I. No. 03724230

Date: 7/25/2016

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Field: Aliso Canyon County: Los Angeles

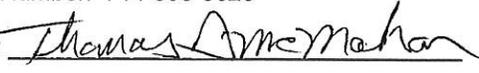
Surface Location: Sec. 27 T3N, R16W, S.B.B&M

Name: Tom McMahon

Title: SIMP Project Manager

(President, Secretary, or Agent)

Telephone Number: 714-398-5020

Signature: 

(Person Submitting Report)

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, balling tests, and initial production data.

Start Date	Ops this Report (DOGGR)
4/30/2016	Held safety meeting. Serviced rig. Field pressure = 1,066 psi, SITP = 0 psi, SICP = 0 psi. Rigged up (Weatherford) testers and rigged up BOP testing equipment. Pressure test BOP as per Gas Company Standard 224.05: Pressure tested pipe and blind rams, all lines and connections at 300 psi low / 5000 psi high for 20 min. each test. Annular preventer at 300 psi low / 3500 psi high for 20 min each test. Good test. Bled off pressure and rigged down (Weatherford) equipment. (Ernie Blevins with the DOGGR inspected BOP equipment. Pulled back pressure valve. Un-land hanger and released seals from (Baker) SC-1. Laid down (3) 2 7/8", 6.5#, N-80, 8rd pup joints and pulled out of the hole with (40) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Secured well for the weekend.
5/2/2016	Held safety meeting. Serviced rig. Field pressure = 1,070 psi. SITP = 0 psi. SICP = 0 psi. Open well. Continue pulling of the hole with and stood back (96) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down gas lift mandrel. Continue pulling of the hole with and stood back (86) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Laid down profile nipple, sliding sleeve, on/off tool and (Baker) seal assembly. Tallied and picked up (Baker) 9 5/8", 47# scraper and bumper sub. Ran in the hole on (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Tagged liner top at 7,031'. Pulled out of the hole with scraper and stood back (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down scraper. Tallied and picked up 2 3/8" mule shoe and (12) joints of 2 3/8", 5.9#, N-80, WTS-6 tubing, 2 3/8" X 2 7/8" crossover. Ran in the hole on (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Had to rotate tubing at 7,036' to get down. Tagged PBTD at 7,359'. Pulled out of the hole with (40) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Secured well till the AM.
5/3/2016	Held safety meeting. Serviced rig. Field pressure = 1,068 psi, SITP = 0 psi, SICP = 0 psi. Pumped 50 bbl's of 8.5 ppg, 56 vis polymer. Open well. Continued pulling out of the hole and stood back (184) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Laid down 2 3/8" X 2 7/8" crossover, (12) joints of 2 3/8", 6.5#, N-80, WTS-6 tubing & 2 3/8" mule shoe. Held pre-job safety meeting with Scientific Drilling. Nipped up shooting flange. Rigged up (SDI) wireline unit and lubricator. Ran in the hole with Gyro and tagged at 7,260' (PBTD 7,354'). Logged from 7,260' to surface. Rigged down (SDI) Wireline unit and lubricator. Nipped down shooting flange. Ran in the hole with (60) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.
5/4/2016	Held safety meeting. Serviced rig. Field pressure = 1,049 psi, SITP = 0 psi, SICP = 0 psi. Open well. Pulled out of the hole with and stood back (60) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Nipped up shooting flange. Rigged up (Tiger) wireline unit. Ran in with caliper tool. Tagged liner top at 7,036' (wireline measurement). Log 7,036' to surface. Rigged down (Tiger) wireline unit. Rigged up (Baker) wireline unit. Ran in with Vertilog. Tagged liner top at 6,992' (wireline measurement). Log from 6,992' to surface. Rigged down (Baker) wireline unit. Nipped down shooting flange. Picked and ran in the hole with (Baker) seal assembly with no latch. Ran on (204) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.
5/5/2016	Held safety meeting. Serviced rig. Field pressure = 1,066 psi. SITP = 0 psi, SICP = 0 psi. Open well. Continued running in the hole with (Baker) seal assembly with no latch and (20) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Stabbed into (Baker) SC-1 packer with 10K down weight. Filled the hole with 66 bbls of 8.5 ppg, 56 vis polymer. Closed pipe rams. Pressured test annulus. No test fluid coming out of tubing. Stabbed in and out several times with 20K down and still no test. Pulled out of the hole with (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Broke out and laid down (Baker) seal assembly. Tallied and picked up (Baker) 9 5/8", 47# Retrievmatic packer. Ran in the hole on (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Tagged liner top at 7,032'. Set packer at 7,021' (COE) with 30K down weight. Filled hole with 15 bbls of 8.5 ppg, 56 vis polymer. Closed pipe rams. Pressure tested annulus. No test fluid coming out the tubing. Move packer up above ECP at 6,976'. Set packer at 6,955' (COE). Tried to test annulus. No test. Pulled out of the hole with (112) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Set packer at 3,550'. Filled hole with 6 bbls of 8.5 ppg, 56 vis polymer. Closed pipe rams. Pressure tested annulus. No test fluid coming out the tubing. Pulled out of the hole with (62) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company

Well: Fernando Fee 38 A

A.P.I. No. 03724230

Date: 7/25/2016

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Field: Aliso Canyon County: Los Angeles

Surface Location: Sec. 27 T3N, R16W, S.B.B&M

Name: Tom McMahon Title: SIMP Project Manager  
 (President, Secretary, or Agent)

Telephone Number: 714-398-5020

Signature: \_\_\_\_\_

(Person Submitting Report)

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, balling tests, and initial production data.

Start Date	Ops: this Report (DOGGR)
5/6/2016	Held safety meeting. Serviced rig. Field pressure = 1,070 psi. Open well. Continued pulling out of the hole with (50) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Rigged up (Weatherford) testers. Plugged tested (Baker) 9 5/8", 47# Retrievmatic packer and (2) of joints of 2 7/8", 6.5#, N-80, 8rd tubing. Tested to 5,000 psi. Good test. Rigged up bar tools. Hydrotested in the hole with (116) of joints of 2 7/8", 6.5#, N-80, 8rd tubing. Set packer at 3,660'. Test annulus. No test fluid coming out the tubing. Rigged down (Weatherford) testers. Rigged up (Western) wireline. Ran in the hole with "XX" plug and set in "X" profile at 3,660'. Test backside. Pumping at 2 bpm at 400 psi. No flow out the tubing. Tested tubing to 1200 psi. Held solid for 10 minutes. Ran in the retrieving tool and pulled out with "XX" plug. Released packer. Secured well till the AM.
5/7/2016	Held safety meeting. Serviced rig. Field pressure = 1,072 psi. Open well and continued pulling out of the hole and stood back (116) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Laid down (Baker) packer. Tallied and picked up new (Baker) 9 5/8", 47# Retrievmatic packer and ran in on (112) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Set packer 3,796' with 15k compression. Filled the annulus with 74 bbls of 8.5 ppg, 56 vis polymer. Continued run in the hole with (116) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Set packer at 7,021' (COE) with 25K compression. Filled the annulus with 13 bbls of 8.5 ppg, 56 vis polymer. Rigged up (PROS) testers. Tested annulus from 7,021' to surface to 2,250 psi for one hour. Bled off pressure and pulled (114) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Set packer at 3,500' (COE) with 17K compression. Filled the hole with 22 bbls of 8.5 ppg, 56 vis polymer. Tested annulus from 3,500' to surface to 3,625 psi for one hour. Witnessed by Kris Gustafson. Bled off pressure. Released packer. Pulled out of the hole with (20) joints of 2 7/8", 6.5#, N-80, 8rd tubing. BOP drill (56 seconds). Secured well for the weekend.
5/9/2016	Held safety meeting. Serviced rig. Field pressure = 1,077 psi, SITP = 0 psi, SICP = 0 psi. Pumped 40 bbls of 8.5 ppg, 56 vis polymer. Open well. Continued pulling out of the hole and stood back (116) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down (Baker) 9 5/8", 47# Retrievmatic packer. Tallied and picked up (Baker) 9 5/8", 47# Lok-Set bridge plug. Ran in the hole on (200) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Bridge plug set at 6,281' going in the hole. Could not release bridge plug. Continued to rotate and try releasing bridge plug for one hour. Bridge plug pulled free. Pulled out of the hole and stood back (200) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down bridge plug. Found that the bridge plug had wrong gauge rings. Picked up new bridge plug and ran in the hole on (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Set (Baker) 9 5/8", 47# Lok-Set bridge plug at 7,021' (COE). Test bridge plug to 500 psi for 10 minutes. Good test. Secured well till the AM.
5/10/2016	Held safety meeting. Serviced rig. Field pressure = 1,073 psi, SITP = 0 psi, SICP = 0 psi. Open well. Dumped 10' of sand. Displaced with 40 bbls of 8.5 ppg, 56 vis polymer. Pulled out of the hole and stood back (224) joints of 2 7/8", 6.5#, N-80, 8rd tubing and (Baker) retrieving head. Filling the hole every 10 stands. Rigged down work floor. Nipped down 11" 5M annular and double gate. Cameron bled off voids. Nipped down tubing spool and DSA. Cameron inspected casing stub. Nipped up 13 5/8" 3M X 11" 5M crossover spool. Nipped up 11" 5M double gate. Rigged up work floor. Secured well till the AM.
5/11/2016	Held safety meeting. Service rig. Field pressure = 1,078 psi. SITP = 0 psi. SICP = 0 psi. Opened well. Held pre-job safety meeting. Rigged up (Schlumberger) wireline unit and lubricator. Ran in the hole with USIT log. Tagged sand @ 7,010'. Log from 7,010' to surface. Rigged down (Schlumberger) wireline unit and lubricator. Secured well. Wait on the tubing spool to be refurbished.
5/16/2016	Held safety meeting. Serviced rig. Field pressure = 1,078 psi. SITP = 0 psi, SICP = 0 psi. Open well. Nipped down 11" 5M double gate BOP and crossover spool. Installed refurbished 13-5/8" 3M X 11" 5M double studded seal flange and 11" 5M tubing head. Cameron packed "P" seals with plastic. Tested "P" seals to 300 psi low / 3,800 psi high for 20 minutes. Tested tubing spool to 300 psi low / 3,000 psi high for 20 minutes. Good test. Nipped up 11" 5M double gate BOP and annular and all lines. Function test BOP. Rigged up work floor. Rigged up (Weatherford) tester. Tested annular connection to 300 psi low / 3,500 psi high. Open annular and closed pipe rams. Tested pipe rams and all connections to 300 psi low / 5,000 psi high all tests 20 minutes. Rigged down (Weatherford) tester. Tallied and picked up (Baker) retrieving head. Ran in the hole on (182) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.  BOP drill: 55 seconds to secure well!

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company

Well: Fernando Fee 38 A

A.P.I. No. 03724230

Date: 7/25/2016

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Field: Aliso Canyon County: Los Angeles

Surface Location: Sec. 27 T3N, R16W, S.B.B&M

Name: Tom McMahon Title: SIMP Project Manager  
 (President, Secretary, or Agent)

Telephone Number: 714-398-5020

Signature: \_\_\_\_\_

(Person Submitting Report)

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, balling tests, and initial production data.

Start Date	Ops this Report (DOGGR)
5/17/2016	Held safety meeting. Serviced rig. Field pressure = 1,080 psi, SITP = 0 psi, SICP = 0 psi. Continued running in the hole with (41) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Tagged sand at 7,020'. Rigged up circulating equipment. Reverse circulated to (Baker) 9 5/8", 47# Lok-set bridge plug at 7,030'. Circulated clean at 4 bpm at 400 psi. Reverse 2 tubing volumes. Opened bypass and let equalize for one hour. Tried to release bridge plug. Got initial turns in but torques up from then on. Tried circulating the long way and work bridge plug. Worked bridge plug for 3 hours. Rigged down circulating equipment. Released from bridge plug. Pulled out of the hole with (222) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Talled and ran in the hole with retrieving head, bumper sub and tubing jar. Ran in the hole on (142) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.
5/18/2016	Held safety meeting. Serviced rig. Field pressure = 1,074 psi. Open well. Ran in the hole with (40) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Rigged up circulating equipment. Reverse circulated 60 bbls of 8.5 ppg, 56 vis polymer. Shut down pump and latched on to the bridge plug. Tried to hold right hand torque and jar on bridge plug. Worked bridge plug for 4 hours jarring and holding right hand torque. Rig started making noise from draw works. Released from bridge plug and laid down one joints. Secured the well till the AM.
5/19/2016	Held safety meeting. Serviced rig. Field pressure = 1,074 psi. SITP = 0 psi, SICP = 0 psi. Open well. Pulled out of the hole with (222) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down retrieving head, bumper sub and tubing jar. Talled and picked up, (Baker) retrieving head, lubricated bumper sub and fishing jar. Ran in the hole on (223) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Rigged up power swivel and circulating equipment. Latched on to bridge plug at 7,026'. Jarred on bridge plug 20K over pull while holding right hand torque with power swivel. Circulated at 2 bpm at 200 psi. Pulled to a maximum 120K. Worked stuck bridge plug for 3.5 hours. Release bridge plug. Rigged down power swivel and circulated equipment. Pulled out of the hole with (30) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.
5/20/2016	Held safety meeting. Serviced rig. Field pressure = 1,074 psi, SITP = 0 psi, SICP = 0 psi. Continued pulling out of the hole with (192) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down retrieving head, lubricated bumper sub and fishing jar. Talled and picked up 5-3/4" box tap, safety joint, 8.5" stop, ported sub, (Baker) Rattler, lubricated bumper sub, bi-directional jar, (4) 4-3/4" drill collars, intensifier, XO, 4' 2-7/8", 6.5#, N-80, 8rd tubing. Ran in the hole on (194) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Tagged down at 6,330'. The 8.5" stop is at 6,290'. Pulled out of the hole with (216) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Broke out the stop and ran back in the hole with (204) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.
5/21/2016	Held safety meeting. Serviced rig. Field pressure = 1,082 psi. SITP = 0 psi, SICP = 0 psi. Continued running in the hole with (12) of 2 7/8", 6.5#, N-80, 8rd tubing. Rigged up power swivel and circulating equipment. Latched on to bridge plug at 7,026' with box tap. Slipped off and could not re-engage. Rigged down power swivel and circulating equipment. Pulled out of the hole with (218) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down box tap. Made up 4-5/8" overshot with 2-3/4" grapple. Ran in the hole with fishing BHA on (218) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Rigged up power swivel and circulating equipment. Latch on to bridge plug at 7,026'. Jarred on bridge plug and activated rattler at 2 bpm at 1,500 psi. Work on stuck bridge plug for 1.5 hours. Bridge plug came free. Rigged down power swivel and circulating equipment. Pulled out of the hole with (32) joints of 2 7/8", 6.5#, N-80, 8rd tubing. Secure well till the AM.
5/23/2016	Held safety meeting. Serviced rig. Field pressure = 1,086 psi, SITP = 0 psi, SICP = 0 psi. Opened well. Continued pulling out of the hole with (186) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Laid down (Baker) 9-5/8", 47# Lok-set bridge plug. Broke out and laid down fishing tools. Talled and picked up (Baker) 9-5/8", 47# positive scraper and bumper sub. Ran in the hole on 2-7/8", 6.5#, N-80, 8rd tubing. Tagged liner top. Pulled out of the hole with (224) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 10 stands. Laid down scraper and bumper sub. Ran in the hole with (50) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company

Well: Fernando Fee 38 A

A.P.I. No. 03724230

Date: 7/25/2016

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Field: Aliso Canyon County: Los Angeles

Surface Location: Sec. 27 T3N, R16W, S.B.B&M

Name: Tom McMahon Title: SIMP Project Manager  
(President, Secretary, or Agent)

Telephone Number: 714-398-5020

Signature: \_\_\_\_\_

(Person Submitting Report)

**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, balling tests, and initial production data.**

Start Date	Ops this Report (DOGGR)
5/24/2016	Held safety meeting. Serviced rig. Field pressure = 1,086 psi. SITP = 0 psi, SICP = 0 psi. Open well. Pulled out of the hole with (50) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Rigged up (Baker) wireline unit. Logged caliper from liner top to surface. Rigged down (Baker) wireline unit. Tallied and picked up 2-3/8" mule shoe, (12) joints of 2-3/8", 5.9#, WTS-6 tubing, 2-3/8" X 2-7/8" crossover. Ran in the hole on (222) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Tagged down at 7,354'. Pulled out of the hole and laid down (87) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Secured well till the AM.  16:40 BOP drill (58 seconds)
5/25/2016	Held safety meeting. Serviced rig. Field pressure = 1,083 psi, SITP = 0 psi, SICP = 0 psi. Opened well. Continued pulling out of the hole laying down (135) joints of 2-7/8", 6.5#, N-80, 8rd tubing. Filling the hole every 20 joints. Rigged up (Weatherford) tester. Changed pipe rams from 2-7/8" to 3-1/2". Test pipe rams. 300 psi low / 5000 psi high for 20 minutes each. Rigged down (Weatherford). Swapped out trailers. Tallied and picked up (Baker) 9-5/8", 47#, "DL" packer with re-entry guide, 10' 2-7/8", 6.5#, L-80, 8rd pup joint, (Baker) "XN" profile nipple (2.313" / 2.205") with plug in place, one joint of 2-7/8", 6.5#, L-80, 8rd tubing, (Baker) CMD sliding sleeve (opens down), one joint of 2-7/8", 6.5#, L-80, 8rd tubing, 2-7/8" X 3-1/2" crossover, one joint of 3-1/2", 9.3#, L-80, 8rd tubing. Rigged up (Weatherford) hydrotesters. Plug tested to 5000 psi for 20 minutes. Good test. Rigged up (Western) wireline unit and pulled plug from "XN". Rigged down (Western) wireline unit. Tallied and picked up (83) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Tested to 5000 psi and Seal Lubed all joints. Secured well till the AM.
5/26/2016	Held safety meeting. Serviced rig. Field pressure = 1,085, SITP = 0 psi, SICP = 0 psi. Opened well. Continued tallying and picking up (37) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Swapped out trailers. Tallied and picked up (103) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Tested to 5000 psi and Seal Lubed all joints. Made up 3-1/2" X 2-7/8" crossover, one joint of 2-7/8", 6.5#, L-80, 8rd tubing, (3) 2-7/8", 6.5#, L-80, 8rd pup joints and tubing hanger. Plugged tested to 5000 psi. Rigged down (Weatherford) hydrotesters. Tried to set packer at 7,014' would not hold. Kept slipping up hole. Attempted multiple times to set it with out any success, move the packer 48' higher and attempted to set it multiple times with out any success. Secured well till the AM.
5/27/2016	Held safety meeting. Serviced rig. Field pressure = 1,050 psi. SITP = 0 psi, SICP = 0 psi. Pull out of the well and lay down (5) joints of 3-1/2", 9.3#, L-80 8rd tubing, Made up tubing hanger, (2) 2-7/8" L-80 tubing pup joints, (1) joint of 2-7/8" L-80 tubing and cross over. Attempted to set 9-7/8" 47# Baker packer at 6,851' COE multiple times with out any success. Pulled out of the hole and stood back (218) 3-1/2", 9.3#, L-80 8rd tubing. Laid down packer. Cone section on packer was unscrewed and one slip was flat with a little scale in it. Made up (Baker) 9-5/8" All weight scraper, 10' 2-7/8" pup joints and (Baker) 9 5/8", 47# positive scraper. Ran in the hole with (50) 3-1/2", 9.3#, L-80 8rd tubing for a kill string. Secured well for the weekend.
5/31/2016	Held safety meeting, Serviced rig. Field pressure = 1,190 psi. SITP = 0 psi, SICP = 0 psi. Pumped 50 bbls of 8.5 ppg, 56 vis polymer. Opened well. Pulled out of the hole with 3-1/2", 9.3#, L-80, 8rd tubing. Picked up (Baker) 9-5/8" All weight scraper, 10' 2-7/8" pup joints and (Baker) 9 5/8", 47# positive scraper. Ran in the hole on (228) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Tagged liner top. Pulled out of the hole with (228) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Broke out and laid down scrapers. Tallied and picked up (Baker) 9-5/8", 43-53.5#, DL packer with re-entry guide, 10' 2-7/8", 6.5#, L-80, 8rd pup joint, (Baker) "XN" profile nipple (2.313" / 2.205") with plug in place, one joint of 2-7/8", 6.5#, L-80, 8rd tubing, (Baker) CMD sliding sleeve (opens down), one joints of 2-7/8", 6.5#, L-80, 8rd tubing, 2-7/8" X 3-1/2" crossover, (2) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Rigged up (Weatherford) hydrotesters. Plug tested to 5000 psi for 20 minutes. Good test. Rigged up (Western) wireline unit and pulled plug from "XN". Rigged down (Western) wireline unit. Ran in with (44) joints of 3-1/2", 9.3#, L-80, 8rd tubing. Hydrotesting to 5000 psi and seal lube all connections. Secured well till the AM.

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company

Well: Fernando Fee 38 A

A.P.I. No. 03724230

Date: 7/25/2016

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Field: Aliso Canyon County: Los Angeles

Surface Location: Sec. 27 T3N, R16W, S.B.B&M

Name: Tom McMahon Title: SIMP Project Manager

(President, Secretary, or Agent)

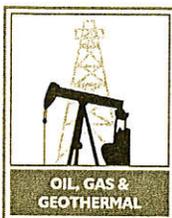
Telephone Number: 714-398-5020

Signature: \_\_\_\_\_

(Person Submitting Report)

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.

Start Date	Ops this Report (DOGGR)
6/1/2016	Held safety meeting. Serviced rig. Field pressure = 1,183 psi, SITP = 0 psi, SICP = 0 psi. Opened well. Continued running in the hole with (70) joints of 3-1/2", 9.3#, L-80, 8rd. Set packer at 2,222'. Released packer. Continued running in the hole with a total of (221) joints of 3-1/2", 9.3#, L-80, 8rd. Picked up 3-1/2" X 2-7/8" crossover. (1) joint of 2-7/8", 6.5#, L-80, 8rd tubing, 10' - 2-7/8", 6.5#, L-80, 8rd pup joint, 4' - 2-7/8", 6.5#, L-80, 8rd pup joint, fatigue nipple and hanger. Plugged tested to 5000 psi. Set packer at 6,951' (COE) in 10K compression. Land hanger. Rigged down (Weatherford) hydrotesters. Rigged up (Western) wireline unit. Ran in the hole with "PXN" plug. Plugged stuck in sliding sleeve. Sheared off of plug. Pulled out of the hole. Ran in with retrieving tool. Pulled out of the hole with plug. Redressed plug and ran in the hole. Could not get past the sliding sleeve. Pulled out of the hole. Ran in with a 2.31" gauge ring. Passed through sliding sleeve and tagged "XN" at 6,935'. Pulled out of the hole. Secured well till the AM.
6/2/2016	Held safety meeting. Serviced rig. Field pressure = 1,184 psi, SITP = 0 psi, SICP = 0 psi. Opened well. Ran in the hole with "PXN" plug and set in "XN" nipple at 6,935'. Pulled out of the hole. Run in hole with equalizing plug and set in plug at 6,935'. Pulled out of the hole. Ran in hole with shifting tool. Shifted sliding sleeve open at 6,904'. Pulled out of the hole. Rigged up circulating equipment. Filled the hole with 28 bbls of 8.5 ppg, 56 vis polymer. Circulated for 10 minutes to get air out. Ran in the hole with shifting sleeve at 6,904' and closed sleeve. Pulled out of the hole and rigged down (Western) wireline unit. Rigged up (PROS) and tested annulus to 1000 psi for one hour. Tested tubing to 3,700 psi for one hour. Good tests. witnessed by Randall Morlan of the DOGGR. Rigged down (PROS). Rigged down circulating equipment. Installed BPV. Rigged out workfloor. Nippled down 11" annular and double gate BOP. Installed 2-9/16" 5M tree. Cameron torqued bolts and tested tree to 300 psi low and 5000 psi high for 20 minutes each. Pulled BPV. Secured well till the AM.
6/3/2016	Held safety meeting. Serviced rig. Field pressure = 1,182 psi. SITP = 0 psi, SICP = 0 psi. Rigged up (Western) wireline unit. Ran in hole with shifting tool and opened sliding sleeve at 6,904'. Pulled out of the hole. Rigged down (Western) wireline unit. Rigged down rig and move equipment to Porter 69B.  Baker "CMD" sliding sleeve @ 6,899' (OPEN) Baker "XN" profile nipple @ 6,934' (Plug in place) (2.313/2.205) Baker 9 5/8", 47#, D&L ASX-1 packer @ 6,950' (COE) Tail @ 6,955'



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  
**REPORT ON OPERATIONS**

No. T216-0155

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

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

Ventura, California  
May 05, 2016

Your operations at well "**Fernando Fee**" 38A, A.P.I. No. 037-24230, Sec. 27, T. 03N, R. 16W, SB B. & M., **Aliso Canyon** field, in **Los Angeles** County, were witnessed on 4/30/2016, by **Ernest Blevins**, a representative of the supervisor.

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

**DECISION:**

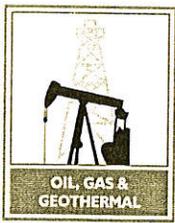
APPROVED

Kenneth A. Harris Jr.  
State Oil and Gas Supervisor

By   
Patricia A. Abel  
District Deputy

EB/tkc  
OG109





NATURAL 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 216-0209

## 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  
June 06, 2016

Your operations at well "**Fernando Fee**" 38A, A.P.I. No. 037-24230, Sec. 27, T. 03N, R. 16W, SB B.&M., **Aliso Canyon** field, in **Los Angeles** County, were witnessed on 6/2/2016, by **Randall Morlan**, a representative of the supervisor.

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

DECISION:

**APPROVED**

RM/TKC

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

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

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

T 216-0209  
16, 1

Casing and Tubing Pressure Test

Operator: Southern California Gas Well Designation: FERNANDO FEE 38A  
Sec. 27, T. 3N, R. 16W, SB B.M. API No. 03124230 Field: ALISO CANYON  
County LOS ANGELES Witnessed on: 6/2/2016 Randall Morlan, representative  
of the supervisor, was present from 1130 to 1430.  
Also Present were M. R. Sandoval

Casing Record of the Well:

13 3/8" 54.5#, K55 CEMENTED TO SURFACE. SHOE @ 840'  
9 5/8" 47#, N80 CEMENTED TO SURFACE. SHOE @ 7558'  
4 1/2" 11.6#, N80S FROM 7028' TO 7354' GP'D IN 9 5/8" CASING.  
9 5/8" PARS 7115'-7185', 7195'-7212', 7222'-7242', 7241'-7345'. 12, 1" SPF

The operations were performed for the purpose of SAPT

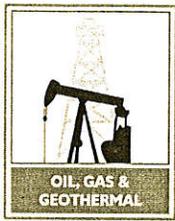
Pressure Test of the Casing

Packer/ Bridge Plug at 6951' Well Type GAS STORAGE  
Casing Pressured with \_\_\_\_\_ Volume \_\_\_\_\_  
Casing Pressure Start PSI: \_\_\_\_\_ Start Time: 1149  
Casing Pressure End PSI: 1122 End Time: 1249  
Pressure Held 60 Min Total drop in Pressure \_\_\_\_\_ psi 4 %  
Test Result:  Good  Not Good

Pressure Test of the Tubing

Packer/ Bridge Plug at 6935' Well Type GAS STORAGE  
Tubing Pressured with \_\_\_\_\_ Volume \_\_\_\_\_  
Tubing Pressure Start PSI: 3107 Start Time: 1312  
Tubing Pressure End PSI: 3501 End Time: 1412  
Pressure Held 60 Min Total drop in Pressure \_\_\_\_\_ psi 0.16 %  
Test Result:  Good  Not Good

Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



STATE OIL AND GAS 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 216-0184

## 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  
June 13, 2016

Your operations at well "**Fernando Fee**" 38A, A.P.I. No. 037-24230, Sec. 27, T. 03N, R. 16W, SB B.&M., **Aliso Canyon** field, in **Los Angeles** County, were witnessed on 5/18/2016, by **Clifford R. Knight**, a representative of the supervisor.

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

DECISION:

**APPROVED**

CRK/TKC

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

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

**BLOWOUT PREVENTION EQUIPMENT MEMO**

216-0184  
12,1

Operator Southern California Gas Well Fernando Fee 38A Sec. 27 T. 3N R. 16W  
 Field Aliso Canyon County Los Angeles Spud Date \_\_\_\_\_  
 VISITS: Date 5-18-2016 Engineer C. Knight Time (0900 to 1000) Operator's Rep. Jeff Sandival Title RSS  
 1st \_\_\_\_\_ ( \_\_\_\_\_ to \_\_\_\_\_ ) \_\_\_\_\_  
 2nd \_\_\_\_\_ ( \_\_\_\_\_ to \_\_\_\_\_ ) \_\_\_\_\_  
 Contractor Ensign Rig # 341 Contractor's Rep. & Title Jeff Sandival  
 Casing record of well: \_\_\_\_\_

OPERATION: Testing (Inspecting) the blowout prevention equipment and installation. Critical well? Y  N   
 DECISION: The blowout prevention equipment and its installation on the 9 5/8 " casing are approved.

Proposed Well Opns: Rework MACP: \_\_\_\_\_ psi  
 Hole size: \_\_\_\_\_ " fr. \_\_\_\_\_ " to \_\_\_\_\_ " to \_\_\_\_\_ " & \_\_\_\_\_ " to \_\_\_\_\_ " **REQUIRED BOPE CLASS: Class III 5M**

CASING RECORD OF BOPE ANCHOR STRING					Cement Details		Top of Cement	
Size	Weight(s)	Grade(s)	Shoe at	CP at			Casing	Annulus
9 5/8								

BOP STACK							TEST DATA						
API Symb.	Ram Size (in.)	Manufacturer	Model or Type	Vert. Bore Size (in.)	Press. Rtg.	Date Last Overhaul	Gal. to Close	Recov. Time (Min.)	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
A	60	Schuffner		11	5M		18.07						
Ad	2 7/8	Schuffner/NOV		11	5M		2.80						
Ad	CSO	Schuffner/NOV		11	5M		2.80						

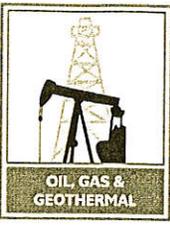
ACTUATING SYSTEM				TOTAL:	AUXILIARY EQUIPMENT					
Accumulator Unit(s) Working Pressure <u>3100</u> psi				<u>24.27</u>	Connections					
Total Rated Pump Output _____ gpm		Fluid Level _____		No.	Size (in.)	Rated Press	Weld	Flange	Thread	Test Press.
Distance from Well Bore <u>50+</u> ft.		<u>1/3</u>								
Accum. Manufacturer	Capacity	Precharge	Fill-up Line							
1 <u>Koomey Type</u>	<u>80</u> gal.	<u>1,000</u> psi	1 Kill Line		<u>2</u>	<u>5M</u>				<u>X</u>
2	gal.	psi	3 Control Valve(s)			<u>5M</u>		<u>X</u>		

CONTROL STATIONS				Elec.	Hyd.	Pneu.	1	Check Valve(s)	5M	X	
1 Manifold at accumulator unit					<u>X</u>		1	Aux. Pump Cnct.	5M	X	
Remote at Driller's station							1	Choke Line	3 5M	X	
Other:							7	Control Valve(s)	5M	X	

EMERG. BACKUP SYSTEM			Press.	Wkg. Fluid	1	Pressure Gauge		X	
4 N <sub>2</sub> Cylinders	1 L= <u>55</u> "	<u>2,600</u>	<u>9.65</u> gal.	2	Adjstble Choke(s)	3 5M		X	
Other:	2 L= <u>55</u> "	<u>2,600</u>	<u>9.65</u> gal.		Bleed Line				
	3 L= <u>55</u> "	<u>2,650</u>	<u>9.96</u> gal.		Upper Kelly Cock				
	4 L= <u>55</u> "	<u>2,650</u>	<u>9.96</u> gal.		Lower Kelly Cock				
	5 L= _____ "		gal.		Standpipe Valve				
	6 L= _____ "		gal.		Stdpipe Pres. Gau.				
TOTAL:			<u>39.22</u> gal.	1	Pipe Safety Valve	5M			

HOLE FLUID MONITORING EQUIPMENT		Alarm Type		Class	Hole Fluid Type	Weight	Storage Pits (Type & Size)
Calibrated Mud Pit				A	<u>Polymer</u>	<u>8.5</u>	<u>500 bbl pump + Bulker Tank</u>
Pit Level Indicator				B			
Pump Stroke Counter							
Pit Level Recorder							
Flow Sensor				C			
Mud Totalizer							
Calibrated Trip Tank							
Other:							

REMARKS AND DEFICIENCIES:  
\* Aux line is flanged for kill operations



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. T216-0168

**REPORT ON OPERATIONS**

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

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

Ventura, California  
May 10, 2016

Your operations at well "**Fernando Fee**" 38A, A.P.I. No. 037-24230, Sec. 27, T. 03N, R. 16W, SB B. & M., **Aliso Canyon** field, in **Los Angeles** County, were witnessed on **5/7/2016**, by **Kris Gustafson**, a representative of the supervisor.

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

**DECISION:**

APPROVED

Kenneth A. Harris Jr.  
State Oil and Gas Supervisor

By   
Patricia A. Abel  
District Deputy

KG/tkc  
OG109

No. T 216-0168  
#16, 1

**INTERNAL MECHANICAL INTEGRITY TEST (MIT)  
 (Standard Annulus Pressure Test-SAPT)**

Operator: <u>SoCal Gas</u>					Well: <u>FF-38A</u>				
Sec.	T.	R.	B.&M.	API No.:		Field:			
<u>27</u>	<u>03N</u>	<u>16W</u>	<u>SB</u>	<u>037-24250</u>		<u>Alliso Canyon</u>			
County: <u>Los Angeles</u>					Witnessed/Reviewed on: <u>5/7/2016</u>				

K. Gustafson, representative of the supervisor, was present from 1130 to 1530.

Also present were: Jeff Sandoval w/ Ensign

Casing record of the well:  
First test w/ PKR @ 7200' was @ 2355 psi  
at start. At 10 minutes pressure was 2355 psi  
At 30 minutes pressure was 2358 psi; At 45 minutes 2363 psi  
At 60 minutes 2364; 2nd test PKR @ 3500'  
pressure @ start 3725; At 15 min 3713; @ 30 min 3711 psi  
At 45 min 3713; At 60 min 3718

The Internal MIT was performed for the purpose of pressure testing the 9 5/8" casing above 7200'  
 (2) (prior to injecting fluid)

The Internal MIT is approved since it indicates that the 9 5/8" casing has mechanical integrity above 7200' at this time..

The Internal MIT is not approved due to the following reasons: (specify)

~~\_\_\_\_\_~~

**INDICATE WHERE PACKER WAS SET AND HOW LONG PRESSURE WAS HELD ALONG WITH ANY BLEEDOFF DATA.**

Block testing held for 1 hour w/o a loss.  
Block test is approved.

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

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

Operator: Southern California Gas Company WELL DESIGNATION: "Fernando Fee" 38A

API No. 03724230 SE 27 T: 3N R.: 16W, SB B. and M.

County: Los Angeles FIELD: Aliso Canyon

Type of Notice: Rework Date 4/26/2016 Report Number: P216-0059

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

**NEW STATUS**

	Date	OK	NEED	Remarks
Well Summary (OG100)			✓	
History (OG103)	7/25/16	✓		
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				
BOPE	4/30/16	✓		
Press Test	5/7/16	✓		Digital Record
BOPE	5/18/16	✓		
Presstest	6-2-16	✓		Digital Record
Gyro	5/13/16		✓	
MAC Vertilog	5/4/16	✓		
USIT	5/11/16	✓		
MAC	5/24/16	✓		
Press Test	6/2/16	✓	✓	

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

**NOTICE OF RECORDS DUE**

DATE: 10-25-16

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) \_\_\_\_\_

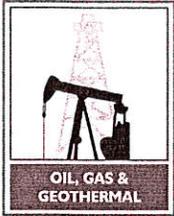
**REMARKS**

RECORDS SCANNED: \_\_\_\_\_

(Date)

RECORDS APPROVED: D.O. 10/25/16

(Date and Engineer)



URAL 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 216-0059

**PERMIT TO CONDUCT WELL OPERATIONS**

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

Gas Storage  
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation

Ventura, California  
May 03, 2016

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

Your proposal to **Rework** well "**Fernando Fee**" **38A**, A.P.I. No. **037-24230**, Section **27**, T. **03N**, R. **16W**, **SB B. & M.**, **Aliso Canyon** field, **Any** area, **Sesnon-Frew** pool, **Los Angeles** County, dated **4/26/2016**, received **4/28/2016** has been examined in conjunction with records filed in this office. (Lat: **34.309721** Long: **-118.544503** 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:
  - a. Class III **5M** on the **9 5/8"** casing.
2. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
3. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
4. A **Temperature and Noise log** are run on the well from the packer to the surface.
5. A **Casing Wall Thickness, Cement Bond Log, and a Multi-Arm Caliper Inspection** shall be performed to demonstrate the mechanical integrity of the **9 5/8"** casing.
6. Prior to commencing injection, a pressure test is conducted to demonstrate the mechanical integrity of the **9 5/8"** casing.
7. Injection shall be through the tubing and packer only. Injection withdrawal through the casing is not permitted.
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 test of the installed blowout prevention equipment prior to commencing **downhole** operations.
  - b. Witness a pressure test of the **9 5/8"** casing prior to commencing injection.

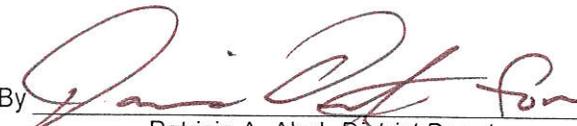
Continued on Next Page

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.

**NOTE:**

1. The base of the freshwater zone is approximately at 800'±, or can be determined by logging.
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 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 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:

- a. Conduct further investigation and demonstrate to the Division's satisfaction that the abnormal finding is not an indicator of a lack mechanical integrity;
- b. Remediate the well to the Division's satisfaction; or
- c. 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:

- a. 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
- b. 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:

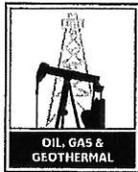
- a. Conduct daily gas monitoring at the surface of the non-operational well, including monitoring the area around the well perimeter and in the annular space between the plugged casing string and the outmost casing;
- b. Conduct noise log, temperature log and positive pressure test every six months;
- 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.



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

Rec'd 04-28-16 DOGGR Ventura.

FOR DIVISION USE ONLY		
Bond	Forms	
		OGD114
	CAL WIMS	115V

## NOTICE OF INTENTION TO REWORK / REDRILL WELL

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

P216-0059

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework  / redrill  well Fernando Fee 38A, API No. 037-24230  
(Check one)

Sec. 27, 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: 7565 feet.

The effective depth is: 7354 feet.

Present completion zone(s): Sesonon  
(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.

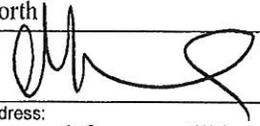
The proposed work is as follows: (A complete program is preferred and may be attached.)

See attached program

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 Mark Ghann-Amoah	Telephone Number: (806) 401-2979	Signature 
Individual to contact for technical questions: Mark Ghann-Amoah	Telephone Number: (806) 401-2979	E-Mail Address: mghann-amoah@semprautilities.com
Date 04/26/16		

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/)

**WORKOVER PROJECT**

(FF38A – Well Inspection)

**DATE:** April 26, 2016  
**OPERATOR:** SOUTHERN CALIFORNIA GAS COMPANY  
**FIELD:** ALISO CANYON  
**PREPARED BY:** MARK GHANN-AMOA  
**API NUMBER:** 037-24230  
**ELEVATION:** All depths based on original KB, 32' above GL

**OBJECTIVE**

The intent of this program is to inspect the wells mechanical integrity and remediate identified conditions as part of the Storage Integrity Management Program (SIMP).

This project will include pulling the current production string, Pressure testing casing and well laterals, running casing inspection logs, installing a new completion string, converting well to tubing flow, and installing pressure monitors.

**CASING & CEMENT RECORD**

CSG. SIZE (INCHES)	TOP OF CSG (FT)	DEPTH OF SHOE(FT)	WEIGHT OF CASING(LBS)	GRADE & TYPE OF CSG.	HOLE SIZE (INCHES)	SACKS OF CMNT(CF)	CMNT TOP (FT)	TYPE OF CEMENT
13 - 3/8	0	864	54.5	K-55, STC	17 - 1/2	316	SURFACE	CLASS G
9 - 5/8	0	7558	47	N-80, LTC	12 - 1/4	1611	SURFACE	CLASS G
4 - 1/2	7029	7354	11.6	J-55			GRAVEL	GRAVEL

**WELL RECORD**

Current Status:	Active
C/O Depths:	TD: 7565', PBTD - 7354' , Last tagged at 7344'(03/ 11/2016 in 4.5" liner)
Injection Conditions:	Estimated BHT – 135 F      Estimated WHP – 1100psi
Current Injection String:	2-7/8" 9.3# 0'/7000'w/GLM at 4317' , Sliding Sleeve – 6958', No-Go Nipple – 6925'(ID-2.205"), Baker E-22 anchor Latch - 7025', Baker On/Off tool w/profile – 6991'(2.313 seal bore) NB: See attached wellbore schematic for detailed description.
Proposed Injection String:	See attached

**GEOLOGIC MARKERS**

UDA2      5953'MD  
LDA      6453'MD  
MP      6708'MD    6418'TVD  
S1      7084'MD    6765'TVD  
S4      7207'MD    6878'TVD  
S8      7293'MD    6957'TVD

**WELL WORK HISTORY/ANALYSIS**

This well was drilled and completed in 2002. Last production data – 1/1/2016 showed that well produced 82bopd, 101bwpd and 472MMCF/D with a recorded casing and tubing pressure of 925psi.

It passed noise and temperature log (1 3/8"OD) ran on 3/11/2016. Last tag depth 3/11/2016 indicates we have ~10' of fill in liner, thus it will be prudent to retag and cleanout well. Also, let monitor type of fill to ensure its not pea gravel.

Drilling information from drilling dailies on DOGGR well records shows that the well was directionally drilled from 1087' to 6896'. However, pipe was successfully recovered and well was directionally drilled to 6002'.

It was noted that while cleaning out well with 1.75" CTU it got stuck but they were able to work stuck CTU (cut and fish out remaining coil tubing). It will be prudent to assess liner integrity and run smaller OD tool to cleanout.

**PROJECT NOTES**

1. BOPE requirements in Gas Company Standard 224.05 shall be fully implemented at all times.
2. The storage reservoir pressures shall be monitored during the workover with a minimum of 300 psig overbalance for well control fluids.
3. Prepare the location by removing all relevant landscaping/lighting fixtures as well as surface piping and electrical components as needed. Locate rig anchors, reinstall if necessary.
4. DOGGR permit must be posted on site. Notify the DOGGR as required for BOPE testing as stated on permit.

**PRE-RIG WORK(FOLLOW CURRENT SOP)**

1. De-energize and remove all laterals.
  - Install companion flanges for circulating the well.
  - LOTO (lock-out/Tag-out) where required.
2. Complete slick-line work as required to set-up well for circulation.
  - Confirm sliding sleeve position is opened

**WELLWORK PROGRAM**

1. MIRU double w/o rig w/all equipment – pump, Baker tank, Shaker and mixer.
  - ➔ Perform JSA, JSP, CW
2. Spot 500 bbl Baker tanks and load well w/3% KCL water or 8.5 ppg.
  - ➔ Connect pump to the tubing and vent the casing through the choke manifold to the SoCal Gas withdrawal system.
  - ➔ Treat all brine with Biocide, 5 gals/100 bbls
3. Bull head HEC polymer into the liner and change over above TOL to 3% KCL since well is open to storage zone, in order to minimize loss circulation.
  - ➔ Pump at 2-3bpm MASP- 3625psig
  - ➔ Tubing volume is ~ 45 bbls., Annulus volume ~ 460 bbls.
4. Install backpressure valve in tubing hanger. ND tree and NU BOPE.
  - ➔ Send-in tree components to Cameron for inspection.
5. Install a Class III 5M BOPE per Gas Company Standard 224.05 and in accordance with the DOGGR permit. All connections and valves must be flanged and at least 5000 psig rated.
  - ➔ Perform a 300 psig low pressure test on the annular preventer, blind rams and pipe rams for 20 minutes. Test all lines and connections to 300 psig.
  - ➔ Pressure test the Class III 5M annular preventer to 3500 psig for 20 minutes. Test blind rams and the 2-7/8" pipe rams to 5000 psig for 20 minutes. Test all lines and connections to 5000 psig.
  - ➔ All tests are to be charted and witnessed by a DOGGR representative.
  - ➔ Pull back pressure valve from tubing hanger.
6. Release E-22 anchor from baker SC-1 packer at 7029'.
  - ➔ Pull 2k # over string weight + rotate right.
7. POOH laying down production string, See tubing/production string details attached.
  - ➔ Send tubing hanger to Cameron for rework from 2-7/8" to 4.5" tubing connection.
  - ➔ RIH w/ 9-5/8", 47# casing scraper (positive) on 2-7/8" work string to top of packer, POOH
  - ➔ If unable to unset packer assembly at 7029'. E-line cut pipe(tubing) at 7014' (+/- 15' above packer) and fish out packer stub in assembly(anchor latch at +/- 7025')
8. RIH w/ bumper sub, Jars, collars and intensifiers w/overshot to catch tubing stub. Rotate out
9. PU a 9-5/8", 47# casing scraper (positive) on 2-7/8" work string and RIH to top of 4.5" inner liner at 7029'.
10. RIH with c/o assembly for 4-1/2" 11.6# liner. Tag and c/o well to bottom of liner at 7354' or as deep as possible, POOH.
  - ➔ Tagged fill at 7344' (10' of fill) on 3/11/16 temp. survey
  - ➔ NB: 2.75" Coil tubing got stuck in liner while crew were completing well in 2002.

11. Rig-up wireline unit(s) with lubricator as required to run the following logs:
  - a.) Gyro survey from TOL to surface (Scientific)
  - b.) Magnetic flux leakage/vertilog from TOL to surface (SLB)
  - c.) Multi-arm caliper log from TOL to surface (Baker)NB: Send copies of all logs to engineering team for review
12. RIH w/seal assembly and test liner seals, POOH
  - ➔ Test to 500psi for 15 minutes. If it does not test, notify engineer.
13. RIH w/ 9-5/8", 47# test packer and run a Pressure Integrity Test on 9-5/8" casing from surface to TOL (7029') to a minimum 115% of the wells maximum allowable operating pressure (3625 psi) as per attached Pressure Test Schedule. POOH with test packer.
  - ➔ Follow Pressure test schedule to prevent over pressure.
14. MU and RIH w/ 9-5/8", 47# RBP on work string. Set at +/- 7020' (9' above liner top), fill hole and pressure test and sand off. POOH and lay down BP retrieving head.
  - ➔ Test pressure - 500 psi for 15minutes( see attached casing test schedule)
  - ➔ If well does not test, notify engineer
15. Nipple down 11" Class III 5 M BOPE, crossover spool, and primary pack-off.
  - ➔ Send wellhead equipment to Cameron for refurbishment
  - ➔ NU spare 13 - 5/8" 3M x 11" 5M DSA, spacer spool.
  - ➔ Pressure test all the wellhead seals to 3625 psig/ 80% of collapse pressure.
  - ➔ Reinstall the 11" Class III BOPE and function test. Retest all connection broken in process.
16. Rig-up wireline unit(s) with lubricator as required to run the following logs in tandem:
  - a.) Ultrasonic imager from BP to surface (SLB)
  - b.) Cement bond log from BP to top of cement (Baker)➔ NB: Send copies of all logs to engineering team for review
17. ND spare well head equipment and NU refurbished well head from Cameron and install BOPE.
  - ➔ Pressure test BOPE and refurbished wellhead equipment per DOGGR requirements.
18. PU retrieving head for BP and RIH to 5' above top of sand. Circulate out sand. Release BP at +/- 7020'.
  - ➔ C/O w/weighted brine as required to control well.
  - ➔ POOH and lay down work string and RBP.
19. Change out rams 4.5", test BOPE and RIH w/new completion string as follows:
  - a.) Baker E-22 anchor latch seal unit w/4.75" seals
  - b.) 4-1/2" x 3-1/2" cross-over
  - a.) 10' pup joint 4-1/2" 12.6# L-80 TCPC tubing
  - b.) 4-1/2" 12.6# L-80 TCPC XN no-go nipple
  - c.) Full joint 4-1/2" 12.6# L-80 TCPC tubing
  - d.) 4-1/2" 12.6# L-80 TCPC sliding sleeve
  - e.) Full joint 4-1/2" 12.6# L-80 TCPC tubing
  - f.) 4-1/2" 12.6# TCPC Pin x 5-1/2" 20# TCPC Box Crossover pup joint
  - g.) 5-1/2" 20# L-80 TCPC tubing to surface
  - h.) Pup joints 5-1/2" 20# L-80 TCPC tubing for space-out

- i.) 4' 5-1/2" 20# L-80 TCPC fatigue nipple (pin x pin)
  - m.) 10-3/4" Tubing hanger with 4-1/2" EUE top box / 4" BPV / 5-1/2" TCPC bottom box
  - ➔ NB: If new injection string is not ready, prep well for new injection string run and RDMO.
  - ➔ NB: Run sliding sleeve in closed position. Ensure new production packer depth is at or above depth at which retrievable bridge plug was used for pressure testing.
20. Land tubing on tubing hanger as per vendor specification at approximately the same depths as prior completion string. **Note: amount of compression to set on packer will be determined by Force Analysis / Tube Move Calculations.**
21. Rig-up slick line unit and lubricator. Set a plug in the 4-1/2" XN profile.
22. Notify DOGGR to witness pressure tests of annulus to 1000 psi. and tubing to 3700 psi. Both tests to be an hour in duration and recorded digitally.
23. Prep well to be unloaded after rig moves off.
24. RDMO

#### EQUIPMENTS / SERVICES

1. Workover Rig double [Ensign Rig 341 – Jeff Sandoval, 6613017102]
1. HEC Polymer, Fluid [ GEO drilling fluids – Gilbert Ortega, 6613312697]
2. Separator, well kill [ Onyx – Dean Leal, 6614870492]
3. Tanks / trucking [ Doby Haggar – Victor, 6615781453]
4. BOP/ packer/ Logging [ Weatherford – Tim Ludeman, 8053202190]
5. Tubing string [ Tuboscope – Nick Taminich, 8052906577]
6. Wellhead [ Cameron – Danny Caraan, 6613038615]

**WELL WORK PRPOGRAM TO UNLOAD WELL**

1. RIH and shift the sliding sleeve open.
2. Rig-up nitrogen unit. Recover workover fluid by pumping down annulus taking returns up tubing.
3. RIH with slick line and shift sliding sleeve closed. POOH and rig down slickline unit.
4. Fill annulus with packer fluid including corrosion inhibitor & biocide.
  - a.) Vent nitrogen returns as appropriate.
  - b.) Monitor annulus fluid level and re-fill with packer fluid as necessary.
5. Install BPV in tubing hanger. Nipple down the Class III 5M BOPE and install the production tree and test to 5000 psig. Remove BPV.
6. Release production rig, rig down and move out.

**WELL LATERAL HYDROTESTING**

1. Per Gas Company Standard 182.0170, pressure test the tubing and casing kill laterals from the wellhead to the remote tie in to 3625 psig. Pressure test the tubing and casing withdrawal/injection laterals from wellhead to operating valves to 3625 psig.
2. Reinstall the hydro-tested laterals.
3. Install the well safety systems and instrumentation. Install pressure transmitters on tubing, casing, and surface casing.
4. Release well to operations.

**EXTERNAL CORROSION PROTECTION**

Per Gas Company Standard 167.30, remove any lead based paint and recoat wellhead, production tree, and laterals.

**Current Tubing Detail as ran 12/9/1993**

Quantity	Item	Length	Depth
1	KB to donut	35.00	35.00
1	Donut	1.00	36.00
3	2-7/8", EUE 8rd, N-80 pup joint	22.00	58.00
136	2-7/8", EUE 8rd, J-55 tbg.	4249.00	4307.00
1	2-7/8", EUE 8rd, J-55 pup joint	4.00	4311.00
1	Gas Lift Mandrel	6.00	4317.00
1	2-7/8", EUE 8rd, J-55 pup joint	1.00	4318.00
83	2-7/8", EUE 8rd, J-55 tbg.	2605.00	6923.00
1	Baker "BX" No Go Nipple	2.00	6925.00
1	2-7/8", EUE 8rd, J-55 tbg.	29.00	6954.00
1	Halliburton "XD" Sliding Sleeve	4.00	6958.00
1	2-7/8", EUE 8rd, J-55 tbg.	32.00	6990.00
1	Baker L-10 on-off tool	1.00	6991.00
1	2-7/8", EUE 8rd, J-55 tbg.	32.00	7023.00
1	2-7/8" x 3-1/2" cross-over	1.00	7024.00
1	Baker E-22 anchor latch seal unit	1.00	7025.00

**Casing Pressure Test Schedule:**

Well: Fernando Fee 38A											
Depth (TVD)	85% of Burst Strength	External Casing Backup Pressure			Pressure Test				Tubing Leak Net Burst Pressure @	Test Pressuree > 85% of Burst	Test Pressure < Tubing Leak - Net Burst (Gas-filled annulus)
		Fluid / Formation Pressure Gradient	External Casing Backup Pressure	Internal Water Hydrostatic	Net Burst Pressure @ Depth						
					1	2	3	Final	Gas-Filled Annulus		
					Surface Test Pressure	3625		2250	3625		
					Test Packer Depth	3500					
					Test Down Casing or Tubing	Casing		Tubing			
					Bridge Plug Depth			7020			
0	5840	0.00	0	0	3625			2250	3625		
500	5840	0.00	0	221	3846			2471	3670		
1000	5840	0.00	0	442	4067			2692	3716		
1500	5840	0.00	0	663	4288			2913	3761		
2000	5840	0.00	0	884	4509			3134	3806		
2500	5840	0.00	0	1105	4730			3355	3852		
3000	5840	0.00	0	1326	4951			3576	3897		
3500	5840	0.00	0	1547	5172			3797	3942		
4000	5840	0.00	0	1768	-			4018	3988		
4500	5840	0.00	0	1989	-			4239	4033		
5000	5840	0.00	0	2210	-			4460	4078		
5500	5840	0.00	0	2431	-			4681	4123		
6000	5840	0.00	0	2652	-			4902	4169		
6500	5840	0.00	0	2873	-			5123	4214		
7020	5840	0.00	0	3103	-			5353	4261		

0.442  
psi/ft  
int. grad.

0.091  
psi/ft  
int. grad.

## Well Fernando Fee 38A

API #: 04-037-24230-00  
Sec 27, T3N, R16W

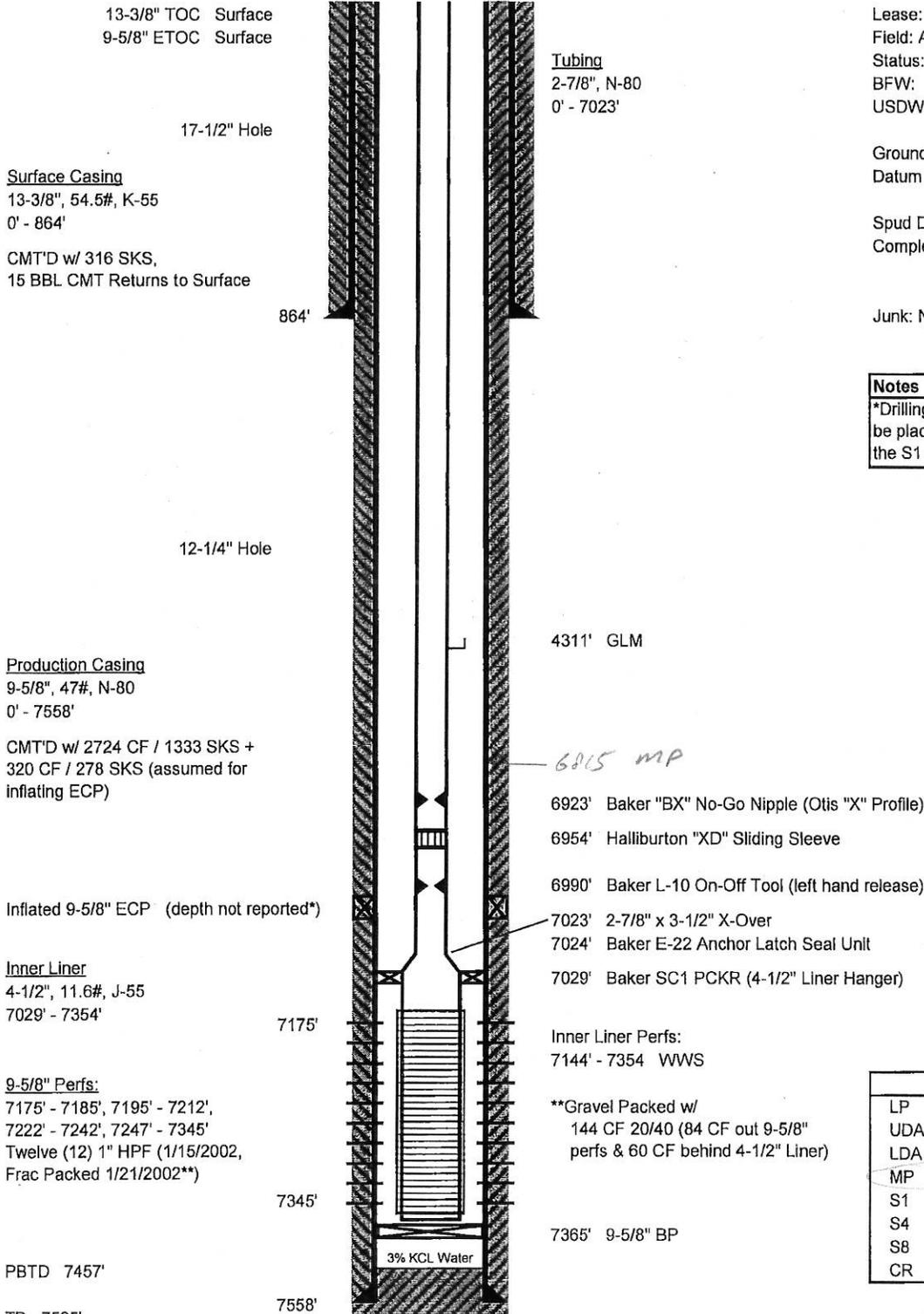
Operator: So. California Gas Co.

Lease: Fernando Fee  
Field: Aliso Canyon  
Status: Active Gas Storage  
BFW:  
USDW:

Ground Elevation: 1716' asl  
Datum to Ground: 32' KB

Spud Date: 10/5/2001  
Completion Date: 1/31/2002

Junk: None



**Notes**  
\*Drilling program specified ECP to be placed in a shale section above the S1 sand

Top of Zone Markers		
LP	5546'	(-3582')
UDA2	5953'	(-3957')
LDA	6453'	(-4418')
MP	6815'	(-4749')
S1	7064'	(-4978')
S4	7177'	(-5082')
S8	7250'	(-5150')
CR	7394'	(-5283')

Prepared by: CAM (3/3/2016)  
Updated by: LD (4/20/2016)

**Well  
Fernando Fee 38A**

API #: 04-037-24230-00  
Sec 27, T3N, R16W

**Production Casing Pressure Test - Program**

Operator: So. California Gas Co.

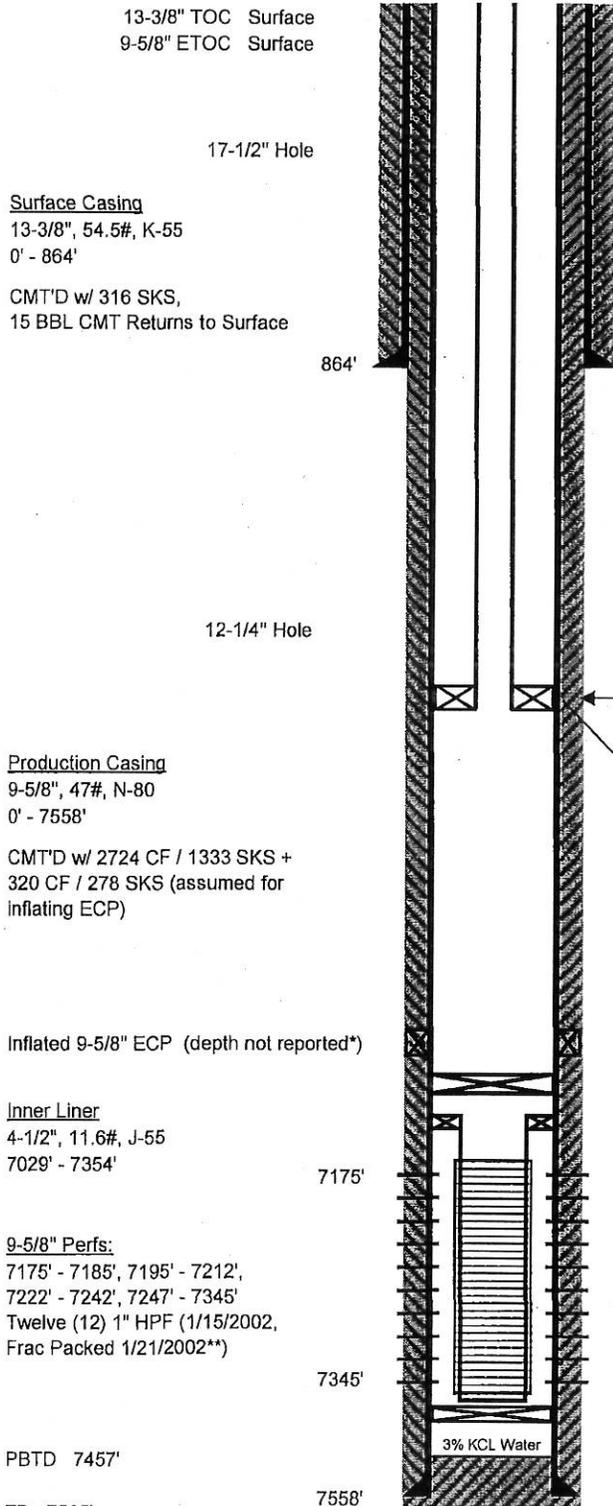
Lease: Fernando Fee  
Field: Aliso Canyon  
Status: Active Gas Storage  
BFW:  
USDW:

Ground Elevation: 1716' asl  
Datum to Ground: 32' KB

Spud Date: 10/5/2001  
Completion Date: 1/31/2002

Junk: None

Notes	
*Drilling program specified ECP to be placed in a shale section above the S1 sand	



TEST 3500' to Surface - 3625 psi  
TEST 3500' to 7020' - 2250 psi

9-5/8" Test Packer (COE @ 3500')

7020' 9-5/8" Retrievable Bridge Plug

7029' Baker SC1 PCKR (4-1/2" Liner Hanger)

Inner Liner Perfs:  
7144' - 7354' WWS

\*\*Gravel Packed w/  
144 CF 20/40 (84 CF out 9-5/8"  
perfs & 60 CF behind 4-1/2" Liner)

7365' 9-5/8" BP

Top of Zone Markers		
LP	5546'	(-3582')
UDA2	5953'	(-3957')
LDA	6453'	(-4418')
MP	6815'	(-4749')
S1	7064'	(-4978')
S4	7177'	(-5082')
S8	7250'	(-5150')
CR	7394'	(-5283')

Prepared by: CAM (3/3/2016)  
Updated by: LD (4/20/2016)

PBTD 7457'  
TD 7565'  
TD VSS (-5441')  
Directionally Drilled: Yes (TD is 545' E, 1723' N of Surf, 7221' TVD)

OPERATOR Southern Oil Co.  
 WELL NO. "Fernando Fee" 38A  
 MAP

A.P.I. 087-24230  
 SECTION 27, T. 3 N, R. 16 W

INTENTION	<u>Drill</u>					
NOTICE DATED	<u>5-22-01</u>					
P-REPORT NUMBER	<u>201-218</u>					
CHECKED BY/DATE						
MAP LETTER DATED	<u>9-14-02</u>					
SYMBOL						

	REC'D	NEED	REC'D	NEED	REC'D	NEED	REC'D	NEED	REC'D	NEED	REC'D	NEED
NOTICE	<u>9-19-01</u>											
HISTORY	<u>3-4-02</u>											
SUMMARY	<u>3-4-02</u>											
E-LOG w/ DENSITY	<u>2-11-02</u>											
MUD LOG												
DIPMETER												
DIRECTIONAL	<u>3-4-02</u>											
CORE/SWS	<u>7-25-02</u>											
CBL												
CALIPER/ GAMMA	<u>2-11-02</u>											
GAMMA/ CCL	<u>2-11-02</u>											
REF MEMO	<u>6-4-02</u>											

ENGINEERING CHECK

T-REPORTS						
OPERATOR'S NAME						
WELL NO.						
LOC & ELEV						
SIGNATURE						
SURFACE INSP.						
DRILL CARD						

RECORD'S COMPLETE 9-14-02

FINAL LETTER OK \_\_\_\_\_  
 MAILED \_\_\_\_\_  
 RELEASED BOND \_\_\_\_\_

INJECTION BOOK \_\_\_\_\_ REMARKS: \_\_\_\_\_  
 IDLE WELL LIST \_\_\_\_\_  
 SURFACE INSP. CARD \_\_\_\_\_  
 OK TO RELEASE FROM CONFIDENTIAL \_\_\_\_\_  
 ABANDONED-REMOVED FROM E.D.P. \_\_\_\_\_

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

**WELL SUMMARY REPORT**

API NO. 037-24230

Operator <b>Southern California Gas Company</b>		Well <b>Fernando Fee 38A</b>				
Field <b>Aliso Canyon</b>		County <b>Los Angeles</b>	Sec. <b>27</b>	T. <b>3N</b>	R. <b>16W</b>	B.&M. <b>SB</b>
Location (Give surface location from property or section corner, street center line) <b>Northing 1935516 Easting 6397214 Nat 83 Zone 5</b>					Elevation of ground above sea level <b>1716</b>	
California Coordinates (if known):						
Was the well directionally drilled? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, show coordinates at total depth. <b>1723' North and 545' East</b>						

Commenced drilling (date) <b>10/5/01</b>	(1st hole) <b>7565</b>	Total depth (2nd)	(3rd)	Depth measurements taken from top of: <input type="checkbox"/> Derrick Floor <input type="checkbox"/> Rotary Table <input checked="" type="checkbox"/> Kelly Bushing	
Completed drilling (date) <b>1/31/02</b>				Which is <b>32</b> feet above ground	
Commenced production/injection (date) <b>Pending</b>	Present effective depth <b>7365</b>			GEOLOGICAL MARKERS	
Production mode: <input type="checkbox"/> Flowing  <input type="checkbox"/> Pumping <input type="checkbox"/> Gas lift	Junk <b>None</b>			DEPTH <b>6752</b> <b>7176</b>	
Name of production/injection zone(s) <b>S4</b> <b>S6</b> <b>S8</b> <b>S10+</b>				Formation and age at total depth <b>Miocene</b>	
				Base of fresh water	

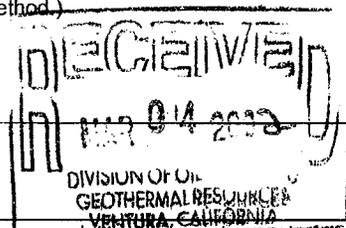
	Clean Oil (bbl per day)	API Gravity (clean oil)	Percent Water (including emulsion)	Gas (Mcf per day)	Tubing Pressure	Casing Pressure
Initial Production	Gas Storage					
Production After 30 days						

**CASING AND CEMENTING RECORD (Present Hole)**

Size of Casing (API)	Top of Casing	Depth of Shoe	Weight of Casing	Grade and Type of Casing	New (N) or Used (U)	Size of Hole Drilled	Number of Sacks or Cubic Feet of Cement	Depth of Cementing (if through perforations)	Top(s) of Cement in Annulus
13-3/8"	Surf	840'	54.5	K55	N	17-1/2	316 sks		Surf
9-5/8"	Surf	7558'	47	N80	N	12-1/4	3044 cf		Surf
4-1/2" WWS Liner	7028	7354	11.6	J55	N	NA	Gravel Packed		NA

PERFORATED CASING (Size, top, bottom, perforated intervals, size and spacing of perforations, and method)  
**7" HSD Tubing Conveyed Perforating Guns w/ 64C CP RDX charges 12 spf 1.00' diameter holes**  
**Intervals (7175' - 7185'), (7195' - 7212'), (7222' - 7242'), (7247' - 7345')**

Logs/surveys run?  Yes  No If yes, list type(s) and depth(s).  
**Directional survey**  
**Platform Express (SP, Resistivity, Gamma-ray, Density, Neutron, Caliper)**



In compliance with Sec. 3215, Division 3, of the *Public Resources Code*, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

Name <b>Dan Neville</b>	Title <b>Drilling Engineer</b>	
Address <b>9400 Oakdale Avenue</b>	City/State <b>Chatsworth CA</b>	Zip Code <b>91313</b>
Telephone Number <b>818-701-3251</b>	Signature 	Date <b>2/22/02</b>

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

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company

Field: Aliso Canyon

County: Los Angeles

Well: Fernando Fee 38 A

Surface Location:

A.P.I. No. 037-24230

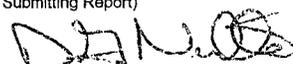
Name: Dan Neville

Title: Storage Field Engineer

(Person Submitting Report)

(President, Secretary, or Agent)

Date: 02/27/2002

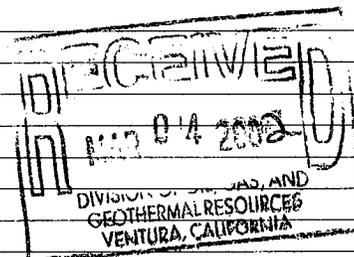
Signature: 

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Telephone Number: (818) 701-3251

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.

Start Date	Ops This Rpt
10/05/2001	Moved in and rigged up Kenai #6.
10/06/2001	Spudded well. Drilled a 17-1/2" hole to 356'.
10/07/2001	Drilled 17-1/2" hole from 356' - 870'. Circulated and conditioned hole to run casing. Ran 13-3/8", 54.5 lb/ft, K-55, ST&C casing to 864'.
10/08/2001	Rigged up cementers. Ran in with stab in tool. Mixed and pumped 316 sacks of "G" cement (with additives; 1482 lbs of calcium chloride, 1072 lbs of bentonite, 103 lbs of cello flake, 72 sacks of Poz fly ash, 7 gallons of FP-6I, 5 gallons of R-21L). Recovered 15 barrels of cement returns at surface. Welded casing head to the 13-3/8" casing string. X-rayed welds. OK.
10/09/2001	Installed 11" Class III 5000 PSI blow out prevention equipment (BOPE). Installed choke and kill lines. Function and pressure tested blinds, pipe rams and annular bag.
10/10/2001	BOPE test approved by Steve Mulqueen (CADOGR). Made up drilling assembly and ran in hole. Tagged cement at 800'. Drilled cement from 800' to 840'. Circulated and conditioned mud. Made up directional drilling assembly (MWD and mud motor) and drilled 12-1/4" hole from 840' to 1087'.
10/11/2001	Directionally drilled from 1087' to 2192'.
10/12/2001	Directionally drilled from 1441' to 3110'.
10/13/2001	Directionally drilled from 3110' to 3793'.
10/14/2001	Directionally drilled from 3973' to 4280'.
10/15/2001	Directionally drilled from 3793' to 4899'.
10/16/2001	Directionally drilled from 4899' to 5449'.
10/17/2001	Directionally drilled from 5499' to 5897'.
10/18/2001	Directionally drilled from 5897' to 6145'.
10/19/2001	Directionally drilled from 6145' to 6690'.
10/20/2001	Directionally drilled from 6689' to 6896'.
10/21/2001	Pulled out of well to change drilling assembly. Laid down MWD and mud motor. Picked up new BHA and ran in hole. Reamed hole from 6827' to 6896'. Drilled and worked pipe to bottom. Drilled ahead to 6957'.
10/22/2001	Drilled from 6957' to 7376'.
10/23/2001	Drilled from 7376' to 7565' (TD). Circulated and conditioned the hole to run open hole logs.
10/24/2001	Rigged up wireline loggers. Installed lubricator. Ran Schlumberger's Platform Express (SP, resistivity, gamma-ray, neutron and density logs from TD to the surface casing shoe. Attempted to pull wear bushing.
10/25/2001	Pulled wear bushing. Made a wiper trip to TD. Circulated and conditioned the hole to run casing.
10/26/2001	Ran 9-5/8", 47 lb/ft, N-80, LT&C casing to 7558'. Applied Seal-lube to all field connections. (Mill connections did not have Seal-lube). Utilized torque monitoring and control to make up casing to optimum torque.
10/27/2001	Rigged up cementers. Mixed and pumped 2140 cf (827 sks) of 12.0 ppg lead slurry, followed by 584 cf (506 sks) of 15.8 class G slurry, followed by 320 cf (278 sks) of 15.8 ppg class G with latex slurry. Reciprocated casing string during cement job. Bumped plug. Inflated ECP.
10/28/2001	Ran 9-5/8" scraper. Tagged float shoe at 7457'. Changed well over to 3% KCL treated with biocide. Laid down drill pipe. Removed BOPE. Installed wellhead. Moved rig to Fernando Fee 38 B.
01/07/2002	Moved in and rigged up workover rig. Spotted equipment for completion.
01/08/2002	Installed Class III 5000 psi BOPE.
01/09/2002	Function tested and pressure tested BOPE. Test approved by Anneliese Anderle (CADOGR).
01/10/2002	Continued rigging up. Ran in well with 3-1/2", 8rd, N-80 tubing.
01/11/2002	Ran in well. Tagged at 7457'. Circulated the well with clean 3% KCl. Pulled out of well with 3-1/2" tubing.
01/14/2002	Ran gamma ray and CCL log from 7450' to 6400. Set Baker 9-5/8", 47 lb/ft bridge plug at 7365'. Picked up Schlumberger 7" HSD TCP guns with 64C CP RDX charges at 12 spf (1" diameter holes). Picked up packer, RA sub, and 3-1/2" tubing and ran in well.



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

## HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company  
Well: Fernando Fee 38 A  
A.P.I. No. 037-24230

Field: Aliso Canyon  
Name: Dan Neville  
(Person Submitting Report)

County: Los Angeles  
Surface Location:  
Title: Storage Field Engineer  
(President, Secretary, or Agent)

Date: 02/27/2002

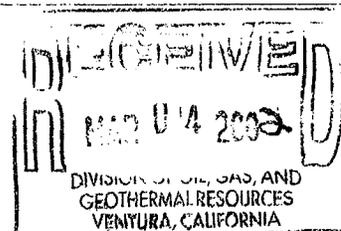
Signature: \_\_\_\_\_

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Telephone Number: (818) 701-3251

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, balling tests, and initial production data.

Start Date	Ops This Rpt
01/15/2002	Continued in well with 7" TCP assembly. Ran gamma ray and CCL to correlate guns. Filled tubing with 3% KCl to obtain a 500 psi underbalance for perforating. Set packer. Installed flow lines. Dropped bar and fired guns. Perforated the following intervals at 12 spf, 1" diameter holes; (7345' - 7247'), (7242' - 7222'), (7212' - 7195'), (7185' - 7175').
01/16/2002	Pulled out of well and laid down 11 joints of cork screwed tubing. Laid down TCP guns. All guns fired. Ran in well with 9-5/8" casing scraper.
01/17/2002	Pulled out of well with 9-5/8" casing scraper. Ran in well with liner assembly consisting of 4-1/2" bullnose, 5 joints (210') of 4-1/2", 11.6 lb/ft, J55 WWS with welded lugs, 2 joints (80') of blank 4-1/2", 11.6 lb/ft, J55 liner, and Baker SC1 packer. Ran 2-3/8" CS Hydril tubing tail inside of liner assembly. Ran in well. Packer assembly accidentally set high at 6746'.
01/18/2002	Released from Baker SC-1 packer. Pulled out of well. Ran in well with packer retrieving tool. Pulled out of well with Baker SC-1 packer and 4-1/2" liner.
01/19/2002	Pulled out of well and laid down Baker SC-1 packer. Made up liner assembly with a new Baker SC-1 packer. Assembly consisted of 4-1/2" bullnose, 5 joints (210') of 4-1/2", 11.6 lb/ft, J55 WWS with welded lugs, 2 joints (80') of 4-1/2", 11.6 lb/ft, J55 blank liner, and Baker SC1 packer. Ran 2-3/8" CS Hydril tubing tail inside of liner assembly. Ran in well.
01/21/2002	Continued in well with liner. Set packer with liner bottom at 7354' and top at 7029'. Rigged up pumping equipment. Positioned the SC1 packer to frac mode. Conducted step rate test using 3% KCl water with 20 lbs/1000 gal HEC. Achieved the following rates; (2 BPM at 870 psi, 3 BPM at 1100 psi, 4 BPM at 1250 psi, 5.4 BPM at 1500 psi, 6 BPM at 1600 psi, 7 BPM at 1800 psi, 8 BPM at 1950 psi, 9 BPM at 2000 psi, 10 BPM at 2200 psi, 10.7 BPM at 2300 psi, 12 BPM at 2500 psi, 12.8 BPM at 2500 psi, 13 BPM at 2600 psi). Began pumping the water pack job as follows; 71 bbls at 0 sand ppg, followed by 36 bbls at 0.5 - 1.0 ppg, followed by 60 bbls at 1.0 - 2.0 ppg, followed by 83 bbls at 2.0 - 3.0 ppg, followed by 95 bbls at 3.0 ppg. Job was pumped at 13.5 BPM and 2600 psi surface pressure. During the final stage (3.0 ppg) the well packed off and pressure built to 4000 psi. Attempted to position the SC1 to reverse out mode but could not move pipe. Worked pipe to 180,000 lbs. Could not move pipe. Gravel pack totals are estimated as follows; Pumped 190 cf 20/40 sand slurry, 84 cf out perforations, 60 cf behind 4-1/2' liner, and 46 cf in tubing.
01/22/2002	Ran in well with 1-3/4" coil tubing unit. Cleaned out 20/40 sand in 3-1/2" tubing from 5817' to 6960'.
01/23/2002	Continued using coil tubing to clean out 20/40 sand from 6960' to 7029'.
01/24/2002	Worked stuck tubing to 180,000 lbs. Attempted to reverse circulate with no success. Rigged up wireline and ran in well with freepoint analysis tool. Tubing free at 7013'. Ran 2-5/8" chemical cutter. Unable to get past the wellhead. Pulled out of well.
01/25/2002	Made manual backoff. Laid down bad joint of 3-1/2" tubing. Screwed back into tubing fish. Made chemical cut at 7008'. Pulled out of well. Top of fish at 7008'. Ran in well with 7-13/16" overshot dressed with 3-1/2" grapple.
01/26/2002	Engaged fish at 6992'. Jarred fish free. Pulled out of well.
01/28/2002	Changed well over to clean 3% KCL water. Pulled out of well laying down 3-1/2" work string.
01/29/2002	Ran in well with completion tubing string consisting of Baker anchor latch seal assembly, (1) joint 2-7/8" N80, 8rd tubing, Baker on/off tool with profile (2.313" seal bore, 2.205" nogo), (1) joint 2-7/8" N80 8rd tubing, Baker CMU sliding sleeve (non-elastomeric with 2.313" Otis Type X profile 4.2 si flow area), (1) joint 2-7/8" N80 8rd tubing, Baker X profile nipple, 220 joints 2-7/8" N80 8rd tubing.
01/30/2002	Continued in well with completion tubing string. Spaced out tubing string. Latched into Baker SC1 packer. Landed with 6000 lbs compression, Tested annulus to 1000 psi for 15 minutes. OK. Nipped down BOPE. Installed wellhead.
01/31/2002	Tested wellhead to 3000 psi for 15 minutes. OK. Rigged down rig and equipment.



**Aliso Canyon  
Fernando Fee, Slot 38A  
38A - Original Hole**

# **SURVEY REPORT**

**19 November, 2001**

Surface Coordinates: 1935516.00 N, 6397214.00 E (34° 18' 34.7493" N, 118° 32' 40.5008" W)  
Surface Coordinates relative to Global Coordinates: 1935516.00 N, 6397214.00 E (Grid)  
Surface Coordinates relative to Structure: 373.70 N, 192.69 W (Grid)  
RKB: 1748.00ft above Mean Sea Level

**RECEIVED**  
NOV 14 2002  
DIVISION OF OIL, GAS, AND  
GEOTHERMAL RESOURCES  
VENTURA, CALIFORNIA

**sperry-sun**  
**DRILLING SERVICES**  
A Halliburton Company

Survey Report for 38A - Original Hole

Aliso Canyon

Fernando Fee

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates		Global Coordinates		Dogleg Rate (°/100ft)	Vertical Section	Comment
					Northings (ft)	Eastings (ft)	Northings (ft)	Eastings (ft)			
0.00	0.000	0.000	1748.00	0.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E		0.00	
142.00	0.500	221.000	1606.00	142.00	0.47 S	0.41 W	1935515.53 N	6397213.59 E	0.352	-0.57	
365.00	1.000	259.000	1383.02	364.98	1.57 S	2.96 W	1935514.43 N	6397211.04 E	0.305	-2.40	
550.00	1.250	211.000	1198.05	549.95	3.61 S	5.58 W	1935512.39 N	6397208.42 E	0.510	-5.14	
840.00	1.500	266.000	908.12	839.88	6.59 S	10.99 W	1935509.41 N	6397203.01 E	0.444	-9.62	
868.00	2.700	264.750	880.14	867.86	6.67 S	12.02 W	1935509.33 N	6397201.98 E	4.289	-10.01	
898.00	2.700	260.250	850.18	897.82	6.86 S	13.42 W	1935509.14 N	6397200.58 E	0.706	-10.62	
928.00	2.800	261.580	820.21	927.79	7.08 S	14.84 W	1935508.92 N	6397199.16 E	0.395	-11.26	
994.00	3.500	268.250	754.31	993.69	7.38 S	18.45 W	1935508.62 N	6397195.55 E	1.195	-12.65	
1024.00	3.800	264.850	724.37	1023.63	7.50 S	20.35 W	1935508.50 N	6397193.65 E	1.233	-13.34	
1055.00	3.500	266.650	693.44	1054.56	7.65 S	22.32 W	1935508.35 N	6397191.68 E	1.036	-14.08	
1099.00	3.400	283.250	649.51	1098.49	7.43 S	24.93 W	1935508.57 N	6397189.07 E	2.274	-14.66	
1131.00	3.300	301.250	617.57	1130.43	6.73 S	26.64 W	1935509.27 N	6397187.36 E	3.288	-14.52	
1162.00	3.100	316.850	586.62	1161.38	5.66 S	27.98 W	1935510.34 N	6397186.02 E	2.872	-13.90	
1192.00	2.900	330.050	556.66	1191.34	4.41 S	28.91 W	1935511.59 N	6397185.09 E	2.391	-13.00	
1223.00	2.500	339.450	525.69	1222.31	3.09 S	29.54 W	1935512.91 N	6397184.46 E	1.921	-11.94	
1253.00	1.900	352.150	495.71	1252.29	1.99 S	29.84 W	1935514.01 N	6397184.16 E	2.565	-10.97	
1284.00	1.300	4.250	464.72	1283.28	1.13 S	29.88 W	1935514.87 N	6397184.12 E	2.211	-10.17	
1315.00	0.900	21.450	433.73	1314.27	0.55 S	29.77 W	1935515.45 N	6397184.23 E	1.659	-9.58	
1345.00	0.700	36.250	403.73	1344.27	0.18 S	29.57 W	1935515.82 N	6397184.43 E	0.953	-9.18	
1377.00	0.800	49.750	371.74	1376.26	0.12 N	29.29 W	1935516.12 N	6397184.71 E	0.632	-8.80	
1407.00	0.700	62.450	341.74	1406.26	0.34 N	28.96 W	1935516.34 N	6397185.04 E	0.645	-8.49	
1439.00	0.900	76.950	309.74	1438.26	0.48 N	28.55 W	1935516.48 N	6397185.45 E	0.885	-8.23	
1470.00	1.200	75.750	278.75	1469.25	0.62 N	27.99 W	1935516.62 N	6397186.01 E	0.970	-7.93	
1501.00	1.100	94.350	247.75	1500.25	0.68 N	27.38 W	1935516.68 N	6397186.62 E	1.240	-7.69	
1532.00	1.000	93.350	216.76	1531.24	0.64 N	26.82 W	1935516.64 N	6397187.18 E	0.328	-7.55	
1564.00	1.100	89.750	184.76	1563.24	0.62 N	26.23 W	1935516.62 N	6397187.77 E	0.374	-7.39	
1595.00	1.200	99.450	153.77	1594.23	0.57 N	25.61 W	1935516.57 N	6397188.39 E	0.705	-7.25	
1627.00	1.000	97.650	121.78	1626.22	0.48 N	25.01 W	1935516.48 N	6397188.99 E	0.634	-7.15	
1657.00	1.100	103.450	91.78	1656.22	0.38 N	24.47 W	1935516.38 N	6397189.53 E	0.486	-7.09	
1689.00	1.000	79.350	59.79	1688.21	0.36 N	23.89 W	1935516.36 N	6397190.11 E	1.404	-6.93	
1720.00	1.400	55.150	28.79	1719.21	0.62 N	23.32 W	1935516.62 N	6397190.68 E	2.056	-6.50	
1783.00	2.500	35.150	-34.17	1782.17	2.19 N	21.89 W	1935518.19 N	6397192.11 E	2.028	-4.58	
1845.00	3.700	19.750	-96.08	1844.08	5.18 N	20.44 W	1935521.18 N	6397193.56 E	2.339	-1.29	
1907.00	4.300	15.950	-157.93	1905.93	9.29 N	19.12 W	1935525.29 N	6397194.88 E	1.057	3.03	

Survey Report for 38A - Original Hole

Aliso Canyon

Fernando Fee

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates		Global Coordinates		Dogleg Rate (°/100ft)	Vertical Section	Comment
					Northings (ft)	Eastings (ft)	Northings (ft)	Eastings (ft)			
1970.00	4.500	22.450	-220.74	1968.74	13.85 N	17.53 W	1935529.85 N	6397196.47 E	0.852	7.86	
2002.00	4.400	27.650	-252.65	2000.65	16.10 N	16.48 W	1935532.10 N	6397197.52 E	1.298	10.32	
2033.00	4.400	31.650	-283.56	2031.56	18.16 N	15.31 W	1935534.16 N	6397198.69 E	0.990	12.64	
2065.00	4.300	32.050	-315.46	2063.46	20.22 N	14.03 W	1935536.22 N	6397199.97 E	0.327	15.00	
2128.00	4.000	29.350	-378.30	2126.30	24.14 N	11.70 W	1935540.14 N	6397202.30 E	0.568	19.44	
2191.00	3.900	28.750	-441.15	2189.15	27.93 N	9.59 W	1935543.93 N	6397204.41 E	0.172	23.69	
2255.00	3.900	26.650	-505.00	2253.00	31.79 N	7.56 W	1935547.79 N	6397206.44 E	0.223	27.98	
2318.00	3.900	27.250	-567.85	2315.85	35.61 N	5.62 W	1935551.61 N	6397208.38 E	0.065	32.21	
2381.00	3.700	26.650	-630.72	2378.72	39.33 N	3.73 W	1935555.33 N	6397210.27 E	0.324	36.33	
2444.00	3.400	22.850	-693.60	2441.60	42.87 N	2.09 W	1935558.87 N	6397211.91 E	0.605	40.20	
2507.00	3.200	23.950	-756.49	2504.49	46.20 N	0.65 W	1935562.20 N	6397213.35 E	0.333	43.81	
2570.00	3.200	25.350	-819.39	2567.39	49.39 N	0.81 E	1935565.39 N	6397214.81 E	0.124	47.30	
2633.00	4.200	18.950	-882.26	2630.26	53.16 N	2.32 E	1935569.16 N	6397216.32 E	1.715	51.35	
2696.00	6.000	15.950	-945.01	2693.01	58.51 N	3.97 E	1935574.51 N	6397217.97 E	2.887	56.94	
2759.00	7.400	16.450	-1007.58	2755.58	65.57 N	6.02 E	1935581.57 N	6397220.02 E	2.224	64.29	
2821.00	8.400	18.750	-1068.99	2816.99	73.69 N	8.61 E	1935589.69 N	6397222.61 E	1.691	72.81	
2884.00	8.400	19.250	-1131.31	2879.31	82.39 N	11.61 E	1935598.39 N	6397225.61 E	0.116	82.01	
2947.00	8.500	17.650	-1193.63	2941.63	91.17 N	14.53 E	1935607.17 N	6397228.53 E	0.406	91.27	
3009.00	9.400	16.250	-1254.87	3002.87	100.40 N	17.34 E	1935616.40 N	6397231.34 E	1.493	100.91	
3072.00	11.100	16.650	-1316.87	3064.87	111.15 N	20.52 E	1935627.15 N	6397234.52 E	2.701	112.12	
3135.00	12.600	16.850	-1378.52	3126.52	123.53 N	24.25 E	1935639.53 N	6397238.25 E	2.382	125.05	
3198.00	13.600	16.750	-1439.88	3187.88	137.20 N	28.37 E	1935653.20 N	6397242.37 E	1.588	139.33	
3261.00	14.900	17.550	-1500.94	3248.94	152.02 N	32.95 E	1935668.02 N	6397246.95 E	2.087	154.84	
3323.00	16.200	17.750	-1560.67	3308.67	167.86 N	37.99 E	1935683.86 N	6397251.99 E	2.099	171.46	
3355.00	16.900	18.050	-1591.34	3339.34	176.53 N	40.79 E	1935692.53 N	6397254.79 E	2.204	180.57	
3417.00	18.200	18.450	-1650.46	3398.46	194.28 N	46.65 E	1935710.28 N	6397260.65 E	2.106	199.27	
3477.00	19.500	17.950	-1707.24	3455.24	212.70 N	52.70 E	1935728.70 N	6397266.70 E	2.183	218.65	
3538.00	21.000	17.350	-1764.47	3512.47	232.82 N	59.10 E	1935748.82 N	6397273.10 E	2.482	239.76	
3601.00	22.100	18.450	-1823.06	3571.06	254.84 N	66.22 E	1935770.84 N	6397280.22 E	1.860	262.90	
3693.00	22.900	18.450	-1908.06	3656.06	288.24 N	77.36 E	1935804.24 N	6397291.36 E	0.870	298.11	
3785.00	23.300	18.450	-1992.68	3740.68	322.47 N	88.78 E	1935838.47 N	6397302.78 E	0.435	334.20	
3877.00	22.900	19.750	-2077.31	3825.31	356.58 N	100.59 E	1935872.58 N	6397314.59 E	0.705	370.28	
3909.00	22.900	20.150	-2106.78	3854.78	368.29 N	104.84 E	1935884.29 N	6397318.84 E	0.486	382.72	
4002.00	22.600	20.650	-2192.55	3940.55	401.99 N	117.37 E	1935917.99 N	6397331.37 E	0.384	418.65	
4095.00	22.800	19.950	-2278.34	4026.34	435.65 N	129.82 E	1935951.65 N	6397343.82 E	0.361	454.50	

Survey Report for 38A - Original Hole

Aliso Canyon

Fernando Fee

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates		Global Coordinates		Dogleg Rate (°/100ft)	Vertical Section	Comment
					Northings (ft)	Eastings (ft)	Northings (ft)	Eastings (ft)			
4186.00	23.100	19.250	-2362.14	4110.14	469.08 N	141.73 E	1935985.08 N	6397355.73 E	0.446	489.96	
4280.00	22.800	17.550	-2448.70	4196.70	503.86 N	153.30 E	1936019.86 N	6397367.30 E	0.774	526.61	
4372.00	23.200	16.850	-2533.39	4281.39	538.20 N	163.93 E	1936054.20 N	6397377.93 E	0.527	562.56	
4467.00	23.600	17.250	-2620.57	4368.57	574.27 N	174.99 E	1936090.27 N	6397388.99 E	0.453	600.28	
4560.00	23.300	17.050	-2705.89	4453.89	609.63 N	185.90 E	1936125.63 N	6397399.90 E	0.334	637.29	
4653.00	22.800	16.550	-2791.47	4539.47	644.49 N	196.43 E	1936160.49 N	6397410.43 E	0.577	673.70	
4744.00	22.500	15.750	-2875.45	4623.45	678.15 N	206.18 E	1936194.15 N	6397420.18 E	0.473	708.73	
4835.00	22.300	15.650	-2959.58	4707.58	711.53 N	215.56 E	1936227.53 N	6397429.56 E	0.224	743.38	
4928.00	22.200	16.050	-3045.66	4793.66	745.41 N	225.18 E	1936261.41 N	6397439.18 E	0.195	778.58	
5018.00	22.500	16.000	-3128.90	4876.90	778.30 N	234.63 E	1936294.30 N	6397448.63 E	0.334	812.79	
5049.00	22.700	16.400	-3157.52	4905.52	789.74 N	237.95 E	1936305.74 N	6397451.95 E	0.814	824.70	
5080.00	22.900	17.700	-3186.10	4934.10	801.22 N	241.47 E	1936317.22 N	6397455.47 E	1.748	836.71	
5143.00	22.900	18.100	-3244.13	4992.13	824.55 N	249.01 E	1936340.55 N	6397463.01 E	0.247	861.22	
5206.00	23.400	19.600	-3302.06	5050.06	847.99 N	257.01 E	1936363.99 N	6397471.01 E	1.227	885.98	
5268.00	23.500	20.000	-3358.94	5106.94	871.20 N	265.37 E	1936387.20 N	6397479.37 E	0.303	910.64	
5331.00	23.500	20.400	-3416.71	5164.71	894.78 N	274.04 E	1936410.78 N	6397488.04 E	0.253	935.74	
5394.00	23.400	21.300	-3474.51	5222.51	918.21 N	282.97 E	1936434.21 N	6397496.97 E	0.590	960.77	
5456.00	23.500	21.000	-3531.39	5279.39	941.22 N	291.87 E	1936457.22 N	6397505.87 E	0.251	985.40	
5519.00	24.100	21.800	-3589.03	5337.03	964.89 N	301.15 E	1936480.89 N	6397515.15 E	1.081	1010.77	
5613.00	23.800	21.500	-3674.94	5422.94	1000.35 N	315.22 E	1936516.35 N	6397529.22 E	0.344	1048.84	
5707.00	23.100	21.900	-3761.17	5509.17	1035.11 N	329.05 E	1936551.11 N	6397543.05 E	0.764	1086.15	
5802.00	22.600	21.600	-3848.72	5596.72	1069.37 N	342.72 E	1936585.37 N	6397556.72 E	0.540	1122.95	
5865.00	22.200	21.000	-3906.96	5654.96	1091.74 N	351.45 E	1936607.74 N	6397565.45 E	0.731	1146.91	
5928.00	21.900	20.900	-3965.36	5713.36	1113.83 N	359.90 E	1936629.83 N	6397573.90 E	0.480	1170.52	
5958.00	21.900	20.600	-3993.19	5741.19	1124.29 N	363.87 E	1936640.29 N	6397577.87 E	0.373	1181.70	
6021.00	21.800	19.700	-4051.66	5799.66	1146.30 N	371.94 E	1936662.30 N	6397585.94 E	0.555	1205.12	
6086.00	21.300	17.800	-4111.19	5859.19	1168.56 N	379.50 E	1936684.56 N	6397593.50 E	1.341	1228.63	
6146.00	22.400	16.900	-4167.81	5915.81	1190.23 N	386.27 E	1936706.23 N	6397600.27 E	1.885	1251.33	
6209.00	22.800	16.900	-4225.97	5973.97	1213.39 N	393.31 E	1936729.39 N	6397607.31 E	0.635	1275.53	
6303.00	23.200	17.600	-4312.50	6060.50	1248.47 N	404.20 E	1936764.47 N	6397618.20 E	0.515	1312.26	
6397.00	23.500	17.100	-4398.80	6146.80	1284.03 N	415.31 E	1936800.03 N	6397629.31 E	0.382	1349.52	
6490.00	23.800	16.400	-4483.99	6231.99	1319.76 N	426.06 E	1936835.76 N	6397640.06 E	0.442	1386.82	
6584.00	23.600	15.700	-4570.06	6318.06	1356.06 N	436.51 E	1936872.06 N	6397650.51 E	0.367	1424.58	
6679.00	24.200	17.800	-4656.92	6404.92	1392.91 N	447.61 E	1936908.91 N	6397661.61 E	1.096	1463.06	
6789.00	24.400	18.000	-4711.60	6459.60	1416.41 N	455.19 E	1936932.41 N	6397669.19 E	0.360	1487.75	

Survey Report for 38A - Original Hole

Aliso Canyon

Fernando Fee

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates		Global Coordinates		Dogleg Rate (°/100ft)	Vertical Section	Comment
					Northings (ft)	Eastings (ft)	Northings (ft)	Eastings (ft)			
6832.00	23.900	17.800	-4796.46	6544.46	1452.61 N	466.89 E	1936968.61 N	6397680.89 E	0.545	1525.80	
7062.00	22.250	17.000	-5008.05	6756.05	1538.62 N	493.87 E	1937054.62 N	6397707.87 E	0.730	1615.94	
7316.00	22.500	16.000	-5242.93	6990.93	1631.33 N	521.32 E	1937147.33 N	6397735.32 E	0.179	1712.60	
7474.00	22.250	14.000	-5389.04	7137.04	1689.42 N	536.89 E	1937205.42 N	6397750.89 E	0.507	1772.67	
7565.00	22.160	13.230	-5473.29	7221.29	1722.84 N	544.99 E	1937238.84 N	6397758.99 E	0.335	1806.98	TD Projection

All data is in Feet (US) unless otherwise stated. Directions and coordinates are relative to Grid North. Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet (US).  
Vertical Section is from Well and calculated along an Azimuth of 17.717° (Grid).

Based upon Minimum Curvature type calculations, at a Measured Depth of 7565.00ft.,  
The Bottom Hole Displacement is 1806.98ft., in the Direction of 17.554° (Grid).

**Comments**

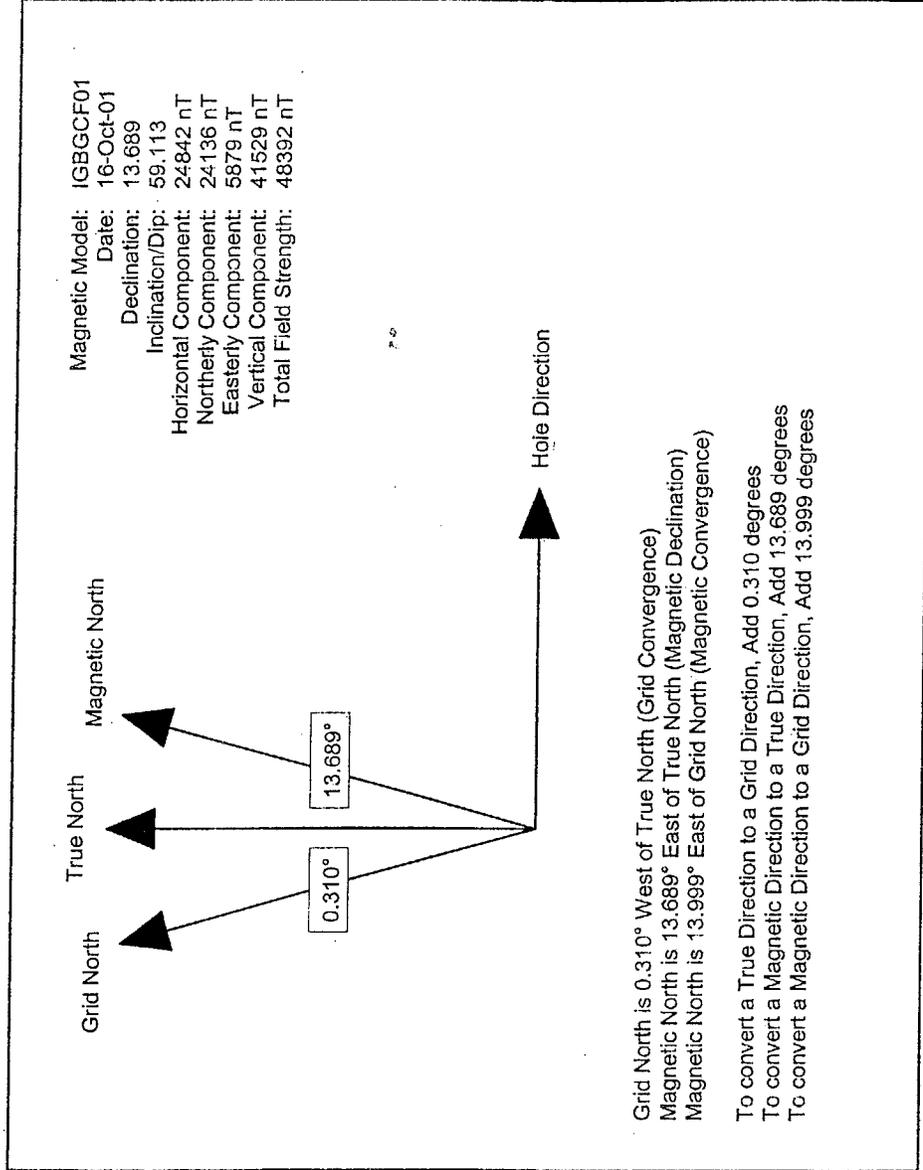
Measured Depth (ft)	Station Coordinates			Comment
	TVD (ft)	Northings (ft)	Eastings (ft)	
7565.00	7221.29	1722.84 N	544.99 E	TD Projection

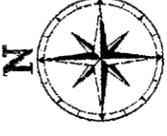
North Reference Sheet for 38A

Aliso Canyon

Fernando Fee

Coordinate System is NAD83 California State Planes, Zone V  
 Grid Coordinates of Well: 1935516.00 N, 6397214.00 E  
 Geographical Coordinates of Well: 34° 18' 34.7493" N, 118° 32' 40.5008" W  
 Grid Convergence at Surface is -0.310°. Magnetic Convergence at Surface is -13.999° (16 October, 2001)

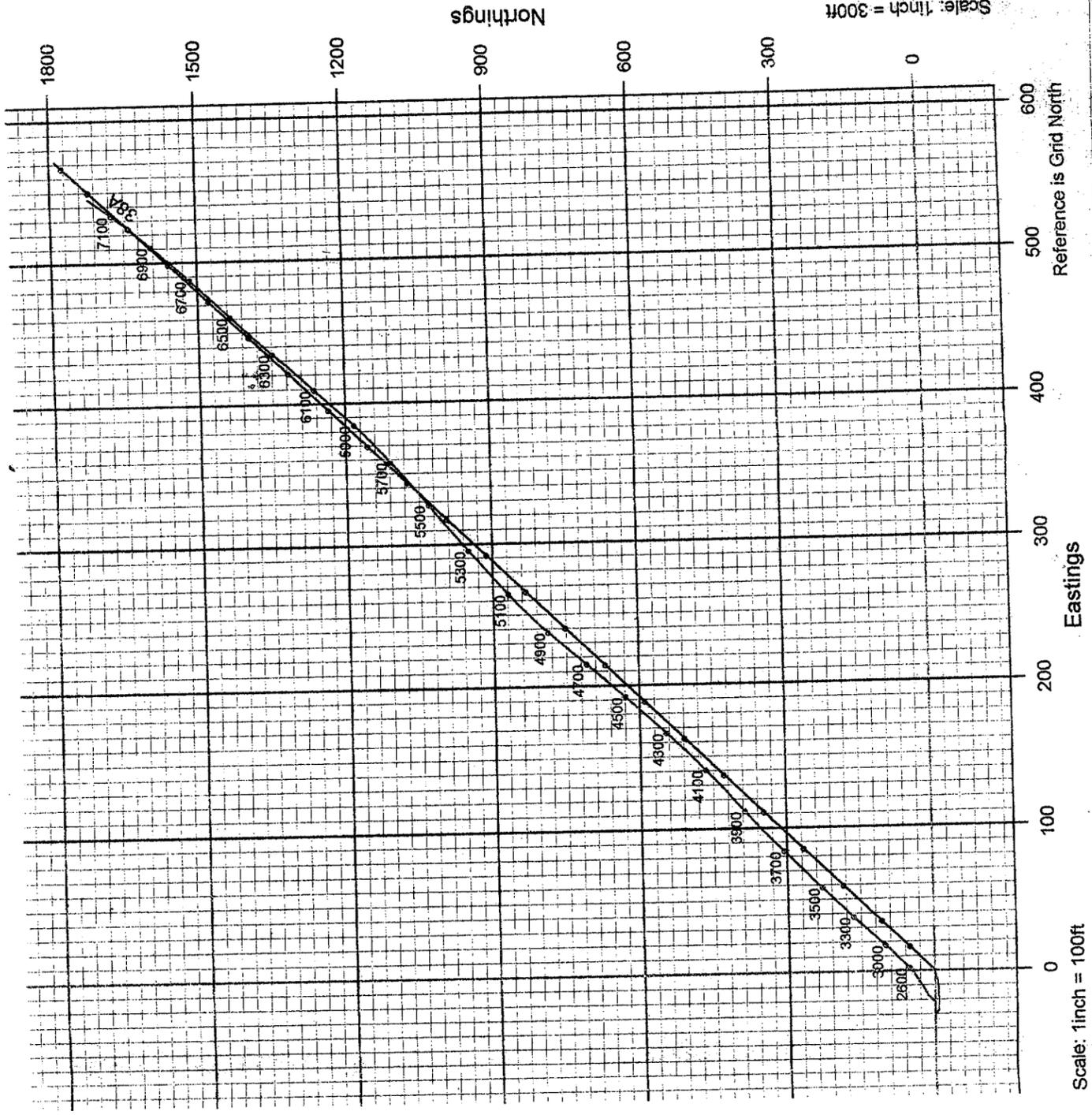
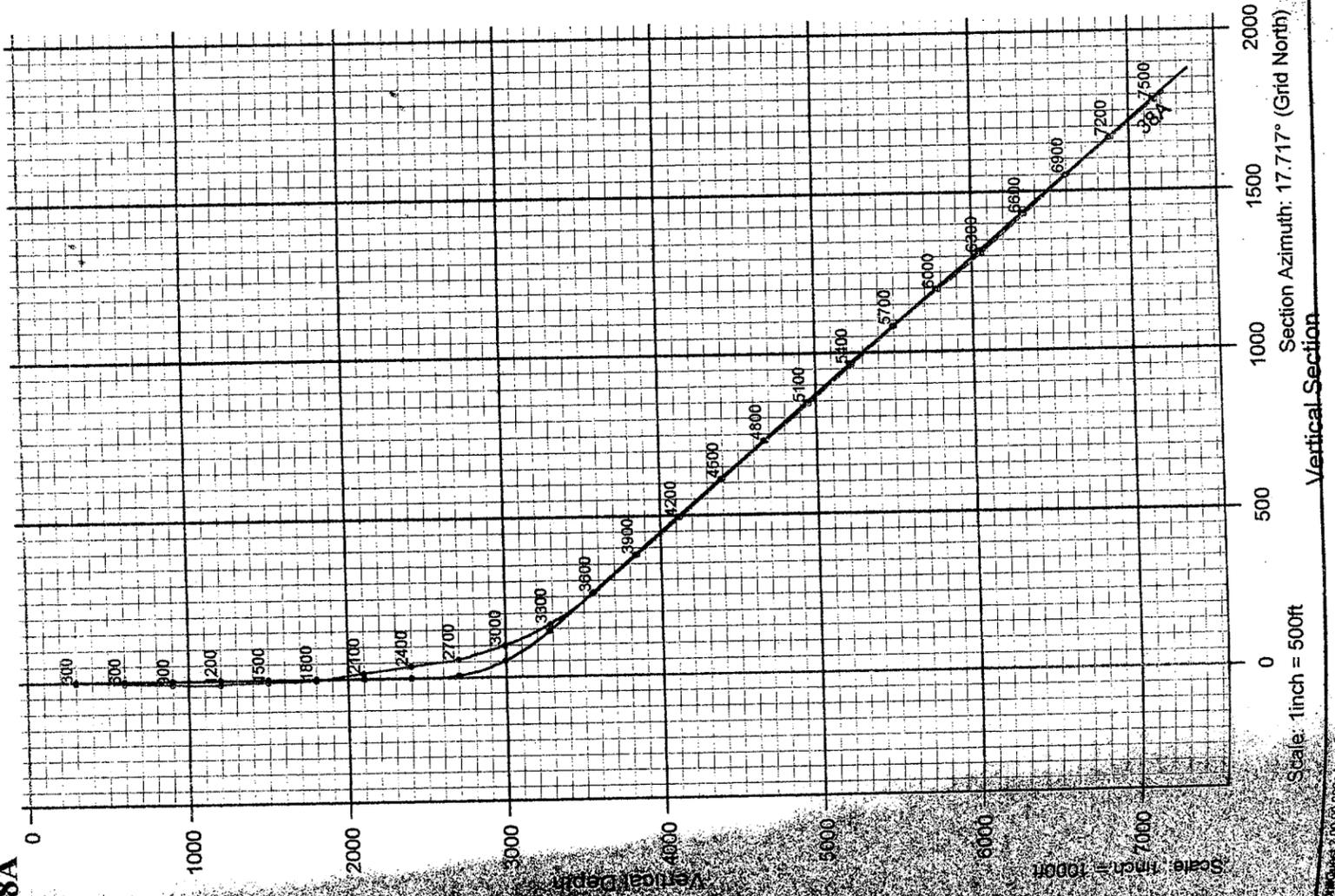




Red-Original Blue-Proposal

**Aliso Canyon  
 Fernando Fee**

**38A**



Prepared by: ATerry  
 Date/Time: 6 December, 2001 - 11:34  
 Checked:  
 Approved:

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

No. T202-031

**Report on Operations**

James D. Mansdorfer, Agent  
SOUTHERN CALIFORNIA GAS CO.  
9400 Oakdale Ave.  
Chatsworth, CA 91313

Ventura, California  
February 19, 2002

Your operations at well "**Fernando Fee**" 38A, API No. 037-24230, Sec. 27, T. 3N, R.16W, S.B.B.&M. **Aliso Canyon** Field, in **Los Angeles** County, were witnessed on **01-9-2002**. **Anne Anderle**, representative of the supervisor, was present from **1500** to **1700**. There were also present **Jim Dayton**.

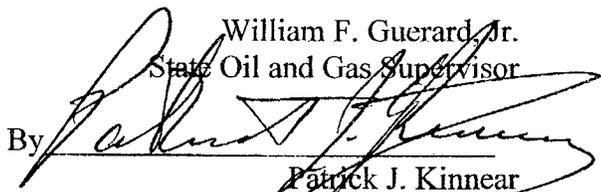
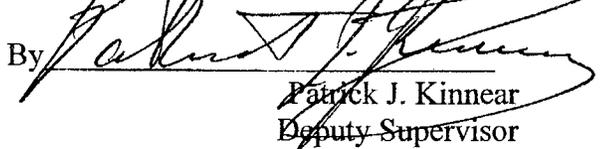
Present condition of well: **20" cem 40'**; **13 3/8" cem 830'**; **9 5/8" cem 7565'**. **TD 7565'**. **Plugged w/ cem 7565'-7469'**.

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

DECISION:

**The blowout prevention equipment and its installation on the 9 5/8" casing are approved.**

tke

By  William F. Guerard, Jr.  
State Oil and Gas Supervisor  
 Patrick J. Kinnear  
Deputy Supervisor

# BLOWOUT PREVENTION EQUIPMENT MEMO

Operator SOUTHERN CAL GAS Well Fernando Fed Sec. 27 T. 3N R. 16W  
 Field ALISO CANYONS County LOS ANGELES Spud Date 10-6-2001

VISITS: 1-9-02 Annaliese Andrade (1500 to 1700) JIM DAYTON DRILLING SUPERVISOR  
 Date Engineer Time Operator's Rep. Title

Contractor POOL Rig # 377 Contractor's Rep. & Title JAKE COOPER SUPERVISOR  
 Casing record of well: 20" CEM 40'; 13 3/8" CEM 830'; 9 5/8" CEM 756.5'  
TD 756.5' PLUGGFA W/ CEM 756.5' - 746.9'

OPERATION: Testing (inspecting) the blowout prevention equipment and installation. Critical well? Y  N   
 DECISION: The blowout prevention equipment and its installation on the 9 5/8" casing are approved.

Proposed Well Opns: Drill Completion MACP: \_\_\_\_\_ psi  
 Hole size: \_\_\_\_\_ " fr. \_\_\_\_\_ " to \_\_\_\_\_ " to \_\_\_\_\_ " & \_\_\_\_\_ " to \_\_\_\_\_ "

REQUIRED BOPE CLASS:

CASING RECORD OF BOPE ANCHOR STRING						Cement Details		Top of Cement	
Size	Weight(s)	Grade(s)	Shoe at	CP at			Casing	Annulus	
<u>9 5/8"</u>	<u>47#</u>	<u>N-80</u>	<u>756.5</u>		<u>2044 CP "G" 12#</u>		<u>746.9</u>	<u>698.0</u>	
					<u>585 CP "G"</u>				
					<u>321 CP</u>	<u>TAIL</u>			

BOP STACK						TEST DATA							
API Symb.	Ram Size (in.)	Manufacturer	Model or Type	Vert. Bore Size (in.)	Press. Rtg.	Date Last Overhaul	Gal. to Close	Recov. Time (Min.)	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
<u>Ap</u>	<u>3 1/2"</u>	<u>HYPORIL</u>	<u>CK10</u>		<u>500K</u>							<u>1-9</u>	<u>1600</u>
<u>yd</u>	<u>CSO</u>	<u>SHAFER</u>			<u>5K</u>							<u>1-9</u>	<u>3K</u>
<u>rd</u>					<u>5K</u>							<u>1-9</u>	<u>3K</u>

ACTUATING SYSTEM				TOTAL:		AUXILIARY EQUIPMENT							
Accumulator Unit(s) Working Pressure <u>2K</u> psi						No.		Size (in.)	Rated Press.	Connections			Test Press.
Total Rated Pump Output _____ gpm Fluid Level _____										Weld	Flange	Thread	
Distance from Well Bore <u>120</u> ft.													
Accum. Manufacturer		Capacity	Precharge	Fill-up Line									
1 <u>KOUMBY</u>		<u>100</u> gal.	<u>500</u> psi	<input checked="" type="checkbox"/> Kill Line									
2 _____		_____ gal.	_____ psi	<input checked="" type="checkbox"/> Control Valve(s)		<u>3</u>		<u>2</u>	<u>5K</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>CONTROL STATIONS</b>				<input checked="" type="checkbox"/> Check Valve(s)									
<input checked="" type="checkbox"/> Manifold at accumulator unit				<input checked="" type="checkbox"/> Aux. Pump Connect.		<u>1</u>			<u>5K</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>3K</u>
<input checked="" type="checkbox"/> Remote at Driller's station				<input checked="" type="checkbox"/> Choke Line		<u>3</u>		<u>5K</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<u>3K</u>
Other: _____				<input checked="" type="checkbox"/> Control Valve(s)		<u>8</u>		<u>5K</u>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<u>3K</u>
<b>EMERG. BACKUP SYSTEM</b>				<input checked="" type="checkbox"/> Pressure Gauge									
3 <u>N2</u> Cylinders		1	L= <u>1800</u>	Wkg. Fluid	<input checked="" type="checkbox"/> Adjustable Choke(s)		<u>2</u>		<u>3</u>	<u>5K</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Other:		2	L= <u>3000</u>	gal.	<input checked="" type="checkbox"/> Bleed Line								
		3	L= <u>2200</u>	gal.	<input checked="" type="checkbox"/> Upper Kelly Cock				<u>3 1/2</u>	<u>5K</u>			<u>3K</u>
		4	L= <u>3100</u>	gal.	<input checked="" type="checkbox"/> Lower Kelly Cock								
		5	L= _____	gal.	<input checked="" type="checkbox"/> Standpipe Valve								
		6	L= _____	gal.	<input checked="" type="checkbox"/> Standpipe Press. Gau.								
TOTAL: _____ ga				<input checked="" type="checkbox"/> Pipe Safety Valve		<u>3 1/2</u>							<u>3K</u>
<input checked="" type="checkbox"/> Internal Preventer				<input checked="" type="checkbox"/> Internal Preventer									

HOLE FLUID MONITORING			Alarm Type			Hole Fluid Type			Storage Pits (Type & Size)		
	Audible	Visual	Class			Weight					
Calibrated Mud Pit		<input checked="" type="checkbox"/>	A		<u>3 7/8 K O L</u>	<u>8.4</u>		<u>1000</u>	<u>B3L</u>		
Pit Level Indicator		<input checked="" type="checkbox"/>									
Pump Stroke Counter			B								
Pit Level Recorder											
Flow Sensor			C								
Mud Totalizer											
Calibrated Trip Tank											
Other:											

REMARKS AND DEFICIENCIES:

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

No. T201-210

**Report on Operations**

James D. Mansdorfer, Agent  
SOUTHERN CALIFORNIA GAS COMPANY  
9400 Oakdale Ave.  
Chatsworth, CA 91313

Ventura, California  
October 30, 2001

Your operations at well "**Fernando Fee**" 38A, API No. 037-24230, Sec. 27, T. 3N, R. 16W, S.B.B.&M. **Aliso Canyon** Field, in **Los Angeles** County, were witnessed on **10-10-2001**. **Steve Mulqueen**, representative of the supervisor, was present from **0600** to **0900**. There were also present **Steve Davis**.

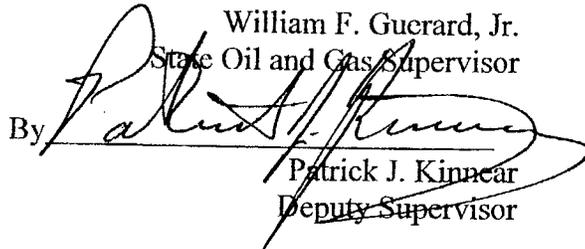
Present condition of well: **20" ccm 40'**; **13 3/8" ccm 830'**. **TD 830' (drilling)**.

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

DECISION:

**The blowout prevention equipment and its installation on the 13 3/8" casing are approved.**

tkc

William F. Guerard, Jr.  
State Oil and Gas Supervisor  
By   
Patrick J. Kinnear  
Deputy Supervisor



# PERMIT TO CONDUCT WELL OPERATIONS

010

(field code)

00

(area code)

30

(new pool code)

(old pool code)

## Gas Storage Project

James D. Mansdorfer, Agent  
Southern California Gas Company  
9400 Oakdale Ave.  
Chatsworth, CA. 91313

Ventura, California

October 3, 2001

Your \_\_\_\_\_ proposal to \_\_\_\_\_ drill \_\_\_\_\_ well \_\_\_\_\_  
A.P.I. No. 037-24230 \_\_\_\_\_ Sec. 27 , T. 3N , R. 16W , SB B.&M. ,  
Aliso Canyon field, \_\_\_\_\_ area, \_\_\_\_\_ Sesnon-Frew pool  
Los Angeles County, dated 5/22/2001 received 9/19/2001 has been examined in conjunction  
with records filed in this office.

### THE PROPOSAL IS APPROVED PROVIDED THAT:

#### Drilling Operations

1. Blowout prevention equipment conforming to DOGGR Class IIIB 5M equipment on the 13-3/8" casing and maintained in operating condition at all times during drilling.
2. Drilling fluid of a quality and in sufficient quantity is used to control all subsurface condition in order to prevent blowouts.
3. An approved blowout prevention and control plan shall be available during the proposed operations.
4. Any sump used during these operations shall be thoroughly cleaned and filled with earth as soon as operations are completed.
5. If extensive, unplanned drill pipe operations occur (such as fishing, milling, etc.) and there is a possibility of casing damage, the casing must be pressure tested prior to resuming normal operations. This Division must be notified to witness the tests
6. The spacing provisions of Section 3606 shall apply.
7. A subsurface directional survey is made and a plat of such survey is filed with this office within 15 days of completion of the well.
8. This office shall be consulted before sidetracking the well or running any additional casing.
9. This office shall be consulted before initiating any changes or additions to this proposed operation, or operations are to be suspended.
10. **THIS DIVISION SHALL BE NOTIFIED:**
  - a. To witness a pressure test of the blowout prevention equipment prior to drilling out of the shoe of the 13-3/8" casing. Prior to notifying the Division engineer to witness the test, the blind rams must be tested. Information on the blind rams test must be entered on the tour sheet along with the signature of the person in charge

Continued on Page 2

SAF:sf  
Super Blanket Bond

Engineer Steven A. Fields  
Phone (805) 654-4761

WILLIAM F. BURRARD, JR., State Oil and Gas Supervisor  
By [Signature]  
Deputy Supervisor

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.

Southern California Gas Company  
October 3, 2001  
P201-218

**Completion Operations**

1. Blowout prevention equipment conforming to DOGGR Class II 5M requirements shall be installed and maintained in operating conditions at all times.
2. Hole fluid of a quality and in sufficient quantity is used to control all subsurface conditions in order to prevent blowouts.
3. Wire line operations are conducted through at least a 5M lubricator.
4. Requirements specified in our approval of the Gas Storage project dated July 26, 1989 shall apply.
5. **THIS DIVISION SHALL BE NOTIFIED:**
  - a. To inspect the installed blowout prevention equipment prior to commencing downhole operations.

Note: The Division recommends, as a minimum, that carbon monoxide monitoring equipment and a vent line be installed and maintained operational during all extensive perforating operations.

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

**NOTICE OF INTENTION TO DRILL NEW WELL**

P201-218  
RECEIVED  
SEP 19 2001

C.E.Q.A. INFORMATION			
EXEMPT <input type="checkbox"/>	NEG. DEC. <input type="checkbox"/>	E.I.R. <input type="checkbox"/>	DOCUMENT NOT REQUIRED BY LOCAL JURISDICTION <input type="checkbox"/>
CLASS _____	S.C.H. NO. _____	S.C.H. NO. _____	
See Reverse Side			

FOR DIVISION USE ONLY				
MAP	MAP BOOK	CARDS	BOND	FORMS
254	9-22-01	/	1,000,000	114 <input checked="" type="checkbox"/> 121 <input checked="" type="checkbox"/>

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to commence drilling well Fernando Fee 38A, well type Gas Storage, API No. 037-24230  
(Assigned by Division)  
Sec. 27, T. 3N, R. 16W, S.B. B&M, Aliso Canyon Field, Los Angeles County.

Legal description of mineral-right lease, consisting of \_\_\_\_\_ acres (attach map or plat to scale), is as follows:  
(See attached base map)

S Do mineral and surface leases coincide? Yes  No . If answer is no, attach legal description of both surface and mineral leases, and map or plat to scale.

Location of well \_\_\_\_\_ feet \_\_\_\_\_ along section  / property  line and \_\_\_\_\_ feet \_\_\_\_\_ at right angles to said line from the \_\_\_\_\_ corner of section  / property  or  
480' East and 2820' South from Station 84  
(Direction) (Check one) (Direction)

Is this a critical well according to the definition on the next page of this form? Yes  No

If well is to be directionally drilled, show proposed coordinates (from surface location) and true vertical depth at total drilled depth:  
530 feet East and 1600 feet North Estimated true vertical depth 7152'. Elevation of ground above sea level 1708 feet. All depth measurements taken from top of KB that is 24 feet above ground.  
(Direction) (Direction) (Derrick Floor, Rotary Table, or Kelly Bushing)

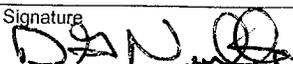
**PROPOSED CASING PROGRAM**

SIZE OF CASING INCHES API	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS	CALCULATED FILL BEHIND CASING (Linear Feet)
13-3/8"	54.5 lb/ft	K55 ST&C	Surface	800	800	800
9-5/8"	47 lb/ft	N80 LT&C	Surface	7550	7550	7550

(A complete drilling program is preferred and may be submitted in lieu of the above program.)

Intended zone(s) of completion Sesnon, Frew Estimated total depth 7550  
(Name, depth, and expected pressure) (Feet)

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

Name of Operator <b>Southern California Gas Company</b>	Type of Organization (Corporation, Partnership, Individual, etc.) <b>Corporation</b>	
Address <b>9400 Oakdale Avenue</b>	City <b>Chatsworth</b>	Zip Code <b>91313</b>
Telephone Number <b>818-701-3251</b>	Name of Person Filing Notice <b>Dan Neville</b>	Signature 
		Date <b>5/22/01</b>

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

Information for compliance with the California Environmental Quality Act of 1970 (C.E.Q.A.).

If an environmental document has been prepared by the lead agency, please submit a copy of the document with this notice or supply the following information:

Lead Agency: \_\_\_\_\_

Lead Agency Contact Person: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone: (        ) \_\_\_\_\_

FOR DIVISION USE ONLY	
District review of environmental document (if applicable)?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Remarks:	_____ _____ _____

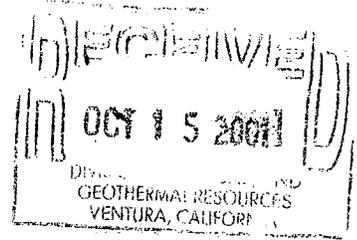
### CRITICAL WELL

As defined in the California Administrative Code, 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 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.

Exceptions or additions to this definition may be established by the supervisor upon his own judgment or upon written request of an operator. This written request shall contain justification for such an exception.

**SOUTHERN CALIFORNIA GAS COMPANY  
2001 -- 2002 CUSHION GAS PROJECT**



**FERNANDO FEE 38A  
ALISO CANYON**

**DRILLING PROGRAM**  
(Revised 10/11/01)

## DRILLING PROGRAM

Operator: Southern California Gas Company

Field: Aliso Canyon

Well: Fernando Fee 38A

Objective: Injection/Withdrawal Well

GWO #: 95077

Surface Location: Section 27, T4N, R16W, SBB&M (Los Angeles County)  
GPS Coordinates (Northing 1935516.48, Easting 6397213.84)  
Nat 83 Zone 5

Elevation: KB: 1748' ASL  
KB: 32' AGL

Target: Top S4  
1587' north and 507' east of surface location at 6868' TVD (7196' MD)

Total Depth: Cretaceous  
Drill approximately 20 ft into the Cretaceous. (7192' TVD or 7547' MD)

Correlations:

Zone	Subsea Depth	True Vertical Depth	Measured Depth
MP	4670	6418	6708
S1	5017	6765	7084
S4	5130	6878	7207
S8	5209	6957	7293
Cret.	5424	7172	7527

(See attached geologic table for a complete list of zone markers)

Proposed Casing Program

13-3/8", 54.5 lb/ft, K55, ST&C      Surface Casing  
9-5/8", 47 lb/ft, N80, LT&C      Production Casing

## Well Program

### Drilling Operations

- 1) Move in and rig up Kenai #6. Post the DOGGR permit at the wellsite.
- 2) Pick up a 17-1/2" bit with two 10" drill collars and drill the surface hole to fit approximately 840' (20 joints) of 13-3/8" casing. Survey the hole using single shots at 90' intervals. Maintain mud weight of 8.6 to 9.2 ppg and mud viscosity of 45 – 55 sec/qt.
- 3) Wipe the hole and condition the mud to run the 13-3/8" casing.
- 4) Run the 13-3/8", 54.5 lb/ft, K-55, ST&C casing to 840' as follows:
  - a) Open guide shoe
  - b) One 20' joint of 13-3/8" casing
  - c) Differential fill stab in float collar
  - d) +/-820' of 13-3/8" casing
  - Note: Prior to running casing, weld the shoe and the bottoms of the first three joints with low hydrogen welding rods. Bakerlok the connections of the first three joints while running the casing. Centralizers are to be placed on every other joint from shoe to surface (11 total).
- 5) With the casing on bottom, pick up stab in assembly on drill pipe and run in hole to the float collar. Circulate and clean the casing annulus for cementing operations. Cement casing in accordance with attached cementing program. Pump a minimum of 6 to 8 barrels per minute. Continue pumping until returns are achieved at surface.

### Cement Slurry

Lead Cement: 65 - 35 Poz cement with 6% gel, 2% CaCl, 0.25 pps cellophane  
(590 linear feet)

Tail Cement: Class "G"  
(250 linear feet)

- 6) Wait on cement. Cut the 13-3/8" casing off and install a 13-5/8", 3000 psi slip on weld casing head. Install a Class III, 5000 psi BOPE stack. Test the BOPE components – blind rams, pipe rams, kill and choke line valves, working safety string valve, internal preventer, kelly cock(s), and standpipe to 2500 PSI with water. Test the annual preventer to 1500 PSI with water. BOPE testing to be charted. Refer to Company Job Instructions 224.05. *The California Division of Oil, Gas & Geothermal Resources shall be given sufficient notice to witness testing of the BOPE.*

- Note: Visually inspect the BOPE prior to assembly. Ring groove surfaces

should be checked for gouging and pitting. Ensure new API rings are used in all connections.

- 7) Make up a 12-1/4" mill tooth bit and run in the hole to drill out the float collar and shoe. Treat out the cement in mud system. Pull out of the hole. Make up a 12-1/4" mill tooth bit on a pendulum drilling assembly with MWD and drill the hole to approximately 2555' (KOP) surveying the hole every 90'. Pull out of hole with pendulum assembly.
- 8) Pick up directional drilling tool, mud motor, and MWD. Run in the hole to the kick off point and begin the directional drilling work. Build angle at 3 degrees per 100 ft to approximately 3321' (EOB). The planned build angle is 23 degrees. When appropriate build angle is achieved and hole is on course, pull out of hole with steerable drilling assembly. Run in with a locked up assembly and MWD and continue drilling to TD of 7547'. (See attached directional plan). Be prepared to make correction runs as necessary to achieve a 25 ft radius target at the top of the gas storage zone (S4).
- 9) Circulate and condition the hole to run electric logs. Run SP/resistivity/neutron/density/caliper logs (Platform Express) from TD to surface casing shoe.
- 10) Make a clean out run to TD. Circulate and condition the hole to run casing. Install 9-5/8" pipe rams in BOPE. Run 9-5/8", 47 lb/ft, N-80 casing from TD to surface as follows:  
Apply Seal Lube compound to all casing threads. Utilize torque-turn monitoring equipment to ensure proper make-up. (It is critical to obtain good pipe make-up as the casing is expected to be in service under high gas pressures for the long term.)
  - a) 9-5/8" LT&C differential fill float shoe
  - b) ± 430' of 9-5/8", 47 lb/ft, N-80, LT&C casing to ECP
  - c) 9-5/8" LT&C external casing packer (7' element, non-continuous ribbed)
  - d) ± 7680' of 9-5/8", 47 lb/ft, N-80, LT&C casing to surface
  - The exact placement of the ECP will be determined from open hole logs and will be placed in a shale section above the S1 sand. The ECP should not be placed in a washed out section of hole, nor in a sandstone interval.
  - Bow type tandem centralizers will be run.
  - Bakerlok and weld the shoe joint and the first three joints of casing in the same manner as the surface pipe.

- 11) With the casing on bottom circulate and condition the drilling mud. Rig up cementers and cement the 9-5/8" casing as follows:
- a) Drop a float activation ball prior to installing the cementing head.
  - b) Pump 40 bbls of weighted mud spacer that is compatible with drilling mud being used. Pilot test the spacer prior to the job.
  - c) Mix and pump the following slurries:

Cement Slurry (TBD)

- d) Use both a top and bottom wiper plug.
  - e) Bump the plug with 500 psi above the final circulating pressure, bleed the pressure off and check the floats.
  - f) Two pump trucks will be required to displace the cement job. The displacement rates should be 12 to 16 bpm. This will allow the best sweep efficiency and mud displacement.
- 12) Land the 9-5/8" casing in the 13-5/8", 5000 psi casing head. Install the secondary seals. Test the seals to 2000 psi for 20 minutes. Rig down BOPE.
- 13) Move the drilling rig to Fernando Fee 38B.

**SOUTHERN CALIFORNIA GAS COMPANY**  
**Geologic Markers - Fernando Fee 38 A**

(Anticipated markers based on pre-drill directional plan created \*\*/\*\*/\*\*)  
 Actual markers from final logs using final directional survey dated \*\*/\*\*/\*\*  
 Depths based on anticipated rotary table elevation of \*\*\*\*' above mean sea level

MARKER/ZONE	Anticipated			Actual / Difference		
	TVDSS	TVD	MD	Subsea	True Vertical	Meas Depth
Older SS Fault				/	/	/
Younger SS Fault				/	/	/
Aliso				/	/	/
A-1	-2000	3748	3807	/ -2000	/ 3748	/ 3807
A-20				/	/	/
A-36	-2707	4455	4575	/ -2707	/ 4455	/ 4575
Upper Porter	-3039	4787	4936	/ -3039	/ 4787	/ 4936
Lower Porter	-3444	5192	5375	/ -3444	/ 5192	/ 5375
Upper Del Aliso I	-3888	5636	5858	/ -3888	/ 5636	/ 5858
Upper Del Aliso II	-3992	5740	5971	/ -3992	/ 5740	/ 5971
Mid Del Aliso				/	/	/
Lower Del Aliso	-4478	6226	6499	/ -4478	/ 6226	/ 6499
MP	-4670	6418	6708	/ -4670	/ 6418	/ 6708
S-1	-5017	6765	7084	/ -5017	/ 6765	/ 7084
S-2	-5076	6824	7148	/ -5076	/ 6824	/ 7148
S-4	-5130	6878	7207	/ -5130	/ 6878	/ 7207
S-6	-5162	6910	7242	/ -5162	/ 6910	/ 7242
S-8	-5209	6957	7293	/ -5209	/ 6957	/ 7293
S-10	-5249	6997	7337	/ -5249	/ 6997	/ 7337
S-12	-5288	7036	7379	/ -5288	/ 7036	/ 7379
S-14	-5315	7063	7408	/ -5315	/ 7063	/ 7408
Santa Susana				/	/	/
Frew				/	/	/
Cretaceous	-5424	7172	7527	/ -5424	/ 7172	/ 7527
<b>Total Depth</b>	<b>-5620</b>	<b>7368</b>	<b>7740</b>	<b>/ -5620</b>	<b>/ 7368</b>	<b>/ 7740</b>

PLANNED CASING	Anticipated			Actual / Difference		
	SS	TVD	MD	Subsea	True Vertical	Meas Depth
Conductor				/ 0	/ 0	/ 0
Surface 9-5/8"						
Intermediate				/ 0	/ 0	/ 0
Liner				/ 0	/ 0	/ 0

**Hole sizes:** Conductor, driven; surface, \*\*\*\*; intermediate, \*\*\*\*, production, \*\*\*\*

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

No. P201-218

PERMIT TO CONDUCT WELL OPERATIONS

010  
(field code)  
00  
(area code)  
30  
(new pool code)  
  
(old pool code)

Gas Storage Project

James D. Mansdorfer, Agent  
Southern California Gas Company  
9400 Oakdale Ave.  
Chatsworth, CA. 91313

Ventura, California  
October 3, 2001

Your \_\_\_\_\_ proposal to \_\_\_\_\_ drill \_\_\_\_\_ well \_\_\_\_\_ "Fernando Fee" 38A  
A.P.I. No. 037-24230 \_\_\_\_\_ Sec. 27, T. 3N, R. 16W, SB B.&M.,  
Aliso Canyon \_\_\_\_\_ field, \_\_\_\_\_ area, \_\_\_\_\_ Sesnon-Frew \_\_\_\_\_ pool  
Los Angeles \_\_\_\_\_ County, dated 5/22/2001 received 9/19/2001 has been examined in conjunction  
with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

Drilling Operations

1. Blowout prevention equipment conforming to DOGGR Class IIIB 5M equipment on the 13-3/8" casing and maintained in operating condition at all times during drilling.
2. Drilling fluid of a quality and in sufficient quantity is used to control all subsurface condition in order to prevent blowouts.
3. An approved blowout prevention and control plan shall be available during the proposed operations.
4. Any sump used during these operations shall be thoroughly cleaned and filled with earth as soon as operations are completed.
5. If extensive, unplanned drill pipe operations occur (such as fishing, milling, etc.) and there is a possibility of casing damage, the casing must be pressure tested prior to resuming normal operations. This Division must be notified to witness the tests
6. The spacing provisions of Section 3606 shall apply.
7. A subsurface directional survey is made and a plat of such survey is filed with this office within 15 days of completion of the well.
8. This office shall be consulted before sidetracking the well or running any additional casing.
9. This office shall be consulted before initiating any changes or additions to this proposed operation, or operations are to be suspended.
10. **THIS DIVISION SHALL BE NOTIFIED:**
  - a. To witness a pressure test of the blowout prevention equipment prior to drilling out of the shoe of the 13-3/8" casing. Prior to notifying the Division engineer to witness the test, the blind rams must be tested. Information on the blind rams test must be entered on the tour sheet along with the signature of the person in charge.

Continued on Page 2

SAF:sf  
Super Blanket Bond

Engineer Steven A. Fields  
Phone (805) 654-4761

WILLIAM F. GUERARD, JR., State Oil and Gas Supervisor  
By [Signature]  
Deputy Supervisor

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.

Southern California Gas Company  
October 3, 2001  
P201-218

**Completion Operations**

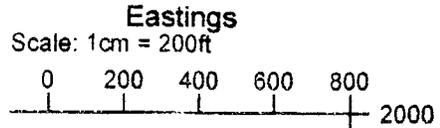
1. Blowout prevention equipment conforming to DOGGR Class II 5M requirements shall be installed and maintained in operating conditions at all times.
2. Hole fluid of a quality and in sufficient quantity is used to control all subsurface conditions in order to prevent blowouts.
3. Wire line operations are conducted through at least a 5M lubricator.
4. Requirements specified in our approval of the Gas Storage project dated July 26, 1989 shall apply.
5. **THIS DIVISION SHALL BE NOTIFIED:**
  - a. To inspect the installed blowout prevention equipment prior to commencing downhole operations.

Note: The Division recommends, as a minimum, that carbon monoxide monitoring equipment and a vent line be installed and maintained operational during all extensive perforating operations.

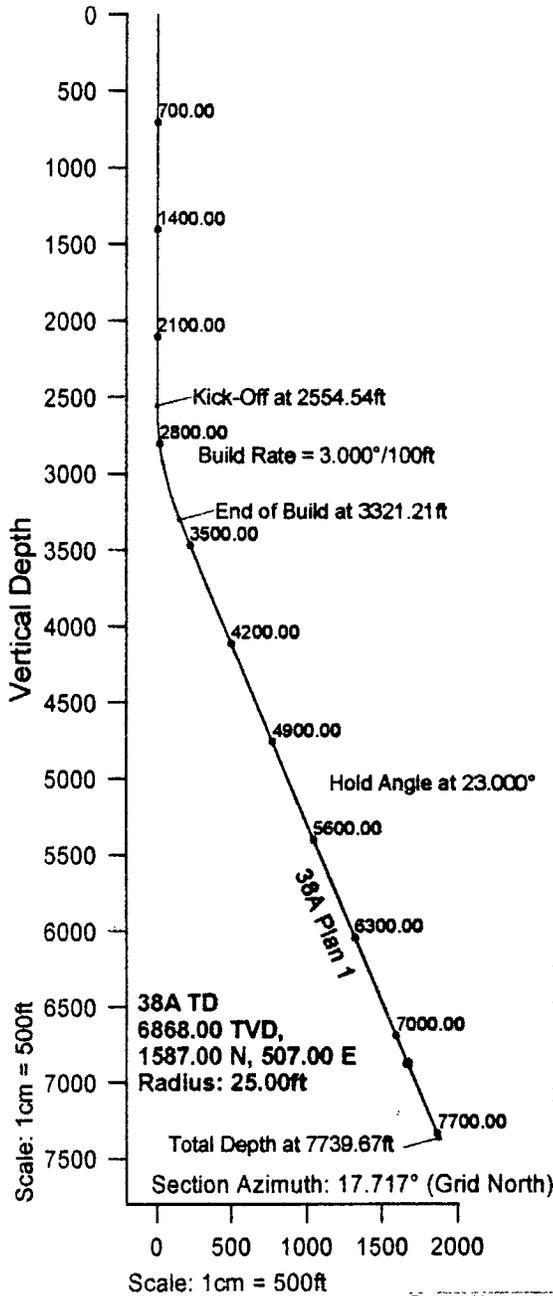
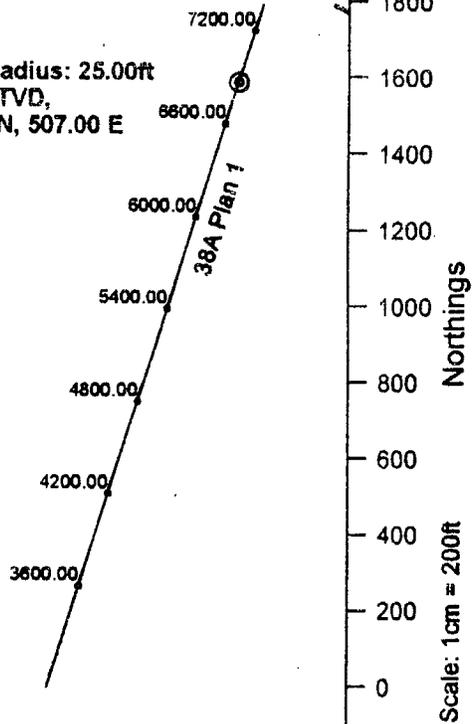
Aliso Canyon  
 Fernando Fee  
 38A

**Current Well Properties**

Well : 38A  
 Horizontal Coordinates :  
 Ref. Global Coordinates : 1935518.00 N, 6397214.00 E  
 Ref. Structure : 373.10 N, 192.69 W  
 Ref. Geographical Coordinates : 34° 18' 34.7493" N, 118° 32' 40.5008" W  
 RKB Elevation : 1748.00ft above Mean Sea Level  
 66.00ft above Fernando Fee 31  
 Grid North Convergence : -0.310°  
 North Reference : Grid North  
 Units : Feet (US)



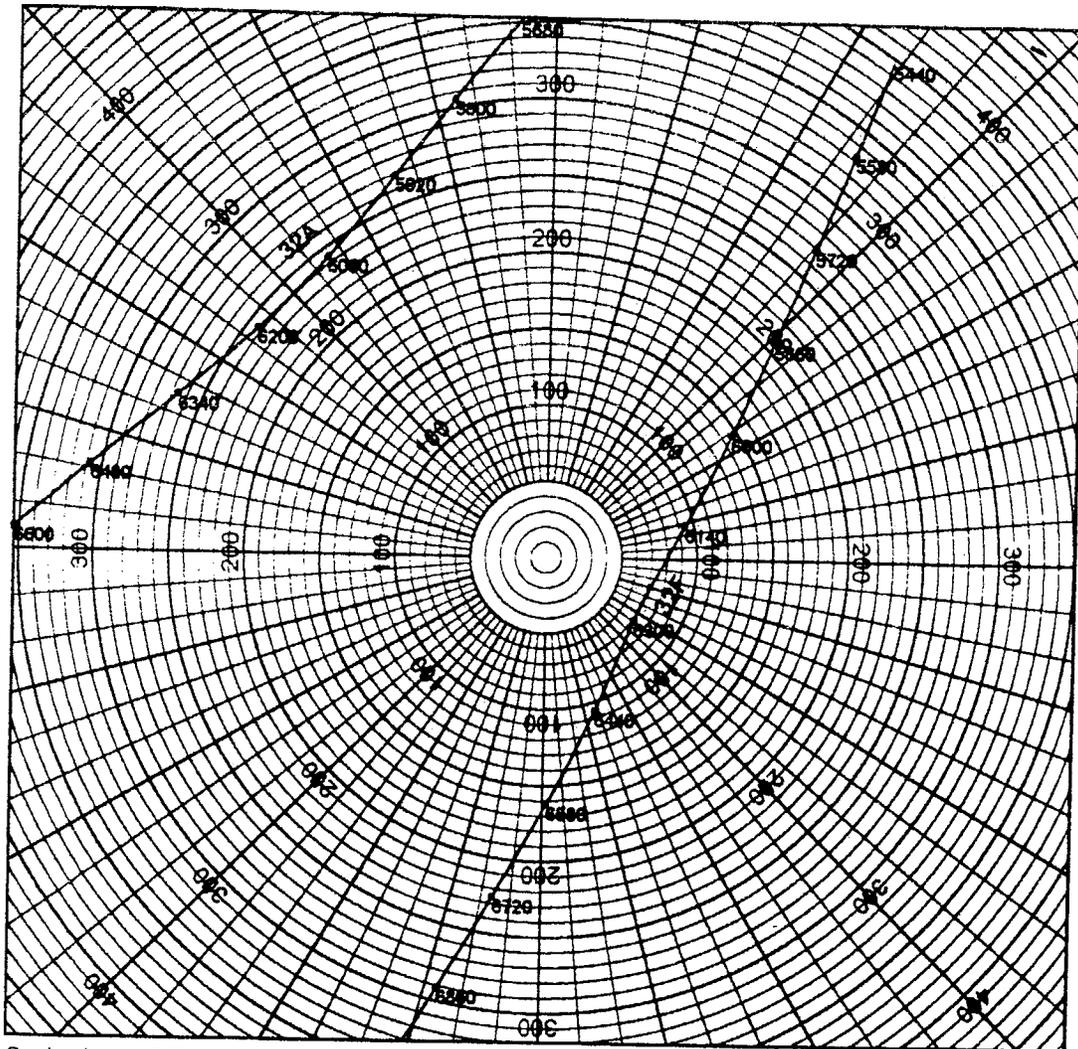
**38A TD**  
 Circle, Radius: 25.00ft  
 6868.00 TVD,  
 1587.00 N, 507.00 E



Proposal Data for 38A Plan 1							
Vertical Origin :	Well						
Horizontal Origin :	Well						
Measurement Units :	ft						
North Reference :	Grid North						
Grid North Convergence :	-0.310°						
Dogleg severity :	Degrees per 100 feet (US)						
Vertical Section Azimuth :	17.717°						
Vertical Section Description :	Well						
Vertical Section Origin :	0.00 N, 0.00 E						
Coordinate System :	NAD83 California State Planes, Zone V						
Measured Depth	Incl.	Azim.	Vertical Depth	Northings	Eastings	Vertical Section	Dogleg Rate
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	0.000
2554.54	0.000	0.000	2554.54	0.00 N	0.00 E	0.00	0.000
3321.21	23.000	17.717	3300.78	144.62 N	46.20 E	151.82	3.000
7196.49	23.000	17.717	6868.00	507.00 N	507.00 E	1666.02	0.000
7739.67	23.000	17.717	7368.00	1789.17 N	571.59 E	1878.26	0.000

Prepared by: Admin Date/Time: 2 October, 2001 - 19:21 Checked: Approved:

Aliso Canyon  
 Fernando Fee  
 38A



Scale: 1cm = 50ft

Scan Reference: Highside Reference  
 Scan Method: Minimum Distance

Proposal Data for 38A Plan 1 (02-Oct-01)							
Vertical Origin :	Well						
Horizontal Origin :	Well						
Measurement Units :	ft						
North Reference :	Grid North						
Grid North Convergence :	-0.310°						
Dogleg severity :	Degrees per 100 feet (US)						
Vertical Section Azimuth :	138.093°						
Vertical Section Description:	Well						
Vertical Section Origin :	0.00 N,0.00 E						
Coordinate System :	NAD83 California State Planes, Zone V						
Measured Depth	Incl.	Azim.	Vertical Depth	Northings	Eastings	Vertical Section	Dogleg Rate
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	0.000
2554.54	0.000	0.000	2554.54	0.00 N	0.00 E	0.00	0.000
3321.21	23.000	17.717	3300.78	144.62 N	46.20 E	-76.77	3.000
7196.49	23.000	17.717	6868.00	1587.00 N	507.00 E	-842.45	0.000
7739.67	23.000	17.717	7368.00	1789.17 N	571.59 E	-949.77	0.000

Prepared by: Admin Date/Time: 2 October, 2001 - 19:12 Checked: Approved:

**Aliso Canyon  
Fernando Fee, Slot 38A  
38A Plan 1**

Revised: 2 October, 2001

# PROPOSAL REPORT

2 October, 2001

Surface Coordinates: 1935516.00 N, 6397214.00 E (34° 18' 34.7493" N, 118° 32' 40.5008" W)  
Surface Coordinates relative to Global Coordinates: 1935516.00 N, 6397214.00 E (Grid)  
Surface Coordinates relative to Structure: 373.10 N, 192.69 W (Grid)  
RKB: 1748.00ft above Mean Sea Level

**sperry-sun**  
**DRILLING SERVICES**  
A Halliburton Company

Proposal Ref: pro34975

# Sperry-Sun Drilling Services

Proposal Report for 38A Plan 1  
Revised: 2 October, 2001

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates Northings (ft)	Local Coordinates Eastings (ft)	Global Coordinates Northings (ft)	Global Coordinates Eastings (ft)	Dogleg Rate (°/100ft)	Vertical Section	Comment
0.00	0.000	0.000	-1748.00	0.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
100.00	0.000	0.000	-1648.00	100.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
200.00	0.000	0.000	-1548.00	200.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
300.00	0.000	0.000	-1448.00	300.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
400.00	0.000	0.000	-1348.00	400.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
500.00	0.000	0.000	-1248.00	500.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
600.00	0.000	0.000	-1148.00	600.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
700.00	0.000	0.000	-1048.00	700.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
800.00	0.000	0.000	-948.00	800.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
900.00	0.000	0.000	-848.00	900.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1000.00	0.000	0.000	-748.00	1000.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1100.00	0.000	0.000	-648.00	1100.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1200.00	0.000	0.000	-548.00	1200.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1300.00	0.000	0.000	-448.00	1300.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1400.00	0.000	0.000	-348.00	1400.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1500.00	0.000	0.000	-248.00	1500.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1600.00	0.000	0.000	-148.00	1600.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1700.00	0.000	0.000	-48.00	1700.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1800.00	0.000	0.000	52.00	1800.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
1900.00	0.000	0.000	152.00	1900.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2000.00	0.000	0.000	252.00	2000.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2100.00	0.000	0.000	352.00	2100.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2200.00	0.000	0.000	452.00	2200.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2300.00	0.000	0.000	552.00	2300.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2400.00	0.000	0.000	652.00	2400.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2500.00	0.000	0.000	752.00	2500.00	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2554.54	0.000	0.000	806.54	2554.54	0.00 N	0.00 E	1935516.00 N	6397214.00 E	0.000	0.00	
2600.00	1.364	17.717	852.00	2600.00	0.52 N	0.16 E	1935516.52 N	6397214.16 E	0.000	0.00	Kick-Off at 2554.54ft
2700.00	4.364	17.717	951.86	2699.86	5.27 N	1.68 E	1935521.27 N	6397215.68 E	3.000	0.54	
2800.00	7.364	17.717	1051.32	2799.32	15.00 N	4.79 E	1935531.00 N	6397218.79 E	3.000	5.54	
										15.75	

Aliso Canyon

Fernando Fee

# Sperry-Sun Drilling Services

Proposal Report for 38A Plan 1  
Revised: 2 October, 2001

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates Northings (ft) Eastings (ft)	Global Coordinates Northings (ft) Eastings (ft)	Dogleg Rate (°/100ft)	Vertical Section	Comment
2900.00	10.364	17.717	1150.12	2898.12	29.68 N 9.48 E	1935545.68 N 6397223.48 E	3.000	31.16	
2937.87	11.500	17.717	1187.31	2935.31	36.52 N 11.67 E	1935552.52 N 6397225.67 E	3.000	38.34	
3000.00	13.364	17.717	1247.97	2995.97	49.26 N 15.74 E	1935565.26 N 6397229.74 E	3.000	51.71	Build Rate = 3.000°/100ft
3100.00	16.364	17.717	1344.61	3092.61	73.69 N 23.54 E	1935589.69 N 6397237.54 E	3.000	77.36	
3200.00	19.364	17.717	1439.78	3187.78	102.91 N 32.88 E	19355618.91 N 6397246.88 E	3.000	108.04	
3300.00	22.364	17.717	1533.22	3281.22	136.83 N 43.71 E	1935552.83 N 6397257.71 E	3.000	143.65	
3321.21	23.000	17.717	1552.78	3300.78	144.62 N 46.20 E	1935660.62 N 6397260.20 E	3.000	151.82	
3400.00	23.000	17.717	1625.31	3373.31	173.95 N 55.57 E	1935689.95 N 6397269.57 E	0.000	182.61	End of Build at 3321.21ft
3500.00	23.000	17.717	1717.36	3465.36	211.17 N 67.46 E	1935727.17 N 6397281.46 E	0.000	221.68	
3600.00	23.000	17.717	1809.41	3557.41	248.39 N 79.35 E	1935764.39 N 6397293.35 E	0.000	260.76	
3700.00	23.000	17.717	1901.46	3649.46	285.61 N 91.24 E	1935801.61 N 6397305.24 E	0.000	299.83	
3800.00	23.000	17.717	1993.51	3741.51	322.83 N 103.13 E	1935838.83 N 6397317.13 E	0.000	338.90	
3900.00	23.000	17.717	2085.56	3833.56	360.05 N 115.03 E	1935876.05 N 6397329.03 E	0.000	377.98	
4000.00	23.000	17.717	2177.61	3925.61	397.27 N 126.92 E	1935913.27 N 6397340.92 E	0.000	417.05	
4100.00	23.000	17.717	2269.66	4017.66	434.49 N 138.81 E	1935950.49 N 6397352.81 E	0.000	456.12	
4200.00	23.000	17.717	2361.72	4109.72	471.71 N 150.70 E	1935987.71 N 6397364.70 E	0.000	495.20	
4300.00	23.000	17.717	2453.77	4201.77	508.93 N 162.59 E	1936024.93 N 6397376.59 E	0.000	534.27	
4400.00	23.000	17.717	2545.82	4293.82	546.15 N 174.48 E	1936062.15 N 6397388.48 E	0.000	573.34	
4500.00	23.000	17.717	2637.87	4385.87	583.37 N 186.37 E	1936099.37 N 6397400.37 E	0.000	612.42	
4600.00	23.000	17.717	2729.92	4477.92	620.59 N 198.26 E	1936136.59 N 6397412.26 E	0.000	651.49	
4700.00	23.000	17.717	2821.97	4569.97	657.81 N 210.15 E	1936173.81 N 6397424.15 E	0.000	690.56	
4800.00	23.000	17.717	2914.02	4662.02	695.03 N 222.04 E	1936211.03 N 6397436.04 E	0.000	729.63	
4900.00	23.000	17.717	3006.07	4754.07	732.25 N 233.93 E	1936248.25 N 6397447.93 E	0.000	768.71	
5000.00	23.000	17.717	3098.12	4846.12	769.47 N 245.82 E	1936285.47 N 6397459.82 E	0.000	807.78	
5100.00	23.000	17.717	3190.17	4938.17	806.69 N 257.71 E	1936322.69 N 6397471.71 E	0.000	846.85	
5200.00	23.000	17.717	3282.22	5030.22	843.91 N 269.60 E	1936359.91 N 6397483.60 E	0.000	885.93	
5258.85	23.000	17.717	3336.39	5084.39	865.81 N 276.60 E	1936381.81 N 6397490.60 E	0.000	908.92	Hold Angle at 23.000°
5300.00	23.000	17.717	3374.27	5122.27	881.13 N 281.49 E	1936397.13 N 6397495.49 E	0.000	925.00	
5400.00	23.000	17.717	3466.32	5214.32	918.35 N 293.39 E	1936434.35 N 6397507.39 E	0.000	964.07	
5500.00	23.000	17.717	3558.37	5306.37	955.57 N 305.28 E	1936471.57 N 6397519.28 E	0.000	1003.15	

Aliso Canyon

Fernando Fee

# Sperry-Sun Drilling Services

Proposal Report for 38A Plan 1  
Revised: 2 October, 2001

Aliso Canyon

Fernando Fee

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coordinates Northings (ft) Eastings (ft)	Global Coordinates Northings (ft) Eastings (ft)	Dogleg Rate (°/100ft)	Vertical Section	Comment
5600.00	23.000	17.717	3650.42	5398.42	992.79 N 317.17 E	1936508.79 N 6397531.17 E	0.000	1042.22	
5700.00	23.000	17.717	3742.47	5490.47	1030.01 N 329.06 E	1936546.01 N 6397543.06 E	0.000	1081.29	
5800.00	23.000	17.717	3834.52	5582.52	1087.23 N 340.95 E	1936583.23 N 6397554.95 E	0.000	1120.37	
5900.00	23.000	17.717	3926.57	5674.57	1104.45 N 352.84 E	1936620.45 N 6397566.84 E	0.000	1159.44	
6000.00	23.000	17.717	4018.62	5766.62	1141.67 N 364.73 E	1936657.67 N 6397578.73 E	0.000	1198.51	
6100.00	23.000	17.717	4110.67	5858.67	1178.89 N 376.62 E	1936694.89 N 6397590.62 E	0.000	1237.59	
6200.00	23.000	17.717	4202.72	5950.72	1216.11 N 388.51 E	1936732.11 N 6397602.51 E	0.000	1276.66	
6300.00	23.000	17.717	4294.78	6042.78	1253.33 N 400.40 E	1936769.33 N 6397614.40 E	0.000	1315.73	
6400.00	23.000	17.717	4386.83	6134.83	1290.55 N 412.29 E	1936806.55 N 6397626.29 E	0.000	1354.80	
6500.00	23.000	17.717	4478.88	6226.88	1327.77 N 424.18 E	1936843.77 N 6397638.18 E	0.000	1393.88	
6600.00	23.000	17.717	4570.93	6318.93	1364.99 N 436.07 E	1936880.99 N 6397650.07 E	0.000	1432.95	
6700.00	23.000	17.717	4662.98	6410.98	1402.21 N 447.96 E	1936918.21 N 6397661.96 E	0.000	1472.02	
6800.00	23.000	17.717	4755.03	6503.03	1439.43 N 459.85 E	1936955.43 N 6397673.85 E	0.000	1511.10	
6900.00	23.000	17.717	4847.08	6595.08	1476.65 N 471.75 E	1936992.65 N 6397685.75 E	0.000	1550.17	
7000.00	23.000	17.717	4939.13	6687.13	1513.87 N 483.64 E	1937029.87 N 6397697.64 E	0.000	1589.24	
7100.00	23.000	17.717	5031.18	6779.18	1551.09 N 495.53 E	1937067.09 N 6397709.53 E	0.000	1628.32	
7196.49	23.000	17.717	5120.00	6868.00	1587.00 N 507.00 E	1937103.00 N 6397721.00 E	0.000	1666.02	Target - 38A TD, Current Target
7200.00	23.000	17.717	5123.23	6871.23	1588.31 N 507.42 E	1937104.31 N 6397721.42 E	0.000	1667.39	
7300.00	23.000	17.717	5215.28	6963.28	1625.53 N 519.31 E	1937141.53 N 6397733.31 E	0.000	1706.46	
7400.00	23.000	17.717	5307.33	7055.33	1662.75 N 531.20 E	1937178.75 N 6397745.20 E	0.000	1745.54	
7500.00	23.000	17.717	5399.38	7147.38	1699.97 N 543.09 E	1937215.97 N 6397757.09 E	0.000	1784.61	
7600.00	23.000	17.717	5491.43	7239.43	1737.19 N 554.98 E	1937253.19 N 6397768.98 E	0.000	1823.68	
7700.00	23.000	17.717	5583.48	7331.48	1774.41 N 566.87 E	1937290.41 N 6397780.87 E	0.000	1862.76	
7739.67	23.000	17.717	5620.00	7368.00	1789.17 N 571.59 E	1937305.17 N 6397785.59 E	0.000	1878.26	Total Depth at 7739.67ft

All data is in Feet (US) unless otherwise stated. Directions and coordinates are relative to Grid North.  
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet (US).  
Vertical Section is from Well and calculated along an Azimuth of 17.717° (Grid).

Based upon Minimum Curvature type calculations, at a Measured Depth of 7739.67ft.  
The Bottom Hole Displacement is 1878.26ft., in the Direction of 17.717° (Grid).

# Sperry-Sun Drilling Services

Proposal Report for 38A Plan 1

Revised: 2 October, 2001

Aliso Canyon

Fernando Fee

**Comments**

Measured Depth (ft)	Station Coordinates		Comment
	TVD (ft)	Eastings (ft)	
2554.54	0.00 N	0.00 E	Kick-Off at 2554.54ft
2937.87	36.52 N	11.67 E	Build Rate = 3,000°/100ft
3321.21	144.62 N	46.20 E	End of Build at 3321.21ft
5258.85	5084.39	276.60 E	Hold Angle at 23,000°
7739.67	1789.17 N	571.59 E	Total Depth at 7739.67ft

**Targets associated with this wellpath**

Target Name	Target Entry Coordinates		Target Shape	Target Type
	TVD (ft)	Northings (ft)		
38A TD	6868.00	1587.00 N	Point	Current Target
	5120.00	1937103.00 N		
		34° 18' 50.4753" N		118° 32' 34.5590" W

Mean Sea Level/Global Coordinates:  
Geographical Coordinates:

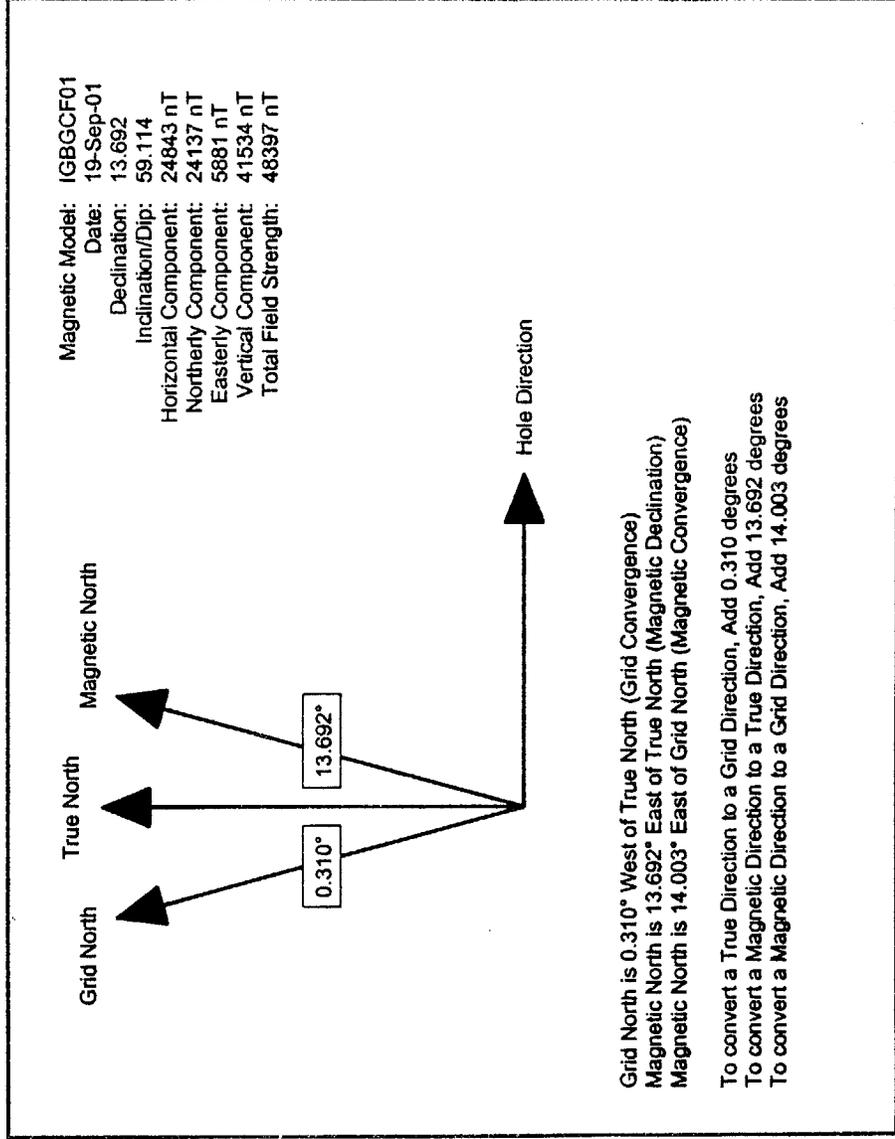
# Sperry-Sun Drilling Services

North Reference Sheet for 38A

Fernando Fee

Aliso Canyon

Coordinate System is NAD83 California State Planes, Zone V  
 Grid Coordinates of Well: 1935516.00 N, 6397214.00 E  
 Geographical Coordinates of Well: 34° 18' 34.7493" N, 118° 32' 40.5008" W  
 Grid Convergence at Surface is -0.310°. Magnetic Convergence at Surface is -14.003° (19 September, 2001)





## Drilling Fluids, Inc.

SOUTHERN CALIFORNIA GAS COMPANY  
"Porter and Fernando Fee" Wells  
Section 27, T3N, R16W  
Aliso Canyon Storage Field  
Los Angeles County, CA

### MUD PROGRAM

**0-800' Drilling 17 1/2" hole to set 13 3/8" surface casing:** Drill the surface hole with available spud mud and/or Gel and water. Maintain a viscosity of 45-55 sec/qt or as needed to clean the surface hole. Maintain weight at 8.6-9.0 ppg with solids control equipment and small amounts of dilution.

<u>Weight</u>	<u>Viscosity</u>
8.6-9.0 ppg	45-65

**800'-2500' Drilling 12 1/4" hole:** Upon drilling out cement and shoe of surface casing, dump any severely cement contaminated mud. Treat out remaining calcium with Bicarbonate of Soda. Recondition the mud system with fresh Gel, as needed. While drilling maintain a low solids, Gel/water system.

Lost circulation is a very common problem in the Aliso Canyon Area and could become a major problem in this interval. Historically, lost circulation in the Aliso Canyon Field can be cured with Coarse L.C.M. This conventional approach would be suggested here as the first step should losses occur. Other remedies can be discussed should losses become a severe problem. Of course, mud weights should be kept as low as possible with continuous efficient use of available solids control equipment.

**Rheology-** To be controlled primarily with Gel and water. Viscosities are to be kept at 38-45 sec/qt. Benex can be used to support rheology and maintain minimum solids. Omnipol, a liquid polymer deflocculant, can be utilized to help control excessive gel strengths if necessary.

**Weight-** To be controlled with the effective use for the solids control equipment. The mud weight should be kept as low as possible.

**API Filtrate**- To be controlled with fresh Bentonite only in this interval. Lower fluid loss control is not necessary.

**pH**- To be kept "native" typically, this runs from 7.6-8.3 in this area.

**Solids**- To be controlled with the mud cleaner and a centrifuge.

<u>Weight</u>	<u>Viscosity</u>	<u>Filtrate</u>	<u>pH</u>	<u>Solids</u>
8.8-9.2 ppg	38-45	12-15	7.6-8.3	3-7%

**2500'-8000'± Drilling 12 1/4" hole:** While drilling below 3000' break the mud over to a fully treated Cypan system. This is easily accomplished by adding 1 ppb Cypan and .1 ppb Omnipol to the existing Gel based mud. Omnipol will be utilized to maintain proper rheological properties. The resulting fluid loss from the initial Cypan additions will range from 6 to 8 cc's. The possibility of lost circulation may still exist, so special attention should be given to maintaining the efficient use of the solids control equipment to keep the mud weight as low as possible. We recommend adding 1 to 2 ppb CFR to help improve lubricity while drilling. Should any shale related problems occur while drilling the Pico, it may be advantageous to add 2-4 ppb of Soltex for stabilization. Continue to maintain the mud weight and drill solids with the use of a mud cleaner and centrifuge. Maintain the system as follows:

**Weight**- To be controlled at a native level of 9.0-9.6 ppg by maximizing the use of all solids control equipment, trying to maintain it as low as possible unless otherwise indicated.

**Rheology**- To be controlled much as in the previous interval. Additional Omnipol use is anticipated to control gel strengths through the Pico formation.

**API Filtrate**- To be reduced to 6 to 8 cc's primarily as a result of the Cypan break over. Thereafter, light hourly additions of Cypan and fresh Gel will maintain this value.

**pH**- Native pH control is most conducive to formation protection.

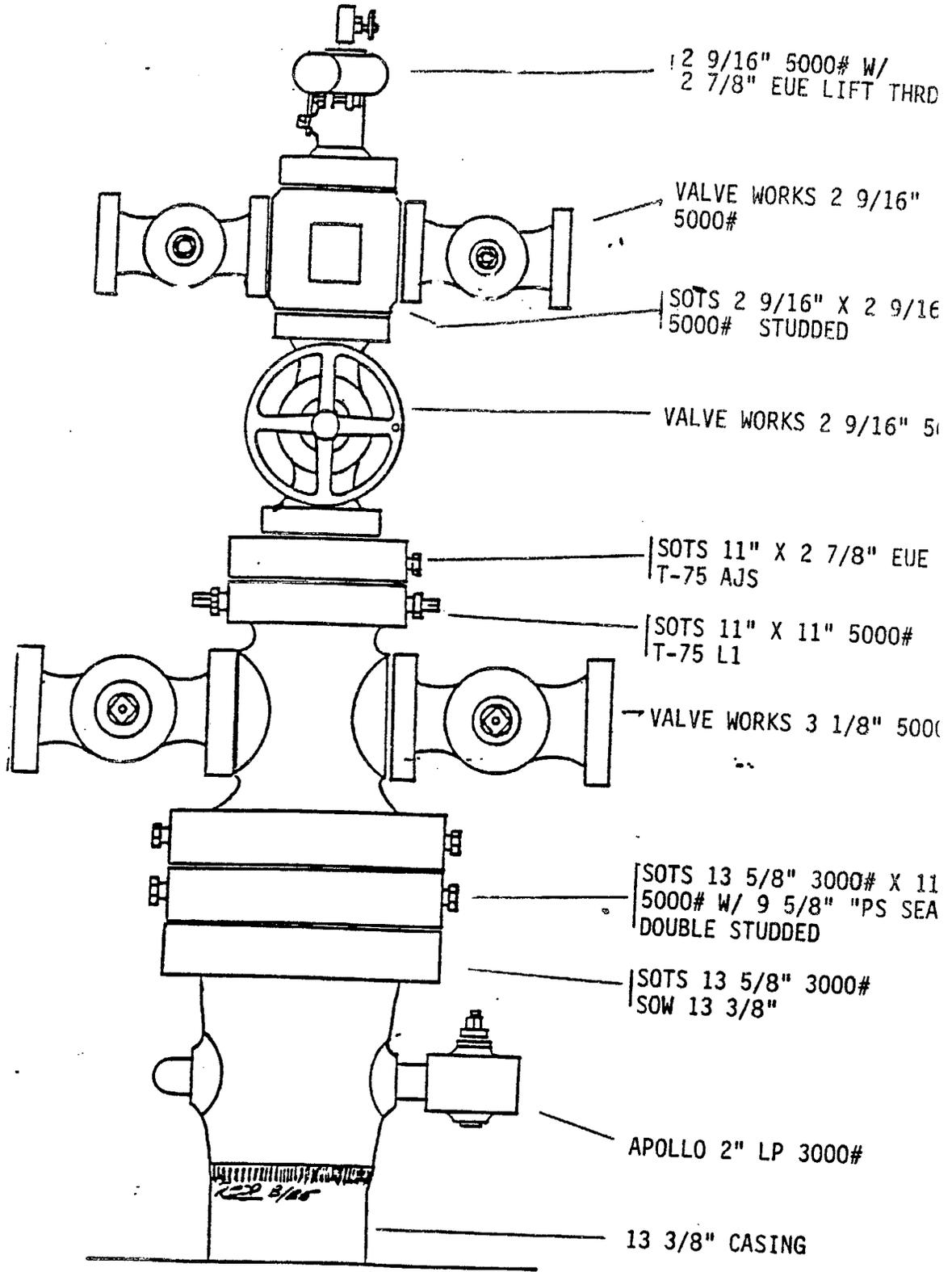
<u>Weight</u>	<u>Viscosity</u>	<u>Filtrate</u>	<u>pH</u>	<u>Solids</u>
9.0-9.6 ppg	38-44	6-8	7.6-8.3	4-8%

**COMMENTS**

We recommend the use of a screened mud cleaner capable of processing 150% of the circulating volume.

We recommend a centrifuge to be set up to discard the high gravity, inert solids.

A minimum of 500 sacks of Barite and 100 sacks of LCM should be on location at all times.



WELL NAME ~~XXXXXXXXXX~~  
 MFGR. SHAFFER OIL TOOL SERVICES  
 DATE PREPARED 9/10/01

(TYPE IV & VI)

Well No.                     

Date Prepared 9/10/01

Field ALISO CANYON

Prepared By                     

Wellhead Mfr. SHAFFER OIL TOOL SERVICES

1. Casing Head SOTS Size 13 5/8" 3000# SOW 13 3/8" Type C-22

Slips & Pack-off 13 5/8" X 9 5/8" I-C-22

A. Surface Csg. Size 13 3/8" Wt                      Grade                     

B. Casing Head Valve APOLLO 3000# Size 2" L.P. Fig No.                     

2. Seal Flange SOTS Size 13 5/8" 3000# X 11" 5000# D.S.

A. Type Seal 9 5/8" "PS" Ring BOTTOM RX-57 & TOP RX-54

3. Tubing Head SOTS Size 11" X 11" 5000# Type 75 L1

Ring BOTTOM RX-54 & TOP RX-54

Outlets 3 1/8" 5000# STUDED Sec. Seal 9 5/8" "PS"

Valve Removal Thrd 2 1/2" L.P.

A. Tubing Hanger SOTS Size 11" X 2 7/8" Type "AJS"

B.P.V. Size SHAFFER 2 7/8" Thrd                     

B. Tubing Head Valves VALVE WORKS Size 3 1/8" 5000# Fig.No.                     

C. Automatic Csg. Valve N/A Size                      Fig.No.                     

4. Adapter Seal Flange SOTS Size 11" X 2 9/16" 5000# Type                     

A. Ring Size BOTTOM RX-54 & TOP RX-27

5. Master Valve VALVE WORKS Size 2 9/16" 5000# Fig.No.                     

6. Xmas Tree Cross SOTS Size 2 9/16" X 2 9/16" 5000# STUDED

Bore: Thru 2 9/16" Across 2 9/16"

7. Tubing Wing Valves VALVE WORKS Size 2 9/16" 5000# Fig.No.                     

A. Automatic Tbg. Valve                      Size                      Fig.No.                     

8. Unibolt Size 2 9/16" 5000# Inside Thrds 2 7/8" EUE

9. Size Landed in Csg. Head 9 5/8" Wt                      Grade                     

10. Size Landed on Doughnut 2 7/8" EUE Wt                      Grade                     

11. Tubing Head to Ground Level