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**Root Cause Analysis of the
Dow RGC 10 Well Blowouts**





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Prepared for

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Nomenclature

API	American Petroleum Institute
bbls	Barrels
BFW	Base of Fresh Water
BOP	Blowout Preventer
BOPE	Blowout preventer equipment
cu-ft.	cubic feet
DOGGR	Division of Oil, Gas and Geothermal Resources
ETOC	Estimated Top of Cement
Ft.	feet
lbs	pounds
LCM	Lost Circulation Materials
MLLW	Mean Lower Low Water
ppg	pound per gallon
ppf	pound per foot
psi	pounds per square inch
RCA	Root Cause Analysis
SOW	Scope of Work
spf	shots per foot
TIW	Texas Iron Works
WCP	Well Control Plan
WSM	Well Site Manager
USDW	Underground Source of Drinking Water

Executive Summary

Exponent submits this Root Cause Analysis (RCA) report to MDR Hotels, LLC (“MDR”), pursuant to Emergency Order to Perform Remedial Work No. 1143 (“Order 1143”) of the State of California, Natural Resources Agency, Department of Conservation, Division of Oil, Gas, and Geothermal Resource (“DOGGR”). DOGGR issued Order 1143 to the operator of the well, MDR, on January 18, 2019 in response to a blowout of well Dow RGC 10 (API 04-037-13798-00). The blowout occurred on January 11, 2019 during operations to re-enter and reabandon the well to current standards for plug and abandonment in the state of California. InterAct PMTI (“InterAct”) was contracted by MDR to draft, manage, and execute the re-abandonment program for Dow RGC 10. California Well Services (“CWS”) was contracted for the rig and mud pump, and Weatherford for the blowout preventer equipment. Electronic documents available from the DOGGR website show that the Dow RGC 10 well was drilled and completed in 1931, and was abandoned twice previously, once in 1956 and again in 1959. The well blew out during the previous abandonment operation on or about March 12, 1956. Three well control events occurred during the Dow RGC 10 well reabandonment operations in 2018 and 2019: (1) on December 20, 2018, drilling mud broached the surface approximately 20-ft. from the well cellar; (2) on December 25, 2018, the well blew out (broached) around the outside of the well cellar; and (3) on January 11, 2019 the well blew out gas and liquids through the drill string. The non-emergency required action of Order 1143 included that, *“Within 60 days following receipt of this Order, complete a root cause analysis detailing the causal factors which led to loss of control and the release of fluids, including gas, which occurred on about January 11, 2019 during the Operator’s reabandonment efforts of Dow R.G.C. 10.”* Order 1143 included subordinate requirements of the RCA, as discussed in the body of this report.

It is our opinion that the following causal factors led to the well control events, in particular the January 11, 2019 blowout, during the reabandonment of Dow RGC 10:

- Insufficient integrity of the old, circa 1931, casing strings in the well allowed inflow of gas into the wellbore and beneath old cement plugs through possible corrosion holes in production casing and non-plugged manmade cuts or perforations, and led to lost mud circulation problems.
- Insufficient barriers placed during previous abandonments of the old well, which allowed shallow gas to enter the wellbore, and led to lost mud circulation problems.
- The original operators, The Ohio Oil Company and Dow Chemical Company, did not adequately characterize the shallow gas formations in the region of the well, which caused a blowout in a previous abandonment of the well in 1956.
- Lost circulation problems and lost mud while drilling through and below cement plugs at about 786-887 ft.
- Reducing the mud weight from 9.0 ppg to 8.4 ppg in the days before the blowout.

- Possible swabbing in of a gas kick when pulling the bit up from 1,617 ft. to 1,492 ft. when the well blew out through drill string.

Other findings in our review of documents and the reabandonment operations were as follows:

- The CWS rig supervisor, rig operator, and a rig hand who worked on the Dow RGC 10 reabandonment operations during the period October 23, 2018 through January 13, 2019 had no evidence of or had expired well control course certifications. In one case the certification had expired as early as July 21, 2013.
- The Dow RGC 10 reabandonment operations presented significant well control challenges involving shallow gas pockets and kicks, and lost circulation of drilling mud. It is most likely that gas entered and mud exited the wellbore through very old casing strings (circa 1931), which likely experienced significant corrosion and which were not well cemented.
- InterAct and CWS brought the well under control and killed the well on or about January 15, 2019. Because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, InterAct and CWS were unable to complete the cement plugs below the depth of approximately 1,500 ft., as required by the permit approved by DOGGR.

1 Introduction

Exponent submits this Root Cause Analysis (RCA) report to MDR Hotels, LLC (“MDR”), pursuant to Emergency Order to Perform Remedial Work No. 1143 (“Order 1143”) of the State of California, Natural Resources Agency, Department of Conservation, Division of Oil, Gas, and Geothermal Resource (“DOGGR”).¹ DOGGR issued Order 1143 to the operator of the well, MDR, on January 18, 2019 in response to a blowout of well Dow RGC 10 (API 04-037-13798-00).² The blowout occurred on January 11, 2019 during operations to re-enter and reabandon the well to current standards for plug and abandonment in the state of California. On or about June 5, 2018, DOGGR approved a permit for the reabandonment operation proposal submitted by MDR.³ The Dow RGC 10 reabandonment operations presented significant well control challenges involving shallow gas pockets and kicks, and lost circulation of drilling mud. It is most likely that gas entered and mud exited the wellbore through very old casing strings (circa 1931), which likely experienced significant corrosion and which were not well cemented. For example, in the first days of drilling it was found that the 18” riveted stove pipe casing was badly corroded and lacked structural integrity to support well control equipment. Shallow gas formations at around 2,200 ft. were known to exist from historic coring records during the original drilling operations in 1931 and subsequent operations, but there was insufficient formation logging and characterization, as described in detail later in this report.

InterAct PMTI (“InterAct”) was contracted by MDR to draft, manage, and execute the re-abandonment program for Dow RGC 10. InterAct drafted the proposal for reabandonment of Dow RGC 10.⁴ California Well Services (“CWS”) was contracted for the rig and mud pump, and Weatherford for the blowout preventer equipment. Electronic documents available from the DOGGR website show that the Dow RGC 10 well was drilled and completed in 1931, and was abandoned twice previously, once in 1956 and again in 1959. In fact, the well blew out during the previous abandonment operation on or about March 12, 1956. Three well control events occurred during the Dow RGC 10 well reabandonment operations in 2018 and 2019:

1. December 20, 2018, drilling mud broached the surface approximately 20-ft. from the well cellar.

¹ Emergency Order to Perform Remedial Work No. 1143 (“Order 1143”) of the State of California, Natural Resources Agency, Department of Conservation, Division of Oil, Gas, and Geothermal Resource, dated January 18, 2019, available at <https://www.conservation.ca.gov/dog/Documents/Orders/1143.pdf>

² “R.G.C.” is an acronym for “Recreation Gun Club,” as reported in the original Notice of Intention to Drill New Well dated February 19, 1931 as submitted by the Ohio Oil Company. We have elected to use RGC rather than R.G.C. in our report.

³ Permit No.: 7000607 issued by DOGGR dated June 5, 2018, available at ftp://ftp.consrv.ca.gov/pub/oil/WellRecord/037/.../03713798_2019-01-22_DATA.pdf, last accessed May 29, 2019.

⁴ Re-abandonment Program Dow RGC-10, dated April 27, 2018, submitted to DOGGR and attached to permit No.: 7000607 issued by DOGGR dated June 5, 2018, available at ftp://ftp.consrv.ca.gov/pub/oil/WellRecord/037/.../03713798_2019-01-22_DATA.pdf, last accessed May 29, 2019.

2. December 25, 2018, the well blew out (broached) around the outside of the well cellar.
3. January 11, 2019 the well blew out gas and liquids through 2-7/8” drill string.⁵

The non-emergency required action of Order 1143 included that, “*Within 60 days following receipt of this Order, complete a root cause analysis detailing the causal factors which led to loss of control and the release of fluids, including gas, which occurred on about January 11, 2019 during the Operator’s reabandonment efforts of Dow R.G.C. 10.*” Order 1143 included subordinate requirements of the RCA, as discussed in the body of this report. MDR retained Exponent to perform a Root Cause Analysis (RCA) of the Dow RGC 10 blowouts.

In a February 12, 2019 letter to MDR, DOGGR approved Exponent’s Scope of Work (“SOW”), with several specific additional requirements, described in Section 2 of this report.⁶ As part of the letter, DOGGR proposed a casing logging program of the Dow RGC 10 wellbore, in addition to logs proposed by Exponent. Ultimately, the proposed wellbore logs could not be performed due to obstructions in the wellbore at or about 1,500 ft. Additionally, in the February 12, 2019 letter to MDR DOGGR required a well control subject expert (“SME”) with practical experience also contribute to the RCA. Exponent designated Mr. Aaron G. Scheet of Wild Well Control (“WWC”) to review our RCA report. MDR contracted WWC on or about January 20, 2019, after the blowout incidents, to advise MDR and the field personnel on operations to ensure well control and complete the well reabandonment. Mr. Scheet independently reviewed our report and we have incorporated his comments and suggestions.

InterAct completed reabandonment of the Dow RGC 10 by placing several cement plugs in the well to the depth of 1,500 ft. DOGGR classified the Dow RGC 10 well as abandoned as of April 4, 2019.⁷ However, the original objective of the permitted reabandonment procedure was to place cement plugs as follows:

- base of freshwater at 700 ft.;
- USDW at 1512 ft.;
- top of the upper most hydrocarbon zone at 2,200 ft.; and
- top of the upper zone at 3,330 ft.

⁵ The “drill string” was essentially composed of 2-7/8” tubing, drill collars, and a drill bit. In their daily workover reports, InterAct and CWS referred to the string as “tubing.”

⁶ Letter dated February 12, 2019 from Kenneth A. Harris, Jr., State Oil and Gas Supervisor, DOGGR, to Michael Hale, MDR Hotels, LLC.

⁷ DOGGR, April 18, 2019, 4:00 pm. Dow RGC 10 Well Final Update, available at <https://www.conservation.ca.gov/dog/Documents/DOW%20RGC%2010%20Well%20Incident/2019%2004%2008%20DOW%20RGC%2010%20Well%20Incident%20Update%20FINAL.pdf>

Because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, InterAct was unable to complete the cement plugs below the depth of approximately 1,500 ft., required by the permit approved by DOGGR.

We have organized our RCA report as follows. In Section 2, we review the documents required by DOGGR in their February 12, 2019, which InterAct provided to us. Section 3 provides a summary of the background and history of the Playa del Rey oilfield and the Dow RGC 10 well. Section 4 reviews the proposed reabandonment of Dow RGC 10. Section 5 is an analysis of the 2018 and 2019 blowout incidents, which includes a summary timeline of the salient reabandonment operations. In Section 6, we present the root cause factors of the blowouts. In Section 7, we list learnings from the blowout incidents. We list references in Section 8.

Our CVs, including biographies and qualifications, are included in Appendices A and B. Appendix C includes the resume and qualifications of well control subject matter expert, Mr. Scheet. Documents required by DOGGR in their February 12, 2019 letter are included in appendices, as discussed in the next section of this report.

2 Documents Required by DOGGR

In a letter dated February 12, 2019 to MDR, DOGGR approved Exponent's Scope of Work, and added the following specific additional requirements:⁸

- a) The RCA team will designate or employ a well control subject expert (SME) with practical experience.
- b) Should Exponent exercise its option to recuse itself for any reason, the operator will secure the services of a replacement independent third party in compliance with Order 1143 within 14 days.⁹
- c) Incorporate a copy of the California Well Service (CWS) company Well Control Plan into the report.
- d) Incorporate a copy of the InterAct company Well Control Plan into the report.
- e) Incorporate copies of the CWS company's International Association of Drilling Contractors 2T6 Daily Drilling Report, or equivalent, between October 23, 2018, through January 13, 2019 into the report.
- f) Incorporate copies of California Well Service well control training certifications for all CWS crewmembers present at the well between October 23, 2018, through January 13, 2019 into the report.
- g) Incorporate records of well control scenarios and training drills that the same crewmembers described in (f) above underwent prior to January 13, 2019.
- h) Incorporate records of any risk assessment completed by Interact and CWS documenting the anticipated risk level and prevention and mitigation measures intended to address both a potential loss of well fluid to underground formations and the control of kicks produced by fluids in underground formations into the report.

DOGGR required that the documents listed above be included in this report. InterAct and CWS provided the documents to Exponent, and they are included in appendices to this report. We review these documents in this section.

The State of California, California Code of Regulations, Section 1744.5, Blowout Prevention and Related Well-Control Equipment requires:¹⁰

⁸ Letter dated February 12, 2019 from Kenneth A. Harris, Jr., State Oil and Gas Supervisor, DOGGR, to Michael Hale, MDR Hotels. LLC.

⁹ This requirement addresses Exponent's terms and conditions for retention.

¹⁰ 14 CCR § 1744.

This equipment shall be installed, tested, used, and maintained in a manner necessary to prevent an uncontrolled flow of fluid from a well. Division personnel shall use the current edition of Division of Oil, Gas, and Geothermal Resources Manual No. M07, “Oil and Gas Well Blowout Prevention in California,” as a guide in establishing the blowout prevention equipment requirements specified in the Division’s approval of proposed operations.

DOGGR publication No. M07 (“M07”) includes the following related to training and a well control plan for operators and field personnel:¹¹

In fact, Section 1722(c), Title 14, California Code of Regulations requires that “For certain critical or high pressure wells designated by the supervisor, a blowout prevention and control plan, including provisions for the duties, training, supervision, and schedules for testing equipment and performing personnel drills, shall be submitted by the operator to the appropriate division district deputy for approval”. Once approved, a copy of the plan must be available at each well site for use by the operator and contractor personnel for training rig crews. The plan is also used by division inspectors when evaluating blowout prevention (BOP) preparedness. For critical or high-pressure wells, the division may elect to witness one or more of the required weekly blowout drills in the company of the operator’s representative or contractor’s foreman.

2.1 CWS Well Control Plan

InterAct provided Exponent with a copy of CWS’s Well Control Plan (“WCP”), which is included in Appendix D. InterAct provided this document in response to requirement c) of DOGGR’s February 12, 2019 letter. This document includes six bullet points briefly summarizing a “General Well Control Plan.” The second bullet states:

- *CWS provides industry 3rd part training where required*
 - *Part of this is well control training/certification*
 - *All of the CWS Rig Supervisors and Rig Operators have been formally trained in well control **but their well control certifications are not current** [Emphasis in bold added]*

The expired certifications are included in Appendix H and discussed below. The remainder of the document consists of a summary timeline of well control events during the Dow RGC 10 reabandonment operations, and the responses by CWS and InterAct. As such, it appears that CWS wrote the document after the Dow RGC 10 well control and blowout events, rather than as an independent general plan for well control.

¹¹ Wygle, P.R., 2006. Publication No. M07 Blowout Prevention, In California Equipment Selection and Testing. California Department of Conservation Division of Oil, Gas, and Geothermal Resources, Tenth edition. Sacramento, California.

2.2 InterAct Well Control Plan

InterAct provided Exponent with a copy of InterAct’s Well Control Plan, which is included in Appendix E.¹² InterAct provided this document in response to requirement d) of DOGGR’s February 12, 2019 letter. InterAct’s WCP summarizes their internal general and specific well control plans, training, quarterly meetings, and certifications, though copies of well control training certifications were not included with the plan. InterAct provided their well control certifications on a later date, which are included in Appendix I and are discussed below. The plan includes a review of DOGGR’s BOPE requirements, per DOGGR publication No. M07 (“M07”) and describes access to API standards and recommended practices for well control, equipment and safety. The WCP includes a summary of plans specific to the Dow RGC 10 well reabandonment, including daily job safety meetings and BOP testing.

The document concludes with a description of InterAct’s Management of Change (“MOC”) process for Dow RGC 10. InterAct lists five MOC requests to DOGGR during the Dow RGC 10 reabandonment operations. The inclusion of these five MOC requests to DOGGR shows that InterAct wrote this document after the blowout events, or added the section on MOCs to their existing WCP. InterAct wrote that DOGGR approved four of the five MOCs. In the final subsection titled “MOC #5,” InterAct wrote that the January 11, 2019 blowout occurred during ongoing discussions with DOGGR requesting approval to terminate well cleanout operations at a depth of approximately 1,300 ft.:

At approximately 5 p.m., the well blew out through the tubing. The Senior Engineer was on the phone with DOGGR when this occurred. InterAct’s WSM immediately called 911, and the field crew implemented necessary emergency procedures to shut in the well using the installed BOPE. The well was sealed within 10 minutes of the blowout, before the emergency vehicles even arrived.

2.3 CWS Daily Drilling Reports

InterAct provided two documents in response to requirement e) of DOGGR’s February 12, 2019 letter.

- InterAct’s Daily Workover / Completion Reports for the date range October 18, 2018 through January 23, 2019, which is included in Appendix F.¹³
- InterAct previously provided Exponent with the narratives from daily workover reports in the form of an Excel spreadsheet, printouts of which are included in Appendix G. The narratives cover the date range August 6, 2018 through February 26, 2019.¹⁴

¹² Email dated March 21, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document undated InterAct Well Control Plan DOW RGC 10.pdf.

¹³ Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document Item e) CWS DAILY REPORTS DOW RGC-10_Oct 23 2018 to Jan 13 2019.xls.

¹⁴ Email dated February 25, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document MDR Daily Report.xls

He daily workover reports include narratives of the events and operations during shifts. The reports to not include an inventory of wellsite fluids, an inspection check list, a record of daily pressures, and a well profile summary is left incompletd. We have used these documents to construct a timeline of the reabandonment of the Dow RGC 10 well.

2.4 CWS and InterAct Well Control Training Certifications

InterAct provided Exponent with a copy of a CWS Well Control Training Certification, which is included in Appendix H. InterAct provided this document in response to requirement f) of DOGGR’s February 12, 2019 letter.¹⁵ The dates on the copies of the well control training certification documents in Appendix H show that the certifications expired prior to the date range of the reabandonment operations of Dow RGC 10 requested by DOGGR, October 23, 2018 and January 13, 2019. The certification of the rig Toolpusher expired on July 21, 2013. The certification of a rig operator expired on February 26, 2017. The certification of a rig hand could not be found. The Toolpusher is in charge of the drilling crew and rig, and is alternatively referred to as the drilling foreman, rig manager, rig superintendent, or rig supervisor. While these CWS employees reportedly received well control training previously, it is important to maintain well control certifications as new technology emerges and to refresh prior learnings.

InterAct also provided Exponent with well control training certifications for its staff who we involved in the Dow RGC 10 reabandonment, which are included in Appendix I.¹⁶ These certifications are valid for the period between October 23, 2018 and January 13, 2019.

2.5 Well Control Scenarios and Training Drills

Requirement g) of DOGGR’s letter of February 12, 2019 stated, “*Incorporate records of well control scenarios and training drills that the same crewmembers described in (f) above underwent prior to January 13, 2019.*” In response to this specific requirement, InterAct provided to Exponent a document on CWS letterhead titled *BOP Drills*, which is included in Appendix J.¹⁷ The short document includes two paragraphs. The first paragraph includes the statement that, “*During the time leading up to well DOW RGC 10 blow-out, BOP drills were held on a regular basis but were not logged in the daily rig report as required by the DOGGR report.*” The document is deficient in response to the DOGGR specific requirement g).

2.6 Risk Assessment Completed by InterAct and CWS

InterAct provided Exponent with a document titled, *InterAct Risk Assessment Protocol*. which is included in Appendix K.¹⁸ InterAct provided this document in response to requirement h) of

¹⁵ Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document RCA Item f) - Well Control Training Certifications.pdf.

¹⁶ Email dated May 22, 2019 from Michelle Pasini, InterAct, to Brun Hilbert and Kelvin Abaa, Exponent, attached document Ltr to Exponent with Additional Info for RCA - 05-22-19.pdf.

¹⁷ Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document RCA Item g) - CWS BOP Drills.pdf.

¹⁸ Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document RCA Item h) - InterAct Risk Assessment Protocol.pdf.

DOGGR's February 12, 2019 letter. The document provides a summary risk assessments reportedly analyzed by InterAct and CWS prior to the initiation of Dow RCG 10 reabandonment operations. InterAct states that the risk assessment included a review of the 1956 blowout that occurred during Dow RGC 10 abandonment, which included InterAct Project Manager, Well Site Manager ("WSM"), and CWS Rig Manager. The document includes a review of DOGGR's BOPE requirements. InterAct states it selected mud pumps for the reabandonment operations based on well control risks.

The remainder of the document is essentially a timeline of well control events that occurred during the Dow RGC 10 well reabandonment operations. The inclusion of such a timeline is not consistent with the "*risk assessment completed by InterAct and CWS documenting the anticipated risk level and prevention and mitigation measures ...*," as required of InterAct and CWS by DOGGR. Rather, the timeline is a recitation of the well control events that occurred *during* the operations. The timeline begins with "*early signs*" during the reabandonment operations, "*During excavation and removal of the surface stove pipe down to about 25', constant gas bubbling was noticed emanating from the excavation pit.*" Of these conditions InterAct stated, "*This was a reminder of the 1956 blow-out and the need to remain vigilant while drilling-out below the surface.*" In addition, InterAct cited occurrences of gas bubbles, gas kicks, lost circulation, and surface broaches outside the wellbore. The timeline concludes with a summary of the events of January 11, 2019, including a statement:

"Based on the above, an e-mail was sent to DOGGR at 6:15 am recommending abbreviating the abandonment to mitigate the risk of a blowout. DOGGR asked for more justification."

The discussion culminates with the January 11, 2019 blowout "*up the tubing*" at about 5 pm, as stated in InterAct's WCP discussed above. In its WCP and Risk Assessment, InterAct's summary of the January 11, 2019 events are.

2.7 Additional Information Provided by InterAct

On April 23, 2019, InterAct transmitted a letter to Exponent providing comments on their review of a draft of this RCA report.¹⁹ Attached to the letter was email correspondence with DOGGR on the day of the January 11, 2019 blowout, and a temperature and noise log run in the well on January 21, 2019. We reviewed InterAct's comments carefully and incorporated additional information as warranted.

The emails attached to the letter were sent by InterAct to DOGGR at 5:53 am, 6:15 am, and 9:07 am on the morning of January 11, 2019. All three of the emails described gas kicks that occurred over the prior three days and during the morning of January 11. The email sent to DOGGR at 6:15 am included the following proposal to DOGGR:

*Consequently, I'd like to explore the idea of getting to the gas show at 2200' (only 894' to go) and immediately cementing from there up leaving the salt water zone un-cemented.
Note: we know that the oil zone below 3376', while not exactly meeting the DOGGR spec for*

¹⁹ Email dated April 23, 2019, from Michelle Pasini, InterAct, to Brun Hilbert, Exponent, attached letter dated April 24, 2019.

abandonment, is effectively isolated because we have not seen any oil at all since drilling out all of the cement plugs for the first time on 12/18/2018. The cement work at 2200' will not only stop the source of the gas leak but will also block any migration of salt water above 2200'.

As described above, InterAct reported additional contacts with DOGGR later in the day on January 11. Moreover, InterAct reported that one of its Senior Engineers was on the phone with DOGGR at about 5 pm when the blowout occurred. If there were any email replies to Interact from DOGGR, InterAct did not provide them to Exponent.

2.8 Dow RGC 10 Critical Well Classification and Stop Work

As discussed above, information provided by InterAct shows that there was concern over the well conditions during the Dow RGC 10 reabandonment operations, with frequent communications with DOGGR. During the days immediately prior to and including January 11, 2019, the Dow RGC 10 onsite crews were experiencing challenging operations, including numerous gas kicks and lost circulation. InterAct was communicating with DOGGR on the day of the blowout and reportedly when the blowout occurred. An alternative to continuing the drilling operations would have been for InterAct or CWS to exercise stop work authority. InterAct and CWS could have shut in the well, and then discussions between InterAct and DOGGR could have continued on an alternative plan. Dow RGC 10 was classified as a “critical well” in The Notice of Intention to Abandon / Reabandon Well submitted to DOGGR.²⁰ A critical well is defined in the California Code of Regulations as, among other things, *within 300 ft. of any building intended for human occupancy that is not necessary to the operation of the well and 100 ft. of any dedicated public street, highway or the nearest rail of an operating railway that is in general use.*²¹ As shown in the next section of this report, the Dow RGC 10 well site is located across the street (Via Marina) from residential structures. As such, the Dow RGC 10 required above-ordinary attention to the risks to the public as well as workers.

²⁰ Notice of Intention to Abandon / Re-abandon Well, dated October 4, 2017, submitted to DOGGR by Methane Specialists. (03713798_2019-01-22_DATA, pp. 49-50)

²¹ 14 CCR § 1720.

3 Background of Dow RGC 10 Well

3.1 The Playa del Rey Oilfield

The locations of the oil and gas fields in southern California, including the Playa del Rey oilfield, are shown in Figure 1. The fields are within DOGGR's District 1 region. The Playa del Rey oilfield is located onshore of the Santa Monica Bay, primarily within and surrounding Marina del Rey, California, as shown in Figure 2. Also shown in Figure 2 is the location of the Dow RGC 10 well. The Dow RGC 10 well site is located next to Via Marina street, and surrounded by residential structures and harbor (Marina del Rey) with numerous boat slips.

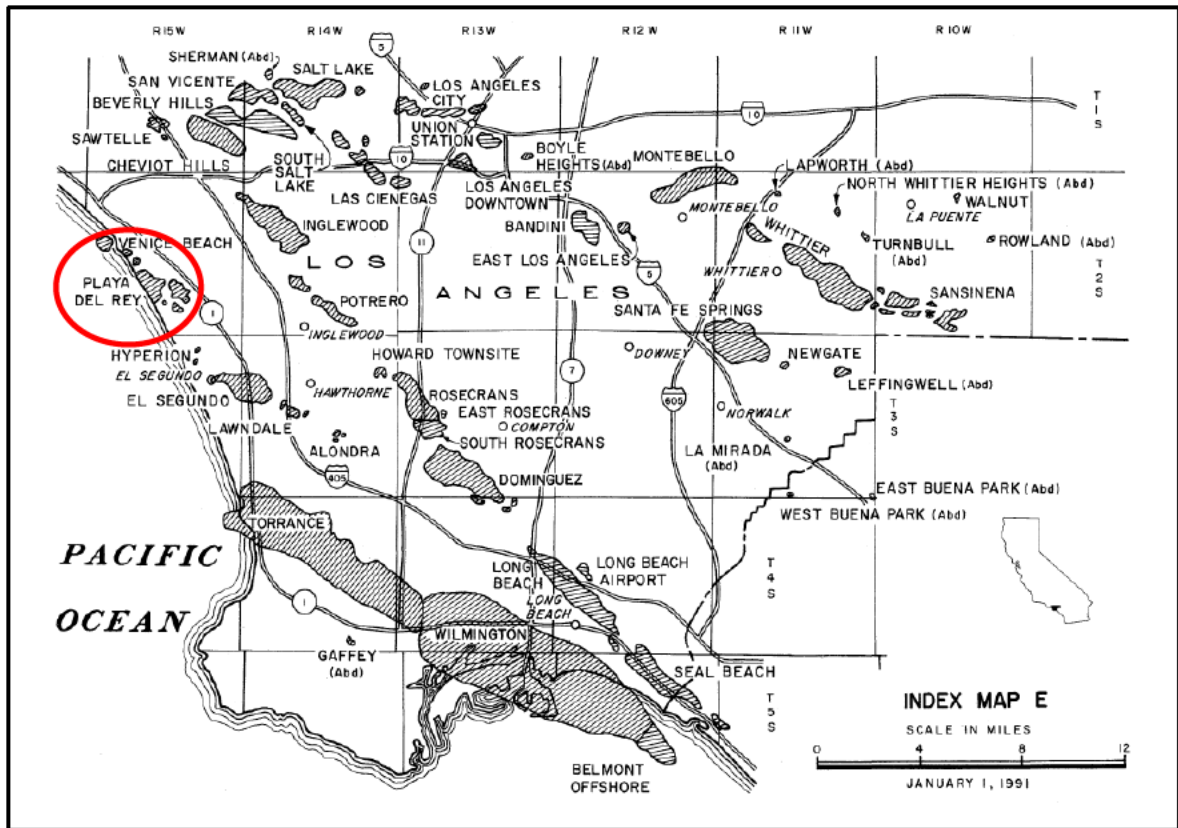


Figure 1. Location of Playa Del Rey Field in California.²²

²² California Department of Conservation Division of Oil, Gas, and Geothermal Resources, 1992. California Oil & Gas Fields, Volume II – Southern, Central Coastal, and Offshore California Oil and Gas Fields, Third edition, Index Map E, p 16. Available at ftp://ftp.consrv.ca.gov/pub/oil/publications/Datasheets/Dtasheet_vol_2.pdf

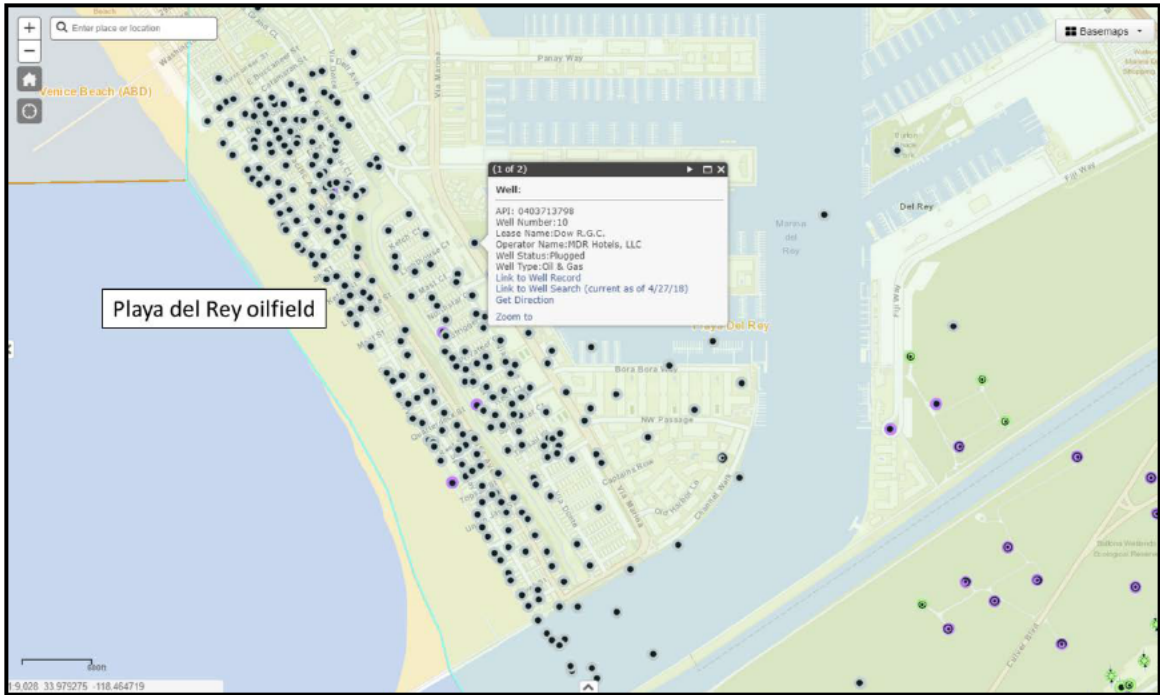


Figure 2. Location of Playa del Rey oilfield and Dow R.G.C. well.²³

We have reviewed reports and information available from DOGGR on the history, discovery, and development of the Playa del Rey oilfield.^{24 25 26} The field was discovered in 1929 during drilling of an exploratory well operated by The Ohio Oil Company, though prospect drilling in the area began as early 1921. As described below in this section, production in the field was from an upper zone shallower than 3,000 – 4,000 ft., and a lower zone below 6,500 ft. Development of the field progressed rapidly with 140 wells drilled by December 31, 1930, 92 of which were producing from the upper zone. Drilling activity and production reached a peak in the late 1930s and then declined steadily. According to data available from DOGGR, all 280 oil and gas production wells listed in the Playa del Rey field are plugged and abandoned.²⁷

²³ <https://maps.conservation.ca.gov/doggr/wellfinder/#openModal> , last accessed April 1, 2019.

²⁴ Barton, C.L., 1931, A Report on the Playa Del Rey Oil Field, in Summary of Operations, California Oil Fields, State of Calif. Div. Of Oil and Gas, San Francisco, Calif. V. 17, n. 2, p. 5-15.

²⁵ Metzner, L.H., 1935, The Del Rey Hills Area of the Playa Del Rey Oil Field, in Summary of Operations, California Oil Fields, State of Calif. Div. Of Oil and Gas, San Francisco, Calif. V. 21, n. 2, p. 5-26.

²⁶ California Department of Conservation Division of Oil, Gas, and Geothermal Resources, 1992. California Oil & Gas Fields, Volume II – Southern, Central Coastal, and Offshore California Oil and Gas Fields, Third edition, pp. 388-392. Available at ftp://ftp.consrv.ca.gov/pub/oil/publications/Datasheets/Dtasheet_vol_2.pdf

²⁷ <https://secure.conservation.ca.gov/WellSearch/>, search of wells in Playa del Rey field at Last accessed April 1, 2019.

In his 1931 report on the Playa del Rey field,²⁸ Barton included two noteworthy statements regarding early wells:

*Between 2500 and 3000 feet is a high pressure gas sand which has caused **several blow-outs of minor importance**. Two or three of these blow-outs resulted in small fires, but these were brought under control very quickly.*

*The usual casing program consists of 16-inch or 14-inch **stovepipe** casing cemented at 600 to 750 feet, 9-inch or 8-5/8-inch casing cemented over the upper oil zone, and 6-5/8-inch or 5-inch casing cemented over the lower oil zone. [Emphasis in bold added]*

3.2 Dow RGC 10 Well Design and History

The following synopsis is based on electronic documents (i.e., the well file) downloaded from the DOGGR well search website.²⁹ The Ohio Oil Company spudded the Dow RGC 10 (API 04-037-13798-00) on March 3, 1931. A 25-1/2" hole was drilled and reamed to 686 ft., where a welded 18" American Double Lock stove pipe was run as surface casing and cemented to surface with 500 sacks of cement.^{30 31} It may be recalled from the previous section that stove pipe was often used for surface casing in the wells. The use of the 18" stove pipe for the surface casing in this well was reported as "S.P." in the Report on Test of Water Shut-off dated April 15, 1931.³² The use of stove pipe for surface casing was probably due to poorly developed well construction practices at the time, but was a common method of casing the shallow part of wells.³³

The Dow RGC 10 well file contains inconsistent references to the size of the surface casing. While it is clear that the well was originally completed with 18" stove pipe, later documents refer to 18-5/8", 84 ppf and 18", 84# casing. In any case, when the well was re-entered on August 6, 2018, InterAct's daily workover narratives include, "*Observed casing was riveted stove pipe unsuitable for installation of riser/BOP.*"³⁴

²⁸ Barton, C.L., 1931, A Report on the Playa Del Rey Oil Field, in Summary of Operations, California Oil Fields, State of Calif. Div. Of Oil and Gas, San Francisco, Calif. V. 17, n. 2, p. 5-15.

²⁹ https://secure.conservation.ca.gov/WellRecord/037/03713798/03713798_2019-01-22_DATA.pdf, last accessed June 5, 2019. The electronic well file is downloadable as a pdf document, 03713798_2019-01-22_DATA.pdf, including incorporated documents to which we cite in the remainder of this report at the document page number.

³⁰ History of Oil or Gas Well submitted by The Ohio Oil Company dated April 25, 1931 (03713798_2019-01-22_DATA, p 79).

³¹ Log of Oil or Gas Well submitted by The Ohio Oil Company dated April 25, 1931 (03713798_2019-01-22_DATA, p 78, 80, 81).

³² Report on Test of Water Shut-off submitted by The Ohio Oil Company dated April 15, 1931 (03713798_2019-01-22_DATA, p 85).

³³ Schwalen, H.C., 1924. The Stovepipe or California Method of Well Drilling as Practiced in Arizona. Master of Science Thesis in Civil Engineering, College of Mines and Engineering, University of Arizona.

³⁴ Email dated February 25, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document MDR Daily Report.xls (See Appendix G).

After drilling the surface hole, the hole size was reduced to 17-1/2" and drilled to 3,426 ft. The 17-1/2" hole was cored from 2,200 ft. to 3,426 ft. An 11-3/4" production casing string was then run and cemented with 600 sacks of cement at 3,423 ft. Drilling and coring continued with a reduced hole size of 10-5/8" to 3,906 ft. and 507 ft. of 6-5/8" perforated liner was run in the open hole. The Ohio Oil Company completed the well on April 17, 1931 and placed it on production as an oil well. Core records during drilling indicated a gas zone from 2,233 to 2,395 ft. and oil zone from 3,331 to 3,906 ft.³⁵

3.3 Sale and Recompletion of Dow RGC 10

After 10 years as an oil producing well, The Ohio Oil Company transferred ownership of the well to the Dow Chemical Company ("Dow").^{36 37} Although Dow submitted to DOGGR a Notice of Intention to Abandon Well, the well was not fully abandoned at that time.³⁸ Prior to transferring the well to Dow, the original production zone of the well was plugged by placing cement in the 6-5/8" liner from 3,906 to 3,376 ft.³⁹ The well was then recompleted for brine production by Dow. Dow converted the Dow RGC 10 well to a brine production well in April 1941 to produce iodine.⁴⁰ Conversion of the well involved perforating the 11-3/4" casing with a knife cutter in three separate operations, 100 holes from 3,341 to 3,241 ft.; 165 holes from 3,241 to 3,076 ft.; and 392 holes from 3,272 to 3,076 ft. According to Dow, no oil was produced from these perforations.

3.4 First Abandonment and First Blowout of Dow RGC 10

A blowout of the well occurred during operations to abandon the well in 1956, with similarities to the blowout that occurred in January 2019. The occurrence of this blowout was listed in a report for DOGGR documenting the history of blowouts in California from 1950 through 1960.⁴¹ Dow proposed to abandon the Dow RGC 10 well on February 14, 1956.⁴² During operations to abandon the well, a blowout occurred, which was described in detail in a Division

³⁵ Log of Oil or Gas Well report submitted by The Ohio Oil Company dated April 25, 1931 (03713798_2019-01-22_DATA, p 78, 80, 81).

³⁶ Supplementary Notice, dated January 3, 1941 reporting intended transfer of ownership from The Ohio Oil Company to I-O-Dow chemical Company and abandonment of well (03713798_2019-01-22_DATA, p 75).

³⁷ Subsequent Work Report dated April 17, 1942 reporting sale of ownership from The Ohio Oil Company to Dow chemical Company (03713798_2019-01-22_DATA, p 67).

³⁸ Notice of Intention to Abandon Well, dated November 12, 1940, submitted by the Ohio Oil Company to DOGGR (03713798_2019-01-22_DATA, p 77).

³⁹ Special Report on Operations Witnessed, dated January 9, 1941 (03713798_2019-01-22_DATA, p 74).

⁴⁰ Subsequent Work Report, dated November 17, 1941 (03713798_2019-01-22_DATA, p 69).

⁴¹ Hauser R. L. and Guerard, W.F., Jr., Publication No. TR43, A History of Oil- and Gas- Well Blowouts 1950 – 1990. California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, Sacramento, CA, p. 24.

⁴² Notice of Intention to Abandon Well, dated February 15, 1956 (03713798_2019-01-22_DATA, p 66).

of Oil and Gas Memorandum of Telephone or Personal Conversation dated March 14, 1956.⁴³ DOGGR memorialized the following descriptions of the blowout in the memorandum:

*The well was being abandoned by the contractor, Gordon Graham. The 11-3/4" casing was shot and parted at 887' and was pulled up 4' when the **well blew out at 3:10 p.m., March 12, 1956.***

The well was located in the Northeast corner of the structure with no producing wells north or east. The well was being used to produce salt water for the manufacturing of iodine.

*Engineer Crowder arrive at the well at 5:00 p.m., March 12, 1956, and noted that the well was blowing marsh gas, salt water and sand at an undetermined rate through the 11-3/4" casing. **The gas was apparently coming from behind the 11-3/4" casing at a depth of 1800'.** [Emphasis in bold added]*

Moreover, additional details on the blowout were communicated later on April 19, 1956:⁴⁴

- 1. The 11-3/4" casing was collar shot at 887' and pulled to 883', when the well blew out.*
- 2. The well finally bridged itself off with sand at approximately 300'.*

Dow brought the well under control and abandoned it successfully.⁴⁵ As described in greater detail later in this report, several cement plugs were placed in the well with the final plug being as follows:

Hung wwooden [sic] plug 35' from surface in 18 5/8" casing Dumped 2 yds. of ready mix concrete in hole filling to 10' below surface

Dow transferred ownership of the Dow RGC 10 well to the County of Los Angeles on December 4, 1958.⁴⁶

3.5 Second Abandonment of Dow RGC 10

On December 9, 1958, Dow notified DOGGR that it proposed to reabandon Dow RGC 10.⁴⁷ DOGGR approved the re-abandonment proposal on January 2, 1959.⁴⁸ The County of Los

⁴³ Memorandum of Telephone or Personal Conversation, dated March 14, 1956 (03713798_2019-01-22_DATA, p 64).

⁴⁴ Special Report on Operations Witnessed submitted by Dow Chemical Company, dated April 19, 1956 (03713798_2019-01-22_DATA, p 62).

⁴⁵ History of Oil or Gas Well submitted by Dow Chemical Company, dated April 24, 1956 (03713798_2019-01-22_DATA, p 61).

⁴⁶ Report of Property and Well Transfer dated December 23, 1958 (03713798_2019-01-22_DATA, p 59).

⁴⁷ Notice of Intention to Abandon submitted by Dow Chemical Company, dated December 9, 1958 (03713798_2019-01-22_DATA, p 57).

⁴⁸ Report on Proposed Operations submitted by the County of Los Angeles, dated January 2, 1959 (03713798_2019-01-22_DATA, p 56).

Angeles reabandoned the well by in April 1959.⁴⁹ During the reabandonment, the well was cleaned out to 304 ft., the cement plug found at 304 ft. was tested for hardness, a surface cement plug was placed to 68 ft., and a steel pipe was welded across the 18" casing stub.

This reabandonment operation also left the 11-3/4" casing with limited integrity and possible communication with the formations outside the wellbore. In both abandonment and reabandonment operations, there are no records of any formation evaluation or integrity logs run in the well. Also, there is no record of plugging or squeeze cementing the 657 knife cut perforations in the well.

3.6 Geologic Setting

The surface formation at the wellsite of the Dow RGC 10 well is generally young (Holocene) detrital sediments that gradually slope to the coast. The soils terminate at the coast as a marsh or wetlands area. Groundwater in the area is generally shallow.

The geologic setting of the Playa del Rey oilfield is shown in Figure 3. The basement of the sedimentary rocks of the Playa Del Rey field consists of an erosional surface formed by a Franciscan schist ridge (Miocene) with a Northwest-trending anticline and depth of 6,000 ft. The reservoir rock is the consolidated schist conglomerate and unconsolidated sand that lay on top of the schist basement. It is comprised of sand and fragments of quarts and schist. The schist conglomerate pinches out along the schist ridges and is absent on top basement structure. The stratigraphic discontinuity of the schist conglomerates implies the creation of traps and two pool areas, the Venice area and the Del Rey Hills area. The Del Rey Hills portion of the oil field was discovered in the early 1930s. The upper oil zone is in the shaly sands of lower Pliocene (upper Repetto). Oil production in the field is the result of the discovery, development in this upper producing zone found at an average depth of 3,900 ft.

A simplified stratigraphic cross-section present at the location of the Dow RGC 10 wellbore is shown in Figure 4. The cross-section was created from core records reported to DOGGR during the initial drilling of the well in 1931.^{50 51} The cross-section indicates that the well was completed in the upper oil zone at a total depth of 3,906 ft. The core records indicate the presence of a shallow gas zone at about 2,200 ft. A review of the history records indicate that no logs were run during the initial drilling and completion of the well. Therefore, the exact depth, pressure and volumes of the gas in this zone are uncertain. In addition, only six wells within a 650 ft. radius of Dow RGC 10 had any records in DOGGR's online database and none had well logs.

⁴⁹ History of Oil and Gas Well submitted by the County of Los Angeles, dated April 8, 1959 (03713798_2019-01-22_DATA, p 54).

⁵⁰ Log of Oil or Gas Well submitted by The Ohio Oil Company, dated April 25, 1931 (03713798_2019-01-22_DATA, p 78, 80, 81).

⁵¹ Core Record of Oil or Gas Well submitted by The Ohio Oil Company, dated April 25, 1931 (03713798_2019-01-22_DATA, p 82-84).

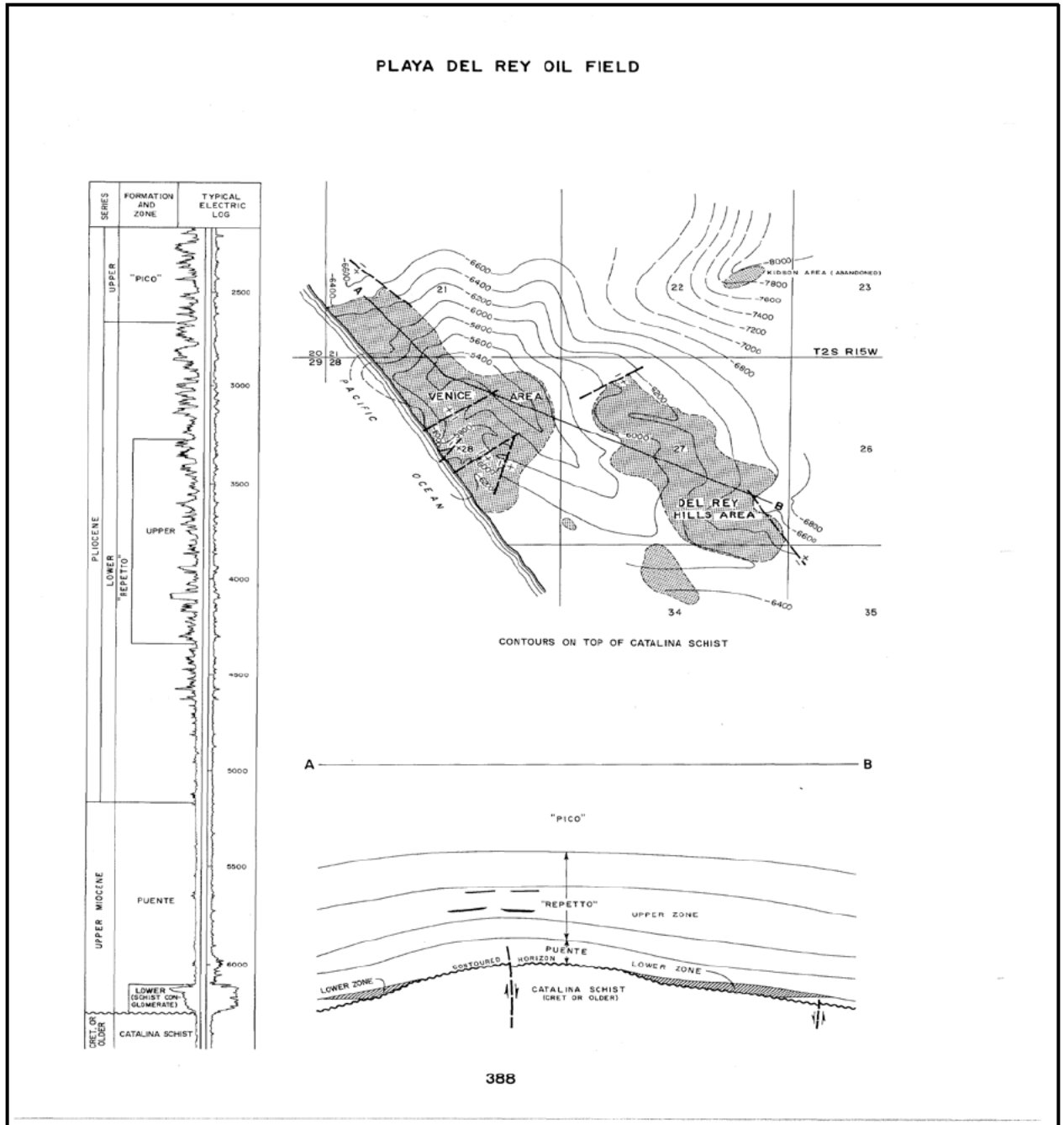


Figure 3. Top map contours and cross-section of Playa Del Rey field.⁵²

⁵² California Department of Conservation Division of Oil, Gas, and Geothermal Resources, 1992. California Oil & Gas Fields, Volume II – Southern, Central Coastal, and Offshore California Oil and Gas Fields, Third edition, p 388. Available at ftp://ftp.consrv.ca.gov/pub/oil/publications/Datasheets/Dtasheet_vol_2.pdf

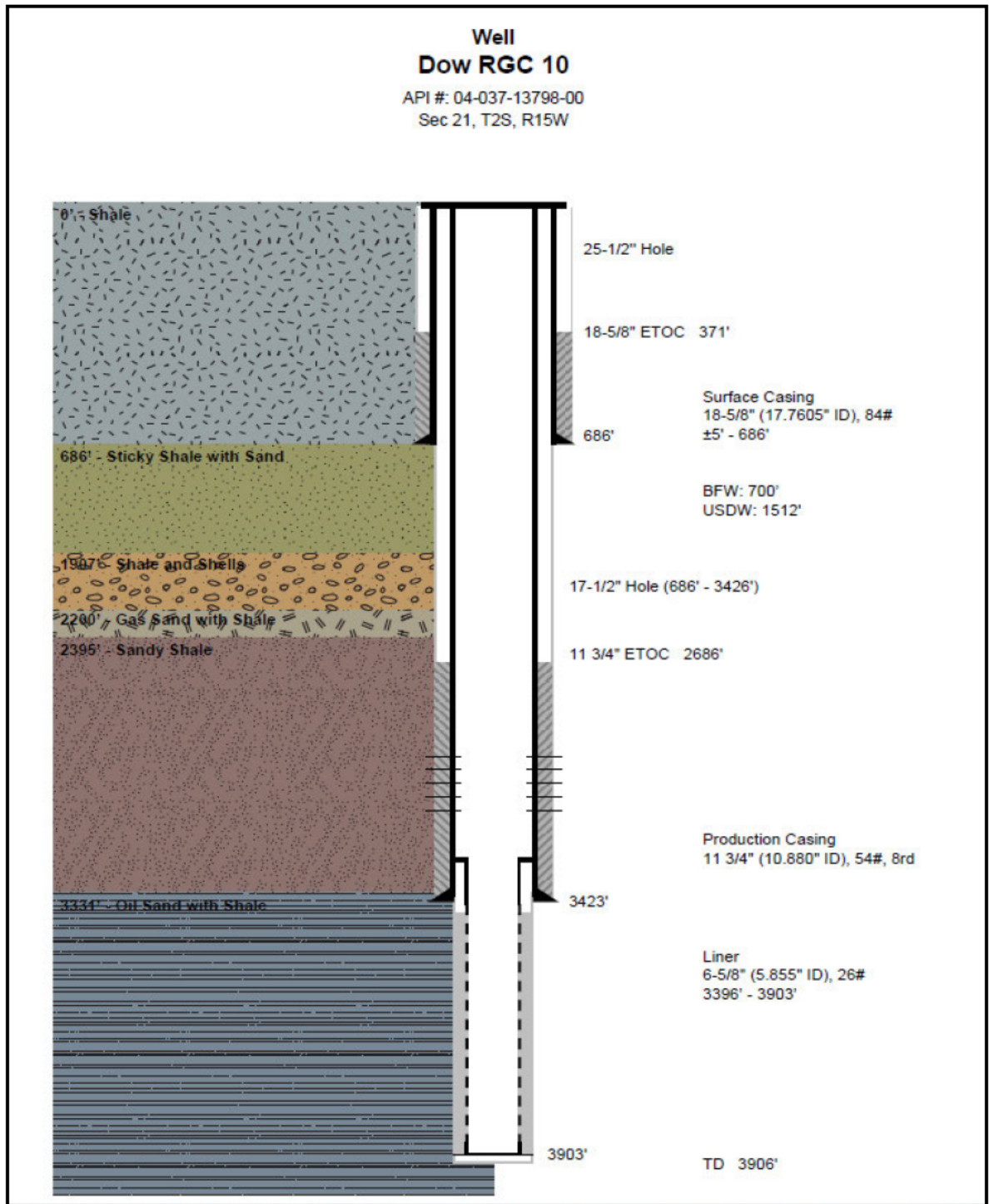


Figure 4. Simplified stratigraphic cross-section of Dow RGC 10 from cores.

3.7 Condition of Dow RGC 10 Prior to 2018

This section describes in detail the condition of the Dow RGC 10 well after Dow reabandoned it in 1959. The condition described is based on the documents cited previously in the DOGGR online well file and independent document reviews performed by Exponent.

On February 15, 1956, Dow submitted a proposal to DOGGR to abandon the Dow RGC 10 well.⁵³ The proposed work for this program included:

- Shoot and pull out the 11-3/4" production casing from below the shoe of the 18-5/8" stove pipe casing (approximately 686 ft.).
- Place a 40 ft. cement plug across the 18-5/8" casing shoe.
- Place 10 ft. cement plug in the 18-5/8" casing at the surface.

On February 21, 1956, DOGGR approved the proposal to abandon the Dow RGC 10.⁵⁴

The proposed abandonment operations began in March 1956. During the abandonment of the well on March 12, 1956:⁵⁵

The 11-3/4" casing was shot and parted at 887' and was pulled up 4' when the well blew out at 3:10 p.m., March 12, 1956.

... the well was blowing marsh gas, salt water, and sand at an undetermined rate through the 11-3/4" casing.

The gas was apparently coming from behind the 11 3/4" casing at a depth of 1800 ft.

The well eventually bridged off with sand on March 14, 1956 at 300 ft.⁵⁶ The sand bridge was washed out by displacing with 800 cu-ft. of water and the parted casing was cemented from 786-887 ft. (based on volume of cement pumped, the bottom of the plug is estimated to be at approximately 875 ft.).

On March 27, 1956, it was reported that:⁵⁷

Gas was escaping from the annulus of the 18-5/8" and 11-3/4" casings.

⁵³ Notice of Intention to Abandon Well, dated February 15, 1956 submitted by the Dow Chemical Company (03713798_2019-01-22_DATA, p 66).

⁵⁴ Report on Proposed Operations, dated February 21, 1956 (03713798_2019-01-22_DATA, p 65).

⁵⁵ Memorandum of Telephone or Personal Conversation, dated March 14, 1956 (03713798_2019-01-22_DATA, p 64).

⁵⁶ Special Report on Operations Witnessed dated April 19, 1956 (03713798_2019-01-22_DATA, p 62).

⁵⁷ Special Report on Operations Witnessed submitted by Dow Chemical Company, dated April 19, 1956 (03713798_2019-01-22_DATA, p 62).

A 2-1/2 lb. shot was exploded at a collar in the 11 3/4" casing at 625 ft., and the gas subsided shortly thereafter.

This incident in the historical record of Dow RGC 10 illuminates the nature of shallow gas problems in the well and that the prior abandonment operations may have reduced the pressure integrity of the well.

A cement plug was placed at approximately 556 to 625 ft. On April 5, 1956, in an attempt to pull the casing a collar in the 11-3/4" casing was shot at 542 ft., but was unsuccessful. Another casing collar shot was “*exploded*” at 310 ft., the casing pulled up to 290 ft. A cement plug comprised of a wooden plug section was placed from 291 to 310 ft. Finally, a surface cement plug was placed at the stub of the 11-3/4" casing at 40 ft. from 10 to 35 ft. This abandonment operation left the 11-3/4" casing with limited integrity and possible communication with the formation.

Dow transferred ownership of the Dow RGC 10 well to Los Angeles County on December 4, 1958.⁵⁸

On December 9, 1959, another proposal to reabandon Dow RGC 10 was submitted to DOGGR.⁵⁹ The proposed work for this reabandonment program included:

- Clean out the 11-3/4 casing to top of cement plug reported at 29 ft.
- Test the location and hardness of the cement plug with the drill pipe.
- Place a 50 ft. cement plug in the top of 11-3/4" and 18-5/8" casing strings
- Cut the 18-5/8" casing at MLLW and welding a steel plate on the stub.

On January 2, 1959, DOGGR approved the reabandonment proposal.⁶⁰ On April 7, 1959, the well was reabandoned.⁶¹ During the reabandonment, the well was cleaned out to 304 ft., the cement plug found at 304 ft. was tested for hardness, the surface cement plug was placed to 68 ft. and a steel pipe welded across the 18 -5/8" casing stub.

This reabandonment operation left the 11-3/4" casing with limited integrity and possible communication with formations. In both abandonment and reabandonment operations, there are no records of any formation evaluation or integrity logs run into the well. A schematic of the 1959 reabandonment configuration, prepared by InterAct as they interpreted it, is shown in Figure 5.

⁵⁸ Report of Property and Well Transfer, dated December 23, 1958 (03713798_2019-01-22_DATA, p 59).

⁵⁹ Notice of Intention to Abandon Well dated December 9, 1958 (03713798_2019-01-22_DATA, p 57).

⁶⁰ Report on Proposed Operations, dated January 2, 1959 (03713798_2019-01-22_DATA, p 56).

⁶¹ Special Report on Operations Witnessed, dated April 9, 1959 (03713798_2019-01-22_DATA, p 55).

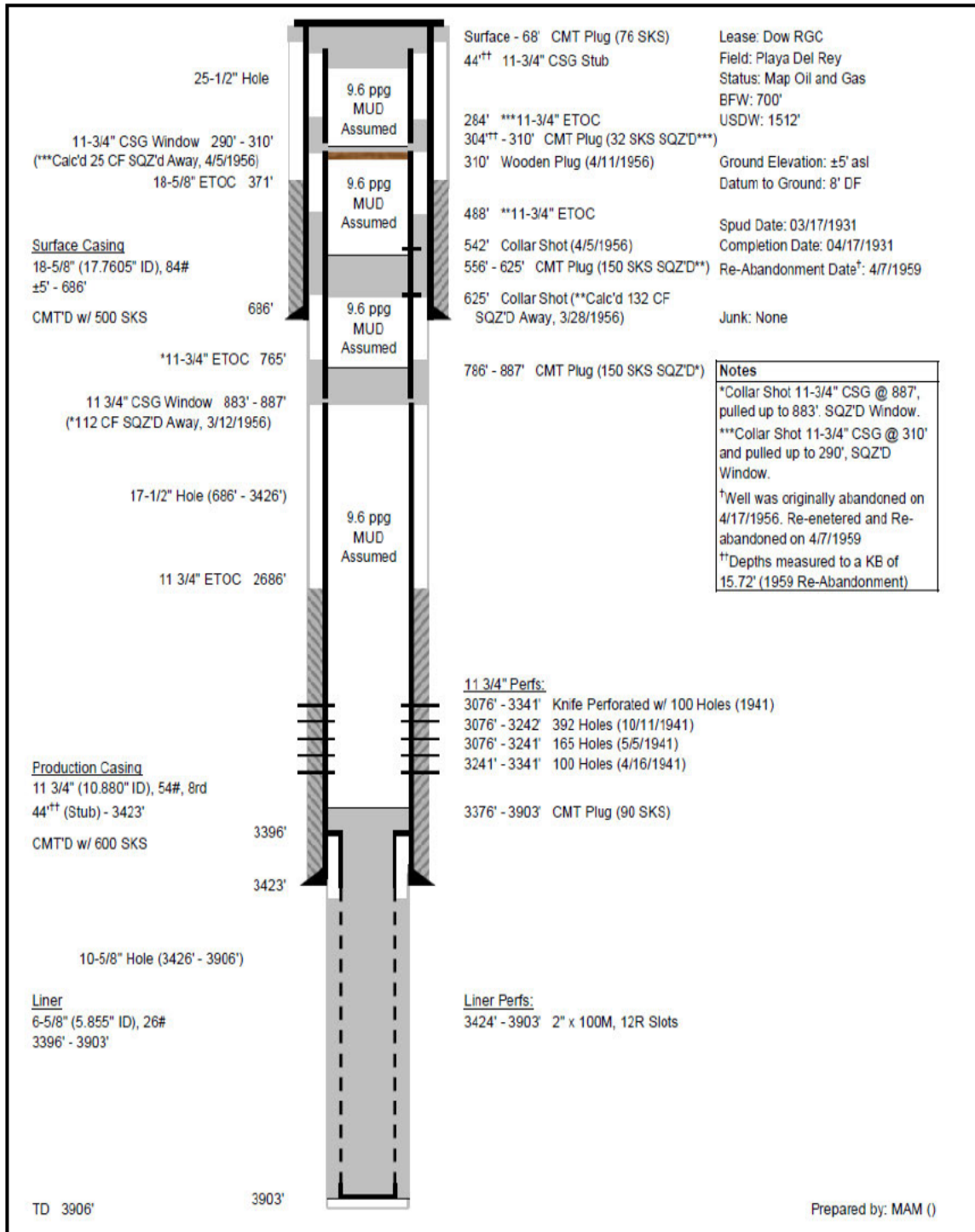


Figure 5. Schematic of Dow RGC 10 after reabandonment in 1959, provided by InterAct in the reabandonment proposal to DOGGR.

4 Proposed Reabandonment in 2018-2019

On April 27, 2018, MDR submitted a proposal to DOGGR for the reabandonment of the Dow RGC 10 well.⁶² MDR contracted InterAct to draft, manage, and execute the reabandonment program for Dow RGC 10. MDR contracted CWS for the rig, rig personnel, and mud pumps, and with Weatherford for the blowout preventer equipment. InterAct proposed the reabandonment program to abandon the well in compliance with current DOGGR standards for unused wells and was an essential part of plans to develop surface property at the well location. The proposed work for this program included the following planned operations (see Figure 5 for the configuration of Dow RGC 10 construction, as InterAct understood it at the time of the proposal):

- Drill out existing plugs: surface cement plug at 40-68 ft.; cement and wooden plugs at 304-310 ft.; and cement plugs at 556-635 ft. and 786-887 ft.
- Tag the cement plug at 3,376 ft.
- Run a cement bond log (CBL) through the 11-3/4" casing from 3,376 ft. to surface.
- Plug back the "oil zone" with a cement plug from 3,376 to 2,976 ft. The top of the plug would be 100 ft. above the shallowest perforation at 3,076 ft. (Note: This zone was perforated in 1941 by Dow using a Midway knife cut perforator for production of salt water.⁶³ Dow reported that no oil was produced from this zone.)
- Perforate above the gas sand zone from 2,198 to 2,200 ft., and isolate by squeeze cementing the perforations and placing a cement plug from 2,100 to 2,200 ft.
- Perforate across the USDW from 1,562 to 1462 ft. to isolate the USDW with a cement plug. The top of the cement plug should be at 1,362 ft., which is 100 ft. above the perforations.
- Isolate the BFW at 700 ft. with a cement plug in the 11-3/4" casing. Perforate from 765 to 625 ft. and pump cement to fill the 11-3/4" annulus inside the casing from 600 to 800 ft.
- Place a surface cement plug from 5 to 50 ft. and weld a metal plate on 18-5/8" casing stub.

A schematic of the planned reabandonment configuration of Dow RGC 10 well prepared by InterAct and approved by DOGGR is shown in Figure 6.

⁶² Re-abandonment Program Dow RGC-10, dated April 27, 2018, submitted to DOGGR and attached to permit No. 7000607 issued by DOGGR dated June 5, 2018, (03713798_2019-01-22_DATA, p 25-30).

⁶³ Subsequent Work Report, dated April 10, 1941 (03713798_2019-01-22_DATA, p 70).

DOGGR approved the permit to reabandon the well on June 5, 2018.⁶⁴ Consistent with DOGGR's specifications, MDR was required to employ and maintain blowout prevention equipment as specified in DOGGR's *Publication No. M07, Blowout Prevention, In California Equipment Selection and Testing* ("M07").⁶⁵ ⁶⁶ M07 is a guide for engineers of DOGGR to establish blowout prevention equipment requirements specified in the division's approval process and to assist operator personnel to plan well operations.

⁶⁴ Letter from DOGGR to Anthony Santo, MDR Hotels, LLC, dated June 5, 2018 (03713798_2019-01-22_DATA, p 13-24).

⁶⁵ Ibid. p 13.

⁶⁶ Wygle, P.R., 2006. *Publication No. M07 Blowout Prevention, In California Equipment Selection and Testing*. California Department of Conservation Division of Oil, Gas, and Geothermal Resources, Tenth edition. Sacramento, California.

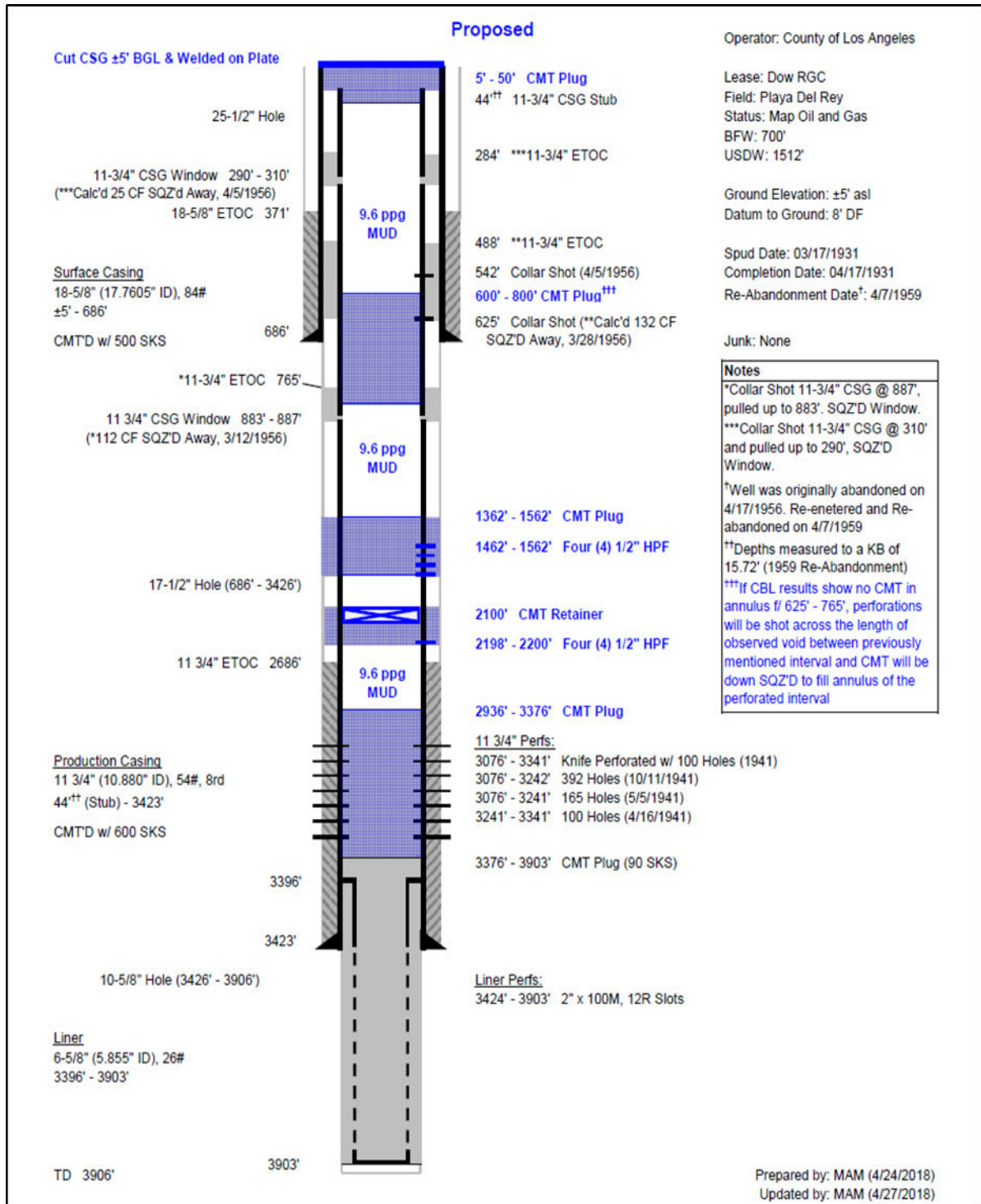


Figure 6. Schematic of proposed reabandonment by InterAct, provided by InterAct in the reabandonment proposal to DOGGR.

5 Analysis of the Blowout

5.1 Timeline of Operations to the Blowout Incidents

We constructed the sequence of operations of the reabandonment of Dow RGC 10 by examining the following documents, provided to Exponent by InterAct:

- InterAct Daily Workover and Completion Reports, October 23, 2018 through January 13, 2019.⁶⁷
- Narratives of daily workover reports, August 6, 2018 through February 26, 2019.⁶⁸
- InterAct’s Recommendation Letter to MDR, February 14, 2019.⁶⁹
- Narratives in InterAct’s Well Control Plan describing InterAct’s MOC process for Dow RGC 10.⁷⁰

We refer in the timeline to InterAct regarding the reabandonment operations, although it should be noted that CWS provided the rig, mud system, pumps, and workover staffing. In some instances we refer to both InterAct and CWS.

The reabandonment of the Dow RGC 10 well began on August 6, 2018. According to the documentation listed above, InterAct contracted with RD Olson to discuss the excavation for the wellhead. The initial excavation of the top 5 ft. with an excavator revealed that the 18-5/8" casing was a riveted stove pipe, “*unsuitable for installation of a riser/BOP system.*” In a recommendation letter to MDR, InterAct reported that the 18-5/8 stove pipe and other conditions in the well were not accurately documented in DOGGR’s online records.⁷¹

The well conditions, as reported in the DOGGR records were found to be inaccurate on several key pieces of data:

- *The reported 18 5/8” 84# surface casing turned out to be very thin and flimsy riveted stove pipe.”*

⁶⁷ Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document Item e) CWS DAILY REPORTS DOW RGC-10_Oct 23 2018 to Jan 13 2019.xls.

⁶⁸ Copy of MDR Daily Report_.xls

⁶⁹ Letter from Val Lerma and Mike Giuliani, InterAct PTMI, to Mike Hale, Hardage Hospitality, Re: Dow RGC 10 Recommendation, February 14, 2019.

⁷⁰ Email dated March 21, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document undated InterAct Well Control Plan DOW RGC 10.pdf.

⁷¹ Letter from Val Lerma and Mike Giuliani, InterAct PTMI, to Mike Hale, Hardage Hospitality, Re: Dow RGC 10 Recommendation, February 14, 2019, p 3.

- *Additional cement plugs were found in the well from 786-880' and 1214-1617', neither of which were documented in the well's records.*

As stated in the previous section of this report, historical records in the DOGGR electronic well file showed that the 18" casing was indeed "stove pipe." As the 18" stove pipe was being exposed, water invasion and sloughing of the hole forced the excavation to be suspended to allow RD Olson to devise a plan for installing shoring to allow excavation and de-watering as required. The well file available from DOGGR's website for Dow RGC 10 shows that Dow placed a cement plug in the well and tagged it at 786 ft. on March 28, 1956.⁷² Also, although there was no cement plug in the historical records, it could have been expected that hard drilling would be encountered from 1,214 to 1,617 ft. due to the sand that bridged off the well in the 1956 abandonment and blowout, and possibly the existence of cement stringers below the cement plug placed in 1956. The hard drilling could also have been due to cement stringers and metal debris from the previously placed plug at 786 ft. In addition, after drilling to 1,214 ft. on January 8, 2019, InterAct and CWS again placed a balanced cement plug in the well at about 786 ft. on January 9, 2019, which would account for hard drilling. Historical records indicate the sand bridge in the 11-3/4" casing was at 300 ft. and 800 cu-ft. of water (142.5 bbls) was injected to out the sand bridge.⁷³ It is not clear from the historical records that all of the sand was cleaned out of the well. The 11-3/4", 54 ppf casing has a capacity of 0.11499 bbl/ft., which would place the estimated top of the sand bridge after displacement at 1,539 ft.

The following is a timeline of salient events during InterAct's 2018-2019 reabandonment operations. Note that the wellbore included five cement plugs, as shown in Figure 5. We emphasize significant events in bold italic text.

August 22, 2018 – RD Olson installed a trench and watering system to excavate and dewater the surface excavation continuously. Dewatering and excavation of the Dow RGC 10 continued through October 2018.

October 9, 2018 – InterAct made the decision to drive 24" casing over the 18" stove pipe to provide a solid base for blowout prevention equipment. InterAct reported that DOGGR approval was requested and obtained for this change in the program.⁷⁴

October 24, 2018 – A 20 in. Class II 2M annular BOP, with a 20 ft. pitcher spool and flow line, was installed. InterAct performed drilling and milling operations through the first (surface) plug until the stub of the 11-3/4" casing was exposed at 41 ft. on October 26, 2019. (It may be recalled that the 11-3/4" casing was cut and the upper portion lifted during the previous abandonment).

October 29, 2018 – One joint of 12-3/4" casing with an 11-3/4" casing bowl with pack-off was installed as a tie-back to the surface.

⁷² History of Oil or Gas Well submitted by Dow Chemical Company, dated April 24, 1956 (03713798_2019-01-22_DATA, p 61).

⁷³ Special Report on Operations Witnessed dated April 19, 1956 (03713798_2019-01-22_DATA, p 62).

⁷⁴ Email dated March 21, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document undated InterAct Well Control Plan DOW RGC 10.pdf.

October 30, 2018 – InterAct cemented the annulus between the 12-3/4" and 24" casing strings from the surface to 41 ft. by pumping 51 cu-ft. of 13.6 ppg cement.

October 31, 2018 – InterAct installed metal base plates from the 24" casing to 12-3/4" casing and welded to a 12-900 3M SOW wellhead. A 21" Class II 2M BOP, with 12" 3M double gate valve with mud cross and 6" flow line, was installed. The BOPE was tested to 2000 psi.

November 1, 2018 – Drilling and cleaning out of the 11-3/4" casing commenced with an 18-5/8" bit. Drilled hard cement, the plug, from 41 to 72 ft.

November 2, 2018 – Reaming and drilling continued. CWS **encountered a gas pocket while reaming at 165 ft.** Mud reconditioned and circulated out of the well, and drilling continued through the second plug.

November 26, 2018 – InterAct encountered numerous drilling problems after drilling through the second plug between 284 and 310 ft. This was the depth range at which the 11-3/4" casing was cut, pulled up, squeeze cemented, and a plug placed in the previous reabandonment. To mitigate the drilling problems, InterAct elected to run a liner consisting of 7", 23 ppf Flush Max II casing to 466 ft. The 7" casing was landed in the 12-3/4" wellhead. InterAct reported that DOGGR approval was requested and obtained for this change in the program.⁷⁵

December 5, 2018 – The well was drilled past the third cement plug, with breakthrough at 640 ft. Drilling continued through hard cement encountered at about 800 ft., within the fourth plug, and **lost circulation at 836 ft.** Circulation may have been lost through the cut in the 11-3/4" casing at 883 to 887 ft. CWS changed a worn drill bit to a 6-1/8" concave mill. The mud was reconditioned, circulation regained, and drilling resumed.

December 18, 2018 – Drilling continued with a 6-1/4" concave mill and broke through the fourth cement plug at 888 ft. The hole was circulated and mill set down for the night at 910 ft.

December 20, 2018 – Reaming of the well continued down to 986 ft., past the casing window at 883-887 ft., when CWS noted a **partial loss of mud returns. InterAct and CWS observed drilling mud surfacing 20 ft. from the well cellar, after which the wellbore fluid level kept falling off.**

December 21 and 24, 2018 – **The wellbore fluid level fell 20 ft. from the surface on two separate occasions and had to be re-filled.**

December 26, 2018 – **After returning from the Christmas day off, InterAct discovered that the well had blown-out of the wellbore and broached at the surface.** The morning report noted:

Discovered well had blown-out over the Christmas break presumably through uncemented gap in casing between 290'-308' and up to the surface just outside the rig and slurry pit.

⁷⁵ Ibid.

Fortunately, the well had stopped flowing on its own. Bled-off casing (40 psi) and tubing (170 psi) pressure and filled hole with mud.

DOGGR representatives visited the site and InterAct received verbal approval to continue with plan to spot a cement plug and cement the 7" sleeve inside of the 11-3/4" casing. A 37 cu-ft. balanced cement plug was spotted and tagged at 532 ft. InterAct reported that DOGGR approval was requested and obtained for this change in the program.⁷⁶

December 28, 2018 – Two fissures were discovered at the surface. One of the fissures was located at a distance of about 15 ft. from the cellar. The fissures were due to the blowout surface broach. Figure 7 is a photograph of the surface expression taken by InterAct. A second surface fissure can be seen near the well in the figure.

December 29, 2018 – A cement plug was placed consisting of 211 cu-ft. of 14.0 ppg Class G cement was pumped and displaced through a retainer set at 310 to 416 ft. below the retainer.

January 1, 2019 –InterAct cemented the 7"×11-3/4" annulus by pumping 376 cu-ft. (67 bbls) of 15.8 ppg Glass G neat cement.

January 4-8, 2019 – Drilling continued past the retainer at 310 ft., hard cement was drilled from 396 to 427 ft. and 532-590 ft. **There was no mud to the surface during reaming at 1,120 ft. and at 1,120 to 1,214 ft.** This indicates a leak in the 11-3/4" production casing.

January 9, 2019 – The well kicked fluid and gas while rigging-up cements. An unspecified volume of gas was bled from the well. The well was then circulated with new 8.4 ppg mud to regain control of the well. Note that prior to this time, the drilling mud density was 9.0 ppg. Also, it should be noted that the density of fresh water is 8.33 ppg (62.4 lb/cu-ft.), so the mud weight was lowered to a density slightly greater than that of water. A balanced cement of 43 cu-ft. of Class G cement 3.5 barrels of mud was pumped. InterAct placed the new cement plug in an attempt to mitigate gas kicks and lost circulation at the through the casing window at 883 to 887 ft. InterAct reported that DOGGR approval was requested and obtained for this change in the program.⁷⁷

January 10, 2019 – The well took a gas kick during the drilling of hard cement from 786 to 885 ft. and lost returns at 1,085 ft. Hard drilling was noted from 1,214 to 1,306 ft. with partial returns.

5.2 The Blowout Incident

Order 1143 refers specifically to the blowout incident that occurred January 11, 2019. As shown above, however, there were two other blowouts, or well control incidents, involving broaching of wellbore fluids at the surface outside the wellbore. The broaching incidents were indications that the wellbore lacked pressure integrity.

⁷⁶ Ibid.

⁷⁷ Ibid.

January 11, 2019 – On the day of the incident, drilling resumed by lowering the bit down to 1,306 ft., when **the well kicked a gas bubble and lost circulation**. CWS added LCM to the mud in an attempt to regain circulation, but this was unsuccessful. The drilling mud was treated with Drispac and LCM, and circulation was regained briefly while drilling from 1,368 to 1,617 ft. **The drill string was pulled out of the hole to 1,492 ft. when the well blew out up in the drill string.** Gas and liquid was observed spraying about 60 to 100 ft. in the air. **The drilling crew was unable to stab the surface full-opening safety valve (TIW valve) onto the top joint of the drill pipe as needed, due to the velocity of the gas kick from the drill string.** InterAct sealed the well by dropping the drill string into the well and activating the BOPE blind rams. InterAct and CWS noted that the shut-in drill pipe pressure was 300 psi and a **10.2 ppg kill mud was bullheaded at 200 psi**. The shut-in drill pipe pressure after pumping the kill-weight mud jumped back to 300 psi and rose to 360 psi over the next hour.

In its Well Control Plan, InterAct reported that on January 11, 2019, prior to the blowout, they were attempting to communicate with DOGGR, reporting numerous gas kicks and seeking approval to terminate wellbore cleaning and drilling operations:⁷⁸

The morning report on Jan. 11 indicated that the cleanout had progressed to 1300'. InterAct Management pushed for termination of the cleanout at this point. The Senior Engineer informed Management that DOGGR would not allow aborting the clean out operation until the gas source at 2200' had been reached. Cleanout operations continued during these discussions. Management pushed back with safety being a priority over DOGGR regulations. An email was sent to DOGGR on 1/11/19 at 6:15 a.m. requesting termination of the cleanout operations at 2200'. The email noted that the well had gas kicks for three consecutive days and the cement job on 1/9/19 was not completely successful in stopping the lost circulation problem. Another email was sent to DOGGR at 12:30 p.m., documenting that another gas kick was taken at 1306'. No reply was received, and DOGGR approval for the change was not obtained. At approximately 5 p.m., the well blew out through the tubing. The Senior Engineer was on the phone with DOGGR when this occurred. InterAct's WSM immediately called 911, and the field crew implemented necessary emergency procedures to shut in the well using the installed BOPE. The well was sealed within 10 minutes of the blowout, before the emergency vehicles even arrived.

5.3 Post Blowout Operations

During the next 34 days, InterAct implemented operations to completely kill the well, recover the lost drill string, and stop the loss of circulation. The operations narratives included the following:

January 12, 2019 – 20 ft. of coiled tubing parted and fell into the well. The BOP was inoperable and leaked. The 20-ft. section of coiled tubing was recovered and found to have been lodged in the blind rams. The coiled tubing unit BOPs were used to control the well.

January 15, 2019 – InterAct and CWS killed the well in a sequence of operations during January 14 and January 15. First InterAct and CWS pumped 90 bbls of 9.0 ppg mud in a lube

⁷⁸ Ibid.

and bleed operation, which was followed by pumping 50 bbls of 10.2 ppg mud in a lube and bleed sequence. Final shut-in drill pipe pressure was zero psi at the surface.

January 16-17, 2019 – The existing 13-5/8" BOPE was replaced with a 7-1/16" Class III BOPE and successfully tested, after coiled tubing was found wadded up on the inside blind rams of 13-5/8" BOPE.

January 18, 2019 – Operations to recover the drill pipe commenced. At that time, InterAct and CWS estimated that the top of the drill pipe fish was estimated from 128, with the bit at about 1,617 ft. **DOGGR issued Order No. 1143 to perform remedial work on Dow RGC 10.**

January 20-21, 2019 –InterAct ran noise, gamma ray and temperature logs to determine any possible fluid movement behind the 11-3/4" casing production casing.

January 24, 2019 – RST (Reservoir Saturation Tool) logs were run to identify possible gas zones or gas migration pathways behind the 11-3/4" production casing.

February 1, 2019 – InterAct and CWS reportedly pumped cement through the bottom of the fish at 1,577 ft. in effort to stop the loss of circulation during the fishing operation. The estimated cement plug depth was estimated to be from 1,677 to 2,027 ft.

February 6, 2019 – CWS recovered top of 4-3/4" drill collar with top of fish estimated at 1,447 ft.

February 13, 2019 – InterAct and CWS ran noise and temperature surveys to determine any possible fluid movement behind the 11-3/4" casing production casing.

February 15, 2019 – The fishing assembly became stuck on the top of drill collar fish at 1,302 ft. The base of the fish estimated at 1,577 ft. Fishing operations were suspended.

5.4 Current Condition of Dow RCG 10 Wellbore

At the time of writing of this report, the well is under control (i.e., dead), with drill collars and a drill bit stuck in the wellbore at about 1,617 ft. Figure 8 is a wellbore sketch provided to DOGGR by InterAct of the condition of the wellbore as of February 11, 2019.⁷⁹ Exponent has reviewed the daily workover records provided by InterAct and believes the wellbore sketch is representative of the current configuration. MDR and InterAct are reportedly working with DOGGR to develop a safe plan forward.

⁷⁹ MDR / DOGGR Meeting DOW RGC 10 Well Re-abandonment Feb. 2019, provided to Exponent March 5, 2019 (DOGGR Presentation 02-14-2019.pdf).



Figure 7. Photograph of drilling mud blowout and surface broach at Dow RGC 10 pad taken by InterAct on December 28, 2018.

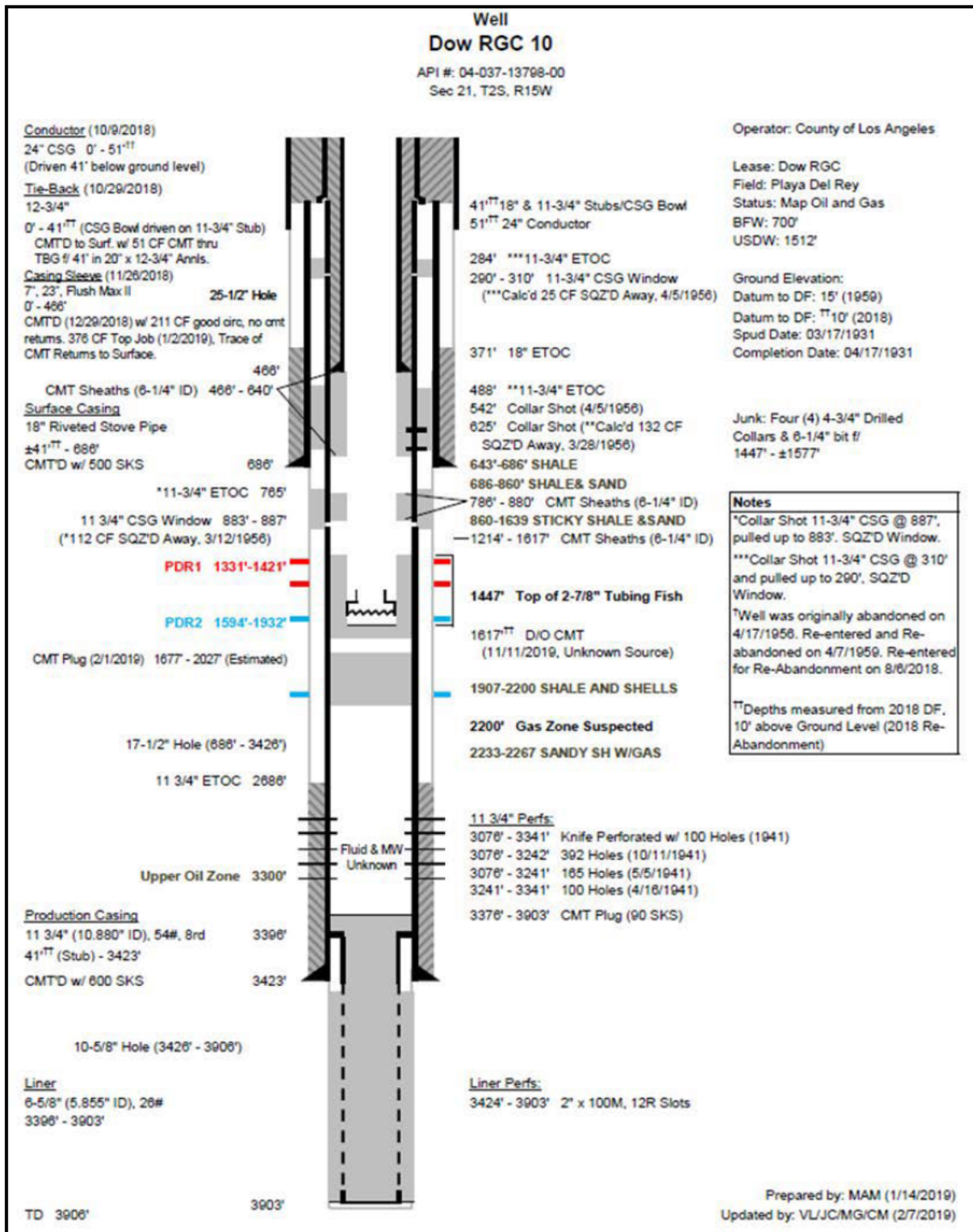


Figure 8. Wellbore sketch provided by InterAct of configuration of Dow RGC 10 as of February 7, 2019.

6 Root Cause Factors of the Blowouts

We list in this section the factors that we consider to have led to two surface broaching blowouts on December 20 and 25, 2018, respectively, and the blowout through the well on January 11, 2019. InterAct mitigated continued surface broaches by running and cementing a 7" casing liner in the well across the cut in the 11-3/4" production casing. Trapped gas likely flowed into the well from formations between 2,000 and 3,000 ft. through knife cuts or corrosion holes in the 11-3/4" casing, and accumulated below wellbore cement plugs. On March 12, 1956, the well blew out when the 11-3/4" casing was cut at 887 ft. and pulled up 4 ft. On December 20 and 25, 2019, the well broached the surface after drilling through the fourth plug at the depth of the 1956 blowout (887 ft.) with continued drilling to about 986 ft. The surface blowouts indicated probable wellbore communication with deeper gas formations. The surface blowout of January 11, 2019 occurred during operations when drilling to 1,617 ft. Most likely, pathways into the production casing were not adequately plugged or sealed during prior abandonments in the late 1950s, though casing corrosion is also likely to have occurred. Since it has not been possible to run casing integrity logs through the wellbore, it has not been possible to determine precisely the pathways of the formation gas into the well.

6.1 Factors: Historic Well Construction and Abandonment

6.1.1 Poor Historical Characterization of Pressured Formations

The 1931 Dow RGC 10 coring and logging reports to DOGGR identified gas present in formations between 2,233 and 2,320 ft. As described in this report, historical accounts of the Playa del Rey field reported blowouts. At least for Dow RGC 10, there was insufficient data and analysis by the original operators, The Ohio Oil Company and the Dow Chemical Company, to identify and properly characterize the gas-pressured formations penetrated by the well. In our review of the well history documentation, we found no records of wireline or production tests that accurately identified all pressured formations or shale barriers encountered by the Dow RGC 10.

Plugging and abandonment operations focus on primarily protecting fresh water aquifers and isolation of either productive or non-completed producible hydrocarbon formations. Pressured formations are potential sources of sustained fluid migration. Therefore, accurate identification and characterization of pressured formations are necessary to properly isolate fluid migration pathways during well abandonment.⁸⁰ A robust formation evaluation program conducted during initial well completion can provide detailed characterization of formations and key information, including:

- Lithological units penetrated by the well.
- Identify all productive and non-completed pressured formations.

⁸⁰ API Bulletin E3, Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations, First edition January 31, 1993, Reaffirmed, June 2000. Section 3.4.2, p 19.

- Identify shale zones that can potentially serve as barriers to fluid migration.
- Provide estimates of initial pressure of the pressure containing zones.
- The fluid type, location and volumes contained in any pressured formations.

Coring, wireline logging, and production testing are three major components of a formation evaluation program. Coring and core analysis involves obtaining cylindrical samples of rock from a drilled well and analyzing these cores in a laboratory to determine fundamental rock properties, such as lithology, porosity, permeability, and saturation of the various fluids in the formation. One limitation of coring, however, is that the rock cores are usually cut over a subset of the reservoir and therefore not representative of the entire reservoir.

We reviewed the well history files for Dow RGC 10 available to the public at DOGGR's online website. The analysis of the records indicates that a coring program was conducted during the initial drilling in 1931, but no wireline logs were run after the initial completion or in subsequent abandonment operations. The coring records indicate gas shows in cores obtained at 2,233 to 2,267 ft. and 2,297 to 2,395 ft. Records of the 1956 blowout incident during well abandonment indicated a gas zone slightly shallower than that depth range. A DOGGR Memorandum during the 1956 abandonment stated that:⁸¹

*Gas was apparently coming from behind **the 11-3/4" casing at a depth of 1800'**.*
[Emphasis in bold added]

Accurate identification of the location and height of the gas zone is not possible if no wireline logs were run. In the case of Dow RGC 10, depths of gas, oil, and brine pore fluids could be inferred from core analysis and historical operations records in the available documentation (i.e., the DOGGR online well file). Based on the reabandonment proposal InterAct submitted to DOGGR, it appears that InterAct reviewed the well history documentation. However, due to the age of wellbore, the time since it was last accessed, probable corrosion of the old casing, and poor historic primary cementing and plugging operations, it is likely that gas from deeper formations migrated into the wellbore to shallower depths.

Wireline logging and production testing provide additional information that cannot be obtained from coring alone. Wireline logs provide continuous measurements of geophysical properties of the undisturbed subsurface. Wire line logs also have a better depth of investigation and the estimated properties are on a reservoir scale. Logs can completely characterize a reservoir's lithology including the exact location of any shale barrier zones, pressured formations and differentiate gas-filled porosity from water-filled zones. This means that running wireline logs would have permitted accurate identification of the all fresh water aquifers including the Base of Freshwater (BFW), the Underground Source of Drinking Water (USDW), and shale barriers not readily shown in the core records.

⁸¹ Memorandum of Telephone or Personal Conversation, dated March 14, 1956 (03713798_2019-01-22_DATA, p 64).

InterAct reviewed 21 wells within a 750 ft. radius of the Dow RGC 10 well.⁸² Exponent independently reviewed the available well records on DOGGR’s online website and confirmed that that only 6 of the 21 wells had well file documentation, and none had wireline logs. Well records indicate that three of these nearby wells, Venezia 2, Graner IV, and 3A, had well blowout events during their initial drilling and, moreover, the reported depth of the source gas in these well control events was estimated to be at about 2,000 ft.^{83 84 85} Figure 9 shows the location of the nearby wells.

Additionally, there are no records of any production tests conducted during the initial drilling and completion of the Dow RGC 10. Production tests provide important information, such as the initial reservoir pressure, fluid type, fluid gradients, and estimates of the reservoir boundaries. Conducting production tests during the completion of the well would have provided useful information for determining the pore pressure and fluid volumes in any pressured zones encountered in the well.

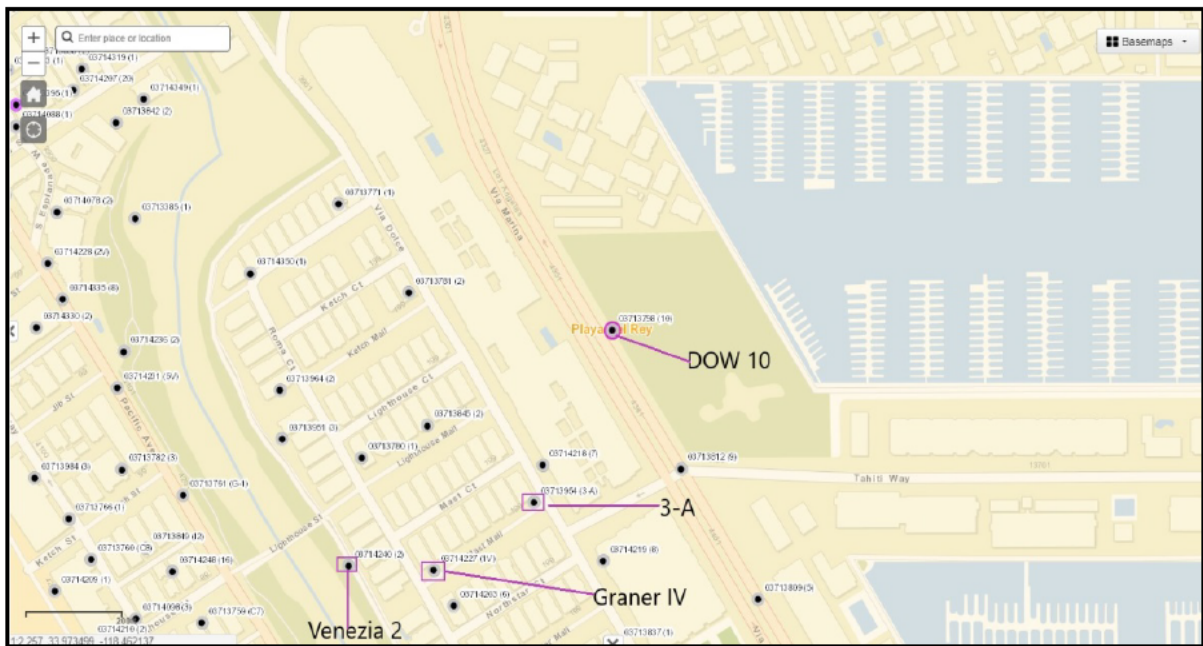


Figure 9. Location of nearby wells with blowout histories.

⁸² Letter from Val Lerma and Mike Giuliani, InterAct PTMI, to Mike Hale, Hardage Hospitality, Re: Dow RGC 10 Recommendation, February 14, 2019.

⁸³ DOGGR online documentation for Venezia well, p 28
https://secure.conservation.ca.gov/WellRecord/037/03714240_2017-10-12_DATA.pdf

⁸⁴ DOGGR online documentation for Graner IV well, p 27
https://secure.conservation.ca.gov/WellRecord/037/03714227_2017-10-12_DATA.pdf

⁸⁵ DOGGR online documentation for 3A well, p 23
https://secure.conservation.ca.gov/WellRecord/037/03713954_2017-10-12_DATA.pdf

6.1.2 Insufficient Prior Abandonment and Cement Barriers

A principal cause of the blowouts in 2018 and 2019 was the lack of pressure integrity of the 11-3/4" casing at a prior casing cut and cement plug at around 310 ft.; a prior casing cut and cement plug at around 556 to 625 ft.; and below the casing cut and cement plug at 887 ft. These casing integrity issues allowed for gas inflow to the wellbore and losses of drilling mud. The shallower casing cuts and plugs resulted in gas kicks and drilling difficulties. The loss of Dow RGC 10 well integrity was most likely a result of inadequate prior abandonment and a lack of annulus cement barrier outside the 11-3/4" production casing across gas-bearing pressured formations over the depths of 887 to 2,686 ft. The Dow Chemical Company made 657 knife-cut perforations in the 11-3/4" casing between 3,076 and 3,341 ft., which do not appear to have been properly plugged during previous abandonment. Potential pathways existed for gas inflow to the wellbore from behind the production casing or to shallower formations through uncemented annuli. The well abandonment operations in 1956 and 1959 most likely left the Dow RGC 10 without adequate future well integrity, failed to isolate gas-pressured zones, and failed to prevent fluid migration behind and through the 11-3/4" production casing. Prior operators did not fully assess the cause of the blowout in March 1956.

A review of the 1931 completion design and recent wellbore sketches (see Figure 5) provided by InterAct for the Dow RGC 10 reabandonment proposal indicated that the primary cement column of the 11-3/4" casing was not sufficient to isolate pressured formations above the oil bearing zones at about 3,300 ft. According to the historical records and well schematics, the estimated top of cement (ETOC) in 18" stove pipe surface casing annulus was about 371 ft. The ETOC in the annulus of the 11-3/4" production casing was 2,686 ft. As discussed previously in this report, the gas zone indicated in core logs was at a depth of about 2,200 ft.

We made independent calculations of the ETOC using an assumed value of cement yield of 1.12 ft³/sack (ignoring cement in the shoe track of the casing string). As indicated in the drilling records, 500 sacks of cement were pumped to complete the surface casing and 600 sacks of cement pumped for completion of the production casing. The calculated ETOCs are 2,687 ft. for the production casing annulus and 347 ft. for the surface casing annulus. Thus the historic records of ETOCs are likely accurate.

Estimates of ETOC from both InterAct well schematics and our calculations show that the primary cement column in the annulus of the 11-3/4" production casing may not have isolated the pressured gas-zone formations. Therefore, there were likely existing potential pathways for an uncontrolled release of formation fluids during re-entry of the Dow RGC 10 wellbore reabandonment workover operations.

According to the well history documentation, the first incident of uncontrolled release of fluids in the Dow RGC 10 occurred during the first well abandonment in March 1956. The blowout

occurred when the 11-3/4" casing was shot and parted at 883 to 887 ft. Historical documentation noted that:⁸⁶

... the well was blowing marsh gas, salt water, and sand at an undetermined rate” was coming up the 11-3/4" casing and that “The gas was apparently coming from behind the 11 3/4" casing at a depth of 1800 ft.”

Based on this foregoing historical information, we reached the following conclusions:

- The exact location of the source of fluid migration and gas-pressured zones was not determined precisely.
- The primary cement barrier in the annulus of the 11-3/4" casing estimated at 2,687 ft. did not isolate the unidentified pressured gas and saltwater zones from the wellbore.
- There was an uncemented annulus outside the 11-3/4" production casing from about 2,687 ft. to the bottom of a cement plug at about 887 ft.

Dow Chemical Company’s contractor who handled the well abandonment at the time reportedly took the following actions to control the blowout and isolate fluid movement into the wellbore:

- Placing a balanced cement plug across the parted casing from 786 to 888 ft.
- Bled off gas by shooting hole in 11-3/4" at 625 ft. and placing cement plug from 556 to 625 ft.
- Shot 11-3/4" casing at 542 and 310 ft. and pulled the casing up 30 ft. from 310 to 290 ft.
- Placed cement plugs at 291 to 310 ft. and 10 to 35 ft.

There are no cement plugs or cement squeezes placed across the blowout depth gas zone identified above as around 1,800 ft., nor across the gas zones at 2,200 to 2,395 ft., which were indicated in the core records. Therefore, the historic abandonments left the well susceptible to the loss pressure integrity and exposed to potential pathways for fluid inflow from behind the casing. Permanent zonal isolation would have been achieved by squeeze cementing the annulus of the 11-3/4" casing from the ETOC of 2,686 ft. to at least 100 ft. above the observed gas source at 1800 ft., per current regulatory standards.⁸⁷

The County of Los Angeles reabandoned the Dow RGC 10 well in April 1959. Abandonment operations consisted of:

- Drilling out to cement plug at 304 ft. and testing for hardness.
- Placing a surface cement plug across the stub of the 11-3/4" casing.
- Placing a steel plate across the 18-5/8" surface casing.

⁸⁶ Memorandum of Telephone or Personal Conversation, dated March 14, 1956 (03713798_2019-01-22_DATA, p 64).

⁸⁷ 14 CA CCR §1723.

This 1959 reabandonment program also did not isolate any pressured formations and left the wellbore with potential for future loss of pressure integrity.

Finally, the 675 knife perforations from 3,076 to 3,341 ft. were evidently never cemented shut nor squeeze cemented during the prior abandonment operations. These unplugged perforations could have provided a pathway for gas and brine into the wellbore.

6.2 Factors: 2018-2019 Reabandonment Operations

We created a timeline for the occurrences of kicks and lost circulation from a review of InterAct's daily workover reports for the reabandonment program in 2018 and 2019. We identified from this timeline three operational factors that led to the January 11, 2019 blowout at the rig.

A review of the 1959 reabandonment records of the Dow RGC 10 well indicate that, in the 1956 abandonment operations, the 11-3/4" casing had been breached at 290 to 310 ft. and at 883 to 887 ft. Both casing windows were reportedly sealed with balanced cement plugs during the historic abandonment operations. During the 2018-2019 reabandonment, InterAct reported numerous incidents of kicks and lost circulation in the daily workover reports. Notable events from the workover reports include:⁸⁸

1. On November 2, 2018, the rig crew "drilled into a gas pocket" when "drilling out cement stringers from 85' to 165'." This depth range is between the first and second historic cement plugs in the well. This indicates that there were either corrosion holes in the 11-3/4" casing or an inadequate cement plug sealing the casing widow at 290 to 310 ft. The second plug was drilled-out without any incident. This exposed window, however, was a potential leak point and pathway for fluids in and out of the production casing. InterAct subsequently ran and cemented a 7" liner to 466 ft., which is across this depth range.
2. On December 20, 2018, the drilling crew observed the first occurrence of mud returns broaching the surface away from the wellbore after drilling to 986 ft. The daily report on the day states:

Had partial loss of returns at 986'. Also noted mud surfacing 20' from the cellar. Pulled bit to 676' and broke circulation with 15 bbls. Conditioned mud with gel and LCM. Lost 20 bbls after circulating for 1-1/2 hours. Pulled bit to 458', conditioned mud with gel and LCM. Filled hole with mud and monitored well for 1 hour. Fluid fell back 5'. Filled hole.

This depth is just below the documented historical casing cut at around 883 to 887 ft. This event is indicative of leaks in the casing below 887 ft. that may have existed since the wellbore's construction in 1931, or after the prior abandonment attempts. Mud broaching the surface at about 20 ft. from the cellar suggests that mud was flowing behind of the production casing via the leak at the casing window or through corrosion holes, and then to the 24" conductor pipe. Additionally, it is unlikely that the use of LCM would have been effective in controlling mud losses through corrosion holes or

⁸⁸ Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document Item e) CWS DAILY REPORTS DOW RGC-10_Oct 23 2018 to Jan 13 2019.xls.

knife cuts in the casing. The effectiveness of LCM is dependent on direct exposure of mud in the wellbore to the loss or thief zones. Direct contact of drilling mud with open formation allows the fine-grained LCM in the mud to plug and seal any thief zones.

3. On December 21 and December 24, 2018, daily workover records indicate that the fluid level fell 20 ft. from the surface. This is an indication that mud was leaving the wellbore from at least one leak path in the production casing.
4. InterAct and CWS documented a second uncontrolled release of fluids from the Dow RGC 10 on December 25, 2018. The drilling crew reported arriving at location on December 26 to discover that the well had blown out and broached at the surface, but bridged off on its own. According to the daily report:

Traveled to location. Discovered well had blown-out over the Christmas break presumably through uncemented gap in casing between 290' to 308' and up to the surface just outside the rig and slurry pit. Fortunately, the well had stopped flowing on its own.

The surface broach blowout suggests that pressured formation fluids entered the wellbore at an unknown entry point and exited the wellbore through the parted casing at around 290 to 310 ft. The drilling reports also noted that InterAct made a decision to spot a cement plug below the 7" casing hung in the 11-3/4" production casing with bottom at 466 ft., and then cemented the 7" casing in place. The cement plug provided a base against which to cement the 7" sleeve, rather than using a drillable cement plug. InterAct carried out this operation on December 26, 2018. The drilling report states:

Rigged-up cementers to 7" X 11-3/4" annulus. Mixed and pumped 376 cu ft. (67 bbls.) of 15.8 ppg Glass G neat cement at minimal pressure (0 – 90) psi at end of job.

Cementing the 7" sleeve would have sealed off the casing cut at 290 to 310 ft., which was an exit point for the formation fluids, but not the entry point for fluids into the wellbore. At this point, the casing cut at 883 to 887 ft. and casing corrosion holes below remained potential entry points for formation fluids into the wellbore, since the plug placed across it had been drilled out.

5. On January 8, 2019, the well took another gas kick while reaming deeper. The drilling report notes:

Picked-up power swivel and continued circulating and reaming down to 996' when took a gas kick. Closed in well and conditioned mud to 9.0 PPG. Slowly bleed off gas in 10 minutes.

The foregoing indicates that there was still gas entering the wellbore and the activity localized around the vicinity of the parted casing at 883-900 ft. and below that depth. Further drilling was marked by a loss of mud returns as the drilling report notes:

*Continued making hole but had to put 8K on bit and drill in order to make hole (acted like drilling on cement) with limited circulation. Lost all returns at 1120'. Attempted to maintain circulation with LCM, no good. **Drilled with no returns from 1120' to 1214'. POOH with bit to 437'.** [Emphasis in bold added.]*

The use of LCM to regain circulation had limited effectiveness in plugging a leaking casing with an empty annular space. InterAct stated that:⁸⁹

Additives to the mud were not effective in regaining circulation until the drilling reached 1368', at which time full circulation was achieved.

In addition, the historical reports show that there was no cement plug in the casing from about 887 ft. to 3,376 ft., and there were unplugged knife cuts in the casing from 3,076 to 3,341 ft. The depth at which mud was being lost was unknown nor could it be determined with certainty.

6. On January 9, 2019, InterAct and CWS prepared to pump a new 43-cu-ft. cement plug at about 800 ft., in an apparent effort to seal suspected leaks in the casing, which were partly responsible for gas kicks and lost circulation. The InterAct letter to MDR stated that the cement plug across the casing window was ineffective in shutting off the source of gas.⁹⁰

The cement plug documented as being set across the casing part at 883-887' was ineffective in shutting off the source of gas that was first identified during the 1956 abandonment.

The crew experienced a kick of gas and fluid while rigging up the cementers prior to placing the plug. InterAct and CWS reduced the mud weight from 9 ppg to 8.4 ppg, and circulated the kick out prior to placing the cement plug:

Bleed down gas and had to circulate well with new 8.4 ppg mud to kill well.

In a letter to MDR dated February 14, 2019, InterAct stated:⁹¹

... the cement was drilled out using 8.4 ppg mud to avoid lost circulation.

Lowering the mud weight to 8.4 ppg, which is slightly greater than the density of water,⁹² increased the risk of losing control of the well, since gas kicks were entering the wellbore and mud was being lost through the leaking casing. InterAct acknowledged the increased risk in the letter to MDR:⁹³

The combination of gas kicks and lost circulation in the well indicated an increased risk of well control issues.

At this point in the reabandonment operation, the 8.4 ppg mud and lost returns associated with the limited casing integrity produced challenging conditions: gas kicks and lost circulation problems continued. Based on the daily workover reports, InterAct

⁸⁹ Letter from Val Lerma and Mike Giuliani, InterAct PTMI, to Mike Hale, Hardage Hospitality, Re: Dow RGC 10 Recommendation, February 14, 2019.

⁹⁰ Ibid.

⁹¹ Ibid.

⁹² The density of water is $62.4 \text{ lb/ft}^3 = 8.33 \text{ ppg}$.

⁹³ Letter from Val Lerma and Mike Giuliani, InterAct PTMI, to Mike Hale, Hardage Hospitality, Re: Dow RGC 10 Recommendation, February 14, 2019.

and CWS did not increase the density of the mud back up to 9.0 ppg prior to continuing drilling operations over the next two days. However, InterAct and CWS increased the mud weight to 10.2 ppg after the January 11, 2019 blowout.

After InerAct and CWS killed the well with the 8.4 ppg mud, the balanced cement plug was placed from about 786 to 880 ft.

7. CWS drilled out the new cement plug with 8.4 ppg mud on January 10, 2019 when the well took another gas kick. The drilling report for the day states:

Continued in hole setting down on hard cement at 786'. Drilled out hard cement from 786' to 885'. Took a gas kick. Bleed-off gas slowly while circulating to kill well.

8. This chain of events clearly shows that the new cement plug and any cement squeezed into the annulus failed to seal the suspected leak at around and below 887 ft., and that gas was still entering the wellbore at or below that depth. On January 11, 2019, the day of the rig floor blowout, the drilling records reported an inability to fill the hole with the 8.4 ppg mud when the bit was lowered to 1,306 ft.:

Lowered bit back down to 1306', no fill. Pumped 30 bbls to break circulation. Well kicked gas bubble then lost all circulation. Attempted to treat mud with LCM to regain circulation, no good.

The foregoing shows that there were leaks in the production casing and the use of LCM was ineffective in controlling the mud losses. InterAct stated in their recommendation letter to MDR that LCM additives were not effective in controlling lost circulation⁹⁴:

Additives to the mud were not effective in regaining circulation until the drilling reached 1368',

Taking gas kicks was another well control warning signals, which indicated that a higher mud weight was required to mitigate additional gas influxes. Drilling continued, however, from 1,306 to 1,368 ft. without circulation, and from 1,368 to 1,617 ft. with “good circulation.” It was while the CWS was pulling pipe out of the hole to about 1,492 ft. that the well blew out:

POOH with bit to 1492' when well blew out up the tubing.

Analysis of the timing of all of the well control events that occurred at depth intervals below the parted casing at 883 to 900 ft. strongly suggests a leak or a plurality of leaks in the casing, as deep as 3,376 ft., allowed communication with gas zones into the wellbore via the uncemented annulus and corrosion holes in the casing. The ineffectiveness of LCM in controlling mud losses through the 11-3/4” casing is consistent with fluid loss through a leaking casing string, rather than fluid losses from drilling in a highly permeable or fractured formation.

6.2.1 Lost Circulation Problems

As discussed above, InterAct and CWS added LCM to the drilling mud in attempts to mitigate lost drilling mud and circulation problems. The LCM additives were largely

⁹⁴ Ibid.

ineffective. Pathways in the old 11-3/4” casing were responsible for repeated occurrences of (1) lost circulation during drilling and (2) several gas kicks experienced during drilling below the cement plug and casing window at around 887 ft. The foregoing were well control warning signals.

The use of LCM additives to control lost circulation and drilling mud alleviated drilling problems only temporarily. As described elsewhere in our report, LCM is not effective for sealing lost circulation or thief zones outside of the casing, and cannot be relied upon for plugging holes in casing or sealing the permeable zones behind the production casing serving as a source of pressured fluids. More effective methods to plug casing holes are: squeeze cement into casing breaches; install casing patches; or run smaller diameter casing or a liner. InterAct successfully ran and cemented a 7” liner to solve shallower drilling and well integrity problems. While the objective of using the LCM additives may have been to transport the material through the casing breaches to seal again the external annular formation surfaces, lost circulation problems persisted. The use of LCM additives was unsuccessful after drilling through the cement plug at about 786 to 887 ft., even after placing a new cement plug at about that same depth. Difficulties with lost circulation led InterAct and CWS to reduce the drilling mud density when they were also experience gas kicks.

6.2.2 Inadequate Drilling Mud Density

The decision to lower the mud weight from 9.0 ppg to 8.4 ppg on January 9, 2018 contributed to the eventual loss of well control and the blowout. Lowering the mud weight removed the pressure tolerance required to offset hydrostatic pressure reduction in the wellbore while tripping out the drill pipe.

As discussed above, the drilling report for January 9, 2018 showed that InterAct and CWS lowered the mud weight to 8.4 ppg in order to circulate out a gas kick:

Bleed down gas and had to circulate well with new 8.4 ppg mud to kill well.

InterAct stated that this decision was made in order to avoid lost circulation.⁹⁵ There is no indication in the daily workover reports that the mud weight was raised back to the prior mud weight of 9 ppg or higher between January 9 and January 11, the day of the blowout. When a loss zone is encountered, the top priority is keeping the wellbore full, so that the hydrostatic pressure does not fall below the pressure that would allow a kick to occur. The hydrostatic pressure may be purposely reduced to stop the loss, as long as sufficient density is maintained to prevent well-control problems. As reported in the daily workover reports, InterAct and CWS were unable to kill the blowout flow:

Unable to stab in with TIW valve to close well in. Had to drop tubing string in hole in order to close the blind rams.

InterAct and CWS the made the decision to increase the mud density:

⁹⁵ Ibid.

Conditioned mud in pit to 40 vis and 10.2 PPG. Bull headed mud away @ 200 psi.

With the 10.2 ppg mud and the blind rams closed, the well pressure increased to 360 psi. On January 12, InterAct and CWS used a coiled tubing unit (“CTU”) to pump 10 ppg mud into the well. The coiled tubing parted and, according to later daily work over reports, the remainder of the coiled tubing in the well jammed the 12” blind rams. The CTU BOP was used to close the well. The surface pressure on the shut in well maintained approximately 340 psi for the day. On January 14, an unsuccessful attempt was made to pump 9 ppg mud into the well, but the well surface pressure had decreased to 100 psi.

InterAct and CWS killed the well on January 15 with 10.2 ppg mud:

Pumped 50 bbls of 10.2 mud in lube and bleed sequence (5 bbl cycles) until well dead. Rigged-down pump truck and monitored well until midnight. Well remained static with zero psi at surface.

Over the next weeks, fishing operations continued and the mud weight was lowered progressively to 9 ppg.

A mud weight of 8.4 ppg is analogous to drilling with fluid density slightly above that of freshwater, 8.33 ppg. It is unlikely that hydrostatic pressure provided by a drilling fluid similar to water would have been sufficient in controlling the pressurized gas zone intersected by the Dow RGC 10 well. The reduction in mud weight corresponds to a pressure reduction of about 50 psi at a depth of 1,617 ft., which was the final drilling depth before the blowout.

6.2.3 Tripping Speed Pulling The Tubing Up

As noted above, according to the drilling report for January 11, 2019, the drill string was being pulled out of the hole when the well blew out:

Continued drilling to 1617' and circulated hole clean. POOH with bit to 1492' when well blew out up the tubing.

Gas influxes are well known to occur as tubulars are pulled from the well, most commonly if the pipe is extracted too quickly, and is a phenomenon referred to as “swabbing.”⁹⁶ It is not known with certainty that the well was swabbed in during this operation, since real-time drilling telemetry data is not available to determine the speed at which the pipe was raised. However, the occurrence of the blowout while the density of the drilling mud was near that of water and while the tubing was being pulled up the wellbore meets two of the most well-known and

⁹⁶ API RP 59, Recommended Practices for Well Control Operations, Second edition, May 2006, Reaffirmed: January 2012, Subsection 5.1

common reasons for well blowouts.^{97 98 99} Lowering the mud weight given the previous history of kicks in the well all but removed the safety margin required for swabbing pressures during a trip out of the hole.

⁹⁷ Ibid.

⁹⁸ Hauser R. L. and Guerard, W.F., Jr., Publication No. TR43, A History of Oil- and Gas- Well Blowouts 1950 – 1990. California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, Sacramento, CA, p. 2.

⁹⁹ Horn, A.J., 1950. Well Blowouts in California Drilling Operations Causes and Suggestions for Prevention. Presented at the spring meeting of the Pacific Coast District, Division of Production, Los Angeles, p. 1.

7 Learnings From the Dow RGC 10 Blowouts

This section is a listing of learnings and recommendations arising from Exponent's RCA of the Dow RGC 10 well historic and 2018-2019 well control events and blowouts.

- Consideration should be given to the use of a snubbing unit or stripping operations,¹⁰⁰ and a drill string internal blowout preventer (IBOP) or check valve, for future Playa del Rey reabandonment operations. The history of surface broaches and gas kicks during the 2018-2019 well reabandonment operations, and the historical blowouts in the Dow RGC 10 and other wells in the area, suggests that the use of an IBOP or check valve could have been beneficial. In particular, these considerations may be appropriate for drilling through old cement plugs, beneath which gas may accumulate through old corroded casing. The use of an IBOP or check valve as a contingency component of the BOPE system could have reduced the risk of gas flow up the drill pipe and likely could have prevented the blowout on January 11, 2019. For the specific case of the Dow RGC 10 blowout, the inability to stab the TIW valve on the tubing quickly during the blowout points out the potential benefit of this alternative equipment. In fact, InterAct's daily workover reports show that a check valve was used in the drill string for the remainder of the wellbore operations after the January 11, 2019 blowout. For example, InterAct's January 28, 2019 report states:

Installed check valve one joint above drill collars.

The check valve was used virtually every day from January 28, 2019 until the well was finally reabandoned.

Based on the previously discussed well control warning signals, gas kicks, and blowouts during reabandonment operations on the Dow RGC 10, contingency plans should have been made to include the use a snubbing unit, stripping operations, and an IBOP or check valve in the drill string capable of mitigating backflow into the drill string. According to DOGGR's Publication No. M07, a Class II BOPE system should include in internal blowout preventer:¹⁰¹

Internal preventer inside the pipe in use, or readily available at the rig in the open position, with fittings adaptable to the safety valve required by 2-2c6. This valve must fit through the wellhead equipment in use and must be stored in such a position or identified in such a manner that it will not be the first valve installed by the crew in response to a kick taken while tripping pipe.

¹⁰⁰ The equipment and operations involved stripping and snubbing are technically different, but are both alternatives for well control work when the drilling string must be run in the wellbore when it is under pressure (i.e., during a kick).

¹⁰¹ Wygle, P.R., 2006. Publication No. M07 Blowout Prevention, In California Equipment Selection and Testing. California Department of Conservation Division of Oil, Gas, and Geothermal Resources, Tenth edition. Sacramento, California. Section 2-2.c.7, p. 5.

In a letter the Exponent dated April 24, 2019, “*InterAct in fact had a snubbing unit compatible with the CWS rig lined up in the days after the 1/11 blowout on this well in the event it was required.*”¹⁰² However, InterAct did not need the unit for the operations after the blowout, although a drill string check valve was used, as described above.

DOGGR’s M07 also refers to the use of an IBOP during stripping operations:

An internal preventer (inside blowout preventer) is defined as a check valve in the drill string that permits circulation down the hole, but prevents back flow..... Float valves installed at the bottom of the drill string, or drop-in pump-down check valves, serve the same purpose, but are often restricted by operators because of the restrictions they place on other operators.

It should be noted that DOGGR’s M07 Section 2-2 subsection c for Class II BOPE systems, which InterAct and CWS had for the Dow RGC 10 operations as required by the reabandonment permit, includes a footnote stating:¹⁰³

For workover operations not requiring a drilling-type circulating system, requirements 4, 5, and 7 do not apply.

Nevertheless, after the January 11, 2019 blowout, InterAct and CWS used a drilling string check valve and had a snubbing unit on standby and.

API Std 53 recommends the use of an IBOP for stripping operations.¹⁰⁴ The continued occurrences of gas kicks in the abandonment and reabandonment of Dow RGC 10 strongly suggested a pressurized wellbore, in which stripping operations and IBOP would be appropriate. An IBOP or check valve in good working order will prevent gas backflow into the pipe and arrest a potential blowout.

- Reabandonment of old wells may seem rather straightforward, but as has been demonstrated in the Playa del Rey oilfield both historically and in contemporary time, well control due to the presence of shallow gas formation is challenging. The Operator should plan well control contingencies for shallow gas in this region, since there is a history of blowouts involving shallow wells. Old wells, such as the Dow RGC 10 spudded in 1931, in which casing and cement integrity is suspect, should be carefully examined for risk versus reward for determining if re-entry is truly warranted.
- The use of lost circulation materials as a means of plugging casing holes or leaks should be carefully considered. In most situations, it may be more efficacious and prudent to take the time to perform squeeze cementing operations. Squeeze cementing operations

¹⁰² Email dated April 23, 2019, from Michelle Pasini, InterAct, to Brun Hilbert, Exponent, attached letter dated April 24, 2019, p 12.

¹⁰³ Wygle, P.R., 2006. Publication No. M07 Blowout Prevention, In California Equipment Selection and Testing. California Department of Conservation Division of Oil, Gas, and Geothermal Resources, Tenth edition. Sacramento, California. Section 2-2.c.7, p. 5.

¹⁰⁴ API Std 53, Blowout Prevention Equipment Systems for Drilling Wells, Fourth edition, November 2012, Section 6.4.3, p. 29.

are not without risks. If a squeeze cementing protocol was established to “seal” annular flow paths, then drilling up the cement could lead to sidetracking operations. Drilling hard cement with weight on bit could cause the bit to mill corroded casing and formation easier than hard cement.

- During operations in which lost returns and gas kicks are occurring, weighting up the drilling mud should be the first priority to prevent gas influxes, and may override the decision to use LCM to mitigate lost returns. While LCM is not necessarily detrimental, it generally does not assist in gas influx prevention.
- Characterize shallow gas sands in the Playa del Field, which have caused well control issues and blowouts in the past and again recently. It is recommended that a new well be drilled at a suitable location and depth in the Playa del Rey field area, in which a complete logging program should be performed, focusing on geological characterization. Also, production testing should be performed to investigate the extent and pressure of shallow natural gas formations.¹⁰⁵
- It is recommended that a study be performed to gather information on geological logging and wellbore abandonment configurations of all 279 Playa del Rey oil wells, at least for those wells for which such information exists. DOGGR data shows that all 279 wells are currently plugged and abandoned, as indicated by a “P” status in DOGGR online records.

¹⁰⁵ By shallow it is meant less than approximately 4,000 ft.

8 References

API Bulletin E3, Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations, First edition January 31, 1993, Reaffirmed, June 2000.

API Std 53, Blowout Prevention Equipment Systems for Drilling Wells, Fourth edition, November 2012.

API RP 59, Recommended Practices for Well Control Operations, Second edition, May 2006, Reaffirmed: January 2012.

Barton, C.L., 1931, A Report on the Playa Del Rey Oil Field, in Summary of Operations, California Oil Fields, State of Calif. Div. Of Oil and Gas, San Francisco, Calif. V. 17, n. 2.

Blowout Profile2.pptx, Contour Maps and Geologic Cross-sections of wells with Blowout Histories near Dow RGC 10, prepared by InterAct provided on February 2, 2019.

California Code of Regulations, Title 14 (14 CCR). Publication No. PRC10, State of California California Statutes and Regulations for the Division of Oil, Gas, & Geothermal Resources, available at

<https://www.conservation.ca.gov/index/Documents/DOGGR%20Statutes%202018%20%20updated%204-4.pdf>

California Department of Conservation Division of Oil, Gas, and Geothermal Resources, 1992. California Oil & Gas Fields, Volume II – Southern, Central Coastal, and Offshore California Oil and Gas Fields, Third edition, Index Map E, p 16. Available at

ftp://ftp.consrv.ca.gov/pub/oil/publications/Datasheets/Dtasheet_vol_2.pdf

Core Record of Oil or Gas Well submitted by The Ohio Oil Company, dated April 25, 1931 (03713798_2019-01-22_DATA, p 82-84).

Copy of MDR Daily Report_.xls

DAILY REPORT INTERACT DOW RGC-10_Oct 23 2018 to Jan 13 2019.xls.

DOGGR, April 18, 2019, 4:00 pm. Dow RGC 10 Well Final Update, available at

<https://www.conservation.ca.gov/dog/Documents/DOW%20RGC%2010%20Well%20Incident/2019%2004%2008%20DOW%20RGC%2010%20Well%20Incident%20Update%20FINAL.pdf>

DOGGR online documentation for Venezia well,

https://secure.conservation.ca.gov/WellRecord/037/03714240_2017-10-12_DATA.pdf

DOGGR online documentation for Graner IV well,

https://secure.conservation.ca.gov/WellRecord/037/03714227_2017-10-12_DATA.pdf

DOGGR online documentation for 3A well,
https://secure.conservation.ca.gov/WellRecord/037/03713954_2017-10-12_DATA.pdf

Email communication from Juan Magan, Zalco Laboratories Inc., to Michael Giuliani, InterAct PMTI, RE: 1901123, January 14, 2019.

Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document RCA Item f) - Well Control Training Certifications.pdf.

Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document RCA Item g) - CWS BOP Drills.pdf.

Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document RCA Item h) - InterAct Risk Assessment Protocol.pdf.

Email dated April 8, 2019, from Michael Giuliani, InterAct, to Brun Hilbert, Exponent, attached document Item e) CWS DAILY REPORTS DOW RGC-10_Oct 23 2018 to Jan 13 2019.xls.

Email dated April 23, 2019, from Michelle Pasini, InterAct, to Brun Hilbert, Exponent, attached letter dated April 24, 2019.

Email dated May 22, 2019 from Michelle Pasini, InterAct, to Brun Hilbert and Kelvin Abaa, Exponent, attached document Ltr to Exponent with Additional Info for RCA - 05-22-19.pdf.

Email dated March 21, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document undated InterAct Well Control Plan DOW RGC 10.pdf.

Email dated February 25, 2019 from Val Lerma, InterAct, to Brun Hilbert, Exponent, attached document MDR Daily Report.xls

Emergency Order to Perform Remedial Work No. 1143 (“Order 1143”) of the State of California, Natural Resources Agency, Department of Conservation, Division of Oil, Gas, and Geothermal Resource, dated January 18, 2019, available at
<https://www.conservation.ca.gov/dog/Documents/Orders/1143.pdf>

Hauser, R.L. and Guerard, W.F., Jr., Publication No. TR 43, A History of Oil- and Gas- Well Blowouts 1950 – 1990. California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, Sacramento, CA.

Helium Gas Sample Analysis Report prepared by Zalco Laboratories, Inc. dated January 18, 2019.

History of Oil or Gas Well submitted by The Ohio Oil Company dated April 25, 1931 (03713798_2019-01-22_DATA, p 79).

History of Oil or Gas Well submitted by Dow Chemical Company dated April 24, 1956 (03713798_2019-01-22_DATA, p 61).

History of Oil and Gas Well submitted by the County of Los Angeles, dated April 8, 1959 (03713798_2019-01-22_DATA, p 54).

Horn, A.J., 1950. Well Blowouts in California Drilling Operations Causes and Suggestions for Prevention. Presented at the spring meeting of the Pacific Coast District, Division of Production, Los Angeles.

<https://maps.conservation.ca.gov/doggr/wellfinder/#openModal>, last accessed April 1, 2019.

<https://secure.conservation.ca.gov/WellSearch/>, search of wells in Playa del Rey field at Last accessed April 1, 2019.

https://secure.conservation.ca.gov/WellRecord/037/03713798/03713798_2019-01-22_DATA.pdf, last accessed April 1, 2019. The electronic well file is downloadable as a pdf document, 03713798_2019-01-22_DATA.pdf, incorporated documents to which we cite in in the reminder of this report.

Letter dated February 12, 2019 from Kenneth A. Harris, Jr., State Oil and Gas Supervisor, DOGGR, to Michael Hale, MDR Hotels. LLC.

Letter from DOGGR to Anthony Santo, MDR Hotels, LLC, dated June 5, 2018 (03713798_2019-01-22_DATA, [13-24).

Letter from Val Lerma and Mike Giuliani, InterAct PTMI, to Mike Hale, Hardage Hospitality, Re: Dow RGC 10 Recommendation, February 14, 2019.

Log of Oil or Gas Well submitted by The Ohio Oil Company dated April 25, 1931 (03713798_2019-01-22_DATA, p 78, 80, 81).

MDR / DOGGR Meeting DOW RGC 10 Well Re-abandonment Feb. 2019, provided to Exponent March 5, 2019 (DOGGR Presentation 02-14-2019.pdf).

Memorandum of Telephone or Personal Conversation, dated March 14, 1956 (03713798_2019-01-22_DATA, p 64).

Metzner, L.H., 1935, The Del Rey Hills Area of the Playa Del Rey Oil Field, in Summary of Operations, California Oil Fields, State of Calif. Div. Of Oil and Gas, San Francisco, Calif. V. 21, n. 2.

Notice of Intention to Abandon Well, dated November 12, 1940, submitted by the Ohio Oil Company to DOGGR (03713798_2019-01-22_DATA, p 77).

Notice of Intention to Abandon Well, dated February 15, 1956 (03713798_2019-01-22_DATA, p 66).

Notice of Intention to Abandon submitted by Dow Chemical Company, dated December 9, 1958 (03713798_2019-01-22_DATA, p 57).

Notice of Intention to Abandon / Re-abandon Well, dated October 4, 2017, submitted to DOGGR by Methane Specialists. (03713798_2019-01-22_DATA, pp. 49-50)

Permit No. 7000607 issued by DOGGR dated June 5, 2018, available at ftp://ftp.consrv.ca.gov/pub/oil/WellRecord/037/.../03713798_2019-01-22_DATA.pdf, last accessed May 29, 2019.

Photograph of Class II BOPE for Dow RGC 10, provided by InterAct on March 11, 2019.

Photograph of Coiled tubing BOPE on Class II BOPE for Dow RGC 10, provided by InterAct on March 11, 2019.

Photograph of Surface Blowout expression near Dow RGC 10 wellhead, provided by InterAct dated December 26, 2019.

Photograph of Surface Blowout expression under plate near Dow RGC 10 wellhead, provided by InterAct dated December 28, 2019

Re-abandonment Program Dow RGC-10, dated April 27, 2018, submitted to DOGGR and attached to permit No. 7000607 issued by DOGGR dated June 5, 2018, (03713798_2019-01-22_DATA, p 25-30).

Report on Test of Water Shut-off submitted by The Ohio Oil Company dated April 15, 1931 (03713798_2019-01-22_DATA, p. 85).

Report of Property and Well Transfer dated December 23, 1958 (03713798_2019-01-22_DATA, p 59).

Report on Proposed Operations submitted by the County of Los Angeles, dated January 2, 1959 (03713798_2019-01-22_DATA, p 56).

Report on Proposed Operations, dated February 21, 1956 (03713798_2019-01-22_DATA, p 65).

Reservoir Saturation Log (RST) on Dow RGC 10 by Schlumberger dated January 24, 2019.

Schwalen, H.C., 1924. The Stovepipe or California Method of Well Drilling as Practiced in Arizona. Master of Science Thesis in Civil Engineering, College of Mines and Engineering, University of Arizona.

Search of wells in Playa del Rey field at <https://secure.conservation.ca.gov/WellSearch/> Last accessed April 1, 2019.

Special Report on Operations Witnessed, dated January 9, 1941 (03713798_2019-01-22_DATA, p 74).

Special Report on Operations Witnessed, dated April 19, 1956 (03713798_2019-01-22_DATA, p 62).

Special Report on Operations Witnessed, dated April 9, 1959 (03713798_2019-01-22_DATA, p 55).

Subsequent Work Report, dated April 10, 1941 (03713798_2019-01-22_DATA, p 70).

Subsequent Work Report, dated November 17, 1941 (03713798_2019-01-22_DATA, p 69).

Subsequent Work Report, dated April 17, 1942 (03713798_2019-01-22_DATA, p 67).

Supplementary Notice, dated January 3, 1941 reporting intended transfer of ownership from The Ohio Oil Company to I-O-Dow chemical Company and abandonment of well (03713798_2019-01-22_DATA, p 75).

Temperature Log/Noise Survey run on Dow RGC 10 by Western Wireline dated February 13, 2019.

Temperature Survey/Gamma Ray-CCL run on Dow RGC 10 by Western Wireline dated January 20, 2019.

Temperature Log/Noise Survey run on Dow RGC 10 by Western Wireline dated January 21, 2019.

Wygle, P.R., 2006. Publication No. M07 Blowout Prevention, In California Equipment Selection and Testing. California Department of Conservation Division of Oil, Gas, and Geothermal Resources, Tenth edition. Sacramento, California.

xsects maps logs temp surveys.pptx, Geologic cross sections created by InterAct provided on February 25, 2019.

9 Limitations

This Root Cause Analysis (RCA) report, submitted to MDR Hotels, LLC (“MDR”), is pursuant to Emergency Order to Perform Remedial Work No. 1143 (“Order 1143”) of the State of California, Natural Resources Agency, Department of Conservation, Division of Oil, Gas, and Geothermal Resource (“DOGGR”). DOGGR issued Order 1143 to the well operator of the well, MDR, on January 18, 2019 in response to a blowout of well Dow RGC 10. The blowout occurred on January 11, 2019 during operations to re-enter and reabandon the well to current standards for plug and abandonment in the state of California. Exponent investigated specific issues relevant to this incident as requested by MDR. The scope of services performed during this investigation may not adequately address the needs of other users of this report, and any reuse of this report or its findings, conclusions, or recommendations is at the sole risk of the user. The opinions and comments formulated during this investigation are based on observations and information available at the time of the investigation. No guarantee or warranty as to future life or performance of the Dow RGC 10 well is expressed or implied.

The findings presented herein are made to a reasonable degree of engineering certainty. We have endeavored to be accurate and complete in our assignment. If new data becomes available or there are perceived omissions or misstatements in this report, we ask that they be brought to our attention as soon as possible so that we have the opportunity to address them.

Nothing in this report shall be construed as design services, and no material procurement or construction should proceed on the basis of the information herein. Although Exponent has exercised usual and customary care in the conduct of this analysis, the responsibility for decisions regarding its use remains with MDR Holdings, LLC.

Appendix A

Professional Résumé for L. Brun Hilbert, Jr., Ph.D., P.E.



Engineering & Scientific Consulting

L. Brun Hilbert, Jr., Ph.D., P.E.

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Professional Profile

Dr. Hilbert has been consulting at Exponent since 1996 in the fields of mechanical and petroleum engineering, with special applications to engineering mechanics and geomechanics. He has worked in the petroleum exploration and production industry for over 35 years.

Dr. Hilbert has expertise in stress analysis, solid mechanics, fluid mechanics, heat transfer, and structural component design. In the area of petroleum engineering, he has expertise in oil and gas well design and integrity, hydraulic fracturing, well production and wellhead equipment, well stability and sand production, well stimulation, drilling mechanics, petroleum rock mechanics, reservoir geomechanics, fixed and floating offshore platforms, and gas and liquid hydrocarbon storage in solution-mined salt caverns and hydrocarbon formations. In the area of geomechanics, Dr. Hilbert has expertise in evaluating the structural integrity of oil and gas wells in compacting or deforming reservoir rocks, in the stability of underground storage structures and nuclear waste repositories and he assists clients in failure analysis involving soil-structure interaction, including pipelines. Dr. Hilbert has highly specialized expertise in the structural integrity and leak resistance of the threaded connections used to join high-pressure pipe. He has conducted failure analyses of steel, rubber, and plastic structures.

Prior to joining Exponent, Dr. Hilbert was employed as an Engineering Specialist for Exxon Production Research Company, where he performed research and taught courses in Well Completions and Workovers in the Middle East, Southeast Asia, Australia, and North America.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Mineral Engineering, University of California, Berkeley, 1995

M.S.E., Mechanical Engineering, University of New Orleans, 1981

B.S., Mathematics, University of New Orleans, 1979

National Academy of Engineering Committee on Connector Reliability for Offshore Oil and Natural Gas Operations, 2017-2018

Society of Petroleum Engineers Distinguished Lecturer, 2015-2016

Jane Lewis Fellowship in Geomechanics

Mathematical Association of America Membership Award

Outstanding Instructor, Exxon Production Research Company 1991

Outstanding Instructor, Exxon Company, U.S.A. 1990

Licenses and Certifications

Licensed Professional Mechanical Engineer, California, #M31490

Licensed Professional Engineer, New Mexico, #20939

Licensed Professional Engineer, Texas, #112060, Mechanical and Petroleum Engineering

Prior Experience

Lawrence Berkeley National Laboratory, 1996

University of California at Berkeley, 1992-1996

Exxon Production Research Company, 1981-1992

Professional Affiliations

American Society of Mechanical Engineers

Society of Petroleum Engineers

American Rock Mechanics Association

Publications

Owens ZC, Smyth BJ, Ames NA, Pye JD, Hilbert LB, Brooks B, Taber RM, Mendez H. Casing-integrated, surface-activated well control tool supplements BOP in uncontrolled blowout scenarios. *Drilling Contractor* 2017 July/Aug; 73(4).

Hilbert LB, Reilly E, Ames N. Underground storage operators must fully understand 2016 PIPES Act. *Oil & Gas Journal*, July 3, 2017.

Hilbert LB, Saraf VK, Birbiglia DKJ, Shumilak EE, Schutjens PMTM, Hindriks COH, Klever FJ. Modeling horizontal completion deformations in a deepwater unconsolidated sand reservoir. *SPE Journal of Drilling & Completion* 2011 Mar; (26)2:68-83.

Hilbert LB, Saraf VK. Salt mechanics and casing deformation in solution-mined gas storage operations. Paper ARMA 08-383, Presented at San Francisco 2008, the 42nd US Rock Mechanics Symposium and 2nd U.S.-Canada Rock Mechanics Symposium, San Francisco, CA, June 29-July 2, 2008.

Hilbert LB, Bergström JS. Evaluating pressure integrity of polymer ring seals for threaded connections in HP/HT wells and expandable casing. *SPE Journal* 2008; 13:1:123-132.

Bergström JS, Hilbert LB. A constitutive model for predicting the large deformation thermomechanical behavior of fluoropolymers. *Mechanics of Materials* 2005; 37:899-213.

Bergström JS, Brown SB, Hilbert LB. Large strain time- and temperature-dependent modeling of PTFE. Presented at 2nd MIT Conference on Computational Fluid and Solid Mechanics, June 2003.

Bessinger B, Suarez-Rivera R, Nihei K, Hilbert B, Myer L, Cook N. P-wave amplitude anisotropy in

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limestone. In: *Advances in Anisotropy: Selected Theory, Modeling, and Case Studies*. Hood JA (ed), Society of Exploration Geophysicists, pp. 322, Tulsa, OK, 2001.

Nihei KT, Hilbert LB Jr, Cook NGW, Nakagawa S, Myer LR. Frictional effects on the volumetric strain of sandstone. *International Journal of Rock Mechanics and Mining Sciences* 2000; 37(1-2):121-132.

Hilbert LB, Gwinn RL, Moroney TA, Deitrick GL. Field-scale and wellbore modeling of compaction-induced casing failures. *SPE Journal of Drilling & Completion* 1999; 14(2):92-101, June.

Guyer RA, McCall KR, Boitnott GN, Hilbert LB Jr, Plona TJ. Quantitative implementation of Preisach-Mayergoyz space to find static and dynamic elastic moduli of rock. *Journal of Geophysical Research* 1997; 102(B3):5281-5293, March.

Nihei KT, Hilbert Jr LB, Cook NGW, Myer LR. Frictional effects on the compressibility of sandstone. *EOS, Transactions of the American Geophysical Union* 1996; 77(46).

Kastenberg WE, Peterson PF, Ahn J, Burch J, Casher G, Chambre PL, Greenspan E, Olander DR, Vujic JL, Bessinger B, Cook NGW, Doyle FM, Hilbert LB Jr. Consideration of autocatalytic criticality of fissile materials in geologic repositories. *Nuclear Technology* 1996; 115:298-310, September.

McCall KR, Guyer RA, Zhu L, Boitnott GN, Hilbert LB Jr, Plona TJ. Experimental determination of the linear and nonlinear dynamic moduli of rock from quasistatic measurements. *Proceedings, 2nd North American Rock Mechanics Symposium: NARMS'96*, Aubertin M, Hassani F, Mitri H (eds), Quebec, Canada, 19-21, Balkema, Rotterdam, Netherlands, pp. 147-154, June 1996.

Hilbert LB, Fredrich, JT, Bruno MS, Dietrick GL, de Rouffignac EP. Two-dimensional nonlinear finite element analysis of well damage due to reservoir compaction, well-to-well interactions, and localization on weak layers. *Proceedings, 2nd Annual North American Rock Mechanics Symposium*, p. 19-21, Montreal, Canada, June 1996.

Bessinger BA, Yi W, Suarez-Rivera R, Nihei K, Hilbert LB, Myer LR. P-Wave amplitude anisotropy in limestones. *Proceedings, 7th International Workshop in Seismic Anisotropy*, Miami, FL, February 1996.

Hilbert LB, Bessinger BA, Cook NGW. Effects of bedding planes and discontinuities on the sorptivity and permeability of rock. Presented at Fall Meeting of AGU, December 11-15, 1995.

Zhu L, Guyer RA, McCall KR, Boitnott GN, Hilbert LB Jr, Plona TJ. Experimental determination of the linear and nonlinear dynamic moduli of rock from quasistatic measurements. *Journal of the Acoustical Society of America* 1995 Nov; 98:2905-2905.

Hilbert L, Cook NGW, Myer L. Numerical modeling of highly jointed and fractured media using discontinuous deformation methods. *Proceedings, 8th International Congress on Rock Mechanics*, Vol. 3, pp. 1159-1165, Tokyo, Japan, September 1995.

Hilbert LB, Liu Z, Cook NGW. On the use of substructuring and domain decomposition techniques in discontinuum mechanics. *Proceedings, 32nd Annual Technical Meeting Society of Engineering Science*, New Orleans, LA, October 1995.

Hilbert LB Jr, Yi W, Cook NGW, Cai Y, Liang GP. A new discontinuous finite element method for interaction of many deformable bodies in geomechanics. *Proceedings, 8th International Conference on Computational Method and Advances in Geomechanics*, pp. 836-931, May 1994.

Hilbert LB, Hwong TK, Cook NGW, Nihei KT, Myer LR. Effects of strain amplitude on the static and dynamic nonlinear deformation of Berea sandstone. In: *Rock Mechanics Models and Measurements Challenges from Industry*, Nelson P and Laubach S (eds), *Proceedings of 1st North American Rock*

Mechanics Symposium, pp. 497-504, June 1994.

Hilbert LB, Hwong T, Cook NGW, Nihei KT, Myer LR. Micromechanics of the static and dynamic nonlinear behavior of Berea sandstone. EOS, Transactions of the American Geophysical Union 1993; 74(43):236.

Hilbert LB, Kalil IA. Evaluation of premium threaded connections using finite element analysis and full-scale testing. Proceedings, IADC/SPE Drilling Conference, New Orleans, LA, February 1992.

Banon H, Johnson DV, Hilbert LB. Reliability considerations in design of steel and CRA production tubing strings. Proceedings of the 1st International SPE Conference on Health, Safety, and the Environment, SPE 23483, The Hague, The Netherlands, pp. 673-680, November 1991.

Kocian EM, Mefford RN, Hilbert LB, Kalil IA. Compressive loading casing design. Proceedings, 1990 IADC/SPE Drilling Conference, IADC/SPE 19923, Houston, TX, pp. 145-155, February 22-March 2, 1990.

Hilbert LB, Janna WS. The feasibility of electric power generation by the wind on the University of New Orleans Campus. Proceedings, ASME Energy Sources Technology Conference and Exhibition, 82-PET-1, New Orleans, LA, March 1982.

Book Chapters

Hilbert, LB et al., National Academies of Sciences, Engineering, and Medicine. High-Performance Bolting Technology for Offshore Oil and Natural Gas Operations. Washington, DC: The National Academies Press. June 2018. <https://doi.org/10.17226/25032>

Hilbert LB. Chapter 7. Reservoir Integrity. In: Underground Gas Storage Regulatory Considerations: A Guide for State and Federal Regulatory Agencies. Ground Water Protection Council and Interstate Oil and Gas Compact Commission. May, 2017.

Hilbert LB. Reservoir compaction, subsidence and well damage. In: Numerical Analysis and Modeling in Geomechanics, Chapter 11. John Bull (ed), Spon Press, May 2003.

Other Technical Publications

Saba T, Mohsen MFN, Hilbert LB, Garry MR. Methanol use in hydraulic fracturing fluids. White Paper, August, 29, 2011.

Presentations and Lectures

Hilbert LB, Saba T. Recent developments in hydraulic fracturing. Presented at: A Whole New Ballgame: Oil and Gas in the Trump Administration. A Seminar by Husch Blackwell, LLP. April Denver, CO, 27, 2017.

Hilbert LB. Society of Petroleum Engineers Distinguished Lecture Program: Well design and integrity: Importance, Risk and scientific certainty. Invited Lecture, 2015-2016.

Hilbert LB, Saba T, Murali A. Hydraulic fracturing: An overview of the current environmental and engineering issues. Exponent Webinar, October 14, 2015.

Hilbert LB, Schell JD, Meyer AA. Considerations of risk in hydraulic fracturing. Invited speaker. ASME Silicon Valley Section Technical Dinner Talk, February 27, 2014.

Hilbert LB, Mosher GE, Schell JD. Hydraulic fracturing: Myths and realities. Exponent Webinar, May 14, 2013.

Hilbert LB, Stewart SE. Hydraulic fracturing: The process. Invited Speaker. Seminar on Fracking Law: From Land Contract Negotiations to Environmental Disputes, National Business Institute Attorney Presentations. Grand Rapids, MI. February 19, 2013.

Hilbert LB (Moderator), et al. Hydraulic fracturing science update and frontiers. Invited Speaker. Seminar presentation: Key Legal Issues and Future Directions in the Environmental Impacts of Shale Development and Hydraulic Fracturing. Sponsored by ALI CLW American Law Institute, November 29, 2012.

Hilbert LB, Hardin WA. Understanding fracking, the potential risks and risk management concerns. Invited Speaker, Shale Gas Drilling Operations (Fracking) Conference, New York, NY, October 3, 2012.

Hilbert LB, Mathieson EL, Osteraas JD. Earthquakes 101: Natural and man-made sources and consequences. Exponent Webinar, January 26, 2012.

Hilbert LB, Saba T, Mohsen F. Hydraulic fracturing: What are the key engineering and environmental issues? Exponent Webinar, May 25, 2011.

Hilbert LB. Unconventional gas resources: Shale gas and hydraulic fracturing. Invited Speaker, Poland - Silicon Valley Technology Symposium, Palo Alto, CA, December 4-7, 2010.

Hilbert LB, Saraf VS. Buckling of multiple concentric casings. Presentation, 2007 West Regional ABAQUS User's Conference, Las Vegas, NV, October 2007.

Hilbert LB. The development and application of user material subroutines for large deformation thermomechanical modeling of Teflon. Presentation, 2006 West Regional ABAQUS User's Conference, Emeryville, CA, October 24-25, 2007.

Hilbert LB. Challenges in constitutive modeling of soft unconsolidated rocks. Presentation, Society of Petroleum Engineers Forum "Challenges in Unconsolidated Reservoirs: Reservoir Performance," Kananaskis, Canada, August 26-31, 2007.

Hilbert LB. Finite element methods in geomechanics. Invited Lecture, Stanford University, March 2, 2007.

Hilbert LB, Bergström JS. Finite element modeling of a thermoplastic seal at high temperature and pressure. Presentation, 2005 East Regional ABAQUS User's Conference, Westborough, MA, November, 2005.

Hilbert LB. Evaluating pressure integrity of polymer ring seals for threaded connections in HP/HT wells and expandable casing. Presentation, American Society of Mechanical Engineers, North West Houston Sub Section, Houston, TX, September 27, 2003.

Hilbert LB. Analysis of pressure integrity of polymer ring seals. Presentation, American Society of Mechanical Engineers, Silicon Valley Chapter, Mountain View, CA, September 18, 2003.

Hilbert LB. Failure analysis in the petroleum industry. Presentation, Society of Petroleum Engineers, Los Angeles Basin Section, Long Beach, CA, May 9, 2000.

Hilbert LB. Limitations and unfulfilled expectations of numerical methods in underground design and construction. Presentation, 3rd Geo-Institute Conference, Urbana, IL, June 1999.

Hilbert LB. Landslides! Presentation, Association of Defense Council, South Lake Tahoe, NV, June 1998.

Hilbert LB. Applications of forensics in geotechnical engineering. Presentation, Society of Civil Engineers

of California Polytechnic State University, San Luis Obispo, CA, October 1998.

Hilbert LB. On the relationship between the pseudo rigid body and discontinuous deformation analysis. Presentation, Neville G.W. Cook Conference, Berkeley, CA, October 1998.

Hilbert LB. Failure analysis in petroleum engineering. Invited Lecture, Stanford University Petroleum Engineering Seminar, February 1998.

Hilbert LB. Geomechanical modeling of subsidence-induced well failures. Society of Petroleum Engineering, Golden Gate Section, San Francisco, CA, December 1997.

Hilbert LB. Discontinuum mechanics: The Manifold Method and the Finite Element Method. Presentation, Working Forum on the Manifold Method of Material Analysis, U.S. Army Corps of Engineers, Waterways Experiment Station, Timber Cove, CA, October 1995.

Hilbert LB. Computational geomechanics at Lawrence Berkeley National Laboratory. Kiso-Jiban Consultants Co., Tokyo, Japan, September 1995.

Hilbert LB. A finite element method for jointed, fractured and faulted geomaterials. Invited Lecture, Earth Sciences Division Seminar, Lawrence Berkeley National Laboratory, Berkeley, CA, July 1994.

Hilbert LB. Computational discontinuum analysis geoenvironmental seminar. Invited Lecture, University of California at Berkeley, October 1994.

Hilbert LB. Tubular string design. Invited Lecture, Subsurface Engineering School, Exxon Company U.S.A., Houston, TX, October 1991.

Hilbert LB. Casing and tubing course. Invited Lecture, Esso Production Malaysia Inc., Kerteh, Malaysia, October 1991.

Hilbert LB. Overview of production engineering school. Invited Lecture, Saudi Aramco, Dhahran, Saudi Arabia, August, 1991

Hilbert LB. Casing and tubing school. Invited Lecture, Exxon Production Research Company, Houston, Texas, April 1991.

Hilbert LB. Tubular design in Subsurface Engineering School. Invited Lecture, Exxon Company U.S.A., Houston, TX, June 1990.

Hilbert LB. The Walne 1-34: Exxon's deepest well. Invited Lecture, Exxon Production Research Company Production Seminar, Houston, TX, August 1989.

Hilbert LB. Evaluation methods for premium threaded connections. Invited Lecture, Exxon Production Research Company Production Seminar, Houston, TX, November 1988.

Hilbert LB. Premium tubing connections and analysis. Invited Lecture, Saudi Aramco Mid-Year Technical Review, Dhahran, Saudi Arabia, June 1988.

Hilbert LB. Tubular string design and stability analysis. Invited Lecture, Exxon Production Research Company Production Seminar, Houston, TX, December 1986.

Hilbert LB. Well completions and workovers school. Invited Lecture, Exxon Production Research Company, Houston, Texas; Kerteh, Malaysia; Ras Tanura and Dhahran, Saudi Arabia; Sale, Australia, 1983-1981.

Appendix B

Professional Résumé for Kelvin N. Abaa, Ph.D., P.E.



Exponent[®]
Engineering & Scientific Consulting

Kelvin Abaa, Ph.D., P.E.

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Professional Profile

Dr. Abaa's expertise is in hydraulic fracturing design, completion design, petrophysics, and geo-mechanical modelling to support completion design and optimization. Other areas of expertise include reservoir simulation of both conventional and unconventional resources and pressure transient analysis for production decline. Dr. Abaa has extensive experience with commercial simulators including FracProPT, Mangrove Petrel, Schlumberger's Eclipse, CMG Imex and Interactive Petrophysics.

Prior to joining Exponent, Dr. Abaa was a researcher at the EMS Energy Institute at Penn State and a member of the Penn State 3S laboratory group where his research work focused on optimizing fracture design and fracturing fluid optimization for low permeability reservoirs. Dr. Abaa has also worked as a reservoir engineer for PTDF/Total Elf and as a production stimulation engineer for Schlumberger Technology Corporation where he supported the design and pumping of hydraulic fracture treatments in the Permian Basin.

Academic Credentials & Professional Honors

Ph.D., Energy and Mineral Engineering, Pennsylvania State University, 2016

M.S., Energy and Mineral Engineering, Pennsylvania State University, 2013

B.S., Chemical Engineering, Federal University of Technology, Nigeria, 2008

Licenses and Certifications

Licensed Professional Petroleum Engineer, California, # 1882

Prior Experience

Post-Doctoral Associate, California Energy Research Center, Bakersfield College, 2016-2017

Production Stimulation Engineering, Schlumberger Technology Corporation, 2011-2013

Reservoir Engineer, PTDF/Total Elf Petroleum Nigeria Limited, 2008-2009

Professional Affiliations

Society of Petroleum Engineers (SPE)

Publications

Abaa K, Yilin-Wang J, Elsworth D, Ityokumbul M. Laboratory investigation of multiphase permeability evolution from surfactants in tight sandstones. *Hydraulic Fracturing Journal* March 2017; 4(2).

Abaa K, ItyokumbuThaddeus I MM, Adewumi M. Effect of acoustic stimulation on aqueous phase trapping in low-permeability sandstones. *ASME. Journal of Energy Resources Technology* 2017; 139(6):062905. <https://doi.org/10.1115/1.4037156>.

Abaa K, Yilin-Wang J, Elsworth D, Ityokumbul M. Laboratory evaluation of multiphase permeability evolution in tight sandstones: impact of slickwater and friction reducers. *Proceedings of the Society of Petroleum Engineers Low Perm Symposium*, May 2016. <https://doi.org/10.2118/180250-MS>.

Abaa K, Yilin-Wang J, Ityokumbul MT. Parametric study of fracture treatment parameters for ultra-tight gas reservoirs. *Journal of Petroleum Exploration and Production Technology* 2013; 3:159. <https://doi.org/10.1007/s13202-013-0058-x>

Presentations

Abaa K. Laboratory evaluation of multiphase permeability evolution in tight sandstones: impact of slickwater and friction reducers. *Society of Petroleum Engineers (SPE). The 2016 Low Permeability Symposium*, Denver, CO, May 5-6, 2016.

Abaa K. Parametric study of fracture treatment parameters for ultra tight gas reservoirs. *Society of Petroleum Engineers (SPE): 2012 Americas Unconventional Resources Conference*, Pittsburgh, PA, June 5-7, 2012.

Project Experience

Assisted in design and execution of three simulation treatments including slickwater/crosslinked gel for low permeability wells in the Spraberry formation in the Permian basin.

Proposed and implemented a plug-n-perf completion strategy for shale horizontal wells in Ector County, Texas.

Carried out reservoir simulation studies to calibrate SRV with microseismic data and predict post-fracture performance of San Andreas low permeability carbonate formation.

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Journal of Petroleum Exploration and Production Technology

Journal of Natural Gas Science and Engineering

Appendix D

CWS Well Control Plan



California Well Services, LLC

1746- F South Victoria Ave. #382 – Ventura, CA 93003

CWS General Well Control Plan

- CWS holds annual safety meetings with all employees in which well control is discussed
- CWS provides industry 3rd party training where required
 - Part of this is well control training/certification
 - All of the CWS Rig Supervisors and Rig Operators have been formally trained in well control but their well control certifications are not current
- Follow BOPE requirements set out in the permit issued by DOGGR or the Operator if the well work does not require a DOGGR permit
- Discuss well control risks specific to each workover, set forth appropriate guidelines
- Perform BOPE/trip drills on a regular basis
- CWS rig crews routinely work on wells that have sufficient pressure to blow-out at the surface including live steam injection wells and producing oil wells in fields under water injection. The Rig supervisors and Rig Operators have been working on these wells for many years and have been required to put into practice standard well control techniques on numerous occasions.

Well Control Training Put into Practice - DOW RGC 10

11/2/2018: Drilled into a gas pocket at 165', controlled safely and circulated gas out of the well.

1/8/2019: Took a gas kick at 996' with 9.0 ppg mud. Shut-in well and conditioned mud. Safely bled-off gas bubble at surface.

1/9/2019: RIH with tubing to place cement across window in casing from 883'-887' (suspected lost circulation point). Took a gas kick at 880'. Bled down gas at surface while changing over to an 8.4 ppg mud. Successfully killed the well.

1/10/2019: Took a gas kick while drilling out cement at 885'. Controlled safely by bleeding-off gas slowly while circulating to kill well.

1/11/2019: Following are InterAct notes from an interview with CWS Rig Supervisor [REDACTED] regarding actions taken by the crew and InterAct WSM [REDACTED] on this day:

- The crew pulled 2 stands and were in the process of standing back the second stand of pipe in the derrick, when almost immediately, [REDACTED] noticed mud spraying out of the tubing. The floor hand had his back turned to the well, as he was placing the stand of pipe back in the derrick. [REDACTED] yelled at him to grab the TIW valve located next to him on the rail of the rig floor. Only about 15 to 20 seconds had passed and all the mud was displaced and a high pressure stream of gas was blowing out of the tubing string. The crew attempted to connect the safety valve but the pressure was too great and the gas was blowing out up to the crown. The blocks were up as they had just stood back the 2nd stand of pipe. [REDACTED] evacuated the rig floor and directed the derrick man to escape using

his anti-fall device and escape rope. This was only about 1 minute into the incident. At that time, two R.D. Olsen employees were returning to the area, [REDACTED] and [REDACTED]. [REDACTED] yelled to them to call 911. [REDACTED] called in to 911. The well was blowing violently with gas and sand.

- The Fire Department arrived within about 3 minutes from the call (about 5- min into the incident). They observed the operation of closing the well in and then left location.
- The Derrick Man ([REDACTED]), escaped without harm, as did the rig crew. Anthony was a bit shaken, but assisted in killing the well.
- When the entire crew was determined to be safe, [REDACTED] and [REDACTED] had a discussion on how to best shut-in the well. It was decided that dropping the tubing string in the well was the only option to secure the well. [REDACTED] operated the BOP and [REDACTED] went to the rig floor and worked the pipe, elevator, and slips. The process included: lowering the blocks and attaching the elevators to the tubing; pulling up on the tubing string to release the slips; closing the blind rams on the tubing to hold in place; releasing the elevators; opening the blind rams to drop the tubing string in the well. This sequence took approximately 4 minutes. The well was secured in about 9 minutes (estimate).

The above narrative illustrates how the CWS crew passed the ultimate test of well control by demonstrating, under extreme duress, the ability to put their well control training into action to quickly shut-in the well. Their actions, in combination with the InterAct WSM [REDACTED], prevented potential loss of life, destruction of property and serious environmental damage to the local community and adjacent wet lands.

Appendix E

InterAct Well Control Plan

InterAct Well Control Plan

The purpose of this Well Control Plan is to document InterAct's practices and policies as they pertain to well control. They are based on applicable API Recommended Practices (RPs), California Department of Oil, Gas, and Geothermal Regulations (DOGGR) regulations and standards, and good oil field practice.

Before commencing any drilling, workover, or abandonment program, a detailed work plan, prepared by an InterAct Sr. Well Engineer and reviewed by InterAct's Engineering Manager and/or InterAct's Sr. Drilling Technical Advisor, must be reviewed and approved by DOGGR.

InterAct's Well Control Plan consists of several parts:

General Plan

1. Well Control Certification for engineers and Well Site Managers (WSMs) responsible for drilling and workover programs.
2. Quarterly Engineering meetings which include well control quizzes and discussions.
3. Familiarity with the DOGGR's M07 publication.
4. Familiarity with relevant API and recommended practices.

Specific Plan

5. Well work program for individual wells, including safety aspects of the work.
6. Compliance with DOGGR permit conditions for individual wells.
7. InterAct's Management of Change (MOC) process during well operations.

Each of these items will be discussed in detail in the following sections.

1. Well Control Certifications

InterAct's full-time highly experienced engineering team consists of an Engineering Manager, one Technical Advisor, four Senior Engineers, and two Project Engineers. InterAct also has part time engineers and Well Site Managers (WSM's) that are engaged on an as needed basis. The engineering team is supported by InterAct's Professional Geologist and Sr. Geophysicist as needed. All InterAct's WSMs, Senior Engineers, and the Technical Advisor and Engineering Manager maintain current well control certifications. InterAct's Engineering Manager is a former Petroleum Engineering part-time professor at the University of Southern California and continues to train through EUCI, PTTC, PETEX, and SPE throughout California and the U.S. She also leads an active training program for DOGGR and Southern California Gas personnel.

2. Quarterly Meetings and Quizzes

InterAct holds Engineering Team meetings quarterly and added quizzes to these meetings beginning in July 2016. These quizzes are given in two parts: 1) Well Control and 2) Process Safety. The quizzes are made up by a designated engineering team member and checked by the Engineering Manager. The quizzes are filled out during the meeting individually, and then reviewed as a group. The purpose of the quizzes is to reinforce the well control training and to place an emphasis on safety at the wellsite and in the field.

3. DOGGR’s M07 Publication

InterAct’s server has a “Shares” drive with a folder for the Engineering Team. This folder has a copy of the DOGGR Publication No. M07, “Blowout Prevention in California, Equipment Selection and Testing.” This document is available to all InterAct Staff. The document spells out the requirement for each type of Blowout Prevention Equipment (BOPE) stack used in California well operations.

The M07 Guidelines for a Rework in the Same zone (a) for an Onshore-Critical Well (b), with for Low-Med Anticipated Surface Pressures (c) requires a Class II Stack.

Table 1. Guidelines for selection of BOPE and hole fluid monitoring equipment.

Shaded area indicates the solution to the example in paragraph 2-4.

a	Proposed Well Operations	Drill, redrill, or deepen	Exploratory																X		X		X	X	X	X		
		Development														X	X			X	X					X		
		Rework	Expose add'l zone													X										X		
			Same zone	X	X	X				X	X		X															
b	Well Environment	Offshore-Surface																										
		Offshore-Subsea																									X	
		Onshore-Critical																										
		Onshore-Noncritical	X	X	X	X		X		X	X		X	X	X		X											
c	Anticipated surface pressure category: <small>(Anticipated zone pressure - 500 Depth x Anticipated fluid gradient) *</small>	High= > 1.0																										
		Med.=0.1-1.0	X																									
		Low= < 0.1	X	X	X	X		X								X												
d	Blowout Prevention Equipment Class	I	II	III	IV	V																						
	Hole Fluid Monitoring Equipment Class	—	A	—	B	—	B	C																				

INSTRUCTIONS:

1. Select the horizontal line in each of boxes a, b, and c that most nearly describes the well in terms of proposed operation, well environment, and anticipated zone pressure category.
2. Move to the right until an "x" is found under each consideration in a single vertical column.
3. Move down that column to box d to determine the equipment classes for BOPE and Hole Fluid Monitoring Equipment.

* Fluid gradient (psi/ft.) = $\frac{\text{fluid density (lb./ft.}^3\text{)}}{144 \text{ (in.}^2\text{/ft.}^2\text{)}}$

** For wells in these columns, consider requiring a nonmanual activating system.

Table 1, Taken from Table 1 in DOGGR’s Publication No. M07

For a Class II Stack, the M07 publication states the requirements as:

- c. A Class II BOPE system (API arrangements A, Rd, RR, or RA) consists of, as a minimum, the following components:
1. Annular and/or ram-type preventers capable of providing complete closure of the well bore, and

closure around the pipe in use. See paragraph 3-2a1 for additional requirements if an annular preventer is used alone (API arrangement A).
 2. Manual closing devices, unless a remote actuating system is specified.
 3. Access line of 2-inch minimum outside diameter into the well bore below the preventer(s), with suitable valves and fittings for pressure relief or well killing operations.
 4. Fill-up line into the bell nipple above the preventer stack, but not in direct line with the flow line.*

* For workover operations not requiring a drilling-type circulating system, requirements 4, 5, and 7 do not apply.

5. Kelly cock or standpipe valve.*
6. Full-opening safety valve readily available on the rig floor, in the open position, with fittings adaptable to all pipe to be used in the proposed operations. If this valve is of the type that is made up into the working string, it must fit through the wellhead equipment in use.
7. Internal preventer inside the pipe in use, or readily available at the rig in the open position, with fittings adaptable to the safety valve required by 2-2c6. This valve must fit through the wellhead equipment in use and must be stored in such a position or identified in such a manner that it will not be the first valve installed by the crew in response to a kick taken while tripping pipe.*

Figure 1, Taken from pp.4-5 in DOGGR's Publication No. M07

At the time of the blow-out, the DOW RGC 10 well had a Class II 3M BOPE (exceeding the permit requirement of a Class II 2M BOPE) installed with ram-type preventers, remote actuating system, access line below the preventer for pressure relief or well killing operations, a fill-up line into the bell nipple, a Kelly cock, and a full-opening safety valve readily available on the rig floor in the open position.

The schematic shown below, taken from the M07 publication for Class II BOPE stacks, is the one used on the CWS rig for the DOW RGC 10 well:

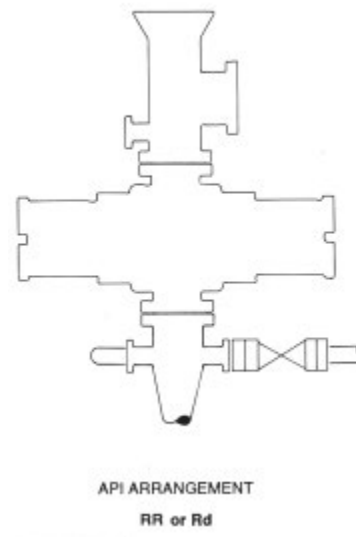


Figure 2, Taken from Figure 1 for Class II stack in DOGGR's Publication No. M07

4. Access to API Documents

InterAct maintains an online and printed library of API Recommended Practices and Specifications, including the following related to well control:

- API Std 53, "Blowout Prevention Equipment"
- API RP 59, "Recommended Practices for Well Control Operations"
- API RP 54, "Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations"

API has developed RP's for many oilfield activities and is considered "best practices" for the industry.

5. Well Work Program for DOW RGC 10

The program for the DOW RGC 10 well was prepared by InterAct's Senior Engineer, reviewed by InterAct's Engineering Manager, and provided to both InterAct's WSM and California Well Services (CWS)'s rig supervisor. The program was discussed by all prior to the start of well work. A copy of the DOGGR permit, the specifications for the 2 7/8" P-110 work string to be used, wellbore diagrams (WBD) of the current and proposed well attributes, and a list of vendors were also provided with the program. Contact information was provided for InterAct's engineer, and WSM and all vendors.

The program included the following safety parameters:

- a. Pre-job safety meeting prior to rig up.
- b. Testing BOPE to 1500 psi.
- c. Note to consult engineering if any problems encountered while drilling out the well.
- d. Pre-job safety meeting prior to rigging up wireline unit for cement bond log.
- e. Pressure test lubricator to 500 psi.
- f. Pressure test cementing lines to 1500 psi.
- g. Hold pre-job safety meeting prior to perforating and squeezing.

6. DOGGR's Individual Well Permit for DOW RGC 10

DOGGR no. 7000607 permit specified:

1. Blowout Prevention Equipment (BOPE), 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 II2M, with hydraulic controls, during downhole operations. All casing annuli control valves must meet, or exceed, the same minimum pressure rating as the BOPE. The pipe safety valve must be suitable for all pipe in use, including casing.
 - b. A 2M lubricator for wireline operations.

BOPE requirements for critical wells must also comply with the following:

- c. Any and all control lines common to the BOPE and installed within 25 feet of the well bore must be shielded properly and insulated so the temperature rating is equal to or greater than 450 degrees Fahrenheit.
- d. Separate controls must be connected to each preventer in the BOPE stack. All control stations must be capable of providing complete opening and closure of each preventer in the BOPE stack.
- e. A minimum of one control station must be located at least 25 feet from the well bore.
- f. An emergency backup system must be installed that utilizes an independent, explosive-safe source of actuating energy. The source of energy and all controlling mechanisms associated with the backup system must be located at least 25 feet from the well bore, and in close proximity to the control station described above.
- g. An access line of 2-inch minimum outside diameter must be installed below the preventer(s). In addition to the control valve installed at the wellhead, the access line must have a minimum of one control valve located at least 10 feet outside the cellar. The valve outside of the cellar will be the primary control valve for well work operations. The part of the access line located between the well bore and the control valve outside of the well cellar must be shielded properly and insulated so the temperature rating is equal to or greater than 450 degrees Fahrenheit.

Figure 3-Taken from Notice of Intention to Re-Abandon DOW RGC 10 Permit dated 6/5/18

The CWS Rig used for the Re-Abandonment of DOW RGC 10 complied with all these permit requirements and was approved via a DOGGR inspection of the BOPE upon rig-up.

The permit and program were reviewed by the InterAct Senior Engineer and WSM prior to the start of the well work. During this review, the history of the well was discussed, including the March 22, 1956 blowout. The importance of keeping the hole full to prevent any well control problems was emphasized. Additionally, on July 26, 2019, InterAct's Senior Engineer and WSM met with CWS's rig supervisor to inspect the wellsite. During this inspection, the history of the DOW RGC 10 well, including the March 22, 1956 blowout was discussed. Again, the importance of keeping the hole full and following well control procedures was emphasized. CWS was also given a copy of the DOGGR permit for the well.

7. InterAct's Management of Change (MOC) process for DOW RGC 10

InterAct's Senior Engineers each have over 10 years of oilfield experience. The Senior Engineer on the DOW RGC 10 well has over 35 years of oilfield experience. The WSM on the DOW RGC 10 well has over 40 years of oilfield experience. The well work was assigned to these highly skilled, experienced individuals to provide the capability to respond to any problems encountered. The MOC process at InterAct is triggered by any individual as the need for a significant change in program becomes apparent. InterAct management is kept informed of well operations via the daily well reporting done at each well site. Once a change is triggered by an individual, individual decision-making reverts to group decision-making to take advantage of InterAct's diverse and experienced work force. This process was followed for numerous changes made to the program during well work up to and including the Jan. 11, 2019 blowout.

Additionally, as this well re-abandonment was performed under the supervision of DOGGR, daily operations reports were provided to DOGGR. Any problems, complications, or deviations from the originally approved work plan were discussed with DOGGR's assigned engineer and/or her supervisor and approved.

Finally, MDR hired a third-party consultant, Ramboll, early in the well operations process as a check on InterAct's operations and decision making. MDR informed InterAct verbally that Ramboll agreed with all of InterAct's operations and decisions. By the time MOC #3 was implemented, MDR felt it no longer needed input from a third party, as Ramboll agreed that InterAct's operations and decisions were consistent with good oilfield practice.

MOC #1: The first problem encountered was the reported 18-5/8, 84# casing was in fact 18" riveted stove pipe which was insufficient for installation of a BOP.

InterAct's management was notified of the need for a tie-back string to the 11 3/4" casing to provide structural integrity for the BOPE stack. The Senior Engineer worked with Weatherford to design and install the tie back string with a modified wellhead to provide well integrity to install the BOPE stack. Management was informed and agreed with the plan. DOGGR approval was requested and obtained for this change in the program.

MOC #2: Secondly, InterAct's management was notified of problems re-entering the well at 300' due to significant damage to the 11 3/4" casing at this depth from the prior well abandonment work. The Senior Engineer recommended running a 7" sleeve inside the 11 3/4" casing down to 466'. The modified wellhead provided the capability to run the sleeve. Management was informed and agreed with the plan. DOGGR approval was requested and obtained for this change in the program.

MOC #3: The third MOC was triggered on Dec. 26, 2018. The rig crew noticed the rig site significantly changed over the holiday weekend. (Operations up to this point had been during daylight hours only due to LA County permit conditions.) The evidence at the site suggested a surface broach outside the 11 3/4" casing, which had somehow bridged-off, effectively killing

itself. There was a large crater next to the well and drilling mud was present over much of the location. Management was notified and the following actions were taken:

- The Senior Engineer inspected the site and held a meeting with the rig crew onsite. The meeting included discussion of the potential danger of the well as indicated by the surface expression. The handling of a potential gas kick was discussed in detail, particularly as it pertained to each crew member's responsibility in the event of a gas kick. The immediacy of response time was emphasized.
- The Senior Engineer confirmed that the required safety valves were on the rig floor, immediately available to shut in the work string in the event of a kick.
- The Rig Supervisor was directed to hold a detailed safety meeting stressing these same points at the earliest opportunity.

As the crew cleaned up the location, InterAct worked on a solution to avoid a repeat event of a blow out beyond the 11 ¾" casing. The problem was believed to have originated at 300', the shallowest known hole in the 11 ¾" casing. At this time, the InterAct team agreed nightly monitoring was prudent and began this practice immediately. Full time (24 hr, 7 days/wk) operations could not be implemented due to permit constraints for well operations. The Senior Engineer recommended cementing the 7" casing sleeve in place to seal the hole in the 11 ¾" casing at 300' to prevent further leakage outside the 11 ¾" casing. Management was informed and agreed with the plan. DOGGR approval was requested and obtained for this change in the program. The cement job was completed in two steps: 1) circulation through a retainer at 310' around the 7" shoe at 466', and 2) via a top job down the 7" x 11 ¾" annulus. During the second step, cement was noted at the 12/26/18 surface breakout location. This procedure was completed on 1/2/19 and proved effective. It's noteworthy that the Jan. 11 blowout was contained within the 11 ¾" wellbore, verifying the competency of the pipe at 300' after the cementing of the 7" sleeve.

MOC #4: The fourth problem began Jan. 8 and continued through well operations leading to the blowout on Jan. 11. The well took a gas kick on Jan. 8 when drilling out at 996'. The mud density was 9.0 ppg. The gas pressure was circulated out of the hole. Clean out operations continued to 1120' when the well lost circulation. The wellbore diagram indicated no cement at this depth, but drilling was required to work the pipe down the hole. Drilling continued with no returns to 1214'. The Senior Engineer worked with the mud company to add loss circulation material (LCM) without success. The Senior Engineer reported to InterAct management that the well would not hold a column of mud, but when the density of the mud was decreased, gas kicks were experienced. The Senior Engineer recommended spotting a cement plug across the hole in the 11 ¾" casing at 883-887' to stop the lost circulation. Management was informed and agreed with the plan. DOGGR approval was requested and obtained for this change in the program. On 1/9/19, cement was pumped in an attempt to regain circulation.

MOC #5: Immediately after drilling out cement, the well took another gas kick on 1/10/19. The gas pressure circulated out and clean out operations continued when circulation was again lost at 1085'. The Senior Engineer began discussions with InterAct's Principal Geologist to identify a competent shale in the DOW RGC 10 well to provide an adequate cap rock to cement across. InterAct's Principal Geologist correlated the DOW RGC 10 well (which had no well logs, only core descriptions) with five offset wells and identified several shales. Discussions between the Senior Engineer and InterAct management resulted in InterAct's recommendation to abort cleanout attempts and request abandonment of the well as soon as possible. The morning report on Jan. 11 indicated that the cleanout had progressed to 1300'. InterAct Management pushed for termination of the cleanout at this point. The Senior Engineer informed Management that DOGGR would not allow aborting the clean out operation until the gas source at 2200' had been reached. Cleanout operations continued during these discussions. Management pushed back with safety being a priority over DOGGR regulations. An email was sent to DOGGR on 1/11/19 at 6:15 a.m. requesting termination of the cleanout operations at 2200'. The email noted that the well had gas kicks for three consecutive days and the cement job on 1/9/19 was not completely successful in stopping the lost circulation problem. Another email was sent to DOGGR at 12:30 p.m., documenting that another gas kick was taken at 1306'. No reply was received, and DOGGR approval for the change was not obtained. At approximately 5 p.m., the well blew out through the tubing. The Senior Engineer was on the phone with DOGGR when this occurred. InterAct's WSM immediately called 911, and the field crew implemented necessary emergency procedures to shut in the well using the installed BOPE. The well was sealed within 10 minutes of the blowout, before the emergency vehicles even arrived.

Summary

InterAct has a competent staff and adequate training for well operations. The performance of the rig crew in shutting in the well on Jan. 11 evidences the competency of the CWS rig crew in regard to well shut-in procedures.

Re-abandonment of the DOW RGC 10 well presented unique challenges because the integrity of the well had been substantially compromised by previous well abandonment operations and the source of the gas was unknown. The InterAct team possesses all the skills required to react to anomalous events which may occur during well operations, and can do so quickly, as long as the regulatory agencies involved allow for such changes.

Appendix F

**International Association of
Drilling Contractors
2T6 Daily Drilling Reports between
October 23, 2018 through January 13, 2019**

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 13, 2019

AFE #: _____ Supr: █ Days on Well: 57
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: █

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

12:00am	HELD JSA. CONTINUED MONITORING WELL FROM MIDNIGHT TO MIDNIGHT. PSI STARTED
12:00PM	AT 340 PSI, DROP TO 220 PSI AT MIDNIGHT DUE TO INCREASE IN CHOCK OPENING

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS	

COSTS RECORD:

	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,775.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 12, 2019

AFE #: _____ Supr: XXXXXXXXXX Days on Well: 56
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: XXXXXXXXXX

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
12:00am	CONTINUED MONITORING WELL FROM 12:00AM TILL 6:30AM W/ A CONSTANT OF 340 PSI WHILE BLEEDING TO FRAC TANK. RIGGED DOWN POWER SWIVEL AND MOVED RIG FLOOR AND PITCHER NIPPLE OUT OF WAY FOR COIL TBG UNIT. RIGGED UP COIL TBG UNIT AND TESTED COIL UNIT BOE @ 3000PSI. TOOK ON 120 BBLs 10 PPG MUD. RIGGED UP CHOKE MANIFOLD TO FRAC TANK W/ STEEL LINES. RIH W/ COIL TBG BUT UNABLE TO WORK PAST 486', HAD TO PULL 5K OVER TO PULL FREE. PUMPED 80 BBLs 10 PPG MUD @ 486'. POOH W/ COIL AND FOUND 20' OF COIL HAD BROKEN OFF. ATEMPTED TO SECURE WELL W/ 12" BOE BLIND RAMS BUT RAMS LEAKING SEVERELY, HAD TO SECURED WELL W/ COIL BOE. RIGGED DOWN COIL UNIT. MONITORED WELL TILL 12:00PM W/ 340 PSI WHILE BLEEDING TO FRAC TANK.

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

														CSGLNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS	
														SIZE						

COSTS RECORD:	Daily	Cum.													
	Daily	Cum.	Daily	Cum.	Daily	Cum.									

Daily Total: \$ 10,172.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 11, 2019

AFE #: _____
 Lease / Well #: _____
 Contr / Rig: _____ CWS #9 _____ Toolpusher: _____
 Supr: [REDACTED] Days on Well: 55
 EFTD: _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG AND PUMP. FOUND WELL W/ ZERO PSI ON WELL. CONDITIONED MUD IN PIT TO 35 VISC W/ 8 SX OF LCM. LOWRED 6 1/4" BIT ASSY BACK DOWN TO 1306', NO FILL. PUMPED 30 BBLS TO BREAK CIRCULATION, WELL KICKED GAS BUBBLE THEN LOST ALL CIRCULATION. ATEMPTED TO TREAT MUD W/ LCM TO REGAIN CIRCULATION TO NO AVAIL. PULLED BIT ASSY TO 871', BROKE CIRCULATION EASILY, LOWERD BIT ASSY TO 996' AND BROKE CIRCULATION EASILY, LOWERED BIT ASSY TO 1120', UNABLE TO BREAK CIRCULATION. LOWERED BIT ASSY BACK DOWN TO 1306', CONDITIONED MUD W/ POLY VISC AND LCM. DRILLED W/ NO CIRCULATION FROM 1306' TO 1368' WHEN REGAINED VERY GOOD CIRCULATION, CONTINUED HARD DRILLING TO 1617'. CIRCULATED HOLE CLEAN, POOH W/ BIT TO 1492' WHEN WELL BLEW OUT AND UNABLE TO STAB TIW VALVE TO CLOSE WELL IN, HAD TO DROP DRILL STRING DOWN HOLE TO CLOSE BLIND RAMS, FOUND WELL W/ 300 PSI SHUT IN PRESSURE. CONDITIONED MUD IN PIT TO 40 VISC @ 10.2 PPG. BULL HEADED MUD AWAY @ 200 PSI. SHUT DOWN PUMP AND PRESSURE STILL @ 300 PSI SHUT IN AND CLIMBED TO 360 PSI IN ONE HOUR. STARTED BLEEDING BACK SLOWLY
12:00PM	TO PUMP TILL MID NITE

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 8,538.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 10, 2019

AFE #: _____ Supr: [REDACTED] Days on Well: 54
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. FOUND WELL W/ ZERO PSI. RIH W/ 6 1/4" BUTTON BIT W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. TAGGED DOWN @ 520', HAD TO PICK UP POWER SWIVEL TO WORK PAST. CONTINUED RIH SETTING DOWN ON HARD CEMENT @ 786'. DRILLED OUT HARD CEMENT FROM 786' TO 885'. TOOK GAS KICK @ 885'. BLEED OFF GAS SLOWLY WHILE CIRCULATING TO KILL WELL. CONTINUED RIH SETTING DOWN @ 1037', CIRCULATED AND REAMED DOWN TO 1085', LOST ALL RETURNS @ 1085'. CONDITIONED MUD W/ LCM TO REGAIN RETURNS, CONTINUED CIRCULATING AND REAMING DOWN TO 1214'. HARD DRILLING FROM 1214' TO 1306'. CIRCULATED HOLE CLEAN. PULLED BIT TO 562'
6:30PM	AND SECURED WELL AND RIG TILL A.M.
	PATRIOT VAC TRUCK KEEP CUTTING BIN PULLED
	SINCLAIR DELIVERED MUD MATERIALS
	WEATHERFORD DELIVERED SHACKER SCREENS

TUBING / ROD STRING

NO. JOINTS							
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WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 9, 2019

AFE #: _____ Supr: _____ Days on Well: 53
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: CWS #9 Toolpusher: _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG AND PUMP. POOH W/ REMAINDER OF BIT ASSY. RIH W/ OPEN ENED \ TBG AND HUNG @ 870'. CLEANED OUT PUMP WHILE WAITING ON BJ CEMENTING. WHILE RIGGING UP BJ CEMENTING WELL KICKED FLUID AND GAS. BLEED DOWN GAS AND HAD TO CIRCULATE WELL W/ NEW 8.4 PPG MUD TO KILL WELL. BJ MIX AND PUMPED 10 BBL "G" CEMENT W/ CC, DISPLACED W/ 3.5 BBL. POOH W/ TBG, RIGGED DOWN BJ. SECURED WELL AND RIG TILL A.M. Patriot Vac Truck washed out pump and took returns during cement job BJ w/ 3 men to do cement job Second Patriot truck hauled off waist fluid but had to haul back due to high PH.
6:00PM	

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 7,120.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 8, 2019

AFE #: _____	DOW RGC-10	Supr: XXXXXXXXXX	Days on Well: <u>52</u>
Lease / Well #: _____		EFTD: _____	_____
Contr / Rig: <u>CWS #9</u>	Toolpusher: XXXXXXXXXX	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG AND PUMP. CONDITIONED MUD IN PUMP. RIH W/ BIT ASSY W/ 2 7/8" PH-6 TBG FROM DERRICK, TAGGED DOWN @ 778'. PICKED UP POWER SWIVEL AND CONTINUED CIRCULATING AND REAMMING DOWN TO 996' WHEN WELL TOOK GAS KICK. CLOSED IN WELL AND CONDITIONED MUD TO 9 PPG. BLEED OFF GAS SLOWLY IN 10 MIN'S. BROKE CIRCULATION W/ 10 BBL'S. CONTINUED CIRCULATING AND DRILLING DOWN W/ LIMITED CIRCULATION HAVING TO PUT 8K ON BIT TO DRILL DOWN. LOST ALL RETURNS AT 1120' AND ATEMPTED TO MAINTAIN CIRCULATION W/ LCM TO NO AVAIL, DRILLED W/ NO RETURN FROM 1120' TO 1214'. POOH W/ BIT ASSY TO 437', LAID DOWN 12 JTS TO DRILL
6:30PM	W/ . SECURED WELL AND RIG TILL A.M.
	DOGGER PREFORMED BOE INSTECTION
	DON HILL W/ SINCLAIR INSPECTED MUD
	PATRIOT KEPT CUTTING BIN PULLED DOWN.

TUBING / ROD STRING

NO. JOINTS									

								WELL PROFILE					
								CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.			Daily	Cum.			Daily	Cum.

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 7, 2019

AFE #: _____ Supr: [REDACTED] Days on Well: 51
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG AND PUMP. FOUND WELL W/ ZERO PSI.
	CONDITIONED MUD IN PIT. CONTINUED DRILLING OUT HARD CEMENT FROM 427' TO 442'.
	COIRCULATED HOLE CLEAN. POOH W/ BIT ASSY AND LAID DOWN JARS AND EXCEL, FOUND
	BIT MISSING CENTER DRILLING EXTENSION. RIH W/ 6 1/4" BUTTON BIT W/ FIVE 4 3/4" DRILL
	COLLORS THEN 2 7/8" PH-6 TBG. CONTINUED DRILLING OUT HARD CEMENT FROM 442' TO
	515'. CIRCULATED AND REAMED DOWN TO 532', DRILLED OUT HARD CEMENT TO 590'. MUD
	STARTED COMING BACK VERY THICK AND GASSY @ 590', CONDITIONED MUD TO 9 PPG.
	UNABLE TO RIH FREELY, CIRCULATED AND ROTATED FROM 590' TO 778'. CIRCULATED HOLE
	CLEAN. PULLED AND LAID DOWN ALL 2 7/8" PH-6 TBG IN HOLE TO REAM WITH. HUNG BIT
7:00PM	W/ COLLORS AND 1 JT TBG. SECURED WELL AND RIG TILL A.M.
	WEATHERFORD DELIVERED FUEL
	WEATHERFORD DROPPED OFF PORTED SUB
	PATROIT HUALED OFF LOAD OF WAIST MUD

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,283.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 4, 2019

AFE #: _____ Supr: [REDACTED] Days on Well: 50
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30am	HELD JSA. SERVICED RIG AND PUMP. LOWERED BIT ASSY BACK DOWN TO TOP OF CEMENT RETAINER @ 310', DRILLED ON RETAINER W/ 1500 LBS DOWN WEIGHT FOR 5 HOURS TO BREAK THRU. CONTINUED RIH TAGGING DOWN @ 385', CONTINUED DRILLING OUT LOOSE RETAINER MATERIAL AND CEMENT TO 396'. DRILLED OUT HARD CEMENT FROM 396' TO 427'. CIRCULATED HOLE CLEAN. PULLED BIT TO 396'. SECURED WELL AND RIG TILL 1-7-2019
7:30PM	RETURNED TO VENTURA OFFICE
	PATRIOT HUALED OFF LOADED OF WAIST FLUID
	WEATHERFORD DELIVERED 2" HOSE FOR WATER LINE
	PATRIOT 70 BBLs 4 HRS IN A.M.
	PATRIOT HAULED OFF ROLL OFF BIN

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

									CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,163.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 3, 2019

AFE #: _____ Supr: ██████████ Days on Well: 49
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: ██████████

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30am	HELD JSA. SERVICED RIG AND PUMP. REMOVED RIG FLOOR, PITCHER NIPPLE ,FLOW LINE AND BOE. HAD WELDER WELD 7" LANDING PLATE TO INSIDE OF WELLHEAD. INSTALLED REPLACEMENT BOE DUE TO INTERAL LEAK. D.O.G.G.R DEFERED INSPECTION. REINSTALLED PITCHER NIPPLE, FLOWLINE AND RIG FLOOR. MIXED GEL MUD. RIH W/ 6 1/4" BIT W/ JARS, EXCELERATOR , FIVE 4 3/4" DRILL COLLORS AND 2 7/8" TBG. TAGGED DOWN ON CEMENT RETAINER @310'. RIGGED UP POWER SWIVEL AND INSTALLED PGSR PACK OFF.
6:30PM	SECURED WELL AND RIG TILL A.M.
	ALCO W/ BACKHOE TRANSFERRED CUTTINGS FROM SHALE BIN TO BIN TO BE HUALED OFF
	SOS DELIVERED EXCHANGE BOE
	PATRIOT HAULED OFF LOAD OF WAIST FLUIDS
	WELDER WELDED UP 7" LANDING FLANGE TO WELLHEAD

TUBING / ROD STRING

NO. JOINTS									

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS					

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 29, 2018

AFE #: _____ Supr: XXXXXXXX Days on Well: 47
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: XXXXXXXXXX

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
12:00AM	CONTINUED WITH TWO MAN CREW MONITORING WELL UNTILL RELIEF @ 6:30AM.
	HELD JSA. SERVICED RIG AND PUMP. BLEED GAS OFF WELL TO PUMP. RIH W/ CEMENT
	RETAINER STAB IN TOOL AND STABBED INTO RETAINER @ 310' WHILE CIRCULATING @
	APROX .5 BPM. RIGGED UP BY CEMENTING AND CEMENTED 7" CSG IN PLACE W/ 37 BBLs
	"G" CEMENT , DISPLACED CEMENT TO 416'. POOH W/ STAB IN TOOL AND RIGGED DOWN BJ.
	SECURED WELL AND RIG. CONTINUED CLEANING UP MUD FROM BLOW OUT. DROVE BACK
4:00PM	TO VENTURA OFFICE
	PATRIOT TRUCK TOOK RETURNS
	BJ W/ 3 MEN ON LOCATION
	TIGER DELIVERED STAB IN TOOL
	ALCO W/ ONE MAN ON BOBCAT CLEANING UP LOCATION

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

									WELL PROFILE		
									CSG/LNR SIZE	WT.	

COSTS RECORD:	Daily			Daily			Daily		
	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 7,177.00 Cum. Total:

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 28, 2018

AFE #: _____ Supr: XXXXXXXXXX Days on Well: 46
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: XXXXXXXXXX _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. BLEED GAS OFF WELL TO PUMP . MIXED GEL MUD IN PIT. CONTINUED CLEANING UP MUD AROUND RIG AND LOCATION FROM SURFACE BLOW OUT, CLEANED OUT SAND TRAP W/ PATRIOT. SOS LIFTED STEEL PLATES TO INSPECT FOOTING AROUND LOCATION AND RIG. FOUND BATHBUB SIZE HOLE 15' FROM CELLOR TOWARDS RAMP. USING RIG CHARGE PUMP PUMPED APROX 10 BBLs MUD DOWN 7" X 11 3/4" ANNULUS, WELL WENT ON VACUUM. MIXED MORE GEL MUD. SECURED WELL
12:00PM	AND HAD TWO MAN MONITORING WELL OVERNIGHT PATRIOT CLEANED SAND TRAP SOS W/ 3 MEN LIFTED STEEL PLATES WETHERFORD BROUGHT BY INVOICES

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:

	Daily			Daily			Daily		
	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 8,653.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 27, 2018

AFE #: _____	Supr: ██████████	Days on Well: 45	
Lease / Well #: _____	DOW RGC-10	EFTD _____	_____
Contr / Rig: CWS #9 _____	Toolpusher: ██████████	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	FOUND WELL W/ ZERO PSI ON TBG AND CSG. BROKE CIRCULATION W/ 1 1/2 BBLs MUD. POOH W/ KILL STRING. RIGGED UP TIGER WIRELINE W/ LUBRICATOR, RIH AND SET 7"
	COMPOSITE CEMENT RETAINER @310'. POOH W/ WIRELINE AND RIGGED DOWN TIGER. RIH W/ RETAINER STAB IN TOOL W/ TBG AND ATEMPED TO STAB INTO RETAINER TO NO AVAIL. POOH W/ STAB IN TOOL AND FOUND BTM OF TOOL EGG SHAPPED. WAITED ON
5:00PM	EXCHANGE TOOL. NO SHOW ON TOOL . SECURED WELL AND RIG TILL A.M.
	PATROIT TRUCK ON LOCATION
	WEATHERFORD DELIVERED DIESEL AND PICKED UP MILLS
	TIGER SET CEMENT RETAINER THEN CAME BACK AND PICKED UP STAB IN TOOL
	ALCO HAD TWO MEN W/ BOBCAT

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.
	Daily Total:	\$	6,726.00	Cum. Total				

Daily Total: \$ 6,726.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 26, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: 44
Lease / Well #: _____	DOW RGC-10	EFTD _____	_____
Contr / Rig: CWS #9 _____	Toolpusher: [REDACTED]	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG AND PUMP. FOUND THAT WELL HAD BLOWN OUT AROUND OUTSIDE OF CELLAR FILLING CELLAR W/ SOLIDS AND APROX 35 BBLs ABANDONMENT MUD AROUND LOCATION AND RIG. CLEAN LOCATION ENOUGH W/ VAC TRUCK TO INSPECT FOOTING AROUND RIG. FOUND WELL W/ 15 PSI ON CSG AND 175 PSI ON TBG, BLEED TO ZERO SLOWLY TO PUMP. TOPPED OFF CSG W/ APPROX 1 BBL. POOH W/ BIT ASSY. RIH W/ OPEN ENDED TBG AND HUNG TBG @ 590'. RIGGED UP BJ CEMENTING AND PLACED CEMENT PLUG FROM 590' TO 540' W/ 37 CUFT "G" 14.5 PPG. POOH W/ TBG. CLEANED UP AROUND RIG AND LOCATION WHILE WOC. RIH W/ TBG AFTER 5 HOURS AND SET DOWN ON HARD CEMENT @ 532'. PULLED TBG TO 403' , BROKE CIRCULATION THEN SECURED
6:00PM	WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,163.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 24, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 43
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG. O PSI ON WELL. OPENED WELL LOOKED
	DOWN THRU BOE BUT UNABLE TO SEE FLUID LEVEL. TOPPED OFF CSG W/ APROX 2.5 BBLs
12:00AM	MUD. RESECURED WELL AND RIG. RETURNED TO VENTURA OFFICE

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

												CSG/LNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS	

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 2,452.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 20, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 41
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. LOWERED BIT ASSY BACK DOWN. PICKED UP POWER SWIVEL, CIRCULATED AND REAMED DOWN FROM 904' TO 986' W/ LITTLE RESTRICTION. LOST MOST RETURNS @ 986' AND MUD RETURNS STARTED COMING UP OUT OF THE GROUND 20' FROM CELLOR. PULLED BIT ASSY TO 676', BROKE CIRCULATION W/ 15 BBLs, CONDITIONED MUD W/ GEL AND LCM. LOST 20 BBLs AFTER CIRCULATING FOR 1 1/2 HOURS. PULLED BIT ASSY TO 458', CONDITIONED MUD W/ GEL AND LCM. FILLED HOLE W/ MUD
4:30PM	MONITORED WELL FOR 1 HOUR, FLUID FELL BACK 5'. SECURED WELL AND RIG TILL A.M. LOST EST 40 BBLs MUD WHILE CIRCULATING AND CONDITIONING MUD PATRIOT HOULED LOAD OF WAIST MUD

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

								CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,530.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 19, 2018

AFE #: _____ Supr: ██████████ Days on Well: 40
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: _____ CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. PICKED UP AND RIH W/ 6 1/4" USED BUTTON BIT W/ JARS / EXCELERATOR / FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG FROM GROUND. TAGGED DOWN @ 904'. RIGGED UP REPLACEMENT POWER SWIVEL AND FOUND SWIVEL TO BE DEFECTIVE. LAID DOWN SWIVEL AND PULLED BIT ASSY TO 769'. MECHANIC ATEMPTED TO REPAIR SWIVEL TO NO AVAIL. RIGGED DOWN SWIVEL. RIGGED UP REPLACEMENT SWIVEL
5:30PM	SECURED WELL AND RIG TILL A.M.
	10:30AM TO 5:30PM DOWN TIME / POWER SWIVEL'S
	JOHN PHILIPS PICKED UP MILLS
	PATRIOT HAULED OFF WAIST FLUIDS
	WEATHERFORD DELIVERED TWO 2" KELLY HOSES AND TWO BUCKETS OF THREAD DOPE
	WEATHERFORD DELIVERED REPLACEMENT SWIVEL
	CW MECHANIC ATEMPTED TO REPAIR SWIVEL
	WEATHERFORD DELIVERED SECOND SWIVEL
	TSC DELIVERED TRENCH PLATES
	ALCO DELIVERED BOBCAT AND TWO HANDS
	SOS MOVED TBG

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

CSGLNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS												

COSTS RECORD:	Daily	Cum.			Daily	Cum.			Daily	Cum.		

Daily Total: \$ 6,923.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 18, 2018

AFE #: _____
 Lease / Well #: _____ DOW RGC-10
 Contr / Rig: CWS #9 Toolpusher: _____
 Supr: _____ Days on Well: 39
 EFTD: _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. RIH W/ 6 1/4" CONCAVE MILL W/ FIVE 4 3/4" DRILL COLLORS W/ JARS AND EXCELERATOR THEN 2 7/8" PH-6 TBG. SET DOWN @ 869', PICKED UP POWER SWIVEL AND DRILL AND MILL FROM 869' DOWN TO 888' WHEN MILL BROKE THRU. CIRCULATED HOLE CLEAN. CONTINUED RIH FREELY SETTING DOWN @ 910'. POOH W/ MILL ASSY. LOADED OUT POWER SWIVEL DUE TO MECHANICAL DEFECTS. SDECURED WELL AND RIG TILL A.M.
	1 HOUR DOWN TIME LOADING OUT POWER SWIVEL
	WEATHERFORD FISHING TOOL HAND ON LOCATION
	SINCLAIR DELIVERED TWO PALLETS OF GEL
	SINCLAIR HAD SECOND DELIVERY OF LCM

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:

	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 17, 2018

AFE #: _____ Supr: ██████████ Days on Well: 38
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG. POOH W/ KILL STRING. RIH W/ 6" O.D. MAGNET ON BTM OF 2 7/8" PH-6 TBG, SET DOWN @ 850'. POOH W/ ASSY, RECOVERED HAND FULL OF METAL SHAVINGS AND TWO PIECES OF 1/4" X 1" X 1 1/4" METAL PIECES. RIH W/ 6 1/4" O.D. WASHOVER SHOE W/ 2' EXTENTION THEN FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG TO TOP OF FISH @ 850'. RIGGED PUMP AND SURFACE EQUIP TO REVERSE CIRCULATE. PUMPED AWAY 60 BBLs H2O @ 2.5 BPM W/ APPROX 3/4" STREAM FOR RETURNS. CHANGED PUMP AND SURFACE EQUIP BACK OVER TO CIRCULATE. CIRCULATED AND ROTATED ASSY PAST 850' DOWN TO 873' IN 3 1/2 HOURS WHEN ASSY BECAME STUCK. WORKED FREE IN 15 MIN'S PULLING MAX OF 100K. CIRCULATED HOLE CLEAN. POOH W/ ASSY. SECURED WELL TILL A.M.
6:00PM	
	PATRIOT DELEVERED MUD AND PULLED DOWN CELLOR AND CUTTING BIN WEATHERFORD FISHING TOOL HAND ON LOCATION

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

												CSGLNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS					
												SIZE										

COSTS RECORD:

	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,633.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 14, 2018

AFE #:		Supr: [REDACTED]	Days on Well:	37
Lease / Well #:	DOW RGC-10	EFTD		
Contr / Rig:	CWS #9	Toolpusher:		

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG. LOWERED TBG BACK DOWN TO 849' CHANGED HOLE OVER TO FRESH H2O W/ CITY H2O LINE. RIGGED UP TIGER WIRELINE W/ LUBICATOR AND RIH W/ VIDEO CAMERA AND INSPECTED AREA BETWEEN 844' AND 850.60'. APPEARED TO HAVE SEVERAL METAL PIECES LAYING ON TOP OF 4 3/4" FISH. RIGGED DOWN TIGER. RIH W/ 5 1/2" O.D. MAGNET ON 2 7/8" PH-6 TBG, SET DOWN @ 850'. POOH AND RECOVERED HAND FULL OF SHAVINGS AND THREE PIECES OF METAL LARGEST BEING 1/4" X 2" X 3 1/2" AND 1/4" X 1" X 1 1/2" . RIH W/ OPENED TBG TO 750' SECURED WELL AND RIG TILL 12-17-2018.
6:30PM	RETURNED TO VENTURA YARD

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE							
CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS		

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,770.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 13, 2018

AFE #: _____	DOW RGC-10	Supr: XXXXXXXXXX	Days on Well: <u>36</u>
Lease / Well #: _____		EFTD: _____	
Contr / Rig: <u>CWS #9</u>	Toolpusher: XXXXXXXXXX	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. RIH W/ 5 1/2" O.D. MAGNET W/ 2 7/8" PH-6 TBG, SET DOWN @ 850.76'. POOH W/ MAGNET ASSY, RECOVERED HAND FULL OF METAL SHAVING W/ 4 SMALL METAL PIECES. RERAN MAGNET AND POOH, RECOVERED HAND FULL OF SHAVINGS W/ 6 SMALL METAL PIECES. RIH PICKING UP 2 7/8 PH-6 TBG W/ 8' PH-6 PUP CUT @ 45DEG, TAGGED DOWN AT 850.76'. PICKED UP POWER SWIVEL AND CIRCULATED AND ROTATED TO 851.76'.
3:00PM	CIRCULATED HOLE CLEAN THEN PULLED TBG TO 753'. SECURED WELL AND RIG TILL A.M.
	WEATHERFORD DELIVERED FISHING TOOLS
	PREMIER DELIVERED WASH PIPE.

TUBING / ROD STRING						
NO. JOINTS						

WELL PROFILE						
CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 5,940.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 12, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: 35
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: _____	CWS #9	Toolpusher: [REDACTED]	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. CONTINUED RIH W/ 6 1/4" CONCAVE MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG. SET DOWN @ 849.65', PICKED UP POWER SWIVEL AND MILLED TO 850.15'. CIRCULATED HOLE CLEAN. POOH W/ MILL ASSY. REMOVED AND CLEANED OUT FLOWLINE. SECURED WELL AND RIG TILL A.M.
	[REDACTED] ATTENDED R.D. OLSON WEEKLY COORDINATION AND SAFTY MEETING
	NO DELIVERIES TODAY

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:

	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 4,954.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 7, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: <u>32</u>
Lease / Well #: _____	DOW RGC-10	EFTD _____	_____
Contr / Rig: <u>CWS #9</u>	Toolpusher: [REDACTED]	_____	_____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG. LOWERED 6 1/4" BLADED JUNK MILL BACK DOWN, MILLED @ 843' FOR 30 MIN'S MAKING NO HOLE. POOH W/ MILL ASSY, FOUND NOSE OF MILL WORN DOWN TO 5 1/4" . RIH W/ 5 1/2" O.D. MAGNET ON TBG , SRT DOWN @ 843'. POOH W/ MAGNET ASSY AND FOUND HAND FULL OF METAL SHAVINGS W/ APROX 10 PIECES OF 1/4" X 1/2" X 1/2" PIECES. RIH W/ 6 1/8" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG TO 843'. PICKED UP POWER SWIVEL AND MILLED FROM 843' TO 845', CIRCULATED HOLE CLEAN AND PULLED MILL ASSY TO 408'. SECURED WELL AND RIG TILL 12-10-2018
7:00PM	RETURNED TO VENTURA YARD.
	JOHN PHILIPS DELIVERED JUNG MILL

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS				

COSTS RECORD:	Daily	Cum.			Daily	Cum.		Daily	Cum.
Daily Total:	\$		6,966.00		Cum. Total				

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 13, 2019

AFE #: _____ Supr: [REDACTED] Days on Well: 57
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

12:00am	HELD JSA. CONTINUED MONITORING WELL FROM MIDNIGHT TO MIDNIGHT. PSI STARTED
12:00PM	AT 340 PSI, DROP TO 220 PSI AT MIDNIGHT DUE TO INCREASE IN CHOCK OPENING

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 6,775.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 12, 2019

AFE #: _____ Supr: [REDACTED] Days on Well: 56
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
12:00am	CONTINUED MONITORING WELL FROM 12:00AM TILL 6:30AM W/ A CONSTANT OF 340 PSI WHILE BLEEDING TO FRAC TANK. RIGGED DOWN POWER SWIVEL AND MOVED RIG FLOOR AND PITCHER NIPPLE OUT OF WAY FOR COIL TBG UNIT. RIGGED UP COIL TBG UNIT AND TESTED COIL UNIT BOE @ 3000PSI. TOOK ON 120 BBLs 10 PPG MUD. RIGGED UP CHOKE MANIFOLD TO FRAC TANK W/ STEEL LINES. RIH W/ COIL TBG BUT UNABLE TO WORK PAST 486', HAD TO PULL 5K OVER TO PULL FREE. PUMPED 80 BBLs 10 PPG MUD @ 486' POOH W/ COIL AND FOUND 20' OF COIL HAD BROKEN OFF. ATEMPTED TO SECURE WELL W/ 12" BOE BLIND RAMS BUT RAMS LEAKING SEVERELY, HAD TO SECURED WELL W/ COIL BOE. RIGGED DOWN COIL UNIT. MONITORED WELL TILL 12:00PM W/ 340 PSI WHILE BLEEDING TO FRAC TANK.

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

									CSG/LNR	
									SIZE	WT.

COSTS RECORD:	Daily		Cum.		Daily		Cum.	
Daily Total:	\$	10,172.00	Cum. Total					

Daily Total: \$ 10,172.00 Cum. Total:

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 11, 2019

AFE #: _____ Supr: Days on Well: 55
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: CWS #9 Toolpusher: _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. FOUND WELL W/ ZERO PSI ON WELL. CONDITIONED MUD IN PIT TO 35 VISC W/ 8 SX OF LCM. LOWRED 6 1/4" BIT ASSY BACK DOWN TO 1306', NO FILL. PUMPED 30 BBLS TO BREAK CIRCULATION, WELL KICKED GAS BUBBLE THEN LOST ALL CIRCULATION. ATEMPTED TO TREAT MUD W/ LCM TO REGAIN CIRCULATION TO NO AVAIL. PULLED BIT ASSY TO 871', BROKE CIRCULATION EASILY, LOWERD BIT ASSY TO 996' AND BROKE CIRCULATION EASILY, LOWERED BIT ASSY TO 1120', UNABLE TO BREAK CIRCULATION. LOWERED BIT ASSY BACK DOWN TO 1306', CONDITIONED MUD W/ POLY VISC AND LCM. DRILLED W/ NO CIRCULATION FROM 1306' TO 1368' WHEN REGAINED VERY GOOD CIRCULATION, CONTINUED HARD DRILLING TO 1617'. CIRCULATED HOLE CLEAN, POOH W/ BIT TO 1492' WHEN WELL BLEW OUT AND UNABLE TO STAB TIW VALVE TO CLOSE WELL IN, HAD TO DROP DRILL STRING DOWN HOLE TO CLOSE BLIND RAMS, FOUND WELL W/ 300 PSI SHUT IN PRESSURE. CONDITIONED MUD IN PIT TO 40 VISC @ 10.2 PPG. BULL HEADED MUD AWAY @ 200 PSI. SHUT DOWN PUMP AND PRESSURE STILL @ 300 PSI SHUT IN AND CLIMBED TO 360 PSI IN ONE HOUR. STARTED BLEEDING BACK SLOWLY
12:00PM	TO PUMP TILL MID NITE

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

								CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.			Daily	Cum.			Daily	Cum.			

Daily Total: \$ 8,538.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 10, 2019

AFE #: _____ Supr: _____ Days on Well: 54
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: _____ CWS #9 _____ Toolpusher: _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. FOUND WELL W/ ZERO PSI. RIH W/ 6 1/4" BUTTON BIT W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. TAGGED DOWN @ 520', HAD TO PICK UP POWER SWIVEL TO WORK PAST. CONTINUED RIH SETTING DOWN ON HARD CEMENT @ 786'. DRILLED OUT HARD CEMENT FROM 786' TO 885'. TOOK GAS KICK @ 885'. BLEED OFF GAS SLOWLY WHILE CIRCULATING TO KILL WELL. CONTINUED RIH SETTING DOWN @ 1037', CIRCULATED AND REAMED DOWN TO 1085', LOST ALL RETURNS @ 1085'. CONDITIONED MUD W/ LCM TO REGAIN RETURNS, CONTINUED CIRCULATING AND REAMING DOWN TO 1214'. HARD DRILLING FROM 1214' TO 1306'. CIRCULATED HOLE CLEAN. PULLED BIT TO 562' AND SECURED WELL AND RIG TILL A.M.
	PATRIOT VAC TRUCK KEEP CUTTING BIN PULLED
	SINCLAIR DELIVERED MUD MATERIALS
	WEATHERFORD DELIVERED SHACKER SCREENS

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

	CSGLNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS
	SIZE					

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,316.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 9, 2019

AFE #: _____ Supr: ██████████ Days on Well: 53
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG AND PUMP. POOH W/ REMAINDER OF BIT ASSY. RIH W/ OPEN ENED \
	TBG AND HUNG @ 870'. CLEANED OUT PUMP WHILE WAITING ON BJ CEMENTING.
	WHILE RIGGING UP BJ CEMENTING WELL KICKED FLUID AND GAS. BLEED DOWN GAS AND
	HAD TO CIRCULATE WELL W/ NEW 8.4 PPG MUD TO KILL WELL. BJ MIX AND PUMPED 10
	BBLs "G" CEMENT W/ CC, DISPLACED W/ 3.5 BBLs. POOH W/ TBG, RIGGED DOWN BJ. SECURED
6:00PM	WELL AND RIG TILL A.M.
	PATRIOT VAC TRUCK WASHED OUT PUMP AND TOOK RETURNS DURING CEMENT JOB
	BJ W/ 3 MEN TO DO CEMENT JOB
	SECOND PATRIOT TRUCK HUALED OFF WAIST FLUID BUT HAD TO HUAL BACK DUE TO
	HIGH PH.

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,120.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 8, 2019

AFE #: _____ Supr: [REDACTED] Days on Well: 52
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. CONDITIONED MUD IN PUMP. RIH W/ BIT ASSY W/ 2 7/8" PH-6 TBG FROM DERRICK, TAGGED DOWN @ 778'. PICKED UP POWER SWIVEL AND CONTINUED CIRCULATING AND REAMMING DOWN TO 996' WHEN WELL TOOK GAS KICK. CLOSED IN WELL AND CONDITIONED MUD TO 9 PPG. BLEED OFF GAS SLOWLY IN 10 MIN'S. BROKE CIRCULATION W/ 10 BBLs. CONTINUED CIRCULATING AND DRILLING DOWN W/ LIMITED CIRCULATION HAVING TO PUT 8K ON BIT TO DRILL DOWN. LOST ALL RETURNS AT 1120' AND ATEMPTED TO MAINTAIN CIRCULATION W/ LCM TO NO AVAIL, DRILLED W/ NO RETURN FROM 1120' TO 1214'. POOH W/ BIT ASSY TO 437', LAID DOWN 12 JTS TO DRILL
6:30PM	W/ . SECURED WELL AND RIG TILL A.M.
	DOGGER PREFORMED BOE INSTECTION
	DON HILL W/ SINCLAIR INSPECTED MUD
	PATRIOT KEPT CUTTING BIN PULLED DOWN.

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

								CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 7, 2019

AFE #: _____	DOW RGC-10	Supr: █	Days on Well: <u>51</u>
Lease / Well #: _____		EFTD: _____	
Contr / Rig: <u>CWS #9</u>	Toolpusher: █		

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG AND PUMP. FOUND WELL W/ ZERO PSI.
	CONDITIONED MUD IN PIT. CONTINUED DRILLING OUT HARD CEMENT FROM 427' TO 442'.
	COIRCULATED HOLE CLEAN. POOH W/ BIT ASSY AND LAID DOWN JARS AND EXCEL, FOUND
	BIT MISSING CENTER DRILLING EXTENSION. RIH W/ 6 1/4" BUTTON BIT W/ FIVE 4 3/4" DRILL
	COLLORS THEN 2 7/8" PH-6 TBG. CONTINUED DRILLING OUT HARD CEMENT FROM 442' TO
	515'. CIRCULATED AND REAMED DOWN TO 532', DRILLED OUT HARD CEMENT TO 590'. MUD
	STARTED COMING BACK VERY THICK AND GASSY @ 590', CONDITIONED MUD TO 9 PPG.
	UNABLE TO RIH FREELY, CIRCULATED AND ROTATED FROM 590' TO 778'. CIRCULATED HOLE
	CLEAN. PULLED AND LAID DOWN ALL 2 7/8" PH-6 TBG IN HOLE TO REAM WITH. HUNG BIT
7:00PM	W/ COLLORS AND 1 JT TBG. SECURED WELL AND RIG TILL A.M.
	WEATHERFORD DELIVERED FUEL
	WEATHERFORD DROPPED OFF PORTED SUB
	PATROIT HUALED OFF LOAD OF WAIST MUD

TUBING / ROD STRING

NO. JOINTS									

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,283.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 4, 2019

AFE #:		Supr:	[REDACTED]	Days on Well:	50
Lease / Well #:	DOW RGC-10	EFTD			
Contr / Rig:	CWS #9	Toolpusher:	[REDACTED]		

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30am	HELD JSA. SERVICED RIG AND PUMP. LOWERED BIT ASSY BACK DOWN TO TOP OF CEMENT RETAINER @ 310', DRILLED ON RETAINER W/ 1500 LBS DOWN WEIGHT FOR 5 HOURS TO BREAK THRU. CONTINUED RIH TAGGING DOWN @ 385', CONTINUED DRILLING OUT LOOSE RETAINER MATERIAL AND CEMENT TO 396'. DRILLED OUT HARD CEMENT FROM 396' TO 427'. CIRCULATED HOLE CLEAN. PULLED BIT TO 396'. SECURED WELL AND RIG TILL 1-7-2019
7:30PM	RETURNED TO VENTURA OFFICE

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,163.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 3, 2019

AFE #:			Supr:		Days on Well: 49
Lease / Well #:	DOW RGC-10		EFTD		
Contr / Rig:	CWS #9	Toolpusher:			

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30am	HELD JSA. SERVICED RIG AND PUMP. REMOVED RIG FLOOR, PITCHER NIPPLE, FLOW LINE AND BOE. HAD WELDER WELD 7" LANDING PLATE TO INSIDE OF WELLHEAD. INSTALLED REPLACEMENT BOE DUE TO INTERNAL LEAK. D.O.G.G.R DEFERED INSPECTION. REINSTALLED PITCHER NIPPLE, FLOWLINE AND RIG FLOOR. MIXED GEL MUD. RIH W/ 6 1/4" BIT W/ JARS, EXCELELATOR, FIVE 4 3/4" DRILL COLLORS AND 2 7/8" TBG. TAGGED DOWN ON CEMENT RETAINER @310'. RIGGED UP POWER SWIVEL AND INSTALLED PGSR PACK OFF.
6:30PM	SECURED WELL AND RIG TILL A.M.
	ALCO W/ BACKHOE TRANSFERRED CUTTINGS FROM SHALE BIN TO BIN TO BE HUALED OFF
	SOS DELIVERED EXCHANGE BOE
	PATRIOT HAULED OFF LOAD OF WAIST FLUIDS
	WELDER WELDED UP 7" LANDING FLANGE TO WELLHEAD

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: January 2, 2019

AFE #: _____ Supr: XXXXXXXXXX Days on Well: 48
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: XXXXXXXXXX

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00am	DROVE TO LOCATION. HELD JSA, SERVICED RIG AND PUMP. FOUND WELL W/ 10 PSI ON 7" X 11 3/4" ANULUS. RIGGED PUMP TO ANULUS AND ATEMPTED TO PRESSURE TEST TO NO AVAIL. PUMPED FLUID AWAY @ 1 BPM @ ZERO PSI. CALLED OUT FOR CEMENT TRUCK. CONTINUED CLEAN UP OPERATION FROM BLOW OUT WHILE WAITING ON BJ CEMENTING. RIGGED DOWN AND MOVED POWER SWIVEL AND TBG ON GROUND FOR CLEAN UP. RIGGED UP BJ CEMENTING TO 7" X 11 3/4" ANULUS, MIXED AND PUMPED AWAY 67 BBLS "G" CEMENT @ ZERO PSI @ 1BPM W/ MUD RETURNS TO SURFACE AROUND OUTSIDE OF CELLAR. DID NOT GET GOOD CEMENT RETURNS TO SURFACE. RIGGED DOWN BJ. SECURED WELL AND RIG TILL A.M.
	SOS CRANE MOVED TBG FOR CLEAN UP , 2 MEN
	BJ W/ 3 MAN FOR CEMENT JOB
	PATRIOT W/ 2 VAC TRUCKS, ONE HAULED OFF WAIST FLUIDS AND ONE FOR CEMENT JOB

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS				

COSTS RECORD:	Daily	Cum.		Daily	Cum.	

Daily Total: \$ 7,163.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 29, 2018

AFE #: _____ Lease / Well #: _____ DOW RGC-10 Contr / Rig: _____ CWS #9 Toolpusher: _____

Supr: [REDACTED] Days on Well: 47
EFTD _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
12:00AM	CONTINUED WITH TWO MAN CREW MONITORING WELL UNTILL RELIEF @ 6:30AM.
	HELD JSA. SERVICED RIG AND PUMP. BLEED GAS OFF WELL TO PUMP. RIH W/ CEMENT
	RETAINER STAB IN TOOL AND STABBED INTO RETAINER @ 310' WHILE CIRCULATING @
	APROX .5 BPM. RIGGED UP BY CEMENTING AND CEMENTED 7" CSG IN PLACE W/ 37 BBLS
	"G" CEMENT , DISPLACED CEMENT TO 416'. POOH W/ STAB IN TOOL AND RIGGED DOWN BJ.
	SECURED WELL AND RIG. CONTINUED CLEANING UP MUD FROM BLOW OUT. DROVE BACK
4:00PM	TO VENTURA OFFICE
	PATRIOT TRUCK TOOK RETURNS
	BJ W/ 3 MEN ON LOCATION
	TIGER DELIVERED STAB IN TOOL
	ALCO W/ ONE MAN ON BOBCAT CLEANING UP LOCATION

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS								

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,177.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 28, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: 46
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: CWS #9	Toolpusher: [REDACTED]	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG AND PUMP. BLEED GAS OFF WELL TO PUMP . MIXED
	GEL MUD IN PIT. CONTINUED CLEANING UP MUD AROUND RIG AND LOCATION FROM
	SURFACE BLOW OUT, CLEANED OUT SAND TRAP W/ PATRIOT. SOS LIFTED STEEL PLATES
	TO INSPECT FOOTING AROUND LOCATION AND RIG. FOUND BATHBUB SIZE HOLE 15' FROM
	CELLOR TOWARDS RAMP. USING RIG CHARGE PUMP PUMPED APROX 10 BBLs MUD DOWN
	7" X 11 3/4" ANNULUS, WELL WENT ON VACUUM. MIXED MORE GEL MUD. SECURED WELL
12:00PM	AND HAD TWO MAN MONITORING WELL OVERNIGHT
	PATRIOT CLEANED SAND TRAP
	SOS W/ 3 MEN LIFTED STEEL PLATES
	WETHERFORD BROUGHT BY INVOICES

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

						WELL PROFILE					
						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily		Cum.		Daily		Cum.	

Daily Total: \$ 8,653.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 27, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 45
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	FOUND WELL W/ ZERO PSI ON TBG AND CSG. BROKE CIRCULATION W/ 1 1/2 BBLS MUD. POOH W/ KILL STRING. RIGGED UP TIGER WIRELINE W/ LUBRICATOR, RIH AND SET 7" COMPOSITE CEMENT RETAINER @310'. POOH W/ WIRELINE AND RIGGED DOWN TIGER. RIH W/ RETAINER STAB IN TOOL W/ TBG AND ATEMPTED TO STAB INTO RETAINER TO NO AVAIL. POOH W/ STAB IN TOOL AND FOUND BTM OF TOOL EGG SHAPPED. WAITED ON
5:00PM	EXCHANGE TOOL. NO SHOW ON TOOL . SECURED WELL AND RIG TILL A.M.
	PATROIT TRUCK ON LOCATION
	WEATHERFORD DELIVERED DIESEL AND PICKED UP MILLS
	TIGER SET CEMENT RETAINER THEN CAME BACK AND PICKED UP STAB IN TOOL
	ALCO HAD TWO MEN W/ BOBCAT

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS						

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,726.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 26, 2018

AFE #:		Supr:	████████	Days on Well:	44
Lease / Well #:	DOW RGC-10	EFTD:			
Contr / Rig:	CWS #9	Toolpusher:	████████		

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG AND PUMP. FOUND THAT WELL HAD BLOWN OUT AROUND OUTSIDE OF CELLAR FILLING CELLAR W/ SOLIDS AND APROX 35 BBLS ABANDONMENT MUD AROUND LOCATION AND RIG. CLEAN LOCATION ENOUGH W/ VAC TRUCK TO INSPECT FOOTING AROUND RIG. FOUND WELL W/ 15 PSI ON CSG AND 175 PSI ON TBG, BLEED TO ZERO SLOWLY TO PUMP. TOPPED OFF CSG W/ APPROX 1 BBL. POOH W/ BIT ASSY. RIH W/ OPEN ENDED TBG AND HUNG TBG @ 590'. RIGGED UP BJ CEMENTING AND PLACED CEMENT PLUG FROM 590' TO 540' W/ 37 CUFT "G" 14.5 PPG. POOH W/ TBG. CLEANED UP AROUND RIG AND LOCATION WHILE WOC. RIH W/ TBG AFTER 5 HOURS AND SET DOWN ON HARD CEMENT @ 532'. PULLED TBG TO 403' , BROKE CIRCULATION THEN SECURED
6:00PM	WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

										CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily		Cum.		Daily		Cum.		Daily		Cum.

Daily Total: \$ 7,163.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 24, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 43
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG. 0 PSI ON WELL. OPENED WELL LOOKED
	DOWN THRU BOE BUT UNABLE TO SEE FLUID LEVEL. TOPPED OFF CSG W/ APROX 2.5 BBLS
12:00AM	MUD. RESECURED WELL AND RIG. RETURNED TO VENTURA OFFICE

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

										CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 2,452.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 21, 2018

AFE #: _____ Supr: █ Days on Well: 42
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: CWS #9 Toolpusher: █

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00am	HELD JSA. SERVICED RIG AND PUMP. FOUND FLUID LEVEL IN CSG HAD DROPPED TO 20' FROM TOP OF BOE, TOPPED OFF WELL. WAITED ON ORDERS. SECURED WELL AND RIG TILL
11:00AM	12/26/2018

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 4,092.00 Cum. Total: _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 20, 2018

AFE #: _____	Supr: _____	Days on Well: 41	
Lease / Well #: _____	DOW RGC-10	EFTD _____	_____
Contr / Rig: _____	CWS #9	Toolpusher: _____	_____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG AND PUMP. LOWERED BIT ASSY BACK DOWN. PICKED UP POWER SWIVEL , CIRCULATED AND REAMED DOWN FROM 904' TO 986' W/ LITTLE RESTRICTION. LOST MOST RETURNS @ 986' AND MUD RETURNS STARTED COMING UP OUT OF THE GROUND 20' FROM CELLOR. PULLED BIT ASSY TO 676' , BROKE CIRCULTION W/ 15 BBLS, CONDITIONED MUD W/ GEL AND LCM . LOST 20 BBLS AFTER CIRCULATING FOR 1 1/2 HOURS. PULLED BIT ASSY TO 458', CONDITIONED MUD W/ GEL AND LCM. FILLED HOLE W/ MUD
4:30PM	MONITORED WELL FOR 1 HOUR, FLUID FELL BACK 5'. SECURED WELL AND RIG TILL A.M. LOST EST 40 BBLS MUD WHILE CIRCULATING AND CONDITIONING MUD PATRIOT HOULED LOAD OF WAIST MUD

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

	CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:

	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,530.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 19, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: 40
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: CWS #9	Toolpusher: [REDACTED]	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. PICKED UP AND RIH W/ 6 1/4" USED BUTTON BIT W/ JARS /
	EXCELERATOR / FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG FROM GROUND. TAGGED
	DOWN @ 904'. RIGGED UP REPLACEMENT POWER SWIVEL AND FOUND SWIVEL TO BE
	DEFECTIVE. LAID DOWN SWIVEL AND PULLED BIT ASSY TO 769'. MECHANIC ATEMPTED TO
	REPAIR SWIVEL TO NO AVAIL. RIGGED DOWN SWIVEL. RIGGED UP REPLACEMENT SWIVEL
5:30PM	SECURED WELL AND RIG TILL A.M.
	10:30AM TO 5:30PM DOWN TIME / POWER SWIVEL'S
	JOHN PHILIPS PICKED UP MILLS
	PATRIOT HAULED OFF WAIST FLUIDS
	WEATHERFORD DELIVERED TWO 2" KELLY HOSES AND TWO BUCKETS OF THREAD DOPE
	WEATHERFORD DELIVERED REPLACEMENT SWIVEL
	CW MECHANIC ATEMPTED TO REPAIR SWIVEL
	WEATHERFORD DELIVERED SECOND SWIVEL
	TSC DELIVERED TRENCH PLATES
	ALCO DELIVERED BOBCAT AND TWO HANDS
	SOS MOVED TBG

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

					CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.				Daily	Cum.				Daily	Cum.

Daily Total: \$ 6,923.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 18, 2018

AFE #: _____ Supr: ██████████ Days on Well: 39
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. RIH W/ 6 1/4" CONCAVE MILL W/ FIVE 4 3/4" DRILL COLLORS W/
	JARS AND EXCELERATOR THEN 2 7/8" PH-6 TBG. SET DOWN @ 869', PICKED UP POWER
	SWIVEL AND DRILL AND MILL FROM 869' DOWN TO 888' WHEN MILL BROKE THRU.
	CIRCULATED HOLE CLEAN. CONTINUED RIH FREELY SETTING DOWN @ 910'. POOH W/
	MILL ASSY. LOADED OUT POWER SWIVEL DUE TO MECHANICAL DEFECTS. SDECURED WELL
6:30PM	AND RIG TILL A.M.
	1 HOUR DOWN TIME LOADING OUT POWER SWIVEL
	WEATHERFORD FISHING TOOL HAND ON LOCATION
	SINCLAIR DELIVERED TWO PALLETS OF GEL
	SINCLAIR HAD SECOND DELIVERY OF LCM

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily Cum.		Daily Cum.		Daily Cum.	

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 17, 2018

AFE #: _____ Supr: _____ Days on Well: 38
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: _____ CWS #9 Toolpusher: _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG. POOH W/ KILL STRING. RIH W/ 6" O.D.
	MAGNET ON BTM OF 2 7/8" PH-6 TBG, SET DOWN @ 850'. POOH W/ ASSY, RECOVERED
	HAND FULL OF METAL SHAVINGS AND TWO PIECES OF 1/4" X 1" X 1 1/4" METAL PIECES.
	RIH W/ 6 1/4" O.D. WASHOVER SHOE W/ 2' EXTENTION THEN FIVE 4 3/4" DRILL COLLORS THEN
	2 7/8" PH-6 TBG TO TOP OF FISH @ 850'. RIGGED PUMP AND SURFACE EQUIP TO REVERSE
	CIRCULATE. PUMPED AWAY 60 BBLs H2O @ 2.5 BPM W/ APPROX 3/4" STREAM FOR RETURNS.
	CHANGED PUMP AND SURFACE EQUIP BACK OVER TO CIRCULATE. CIRCULATED AND
	ROTATED ASSY PAST 850' DOWN TO 873' IN 3 1/2 HOURS WHEN ASSY BECAME STUCK.
	WORKED FREE IN 15 MIN'S PULLING MAX OF 100K. CIRCULATED HOLE CLEAN. POOH W/
6:00PM	ASSY. SECURED WELL TILL A.M.
	PATRIOT DELEVERED MUD AND PULLED DOWN CELLOR AND CUTTING BIN
	WEATHERFORD FISHING TOOL HAND ON LOCATION

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 6,633.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 14, 2018

AFE #: _____		Supr: XXXXXXXXXX	Days on Well: 37
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: CWS #9 _____	Toolpusher: XXXXXXXXXX	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. LOWERED TBG BACK DOWN TO 849' CHANGED HOLE OVER TO FRESH H2O W/ CITY H2O LINE. RIGGED UP TIGER WIRELINE W/ LUBICATOR AND RIH W/ VIDEO CAMERA AND INSPECTED AREA BETWEEN 844' AND 850.60'. APPEARED TO HAVE SEVERAL METAL PIECES LAYING ON TOP OF 4 3/4" FISH. RIGGED DOWN TIGER. RIH W/ 5 1/2" O.D. MAGNET ON 2 7/8" PH-6 TBG, SET DOWN @ 850'. POOH AND RECOVERED HAND FULL OF SHAVINGS AND THREE PIECES OF METAL LARGEST BEING 1/4" X 2" X 3 1/2" AND 1/4" X 1" X 1 1/2" . RIH W/ OPENED TBG TO 750' SECURED WELL AND RIG TILL 12-17-2018.
6:30PM	RETURNED TO VENTURA YARD
	WEATHERFORD DELIVERED THREE 2 7/8" EUE PUP JTS
	WEATHERFORD BROUGHT BY RENTAL TICKETS
	TIGER WIRELINE ON LOCATION FOR WIRELINE WORK
	DOWN HOLE VIDEO ON LOCATION W/ CAMERA
	PATRIOT PULLED LOAD OF WASTE WATER

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,770.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 12, 2018

AFE #: _____		Supr: XXXXXXXXXX	Days on Well: <u>35</u>
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: _____	CWS #9	Toolpusher: XXXXXXXXXX	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. CONTINUED RIH W/ 6 1/4" CONCAVE MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG. SET DOWN @ 849.65', PICKED UP POWER SWIVEL AND MILLED TO 850.15'. CIRCULATED HOLE CLEAN. POOH W/ MILL ASSY. REMOVED AND CLEANED OUT FLOWLINE. SECURED WELL AND RIG TILL A.M.
1:00PM	XXXXXXXXXX ATTENDED R.D. OLSON WEEKLY COORDINATION AND SAFTY MEETING
	NO DELIVERIES TODAY

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 4,954.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 11, 2018

AFE #: _____ Supr: ██████████ Days on Well: 34
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG AND PUMP. LOWERED 5 1/2" BLADED JUNK MILL BACK DOWN AND CONTINUED MILLING FROM 845' TO 848' WHEN MILL STOPPED MAKING HOLE. POOH W/ MILL ASSY AND FOUND MILL WORN TO 5 1/4" . RIH W/ 6 1/4" TAPPED MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. MILLED FROM 846' TO 848' WHEN DRIVE HEAD OF POWER SWIVEL LOCKED UP. CIRCULATED HOLE CLEAN. POOH W/ MILL ASSY. FOUND 5' PIECE OF 4 3/4" O.D. PIECE OF TBG W/ 5 1/4" O.D. COLLOR ON THE BTM OF THE PIECE STUCK ON THE BTM OF THE TAPPED MILL. RIGGED DOWN AND LOADED OUT FAILED POWER SWIVEL AND RIGGED UP EXCHANGE SWIVEL. RIH W/ 6 1/4" CONCAVE MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG TO 400' AND SECURED WELL AND RIG
6:30PM	TILL A.M.
	2 HOURS DOWN TIME REPLACING POWER SWIVEL
	PATRIOT CLEANED OUT SAND TRAP OF PUMP
	WEATHERFORD DELIVERED DIESEL
	WEATHERFORD HAD SECOND DELIVERY OF TAPPED MILLS
	WEATHERFORD HAD THIRD DELIVERY OF EXCHANGE POWER SWIVEL
	JOHN PHILIPS PICKED UP TWO USED MILLS AND DROPPED OFF TWO MILLS

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 7,316.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 10, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 33
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

5:00AM	DROVE TO LOCATION. HELD JSA. SERVICED RIG. CONTINUED POOH W/ 6 1/8" BLADED JUNK MILL ASSY, FOUND MILL WORN DOWN TO 5 1/4" @ NOSE. RIH W/ 6 1/4" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. MILLED FROM 843' TO 847' IN 3 1/2" HOURS WHEN MILL STOPPED MAKING HOLE AND JUNK CHASED MILL TO 845'. POOH W/ MILL ASSY AND FOUND NOSE WORN TO 5". RIH W/ 5 1/2" MAGNET ON 2 7/8" PH-6 TBG, SET DOWN @ 847', POOH W/ MAGNET AND RECOVERED HAND FULL OF FINE METAL SHAVINGS. RIH W/ 5 1/2" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. SET DOWN @ 845'. MILLED @ 845' FOR 1 HOUR MAKING NO HOLE. CIRCULATED HOLE CLEAN AND PULLED MILL TO 720' AND SECURED WELL AND RIG TILL
6:30PM	A.M.
	WEATHERFORD DELIVERED 2 MILLS

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily		Cum.		Daily		Cum.	

Daily Total: \$ 7,086.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 7, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 32
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. LOWERED 6 1/4" BLADED JUNK MILL BACK DOWN, MILLED @ 843' FOR 30 MIN'S MAKING NO HOLE. POOH W/ MILL ASSY, FOUND NOSE OF MILL WORN DOWN TO 5 1/4" . RIH W/ 5 1/2" O.D. MAGNET ON TBG , SRT DOWN @ 843'. POOH W/ MAGNET ASSY AND FOUND HAND FULL OF METAL SHAVINGS W/ APROX 10 PIECES OF 1/4" X 1/2" X 1/2" PIECES. RIH W/ 6 1/8" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG TO 843'. PICKED UP POWER SWIVEL AND MILLED FROM 843' TO 845', CIRCULATED HOLE CLEAN AND PULLED MILL ASSY TO 408'. SECURED WELL AND RIG TILL 12-10-2018
7:00PM	RETURNED TO VENTURA YARD.
	JOHN PHILIPS DELIVERED JUNG MILL

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

CSGLNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS						

COSTS RECORD:		Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,966.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 6, 2018

AFE #: _____	Supr: ██████████	Days on Well: 31	
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: CWS #9 _____	Toolpusher: ██████████	_____	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. CONTINUED RIH W/ 6 1/8" CONCAVE MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG TO 842'. BROKE CIRCULATION W/ 10 BBLS, FILLED PIT W/ FRESH H2O AND CONDITIONED MUD. MILLED FROM 842' TO 843' IN 3 1/2" HOURS WHEN MILL STOPPED MAKING HOLE. POOH W/ MILL ASSY AND FOUND MILL COMPLETELY WORN DOWN AND WORN TO 5 7/8" AT NOSE. RIH W/ 6 1/4" BLADDED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG. CONTINUED MILLING FROM 843' TO 844' IN 1 1/2" HOURS.
6:30PM	PULLED MILL ASSY TO 751' AND SECURED WELL AND RIG TILL A.M.
	WEATHEFORD DELIVERED DIESEL TODAY
	SINCLAIR DELIVERED 80 SX GEL MUD \$919.80
]	

TUBING / ROD STRING

NO. JOINTS							

							WELL PROFILE					
							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 7,316.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 5, 2018

AFE #: _____ Supr: ██████████ Days on Well: 30
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. LOWERED BIT BACK DOWN AND CONTINUED DRILLING DOWN
	THRU CEMENT FROM 635' BREAKING THRU @ 640'. CONTINUED REAMING DOWN FROM
	640' TO HARD CEMENT @ 800'. DRILLED DOWN TO 832'. CHANGED OUT MUD IN PIT.
	CONTINUED DRILLING DOWN TO 836' WHEN WE LOST MOST ALL CIRCULATION LOSING
	30 BBLs. PULLED BIT TO 400'. TOPPED OFF PIT W/ FRESH H2O AND CONDITIONED MUD.
	BROKE CIRCULATION W/ 20 BBLs PUMPED, TOPED OFF PIT AND RECONDITIONED MUD.
	RIH W/ BIT TO 717' AND BROKE CIRCULATION W/ .5 BBLs. CONTINUED RIH AND CONTINUED
	DRILLING 836' TO 842' MAKING EXTREMELY SLOW HOLE. CIRCULATED HOLE CLEAN AND
	POOH W/ BIT ASSY. FOUND BIT W/ SEVERAL BUTTONS WORN OFF. RIH W/ 6 1/8" CONCAVE
	MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG TO 400' AND SECURED WELL AND
5:30PM	RIG TILL A.M. NOTE; HELD TRIP DRILL @ 7:30AM
	JOHN PHILIPS DELIVERED JUNK MILL

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,923.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 4, 2018

AFE #: _____ Supr: Days on Well: 29
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher:

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30AM	HELD JSA. SERVICED RIG. CONTINUED RIH W/ 6 1/4" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS AND 2 7/8" PH-6 TBG. SET DOWN @ 556' , PICKED UP POWER SWIVEL AND MILLED TO 564' IN 3 1/2 HOURS. DRILLED OUT CMT FROM 564' TO 626' WHEN MILL STOPPED MAKING HOLE. POOH W/ MILL ASSY, FOUND MILL COMPLETELY WORN OUT AND DOWN TO 5 15/16". RIH W/ 6 1/4" BUTTON BIT W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG, SET DOWN AT 568'. PICKED UP POWER SWIVEL AND WORK THRU TIGHT SPOT IN 5 MIN'S . CONTINUED RIH TO 626', DRILLED FROM 626' TO 635' W/ LOTS OF WOOD AND CMT IN RETURNS BUT MAKING VERY SLOW HOLE. CIRCULATED HOLE CLEAN AND PULLED BIT TO 400'.
6:30PM	SECURED WELL AND RIG TILL A.M.
	WEATHERFORD DELIVERED 4 1/2" SLIT DIES
	PREMIER DELIVERED MILLS

TUBING / ROD STRING

NO. JOINTS							

WELL PROFILE

	CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 7,316.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: December 3, 2018

AFE #: _____		Supr: 	Days on Well: 28
Lease / Well #: _____	DOW RGC-10	EFTD: _____	_____
Contr / Rig: _____	CWS #9	Toolpusher: 	_____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00am	DROVE TO LOCATION. HELD JSA. SERVICED RIG. BROKE DOWN MAGNET ASSY. RIH W/ 6 1/4" CONVEX MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. SET DOWN @ 555', PICKED UP POWER SWIVEL AND MILLED DOWN FROM 555' TO 556' IN 4 HOURS. POOH W/ ASSY AND FOUND MILL COMPLETELY WORN DOWN AND WAS WORN TO 5 3/4" O.D. RIH W/ 5 1/2" O.D. MAGNET ASSY W/ TBG, SET DOWN SEVERAL TIMES @ 556', POOH W/ ASSY AND FOUND HAND FULL OF VERY FINE SHAVINGS W/ 3 SMALL PIECES OF 1/4" X 1" X 1" METAL. RERAN MAGNET SETTING DOWN ONE TIME @ 556'. POOH ,RECOVER HAND FULL OF FINE METAL SHAVINGS. RIH W/ 6 1/4" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG TO 400', SECURED WELL AND RIG TILL A.M.
6:00PM	BLACK JACK MECHANIC PREFORMED REPAIRS TO RIG PUMP PATRIOT HAD 2 TRUCKS CHANGE OUT CUTTING BIN PATRIOT VACUUM TRUCK PULLED CELLOR AND CUTTING BIN WEATHERFORD DELIVERED DIESEL SINCLAIR DELIVERED MUD SUPPLIES

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

									CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.			Daily	Cum.			Daily	Cum.

Daily Total: \$ 6,890.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 30, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 27
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. RIH W/ 5 1/2" MAGNET ON 2 7/8" PH-6 TBG. SET DOWN @ 554', PICKED UP POWER SWIVEL AND WASHED DOWN TO 555' BUT UNABLE TO WORK PAST. POOH W/ MAGNET ASSY, RECOVERED A HAND FULL OF VERY SMALL METAL MATERIAL. RIH W/ 6 1/4" BUTTIN BIT W/ FIVE 4 3/4' DRILL COLLORS THEN 2 7/8" TBG. SET DOWN @ 555' AND UNABLE TO WORK DEEPER W/ NO RECOVERY IN RETURNS. POOH W/ BIT ASSY. RIH W/ 5 1/2" MAGNET ON TBG, SET DOWN @ 555' SEVERAL TIMES, POOH W/ NO RECOVERY. RERAN MAGET SETTING DOWN @ 555'. POOH W/ NO RECOVERY. RERAN 5 1/2" O.D. MAGNET SETTING DOWN @ 555' ATEMPTED TO WORK DEEPER BY SETTING BLOCKS DOWN ON TOP
3:30PM	OF TBG TO NO AVAIL. POOH , NO RECOVERY. SECURED WELL AND RIG TILL 12-3-2018

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,393.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 29, 2018

AFE #: _____	Supr: ██████████	Days on Well: <u>26</u>
Lease / Well #: _____	DOW RGC-10	EFTD _____
Contr / Rig: _____	CWS #9	Toolpusher: ██████████

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG . POOH W/ 6 1/4" BLADED JUNK MILL ASSY. RIH W/ 6 1/4" CONVEX MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. MILLED FROM 555' TO 555.5' IN 4 HOURS. POOH W/ MILL ASSY AND FOUND MILL COMPLETELY WORN DOWN.. RIH W/ 5 1/2" O.D. MAGNET ON BTM OF 2 7/8" PH-6 TBG, SET DOWN 4 TIMES @ 555.5'. POOH W/ ASSY AND RECOVERED 13 METAL PIECES LARGEST BEING 1/2" THICK X 3" X 2". RERAN MAGNET, POOH AND RECOVERED 6 MORE PIECES W/ LARGEST BEING 1/4" THICK X 4 3/4" X 4". SECURED
5:30PM	WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS																			

COSTS RECORD:	Daily	Cum.					Daily	Cum.				Daily	Cum.

Daily Total: \$ 6,393.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 28, 2018

AFE #: _____ Supr: █ Days on Well: 25
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: █

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG . POOH W/ 6 1/4" JUNK MILL ASSY, FOUND MILL COMPLETELY
	WORN DOWN. RIH W/ 6 1/4" BUTTON BIT W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6
	TBG. TAGGED DOWN @ 554'. PICKED UP POWER SWIVEL AND DRILED FROM 554 TO 554.6
	IN 3 HOURS. POOH W/ ASSY. RIH W/ 6 1/4" BLADED JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS
	THEN 2 7/8" PH-6 TBG. MILLED FROM 554.6 TO 555 IN FOUR HOURS . PULLED MILL TO 470'
6:30PM	AND SECURED WELL AND RIG TILL A.M.
	NOTE; SOS PICKED UP 3 1/2" DRILL COOLOR AND ALL EXTRA WEATHERFORD TOOLS AND
	SUBS. WEATHEFORD DELIVERED DIESEL FOR POWER SWIVEL . JPM DROPPED OFF 6 1/4"
	MILLS AND PICKED UP 4 3/4" PONY DRILL COLLOR

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

	CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS				

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,756.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 27, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 24
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: _____ CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG . RAISED WORK FLOOR OUT OF WAY. NIPPLED DOWN FLOW LINE AND BOE. LIFTED AND SWUNG BOE OUT OF WAY FOR WELDER. HAD WELDER WELD 7" LANDNG PLATE TO WELL HEAD. REINSTALLED BOE AND FLOW LINE. LOWERED RIG FLOOR BACK DOWN. BROKE OUT ALL LARGER TOOL JT X-OVERS AND LAID DOWN 3 1/2" DRILL COLLORS FROM DERRICK. RIH W/ 6 1/4" JUNK MILL W/ FIVE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG, SET DOWM @ 515', PICKED UP POWER SWIVEL AND MILLED AND DRILL DOWN TO 527' W/ CEMENT AND METAL IN RETURNS, VERY SLOW DRILLING. CIRCULATED HOLE
6:30PM	CLEAN AND PULLED MILL BACK UP INTO 7" CSG. SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,756.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 26, 2018

AFE #: _____ Supr: XXXXXXXXXX Days on Well: 23
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: _____ CWS #9 Toolpusher: XXXXXXXXXX _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00am	DROVE TO LOCATION. HELD JSA. SERVICED RIG. RIH W/ 10 5/8" BULL NOSE JUNK MILL ASSY W/ THREE 4 3/4" DRILL COLLORS THEN 2 7/8" PH-6 TBG. SET DOWN @ 308' PICKED UP POWER SWIVEL AND REAMED THRU IN 5 MIN'S. CONTINUED RIH SETTING DOWN @ 398'. ATEMPTED TO MILL THRU IN 30 MIN'S TO NO AVAIL AFTER MILLING DOWN 6". POOH W/ MILL ASSY. RIH W/ ONE JT 7" CSG W/ CUT LIP ON BTM. ATEMPTED TO WORK PAST 308' TO NO AVAIL. POOH W/ ASSY. HAD WELDER CUT 18" LONG SLIDE CUT ON BTM OF CSG. RIH W/ ASSY AND WORKED PAST 308' AND 398' BY WORKING UP AND DOWN WHILE TURNIG ASSY 1/4 TURN, CONTINUED RIH TO 484' W/ NO RESTRICTION. POOH W/ ASSY TO CSG. RIGGED UP WEATHERFORD CSG TONGS, RIH W/ 456' OF 7" #23 FLUSH MAX II CSG PASSING THRU 308' AND 398' W/ NO RESTRICTION. HAD WELDER INSTALL LANDING RING ON LAST JT. LANDED CSG IN 12" WELL HEAD W/ BTM OF CSG @ 566' W/ KB. SECURED WELL AND RIG TILL
6:30 PM	A.M.

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,814.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 20, 2018

AFE #: _____ Supr: █ Days on Well: 22
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: CWS #9 Toolpusher: █ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. LOWERED 7 3/4" JUNK MILL BACK DOWN AND ATEMPTED TO WORK PAST 308' TO NO AVAIL. POOH W/ MILL ASSY . RIH W/ 8 1/2" BUTTOM BIT W/ FOUR 3 1/2" DRILL COLLORS AND 2 7/8" PH-6 TBG, UNABLE TO WORK PAST 308'. POOH W/ BIT ASSY. RIH W/ ONE JT 7" CSG W/ CUT LIP ON BTM, UNABLE TO WORK PAST 308'. PULLED AND
2:30PM	LAI D DOWN 7" JT. SECURED WELL AND RIG TILL 11-26-2018
	WEATHERFORD DELIVERED X-OVER FROM 2 7/8" EUE X 2 7/8" PH-6 FOR 7" CSG LIFTER

TUBING / ROD STRING

NO. JOINTS									

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 5,544.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 19, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 21
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: _____ CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00AM	DROVE TO LOCATION. SERVICED RIG AND HELD JSA. MADED UP AND RIH W/ 8 1/2" BUTTON BIT W/ FOUR 3 1/2" DRILL COLLORS THEN 2 7/8" PH-6 TBG. SET DOWN @ 308' AND WORKED PAST BY WORKING BIT UP AND DOWN AND FROM SIDED TO SIDE @ SURFACE. HAD TO CONTINUE WORKING BIT DOWN TO TIGHT SPOT @ 398', HAD TO PICK UP POWER SWIVEL AND ROTATE BIT THRU 398'. CONTINUED RIH SETTING DOWN @ 548' PICKED UP POWER SWIVEL AND DRILL DOWN ON VERY HARD MATERIAL FROM 548' TO 554'. CIRCULATED HOLE CLEAN AND POOH W/ BIT ASSY, BIT STILL IN GOOD CONDITION. RIH W/ 7 3/4" FLAT BTM JUNK MILL W/ DRILL COLLORS AND 2 7/8" PH-6 TBG. ATEMPTED TO WORK PAST 308' TO NO
6:30PM	AVAIL. SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

						CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.	

Daily Total: \$ 6,814.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 16, 2018

AFE #: _____ Supr: XXXXXXXXXX Days on Well: 20
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: _____ CWS #9 Toolpusher: XXXXXXXXXX _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30am	HELD JSA. SERVICED RIG. RIH W/ 8 3/4" BIT W/ 3- 4 3/4" DRILL COLLORS THEN TBG, UNABLE TO WORK PAST 308', POOH W/ ASSY. RIH W/ 8 3/4" BIT ON BTM OF TBG, UNABLE TO WORK PAST 308', POOH W/ ASSY. RIH W/ 9 7/8" BULL NOSED JUNK MILL ON BTM OF TBG AND MILLED THRU TIGHT @ 308' IN ONE HOUR. CONTINUED RIH TO 505' W/ NO OTHER RESTRICTION. PULLED MILL ASSY TO 308', ATEMPTED TO PASS BACK THRU 308' TO NO AVAIL. PICKED UP POWER SWIVEL AND REAMED TIGHT SPOT @ 308' TO 318' FOR 30 MIN'S. POOH W/ MILL ASSY
5:30PM	SECURED WELL AND RIG TILL 11-19-2018

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS					

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,633.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 15, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 19
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

6:30am	HELD JSA. SERVICED RIG. POOH W/ 9 7/8" BULL NOSE JUNK MILL ASSY. RIH W/ 8 3/4" BIT ASSY ON BTM OF TBG. WORKED PAST 308' BY SHAKING TBG BY HAND, CONTINUED RIH SETTING DOWN @ 398' . HAD TO PICK UP POWER SWIVEL TO ROTATE PAST 398'. CONTINUED RIH SETTING DOWN @ 548', DRILLED DOWN TO 549' VERY SLOWLY AND STOPPED MAKING HOLE @ 549'. POOH W/ BIT ASSY. RIH W/ 8 3/4" BLADED JUNK MILL ASSY ON TBG, WORKED PAST 308' AND 398' BY HAND. PICKED UP POWER SWIVEL AND MILLED FROM 549' TO 549.6'.
5:30PM	POOH W/ MILL ASSY AND SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS																

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 6,393.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 14, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 18
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30am	HELD JSA. SERVICED RIG. PREFORMED TRIP DRILL. LOWERED 9 7/8" BULL NOSE JUNK MILL BACK DOWN PASSING THRU 308' W/ LITTLE RESTRICTION, CONTINUED RIH SETTING DOWN AT 398'. PICKED UP POWER SWIVEL AND MILLED FROM 398' TO 400' TO FALL THRU, REAMED TIGHT SPOT FOR 15 MIN'S. CONTINUED RIH SETTING DOWN @ 515', MILLED FROM 515' TO 517' TO FALL THRU. CONTINUED RIH, SET DOWN @ 541'. DRILLED FROM 541' TO 548' VERY SLOWLY, STOPPED MAKING HOLE @ 548'. POOH W/ MILL ASSY. RIH W/ 8 3/4" BIT ASSY BUT UNABLE TO WORK PAST 308'. POOH W/ ASSY. RIH W/ 9 7/8" DRAG BIT ASSY BUT UNABLE TO WORK PAST 308', POOH W/ ASSY. RIH W/ 9 7/8" BULL NOSE JUNK MILL ASSY, PICKED UP POWER SWIVEL AND WORKED PAST IN 5 MIN'S. PULLED ASSY ABOVE TIGHT SPOT AND
6:30PM	SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS								

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,756.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 13, 2018

AFE #: _____ Supr: ██████████ Days on Well: 17
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30am	HELD JSA. SERVICED RIG. POOH W/ 8 11/16" TAPPERED MILL ASSY. MADE UP AND RIH W/ 7 1/2" TAPPERED MILL THEN TWO 4 3/4" DRILL COLLORS THEN 8 7/8" STRING MILL THEN ONE 4 3/4" DRILL COLLOR THEN TBG, SET DOWN @ 308' . ATEMPTED TO WORK PAST W/ TBG TONGS TO NO AVAIL. PICKED UP POWER SWIVEL AND AND ATEMPTED TO WORK PAST TO NO AVAIL. POOH W/ MILL ASSY. RIH W/ 8 3/4" BIT ASSY AND ATEMPTED TO WORK PAST 308' TO NO AVAIL, POOH W/ BIT ASSY. RIH W/ 9 7/8" BULL NOSED JUNK MILL ASSY. PICKED UP POWER SWIVEL AND MILLED FROM 308' TO 310' WHEN MILL PASSED THRU. CONTINUED RIH W/ ASSY TAGGING DOWN @ 398'. PULLED ASSY TO 256' AND SECURED WELL AND RIG
6:30PM	TILL A.M.

TUBING / ROD STRING

NO. JOINTS									

WELL PROFILE

												CSG/LNR		PERFS/SLOTS	
												SIZE	WT.		GRADE

COSTS RECORD:	Daily		Cum.	Daily		Cum.	Daily		Cum.

Daily Total: \$ 6,756.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 12, 2018

AFE #: _____ Supr: ██████████ Days on Well: 16
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: ██████████ _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

7:00AM	HELD JSA. SERVICED RIG. LOWERED 7 1/2" TAPPED MILL ASSY BACK DOWN TO 546', RIGGED UP REPLACEMENT POWER SWIVEL AND CONTINUED DRILLING DOWN VERY SLOWLY TO 550'. CIRCULATED HOLE CLEAN AND POOH W/ MILL ASSY. RIH W/ 7 1/2" BIT ASSY, UNABLE TO WORK PAST 398'. POOH W/ BIT ASSY. RIH W/ 5 5/8" BIT ASSY, UNABLE TO WORK PAST 398', POOH W/ BIT ASSY. RIH W/ 8 11/16" TAPPED MILL ASSY AND ATEMPETED 6:30PM TO WORK PAST TIGHT SPOT @ 308'. SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

	CSG/LNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 6,814.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 10, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 15
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: _____ CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00AM	HELD JSA. SERVICED RIG. REMOVED 7 1/2" BIT AND MADE UP 7 1/2" TAPPERED MILL ASSY. RIH AND WORKED THRU TIGHT SPOT @ 398' W/ TBG TONGS. CONTINUED RIH AND TAGGED DOWN @ 532', PICKED UP POWER SWIVEL AND MILLED THRU TIGHT SPOT FROM 532' TO 533'. CONTINUED DRILLING DOWN TO 546' WHEN POWER UNIT ON POWER SWIVEL FAILED. CIRCULATED HOLE CLEAN AND POOH W/ MILL ASSY. LOADED OUT POWER SWIVEL AND
12:00PM	SECURED WELL AND RIG TILL 11-12-2018
	\$9000 EST COST OF WEATHERFORD 7 1/2" TAPPERED MILL W/ SERVICED MAN

TUBING / ROD STRING

NO. JOINTS						

WELL PROFILE

					CSG/LNR					
					SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 5,455.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 9, 2018

AFE #: _____ Supr: _____ Days on Well: 14
Lease / Well #: _____ DOW RGC-10 EFTD _____
Contr / Rig: CWS #9 Toolpusher: _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

7:00AM	HELD JSA. SERVICED RIG . 0 PSI ON WELL. REMOVED 8 7/8" TAPPED MILL FROM BTM OF 8 7/8" STRING MILL AND INSTALLED 8 11/16" JUNK MILL . RIH AND WORKED THRU TIGHT SPOT @ 309' AND CONTINURED RIH TO TIGHT SPOT @ 397'. PICKED UP POWER SWIVEL AND MILLED FROM 397' TO 398' MAKING VERY SLOW HOLE, CIRCULATED HOLE CLEAN AND POOH W/ MILL ASSY. RIH W/ 8 3/4" BIT ASSY , UNABLE TO DRILL PAST 398', POOH W/ BIT ASSY. RIH W/ 7 1/2" BIT ASSY ROTATED THRU 309' W/ TONGS AND CONTINUED RIH TO 398'. PICKED UP POWER SWIVEL AND DRILL PAST 398' AND CONTINUED REAMING AND DRILLING DOWN TO 532' WHERE BIT WAS DRILLING VERY SLOW AND TORQUING UP.
5:30PM	CIRCULATED HOLE CLEAN AND POOH W/ BIT ASSY. SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS					

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 6,211.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 8, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: <u>13</u>
Lease / Well #: _____	DOW RGC-10	EFTD: _____	
Contr / Rig: <u>CWS #9</u>	Toolpusher: [REDACTED]		

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00AM	HELD JSA. SERVICED RIG. 0 PSI ON WELL. POOH W/ JUNK MILL ASSY. MADE UP AND RIH W/ 8 7/8" TAPERED MILL W/ 8 7/8" STRING MILL DIRECTLY ON TOP OF TAPPERED MILL. TAGGED DOWN @ 309'. POICKED UP POWER SWIVEL AND MILLED THRU TIGHT SPOT FROM 309' TO 313', CONTINUED REAMING DOWN TO 461'. MILLED AND DRILLED DOWN FROM 461' TO 518' WHEN MILL ASSY STOPPED MAKING HOLE. CIRCULATED HOLE CLEAN AND POOH W/ MILL ASSY. SECURED WELL AND RIG TILL A.M.
	NOTE; PREFORMED TRIP DRILL @ 9:00AM
	EST COST OF 8 7/8" MILL ASSY @ \$ 17,500

TUBING / ROD STRING

NO. JOINTS									

WELL PROFILE

									CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.
Daily Total: \$			6,211.00	Cum. Total				

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 7, 2018

AFE #: _____
 Lease / Well #: _____
 Contr / Rig: CWS #9

DOW RGC-10
 Toolpusher: _____

Supr: _____ Days on Well: 12
 EFTD: _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00AM	HELD JSA. SERVICED RIG . NO PSI ON WELL. RIH W/ 8 3/4" BIT ASSY, ADDED ONE MORE 4 3/4" DRILL COLLOR. TAGGED DOWN @ 310'AND ROTATED THRU EASILY W/ TBG TONGS, CONTINUED RIH SETTING DOWN ON FILL @ 394'. PICKED UP POWER SWIVEL AND DRILLED DOWN FROM 394' TO 461', DRILLING VERY HARD @ 461'. CIRCULATED HOLE CLEAN AND POOH W/ BIT ASSY. MADE UP AND RIH W/ 8 11/16" JUNK MILL ASSY, SET DOWN @ 308' ATEMPTED TO ROTATE PAST W/ TBG TONGS TO NO AVAIL. PICKED UP POWER SWIVEL AND MILLED FOR 30 MIN'S MAKING 6". CIRCULATED HOLE CLEAN AND PULL MILL HIGH.
5:30PM	SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

										CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.			Daily	Cum.			Daily	Cum.

Daily Total: \$ 6,211.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 6, 2018

AFE #: _____ Supr: XXXXXXXXXX Days on Well: 11
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: CWS #9 Toolpusher: XXXXXXXXXX _____

Objective: REABANDONMENT

Time / Hrs **DESCRIPTION DAILY ACTIVITY**

7:00AM	HELD JSA. SERVICED RIG. NO PSI ON WELL. POOH W/ 9 7/8" BULL NOSE MILL ASSY. MADE UP AND RIH W/ 8 3/4" BIT ASSY. TAGGED DOWN @ 308', DRILLED DOWN FROM 308' TO 440'
	DRILLING THRU NUMEROUS HARD SPOTS AND TIGHT SPOTS W/ MOSTLY CEMENT AND VERY LITTLE WOOD IN RETURNS. CIRCULATED HOLE CLEAN, POOH W/ BIT ASSY. BIT DID
5:30PM	NOT HANG UP AT ANY SPOTS WHILE POOH. SECURED WELL AND RIG TILL A.M.
	NOTE; HAD VAC TRUCK HAUL IN 50 BBLs MUD TO REPLACE MUD LOST DOWN HOLE
	ON 11-5-2018 HAD WELDER ON LOCATION FABRICATING NEW PITCHER NIPPLE

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.	

Daily Total: \$ 6,211.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: November 2, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 10
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00am	HELD JSA. SERVICED RIG. LOWEREED BIT BACK DOWN AND CONTINUED DRILLING OUT SOLID CEMENT FROM 72' TO 85'. POOH W/ TBG TO DRILL COLLOR, PICK UP 1 DRILL COLLOR FOR MORE WEIGHT ON BIT. RIH W/ TBG AND PICKED UP POWER SWIVEL AND CONTINUED DRILLING OUT CEMENT STRINGERS FROM 85' TO 165' WHEN DRILLED INTO GAS POCKET, SECURED WELL CONDITIONED MUD AND CIRCULATED OUT GAS POCKET. CONTINUED REAMING DOWN FROM 165' TO 309'. DRILLED OUT , DRILLING HARD AND SLOW FROM 309' 310.5' WHEN VERY LARGE PIECES OF WOOD PLUGGED OFF PITCHER NIPPLE. PULLED UP AND
4:30PM	REMOVED 12' MUD-X TO CLEAN OUT PITCHER . SECURED WELL AND RIG TILL 1-5-2018
	HAD OILY RETUENS OVER SHACKER
	AT 10:30AM DALE PETERSON W/ DOGGER WITNESSED AND APPROVED BOE

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

CSG/NR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 6,088.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 31, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 8
Lease / Well #: _____ DOW RGC-10 EFTD: _____
Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

7:00am	HELD JSA. SERVICED RIG. NIPPLED DOWN AND LOADED OUT 20" BOE, ACCUMALATOR, GENATRATOR AND OTHER JOHN PHILL EQUIP. ASSISTED WELDER TO REMOVE 24" STARTING FLANGE, INSTALL PLATES FROM 24" CSG TO 12" CSG , WELD ON 12-900 3M SOWO WELLHEAD. INNSTALLED 12" 3M DOUBLE GATE W/ MUD-X. INSTALLED 6" FLOWLINE. REINSTALLED RIG FLOOR. PICKED UP AND SEATED TEST PLUG IN WELLHEAD, FILLED STACK AND SECURED W/ 2 7/8" PIPE RAMS. TESTED BOE 300PSI LOW / 2000 PSI HIGH SOLID FOR 10 MIN'S. SECURED
6:00PM	WELL AND RIG TILL A.M.
	AT 10:45 AM DANIEL DORA W/ DOGGER DEFERRED INSPECTION OF BOE.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

								CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:			Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 6,393.00 Cum. Total

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 30, 2018

AFE #: _____	DOW RGC-10	Supr: _____	Days on Well: <u>7</u>
Lease / Well #: _____		EFTD: _____	
Contr / Rig: <u>CWS #9</u>	Toolpusher: _____		

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00am	HELD JSA. SERVICED RIG. LOWERED 2 7/8" TOP JOB JT BACK DOWN IN BETWEEN 12" AND 24" CSG TO 41'. WAITED ON BJ CEMENTING. RIGGED UP BJ CMT AND PLACED 51 CUFT 14.6 PPG TOP JOB CEMENT FROM 41' TO SURFACE ,CIP @ 10:45AM. PULLED AND LAID DOWN 2 7/8" TBG, RIGGED DOWN BJ. WHILE WAITING ON CEMENT TO HARDEN RIGGED UP WEATHER FORD HYD TONGS AND BROKE DOWN 13 3/8" WASHOVER ASSY. HAD CRANE OFF LOAD 12" DOUBLE GATE BOE AND ACCUMALATOR. LOADED OUT 8" DRILL COLLOR AND EXTRA EQUIP. CEMENT STILL NOT SET UP AFTER 5 HOURS. SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 5,848.00 Cum. Total _____

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 29, 2018

AFE #: _____ Supr: Days on Well: 6
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher:

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
5:00am	HELD JSA. SERVICED RIG AND PUMP. LOWERED 13 3/8" WASHOVER ASSY BACK DOWN AND ROTATED AND CIRCULATED OVER 11 3/4" STUB FROM 41' TO 50', CIRCULATED HOLE CLEAN. PULLED AND LAID DOWN POWER SWIVEL AND WASHOVER TOOL ASSY. PICKED UP AND RIH W/ 1 JT 12" CSG W/ 11 3/4" CSG BOWL ASSY W/ PACK OFF. HAD TO REMOVED ELEVATORS AND BAILS FROM BLOCKS AND HAMMER DOWN ON BLIND FLANGE ON TOP OF 12" FOR APROX 5 1/2 HOURS TO DRIVE ASSY OVER STUB TO 49'. PULLED 40K OVER TO SET PACK OFF ASSY. RIH W/ 2 7/8" TBG W/ SUBS TO 41', PULLED 2 7/8" BACK OUT AND SECURED WELL
5:00PM	AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

									CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.

Daily Total: \$ 22,391.00 Cum. Total \$ 70,596.00

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 27, 2018

AFE #: _____		Supr: <u> </u>	Days on Well: <u>5</u>
Lease / Well #: _____	DOW RGC-10	EFTD: <u> </u>	
Contr / Rig: <u> CWS #9 </u>	Toolpusher: <u> </u>		

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
7:00AM	DROVE TO LOCATION. OFF LOADED 11-3/4" PACKOFF ASSY AND 40' JT OF 12" PIPE, WELL
	HEAD TEST PLUG AND 2 JTS 2 7/8" TOP JOB TBG. SET UP R&R WELDING. WELDED PACKOFF
	ASSY TO 12" PIPE. WELDED SLIP ON FLANGE TO 12"AND 2" COLLAR TO BLIND FLANGE.
3:30PM	BJ REP CHECKED OUT LOCATION ACCESS. NO INCIDENTS RECORDED.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

							CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.		Daily	Cum.		Daily	Cum.
Daily Total:	\$	10,475.00	Cum. Total	\$	48,185.00			

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 26, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 4
 Lease / Well #: _____ DOW RGC-10 EFTD: _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED]

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

7:00AM	HELD JSA. SERVICED RIG. LAID DOWN 20" MILL ASSY AND 8' DRILL COLLOR. PICKED UP AND MADE UP 13-3/8" X 13' WASH OVER ASSY W/ 4 3/4" DRILL COLLOR, HAD TO RIG UP WEATHER FORD 13 3/8' HYD TONGS TO MAKE UP TOOLS. WASHED OVER AND ROTATED DOWN OVER 11 3/4" STUB FROM 41' TO 45'. CONDITIONED MUD BACK TO 9.7 PPG / 70 PLUS VISC.
3:30PM	CONTINUED ROTATING AND WASHING OVER TO 50' GETTING CEMENT AND LARGE PIECES OF WOOD IN RETURNS. CIRCULATED CLEAN. PULLED UP AND SECURED WELL AND RIG TILL
10/29/2018	

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

CSG/LNR	SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:		Daily	Cum.		Daily	Cum.	Daily	Cum.

Daily Total: \$ 10,475.00 Cum. Total \$ 48,185.00

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 25, 2018

AFE #: _____		Supr: [REDACTED]	Days on Well: <u>3</u>
Lease / Well #: _____	DOW RGC-10	EFTD _____	
Contr / Rig: <u>CWS #9</u>	Toolpusher: [REDACTED]	_____	_____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

7:00AM	HELD JSA. SERVICED RIG. CONTINUED MILLING OPERATION, MILLED DOWN TO 41' @ 6:00PM.
	PULLED UP AND INSPECTED BTM OF MILL ASSY. NO CLEAR SHOWINGS ON MILL. SECURED
6:00PM	WELL AND RIG TILL A.M.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

CSG/LNR	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.	Daily	Cum.	Daily	Cum.
Daily Total:	\$	12,143.00	Cum. Total	\$	37,710.00	

Daily Total: \$ 12,143.00 Cum. Total \$ 37,710.00

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 24, 2018

AFE #: _____
 Lease / Well #: _____ DOW RGC-10
 Contr / Rig: _____ CWS #9 Toolpusher: _____
 Supr: _____ Days on Well: 2
 EFTD _____

Objective: REABANDONMENT

Time / Hrs DESCRIPTION DAILY ACTIVITY

7:00AM	HELD JSA. SERVICED RIG. INSTALLED AND RIGGED UP 20" 2M BOE W/ 20' PITCHER SPOOL AND FLOW LINE TO MUD PUMP. RIGGED UP RIG FLOOR. RIGGED UP 2.5 POWER SWIVEL W/ DOUBLE DEAD LINES. PICKED UP AND MADE UP 8" DRILL COLLOR ON BTM OF POWER SWIVEL W/ 20" CONCAVE JUNK MILL ON BTM. RIH AND TAGGED @ 35' BELOW RIG FLOOR AND STARTED CIRCULATING AND MILLING FROM 35' , MIILED DOWN 1'-5" IN 4 HOURS.
6:30PM	SECURED WELL AND RIGB TILL A.M.

TUBING / ROD STRING

NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD	REMARKS

WELL PROFILE

	CSG/ANR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:			Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 11,575.00 Cum. Total \$ 25,567.00

INTERACT

DAILY WORKOVER / COMPLETION REPORT

Date: October 23, 2018

AFE #: _____ Supr: [REDACTED] Days on Well: 1
 Lease / Well #: _____ DOW RGC-10 EFTD _____
 Contr / Rig: CWS #9 Toolpusher: [REDACTED] _____

Objective: REABANDONMENT

Time / Hrs	DESCRIPTION DAILY ACTIVITY
6:30AM	HELD JSA. SERVICED RIG. OFF LOADED RIG FROM TOW TRUCK IN MARINA DEL REY.
	MOVED RIG AND EQUIP TO LOCACTION. FOUND THAT RIG PAD WAS NOT STABLE ENOUGH TO SUPPORT RIG. CALLED OUT AND WAITED ON 5- 8'X 20' X 1 1/2" PLATES. SPOTTED RIG PLATES. SPOTTED RIG AND RIGGED UP , INSTALLED RIG ANCHORS AND SECURED RIG.
	SPOTTED CIRCULTION PUMP W/ CUTTING BIN. OFF LOADED DRILL COLLARS, MILLS, BITS AND OTHER ASSORTED EQUIP, HAD WELDER FABRICATE 24" PITCHER NIPPLE FLANGE.
5:00PM	SECURED WELL AND RIG TILL A.M.

TUBING / ROD STRING							REMARKS
NO. JOINTS	FOOTAGE	SIZE	WEIGHT	GRADE	THREAD		

							WELL PROFILE					
							CSG/LNR SIZE	WT.	GRADE	TOP	BOTTOM	PERFS/SLOTS

COSTS RECORD:	Daily	Cum.	Daily	Cum.	Daily	Cum.

Daily Total: \$ 13,992.00 Cum. Total \$ 13,992.00

Appendix G

**Narratives of InterAct Daily Report Summary
Dow RGC 10 Reabandonment
August 6, 2018 through February 26, 2019**

Daily Report Summary
DOW RGC #10 Re-abandonment

Date	Daily Report
8/6/18	Met with R.D. Olsen to discuss job. Exposed top 5' of well with excavator. Well full of cement. Remove thin metal jacket from exterior of well (top 3'). Observed casing was riveted stove pipe unsuitable for installation of riser/BOP. Exposed another 5' (10' total) of pipe looking for competent connection point for riser - all stove pipe. As pipe was being exposed it fell apart in 3' sheets. Water coming in from bottom, hole began sloughing in. Covered back up to 4' from surface.
8/7/18	Met with R.D. Olsen rep to devise a plan for installing shoring to allow excavation down to top of 11-3/4" casing including de-watering as required.
8/8-21/2018	Job shut-down waiting for decision on trench shoring. Mobilized equipment to begin excavation.
8/22/18	After RD Olson installed trench and dewatering systems, excavated down to 16', removing stove pipe and cement.
8/23/18	Continue excavation, little progress made due to issues with dewatering and competing priorities on jobsite with excavation company
8/24/18	Continue excavation, same problems until 10:00 am, then ran into old wood beams under trench side boards. Was able to remove wood beams but dewatering pump broke down again. Spent rest of the day repairing pump. Trenching company will have extra operator on site Monday to allow continuous operation. Note: no further stove pipe removed since 8/22.
8/27/18	Pit full of water. Repaired pump. Unplugged sanded-up discharge line to Adler tank. Began to excavate & dewater within trench shoring. Recovered 18' of 8" wood pilings & 9' of stove pipe filled with cement (total stove pipe removed 25' - 3-5' from 11-3/4" casing). Re-installed dewatering pump in pit for night. Ten trucks scheduled to haul excavation dirt in the morning.
8/28/18	Load out 19 trucks of dirt from pit. Trench shoring assisting bore operation. Continue digging for casing & driving down side walls. Remove 3' of 18" casing & 2 wooden piers. Install dewater pump - not working. Remove, repair pump. Unplug sanded line & reinstall. No accidents or incidents reported. Tomorrow's plan: Drive sidewalls/posts approx. 4' and dewater/prep casing stub.
8/29/18	Excavator working across street on sewer line till 1 pm. Excavate & drive 2 shoring corners. Install 4' inner doors on all 4 sides to allow deeper depth. Install dewater pump, hose broke. Remove, repair, & reinstall pump. Secure location. No accidents or incidents reported. Top of stub +/- 2' below fluid level. Promised full day w/ excavator tomorrow to continue driving shoring deeper & dewater.
8/30/18	Continue excavating & driving shoring deeper. Bench down 6' on 2 sides to allow excavator deeper reach. Install 2nd dewater pump. Top of stub covered by 1' sand, unable to visually see. Hydraulic hose broke on excavator at end of day. Repair excavator hose & load out ex dirt tomorrow & dig hole deeper to expose casing.
8/31/18	Found well pit full of water in morning. Rent trash pump & attempt to pump out water. System unable to handle water. Hydroquip rep made equipment list for upgrade of dewatering system. Replaced 1 HP discharge pump in Adler tank w/ 2 HP pump. Operations shut down till Tuesday.
9/4/18	Installed uprated dewatering system & additional line to filtration system. Begin to drain hole. Rig being utilized elsewhere - no standby charge. InterAct not on site.
9/5/18	Continue dewatering hole. Rig being utilized elsewhere - no standby charge. InterAct site visit to assess progress.
9/6/18	Continue dewatering hole.
9/7/18	Continue dewatering hole. Hydroquip unable to provide larger pump until Monday.
9/10/18	Continue dewatering hole. Hydroquip installed larger pump.
9/12/18	Continue dewatering hole. Removed and serviced pumps while excavator removed sand from pit. Reinstalled pumps and continued dewatering. Decision made to bring in 500 bbl. tank to assist in dewatering.
9/13/18	Mobilized 500 bbl. tank. Continue dewatering with upgraded system. Progress made but water level still above casing stub.

9/14/18	Continue dewatering hole. Team discussion regarding accelerated dewatering plan for Monday.
9/17/18	Continue dewatering hole. Cleared space and set 2nd 500 bbl. tank, Pumped water down to within 2' of bottom. Pump/electrical problems prevented further progress.
9/19/18	Continue dewatering hole. Finished emptying 500 bbl. tanks. Cleared area and spotted 2 generators. Rain for Rent wired two 10 hp submersible pumps to control panels. Installed shroud around pumps and rigged-up 4" hoses from pumps to tanks. Lower pumps to bottom of pit with excavator and started pumping. Remove 3 smaller pumps from pit which appeared to be out of round. After pit dewatered dug about 4' deeper to expose top 3" of stove pipe. Water flow appears to be coming from the stove pipe. Tanks filled up in about 2 hours. Unable to see 11-3/4" casing.
10/4/18	C&W on location at 0700. System not set-up to handle returns for dredging operation. Began diving operation at 10:00 am after dredging system set-up. Had problems with trash pump plugging-up. Combination of hand digging and dredging sufficiently exposed about 2' of stove pipe. Note: zero visibility at bottom of pit, diver worked by feel only. Noted that stove pipe was not bent over but standing up mostly vertical with jagged pieces sticking-up on top, cement present on inside of stove pipe, water flowing up outside of stove pipe. Unable to cut-off top of damaged stove pipe. Went to hardware store and bought new pneumatic disc cutter. Same result. Could not get a 20-1/2" gauge ring over top of 18" stove pipe indicating top of stove pipe flared out or oval in shape. Diver attempted bend-in jagged pieces on top of stove pipe before exiting pit for final time. Was unable to re-gauge top of stove pipe since gauge ring damaged on first attempt to get over stove pipe.
10/6/18	Unload 20' and 41' joints of 24" casing & flanges from BPS. Load 20" joint of casing for return to JD Rush. Cut collar off 24" jt. and weld on flange. Install 2" outlet below flange and three 3' supports 15' from bottom of joint. Ready for driving on Tuesday.
10/8/18	Check Rain for Rent & Pure Effect equipment and lines. Begin pumping out pit with one 10 hp pump while filtering from Adler Tanks. Add second 10 hp pump while fine tuning filtering. Emptying carbon filters every 45 mins. Observed top of 18" stove pipe. Patriot obtained gas readings of 1 ppm of LEL and 3 ppm H2S. Assembled Maxim crane equipment while keeping pit dewatered. Removed 4 small pumps and hoses from pit. Also providing over night supervision of filter system and pit at a lower static level with one 10 hp pump.
10/9/18	Pit maintained in pumped-off condition all night with top of well above water level. RU Patriot confined space equipment and welder. Off load Maxim vibratory hammer. Weld hammer pickup assembly on 24" blind flange and bolt on to riser. Patriot recorded 0 ppm LEL and 100 ppm H2S. Install ventilation system in pit. Readings show safe environment to enter. Held safety meeting. Confined space certified Patriot employee entered pit to prep 18" stove pipe. Held safety meeting for crane ops. Adjusted pit pumps using excavator as required to maintain pumped-off condition. Picked-up the 24" casing and set in the pit next to one corner post and secured. Latched on to 24" casing with vibro hammer. Picked-up and placed over top of well. Adjusted pipe to vertical. Drive 24" into place, 16' over top of stove pipe. RD hammer and power pack. Water level in pit to be monitored all night.
10/19/18	Clean and remove two 500 bbl. tanks. Two left on location for rig work. Set cellar box over well at grade. Welder made 24" x 21-1/4" 2K spool for annular preventer. Hauled in base to grade location. Set up to get fresh water from hydrant.
10/23/18	Held JSA. Off loaded rig from tow truck in Marina del Rey. Called out and waited on five 8'X 20' X 1-1/2" plates. Spotted rig plates, drove rig on plates and rigged-up. Spotted pump with cuttings bin. Off loaded drill collars, mills, bits, and other assorted equipment. Had welder fabricate 24" pitcher nipple flange. Secured well and rig.
10/24/18	Held JSA. Installed and rigged-up 20" 2M annular BOP W/ 20' pitcher spool and flow line to mud pump. Rigged-up rig floor and 2.5 power swivel with double dead lines. Picked-up and made up 8" drill collar on bottom of power swivel with 20" concave junk mill on bottom. RIH and tagged at 35' below rig floor. Started circulating and milling from 35', milled down 1.5' in 4 hours. Secured well and rig.
10/25/18	Held JSA. Continued milling down to 41' (6' total). Pulled up and inspected bottom of mill. No clear showings on mill but some indications on top of 11-3/4" casing. Secured well and rig.

10/26/18	Held JSA. Laid down 20" mill assembly and collar. Picked-up and made-up 13-3/8" X 13' wash-over assembly with 4-3/4" drill collar. Rigged-up 13-3/8" hydraulic tongs to make-up tools. Washed over and rotated down over 11-3/4" casing stub from 41' to 45'. Conditioned mud back to 9.7 PPG/70 plus viscosity. Continued rotating and washing over to 50' getting cement and large pieces of wood in returns. Circulated clean. Pulled-up and secured well and rig.
10/27/18	Offloaded 40' joint of 12-3/4", 13-3/8" wellhead and one joint to 2-7/8" joint of tubing for top job. Welded slip-on casing bowl to bottom of 12-3/4", slip-on flange to top of 12-3/4" and 2" collar to blind flange.
10/29/18	Held JSA. Lowered 13-3/8" washover assembly back down and rotated/circulated over 11-3/4" stub from 41' to 50', circulated hole clean. Pulled and laid down power swivel and washover tool assembly. Picked-up and RIH with 1 jt. 12-3/4" casing with 11-3/4" casing bowl with pack-off. Had to removed elevators and bails from blocks and hammer down on blind flange on top of 12-3/4" casing for 5-1/2 hours to drive assembly over stub to 41'. Pulled 40K over to set pack-off assembly. RIH with 2-7/8" jt. of tubing with subs to 41'. Pulled 2-7/8" tubing back out and secured well and rig.
10/30/18	Held JSA. Lowered 2-7/8" tubing back down between 12-3/4" and 24" casing to 41'. Rigged-up BJ Services. Mixed and pumped 51 ft3 13.6 PPG cement from 41' to surface, CIP @ 10:45AM. Pulled and laid down 2-7/8" tubing. Rigged down BJ. While waiting on cement to harden, rigged-up Weatherford tongs and broke down 13-3/8" washover assembly. Had crane off load 12" double gate BOPE and accumulator. Loaded out 8" drill collar and extra equipment. Cement still not set up after 5 hours. Secured well and rig.
10/31/18	Held JSA. Nippled down and loaded out 21" BOPE, accumulator, generator, and other JMP equipment. Assisted welder to remove 24" starter flange, installed plates from 24" casing to 12-3/4" casing, weld on 12-900 3M SOW wellhead. Installed 12" 3M double gate with mud cross. Installed 6" flowline. Reinstalled rig floor. Picked up and seated test plug in wellhead, filled stack and secured with 2-7/8" pipe rams. Tested BOPE to 300 PSI low / 2000 PSI high solid for 10 minutes. Secured well and rig. Note: at 10:45 am Daniel Dora with DOGGR deferred inspection of BOPE.
11/1/18	Held JSA. Removed test plug from wellhead. Made up 10-5/8" bit on bottom of one 4-3/4" drill collar. Picked-up power swivel and made-up joint of 2-7/8" PH-6 tubing on swivel, installed PGSR circulating head. While performing BOPE trip drill accumulator failed (faulty electric motor). Waited on exchange accumulator. Conditioned mud while waiting. Rigged-up exchange accumulator and function tested. Lowered bit tagging down at 41'. Drilled out hard cement from 41' TO 72'. Circulated hole clean. Secured well and rig.
11/2/18	Held JSA. Lowered bit back down and continued drilling out solid cement from 72' to 85'. POOH with tubing to drill collar, pick-up 1 drill collar for more weight on bit. RIH with tubing and picked-up power swivel and continued drilling out cement stringers from 85' to 165' when drilled into gas pocket, secured well, conditioned mud and circulated out gas. Continued reaming down from 165' to 309'. Drilling hard and slow from 309' to 310.5' when very large pieces of wood plugged off the pitcher nipple. Pulled up and removed 12' mud cross to clean out pitcher. Secured well and rig.
11/5/18	Held JSA. Serviced rig. Reinstalled cleaned out mud cross and PGSR head. Lowered bit back down and cleanout fill material from 308' to 310.5'. Appeared to be drilling on casing at 310.5'. Circulated hole clean with cement rocks in returns. POOH with bit assembly. Installed new pitcher nipple with full 6" flowline. RIH with 9-7/8" bull nose junk mill assembly. Milled from 310.5' to 312' with mostly cement, up to 3" in diameter, and some wood in returns. Circulated hole clean. Secured well and rig.
11/6/18	Held JSA. No pressure on well. POOH with 9-7/8" bull nose mill assembly. Made-up and RIH with 8-3/4" bit assembly. Tagged down at 308'. Drilled down from 308' to 440' going through numerous hard spots and tight spots with mostly cement returns. Did not hang-up at any spots while POOH. Secured well and rig. Note: took delivery of another 50 bbls of mud.
11/7/18	Held JSA. No pressure on well. RIH with 8-3/4" bit assembly, added one more 4-3/4" drill collar. Tagged down at 310' and rotated through easily with tubing tongs. Continued RIH to top of fill at 394'. Picked-up power swivel and drilled down from 394' to 461', seemed like drilling on junk at 461'. Circulated hole clean and POOH with bit assembly. Made-up and RIH with 8-11/16" junk mill assembly, set down at 308' and were unable to rotate past with tubing tongs. Picked-up power swivel and milled for 30 minutes making 6". Circulated hole clean and POOH. Secured well and rig. Rig hours 0700-1730.

11/8/18	Held JSA. No pressure on well. POOH with junk mill assembly. Made-up and RIH with 8-7/8" tapered mill with 8-7/8" string mill on top of tapered mill. Tagged down at 309'. Picked-up power swivel and milled through tight spot from 309' to 313'. Continued reaming down to 461'. Milled past junk at 461' and reamed down and stacked-out at 518' (possibly top of cement for Plug #2). Circulated hole clean and POOH with mill assembly. Secured well and rig. Rig hours 0700-1730.
11/9/18	Held JSA. No pressure on well. Removed 8-7/8" tapered mill from bottom of 8-7/8" sting mill and made-up 8-11/16" junk mill. RIH and worked through tight spot at 309' and continued to tight spot at 397'. Picked-up power swivel and milled from 397' to 398' making hole very slowly. Circulated hole clean and POOH with mill assembly. RIH with 8-3/4" bit assembly, unable to get past 398', POOH with bit assembly. RIH with 7-1/2" bit assembly and rotated through 309' with tubing tongs and continued in hole to 398'. Picked up power swivel and drilled past 398' and continued reaming and drilling down to 532' where bit stopped making hole and started torquing up. Circulated hole clean and POOH with bit assembly. Secured well and rig. Rig hours 0700 to 1730.
11/10/18	Held JSA. Removed 7-1/2" bit and made-up 7-1/2" tapered mill assembly. RIH and worked through tight spot at 398' with tubing tongs. Continued RIH and tagged at 532'. Picked-up power swivel and milled through tight spot from 532' to 533'. Continued drilling down to 546' when power unit on power swivel failed. Circulated hole clean and POOH with mill assembly. Note: got back iron, cement, rubber and formation in returns from 532'-546'. Loaded out power swivel. Secured well and rig. Rig hours 0700-1200.
11/12/18	Drove to location. Serviced rig. Held JSA. Lowered 7-1/2" tapered mill assembly back down to 546'. Rigged-up replacement power swivel and continued drilling down very slowly to 550'. Circulated hole clean and POOH with mill assembly. RIH with 7-1/2" bit assembly, unable to work past 398'. POOH with bit assembly. RIH with 5-5/8" bit assembly, unable to work past 398'. POOH with bit assembly. RIH with 8-11/16" tapered mill assembly and attempted to work past tight spot at 308'. Secured well and rig. Rig hours 0500-1830
11/13/18	Held JSA. POOH with 8-11/16" tapered mill assembly. Made-up and RIH with 7-1/2" tapered mill, two 4-3/4" drill collars, 8-7/8" string mill, one 4-3/4" drill collar, and tubing. Set down at 308'. Attempted to work past with tubing tongs, no good. Picked-up power swivel and still couldn't get past 308'. POOH with mill assembly. RIH with 8-3/4" bit assembly and attempted to work past 308', no good. POOH with bit assembly. RIH with 9-7/8" bull nosed mill assembly to 308'. Picked-up power swivel and milled from 308' to 310' when mill passed through. Continued to RIH tagging down at 398'. Pulled up to 256'. Secured well and rig. Rig hours 0700-1830.
11/14/18	Held JSA. Lowered 9-7/8" bull nose mill back down passing through 308' with little restriction, continued RIH setting down at 398'. Picked-up power swivel and milled from 398' to 400' and fell through. Reamed tight spot for 15 minutes. Continued RIH setting down at 515'. Milled from 515' to 517' and fell through. Continued RIH setting down at 541'. Drilled from 541' to 548' very slowly. Stopped making hole at 548'. POOH with mill assembly. RIH with 8-3/4" bit assembly but unable to work past 308'. POOH with bit assembly. RIH with 9-7/8" drag bit but unable to work past 308'. POOH with drag bit. RIH with 9-7/8" bull nose mill to 308'. Picked-up power swivel and worked past in 5 minutes. Pulled assembly above tight spot. Secured well and rig. Rig hours 0630-1830
11/15/18	Held JSA. POOH with 9-7/8" bull nose mill assembly. RIH with 8-3/4" bit assembly on tubing (no collars). Worked past 308'. Continued RIH setting down at 398'. Had to pick-up power swivel to rotate past 398'. Continued to RIH setting down at 548'. Drilled down very slowly to 549' and stopped making hole. POOH with bit assembly. RIH with 8-3/4" bladed junk mill on tubing (no collars). Worked past 308' and 398' by hand. Picked-up power swivel and milled from 549' TO 549.6'. Not making hole due to very hard material and lack of weight on tool. POOH with mill assembly. Secured well and rig. Rig hours 0630-1730.
11/16/18	Held JSA. RIH with 8-3/4" bit with three 4-3/4" drill collars. Unable to work past 308', POOH with bit. RIH with 8-3/4" bit without collars. Unable to work past 308', POOH with bit. RIH with 9-7/8" bull nosed mill on tubing and milled through 308' in one hour. Continued to RIH to 505' with no other restrictions. Pulled mill assembly above casing stub at 308' and attempted to re-enter stub, no go. Picked-up power swivel and reamed tight spot from 308' to 318' for 30 minutes, POOH with mill. Off load 3-1/2" drill collars and bits. Sent 9-7/8" bull nose mill back to Bakersfield to have redressed. Secured well and rig. Rig hours 0630-1730.

11/19/18	Held JSA. Made-up and RIH with 8-1/2" button bit on four 3-1/2" drill collars. Set down at 308' and worked past without power swivel. Continue to work bit down to tight spot at 398' (bit would not fall without working it). Had to pick-up power swivel and rotate bit through 398'. Continued to RIH setting down at 548'. Picked-up power swivel and drilled down very slowly from 548' to 554' getting back metal shavings and cement. Circulated hole clean and POOH with bit. Bit still in good condition. RIH with 7-3/4" flat bottom mill with 3-1/2 DCs and attempted to work past 308' unsuccessfully. Secured well and rig. Rig hours 0500-1830.
11/20/18	Held JSA. Lowered 7-3/4" junk mill back down and attempted to work past 308' to no avail. POOH with mill. RIH with 8-1/2" button bit with four 3-1/2" drill collars, unable to work past 308'. POOH with bit. Pick-up and RIH with single joint of 7" casing with cut lip on bottom. Unable to work past 308'. Pulled and laid down 7" JT. Secured well and rig. Traveled home. Rig hours 0630-1630.
11/26/18	Traveled to location. Held JSA. RIH with 10-5/8" bull nose mill with three 4-3/4" drill collars. Set down at 308'. Picked-up power swivel and reamed through. Continued RIH setting down at 398'. Attempted to mill through for 30 mins, no good. POOH with mill. RIH with one joint of 7" casing with cut lip on bottom. Attempted to work past 308', no good. POOH and had welder cut 18" long slide cut on bottom of casing. RIH with single joint of casing and worked past 308' and 398' by working up and down while turning joint 1/4 turn each time. Continued to RIH to 484' with no restrictions. POOH with 7" feeler. Rigged-up Weatherford casing tongs and RIH with 456' of 7", 23# Flush Max II casing passing through 308' and 398' with no restrictions. Had welder install landing ring on last joint. Landed 7" casing in 12" well head with bottom of casing at 466' including 10' KB. Secured well and rig. Rig hours 0500-1830.
11/27/18	Held JSA. Raised work floor out of way. Nipped down flow line and BOPE. Welded 7" landing plate to wellhead. Reinstalled BOPE and flow line. Lowered rig floor back down. Broke out all larger tool joint cross-overs and laid down 3-1/2" drill collars from derrick. RIH with 6-1/4" junk mill with five 4-3/4" drill collars and set down at 515' (previously had been down to 554' with an 8-3/4" button bit). Picked-up power swivel and milled down very slowly to 527' with cement and metal in returns. Circulated hole clean and pulled mill back up into 7" casing. Secured well and rig. Rig hours 0630-1830.
11/28/18	Held JSA. POOH with 6-1/4" junk mill, found completely worn down. RIH with 6-1/4" button bit with five 4-3/4" drill collars and worked through bad spot at 515'-527' and tagged down at 554'. Picked-up power swivel and drilled from 554' to 554.6' in 3 hours. POOH with button bit. RIH with 6-1/4" bladed junk mill and five 4-3/4" drill collars. Milled from 554.6' to 555' in 4 hours. Pulled mill into 7" sleeve and secured well and rig. Rig hours 0630-1830.
11/29/18	Held JSA. POOH with 6-1/4" bladed junk mill. RIH with 6-1/4" concave mill with five 4-3/4" drill collars. Milled from 555' to 555.5' in 4 hours. POOH with mill and found it completely worn down. RIH with 5-1/2" OD magnet and set at 555.5'. POOH with magnet and recovered 13 pieces of metal, largest being 1/2" thick X 3" X 2". Reran magnet and POOH. Recovered 6 more pieces with largest being 1/4" thick x 4-3/4" X 4". Secured well and rig. Rig hours 0630-1730.
11/30/18	Held JSA. RIH with 5-1/2" magnet and set down at 554'. Picked-up power swivel and washed down to 555' but unable to work past. POOH with magnet, recovered a hand full of small metal pieces. RIH with 6-1/4" button bit with five 4-3/4" drill collars to 555'. Unable to work deeper with no recovery in returns. POOH with bit. Made two more runs with the magnet, no further recovery. Secured well and rig. Rig hours 0630-1530.
12/3/18	Drove to location. Held JSA. Broke down magnet assembly. RIH with 6-1/4" concave mill with five 4-3/4" drill collars. Set down at 555'. Picked-up power swivel and milled down from 555' to 556' in 4 hours. POOH with mill and found it completely worn flat on bottom with under gauge OD at 5-3/4". RIH with 5-1/2" OD magnet and set down several times at 556'. POOH and found hand full of very fine metal shavings and three small pieces of metal. Reran magnet to 556' and recovered another hand full of fine metal shavings. RIH with 6-1/4" bladed junk mill on five 4-3/4" collars to 400'. Secured well and rig. Rig hours 0500-1800.

12/4/18	Drive to location. Held JSA. Continued RIH with 6-1/4" bladed junk mill with five 4-3/4" drill collars and set down at 556'. Picked-up power swivel and milled to 564' in 3-1/2 hours then drilled out cement from 564' to 626' when mill stopped making hole. POOH with mill and found it completely worn out on bottom and down to 5-15/16" OD. RIH with 6-1/4" button bit and five 4-3/4" drill collars and set down at 568'. Picked up power swivel and worked through tight spot. Continued to RIH to 626' and drilled down to 635'. Lot's of wood and cement in returns. Circulated hole clean and pulled bit to 400'. Secured well and rig. Rig hours 0630-1830.
12/5/18	Drove to location. Held JSA. Lowered bit back down and continued drilling through cement from 635' breaking through at 640'. Continued reaming down from 640' to hard cement at 800'. Drilled down to 832'. Changed out mud in pit. Continued drilling down to 836' and lost circulation (30 Bbls). Pulled bit up to 400'. Topped off pit with fresh water, conditioned mud and broke circulation. RIH to 717' and broke circulation again. Continued in hole and drilled down from 836' to 842' when bit quite making hole. Circulated hole clean and POOH with bit. Found bit with several buttons worn off. RIH with 6-1/8" concave mill on five 4-3/4" drill collars to 400'. Secured well and rig. Rig hours 0630-1730.
12/6/18	Drove to location. Held JSA. Continued RIH with 6-1/8" concave mill with five 4-3/4" drill collars to 842'. Broke circulation with 10 bbl., filled pit with fresh water and conditioned mud. Milled from 842' to 843' in 3-1/2" hours when mill stopped making hole. POOH with mill and found completely worn down and under gauge to 5-7/8" at nose. RIH with 6-1/4" bladed junk mill with five 4-3/4" drill collars. Continued milling from 843' to 844' in 1-1/2" hours. Pulled mill to 751'. Secured well and rig. Rig hours 0630-1830.
12/7/18	Drove to location. Held JSA. Lowered 6-1/4" bladed junk mill to 843', milled for 30 minutes making no hole. POOH with mill and found nose of the mill worn down to 5-1/4" . RIH with 5-1/2" OD magnet and set down at 843'. POOH and found a hand full of metal shavings with approximately 10 pieces 1/4" X 1/2" X 1/2" in size. RIH with 6-1/8" bladed junk mill with five 4-3/4" drill collars to 843'. Picked-up power swivel and milled from 843' to 845'. Circulated hole clean and pulled up to 408'. Secured well and rig. Traveled back to Ventura yard. Rig hours 0630-1900.
12/10/18	Drove to location. Held JSA. Continued to POOH with 6-1/8" Bladed junk mill and found mill worn down at the nose. RIH with a 6-1/4" bladed junk mill and milled from 845' to 847' in 3-1/2 hours when mill stopped making hole. POOH with mill and found worn down again at the nose. RIH with 5-1/2" magnet and set down at 847'. POOH and recovered a hand full of fine metal shavings. RIH with a 5-1/2" bladed junk mill and set down at 847'. Milled at 847' for 1 hour not making any hole. Circulated hole clean and pulled up to 720'. Secured well and rig.
12/11/18	Drove to location. Held JSA. Lowered 5-1/2" bladed junk mill back down and continued milling from 845' to 848' when mill stopped making hole. POOH with mill and found worn to 5-1/4" OD. RIH with tapered mill on five 4-3/4" drill collars. Milled from 846' to 848' when power swivel failed. Circulated hole clean and POOH with mill. Found 5' piece of 4-3/4" OD tubing with 5-1/4" OD collar on bottom. Rigged down and loaded out failed power swivel. Rigged-up replacement power swivel. RIH with 6-1/4" concave mill on five 4-3/4" drill collars to 400'. Secured well and rig. Rig hours 0630-1830.
12/12/18	Drove to location. Held JSA. Continue RIH with 6-1/4" concave mill with five 4-3/4" drill collars. Set down at 849.65'. Picked-up power swivel and milled to 850.15'. Circulated hole clean. POOH with mill. Little to no wear noted on bottom but wear/scratches on side of mill. Removed and cleaned out flowline. Secured well and rig. Rig hours 0630-1300.
12/13/18	Drove to location. Held JSA. RIH with 5-1/2" OD magnet and set down at 850.76'. POOH with magnet, recovered hand full of metal shavings with 4 small metal pieces. Reran magnet and POOH, recovered another hand full of shavings with 6 small metal pieces. RIH picking-up unused 2-7/8 PH-6 tubing off ground with 8' PH-6 pup cut at 45 deg on bottom. Tagged down at 850.76' and Picked-up power swivel. Rotated and circulated to 851.76'. Circulated hole clean and pulled tubing to 753'. Secured well and rig. Rig hours 0630-1500.
12/14/18	Drove to location. Held JSA. Lowered tubing back down to 849' and changed hole over to fresh water. Rigged-up Tiger Wireline with lubricator and RIH with video camera. Inspected area between 844' and 850'. Observed several pieces of junk laying on top of 4-3/4" tubing fish. Rigged down tiger. RIH with 5-1/2" OD magnet and set down at 850'. POOH and recovered had full of shavings and three pieces of metal the largest being 1/4" X 2" X 3-1/2" and 1/4" X 1" X 1-1/2". RIH with open ended tubing to 750'. Secured well and rig. Traveled back to Ventura yard. Rig hours 0630-1830.

12/17/18	Traveled to location from yard. Held JSA. POOH with kill string. RIH with 6" OD magnet and set down at 850'. POOH with magnet and recovered a hand full of metal shavings and two metal pieces 1/4" X 1" X 1-1/4". RIH with 6-1/4" OD mill shoe with 2' extension and five 4-3/4" drill collars to 850'. Rigged pump and surface equipment to reverse circulate. Pumped away 60 bbl. of water at 2.5 BPM with very poor returns. Re-rigged pump and surface equipment to circulate. Changed hole over to mud. Drilled down past 850' to 873' when BHA started sticking. Pulled free, circulated hole clean and POOH. Secured well and rig. Rig hours 0500-1800.
12/18/18	Drove to location. Held JSA. RIH with 6-1/4" concave mill with five 4-3/4" drill collars with jars and accelerator. Set down at 869'. Picked up power swivel and drilled from 869' to 888' when mill broke through. Circulated hole clean. Continued in hole setting down at 910'. POOH with mill. Loaded out power swivel due to mechanical failure. Secured well and rig. Rig hours 0630-1830.
12/19/18	Drove to location. Held JSA. RIH with 6-1/4" bit with jars and accelerator while picking-up additional tubing off ground. Tagged down at 904'. Rigged-up replacement power swivel and found swivel to be defective. Laid down swivel and pulled bit to 769'. Mechanic unsuccessfully attempted to repair swivel. Rigged down swivel. Rigged-up replacement swivel. Secured well and rig. Rig hours 0630-1730.
12/20/18	Drove to location. Held JSA. Lowered bit back down to 904', picked-up power swivel and circulated/reamed down to 986' with little restriction. Had partial loss of returns at 986'. Also noted mud surfacing 20' from the cellar. Pulled bit to 676' and broke circulation with 15 bbls. Conditioned mud with gel and LCM. Lost 20 bbls after circulating for 1-1/2 hours. Pulled bit to 458', conditioned mud with gel and LCM. Filled hole with mud and monitored well for 1 hour. Fluid fell back 5'. Filled hole. Secured well and rig. Rig hours 0630-1630.
12/21/18	Drove to location. Held JSA. Fluid level 20' from surface. Filled well. Waited on orders. Secured well and rig. Traveled back to yard. Rig hours 0700-1100.
12/24/18	Traveled from yard. Held JSA. Fluid level 20' from surface. Filled well with 2.5 bbls of mud. Secured well and rig. Traveled back to yard. Rig hours 0600-1200.
12/26/18	Traveled to location. Discovered well had blown-out over the Christmas break presumably through uncemented gap in casing between 290'-308' and up to the surface just outside the rig and slurry pit. Fortunately, the well had stopped flowing on its own. Bled-off casing (40 psi) and tubing (170 psi) pressure and filled hole with mud. Notified DOGGR. Cleaned-up an estimated 35 bbls of mud around the rig. Circulated well and POOH with bit assembly. Site visit by DOGGR reps, gave verbal approval to continue with plan to spot cement plug and cement 7" sleeve. RIH with open-ended tubing to 590'. Rigged-up cementers and balanced a 37 cuft plug of Class G 14.5 ppg slurry with 1 gal/100 sacks De-foamer, 1% Sodium Metasilicate. POOH with tubing. Waited on cement for 5 hours while keeping hole full and cleaning up the location. RIH with tubing and tagged plug at 532'. Pulled tubing to 403'. Broke circulation. Secured well and rig. Rig hours 0500-1800.
12/27/18	Found well with zero psi on tbg and casing. Broke circulation with 1-1/2 bbls mud. POOH with kill string. Rigged-up Tiger Wireline with lubricator. RIH and set 7" composite cement retainer at 310'. POOH with wireline and rigged down Tiger. RIH with retainer stab-in tool on tubing and attempted to stab into retainer, no good. POOH with stab-in tool and found bottom of tool egg shaped. Waited on exchange tool, later informed replacement tool not available until first thing tomorrow AM. Secured well and rig. Rig hours 0630-1700.
12/28/18	Traveled to location. Held JSA. Bleed off gas from well to pump. Mixed gel mud in pit. Continued cleaning up mud around rig and location from blow out. Cleaned out sand trap with Patriot. SOS lifted steel plates to inspect footing around location and rig. Found bathtub size hole 15' from cellar towards ramp. Pumped approximately 10 bbls mud down 7" X 11-3/4" annulus using charge pump. Well went on a vacuum. Mixed more gel mud. Secured well and rig. Two man crew on location monitoring well over night. Rig hours 0630-2400.

12/29/18	Continued with two man crew monitoring well until relief at 6:30 am. Held JSA. Bled off gas pressure from well. RIH with stab-in tool for cement retainer and stabbed into retainer at 310' while circulating at 0.5 BPM. Rigged-up cementers. Pressure tested lines to 2100 psi. Mixed and pumped 211 cu ft of Class G 14.0 PPG cement with 1 gal/100 sacks de-foamer, 0.3% dispersant, 0.6% fluid loss, 3% bentonite and 0.5% sodium metasilicate. Displaced with 32 cu ft of water below retainer to 416'. Good returns through the job but no cement to surface. POOH with stab-in tool and rigged down BJ. Secured well and rig. Continued cleaning up location. Traveled back to Ventura yard. Rig hours 0000-1600.
1/2/19	Traveled to location. Held JSA. Found well with 20 psi on 7" x 11-3/4" annulus. Bled-off pressure. Rigged-up pump to annulus and attempted to pressure test. Pumped mud away at 1 BPM, 0 psi. Ordered out cementers. Rigged-up cementers to 7" X 11-3/4" annulus. Mixed and pumped 376 cu ft (67 bbls.) of 15.8 ppg Glass G neat cement at minimal pressure (0 - 90 psi at end of job). After 20 bbls, observed mud returns to surface where blow-out occurred outside of cellar. Trace amount of cement noticed at end of job. Rigged down cementers. Secured well and rig. Rig hours 0500-1800.
1/3/19	Held JSA. Removed rig floor, pitcher nipple, flowline and BOPE. Had welder weld 7" landing plate to inside of wellhead. Installed replacement BOPE due to internal leak. DOGGR deferred inspection. Reinstalled pitcher nipple, flowline and rig floor. Mixed gel mud. RIH with 6-1/4" bit, jars accelerator and five 4-3/4" drill collars. Tagged down on cement retainer at 310'. Rigged-up power swivel and installed PGSR circulation rubber. Secured well and rig. Rig hours 0630-1830.
1/4/19	Held JSA. Lowered bit back down to top of cement retainer at 310'. Drilled on retainer for 5 hours to breakthrough. Continued RIH tagging down at 385'. Continued drilling out loose retainer material and cement to 396'. Drilled out hard cement from 396' to 427'. Circulated hole clean. Pulled bit to 396'. Secured well and rig. Traveled back to Ventura. Rig hours 0630-1930.
1/7/19	Traveled to location. Held JSA. No pressure on well. Conditioned mud in pit. Continued drilling out hard cement from 427' to 442'. Circulated hole clean. POOH with bit and laid down jars and accelerator. Found bit missing center drilling extension. RIH with 6-1/4" button bit with five 4-3/4" drill collars and continued drilling out cement from 442' to 515'. Circulated and reamed down to 532'. Drilled out hard cement to 590'. Mud started coming back very thick and gassy. Conditioned mud to 9.0 PPG. Circulated and rotated from 590' to 778'. Circulated hole clean. Pulled and laid down all 2-7/8" tubing in hole to ream with. Hung bit, collars and 1 joint of tubing for kill string. Secured well and rig. Rig hours 0500-1900.
1/8/19	Held JSA. Conditioned mud in pump. RIH with bit and tagged down at 778'. Picked-up power swivel and continued circulating and reaming down to 996' when took a gas kick. Closed in well and conditioned mud to 9.0 PPG. Slowly bleed off gas in 10 minutes. Broke circulation with 10 bbl. mud. Continued making hole but had to put 8K on bit and drill in order to make hole (acted like drilling on cement) with limited circulation. Lost all returns at 1120'. Attempted to maintain circulation with LCM, no good. Drilled with no returns from 1120' to 1214'. POOH with bit to 437'. Secured well and rig. Rig hours 0630-1830.
1/9/19	Held JSA. POOH with bit. RIH with open-ended tubing and hung at 880'. While rigging-up cementers well kicked fluid and gas. Bleed down gas and had to circulate well with new 8.4 ppg mud to kill well. Mixed and pumped 43 ft ³ of Class G cement with 2% calcium chloride and balanced plug with 3.5 bbls of mud. POOH with tubing and rigged down cementers. Secured well and rig. Rig hours 0630-1800.
1/10/19	Held JSA. Found well with 0 psi. RIH with 6-1/4" button bit with five 4-3/4" drill collars and tagged down at 520'. Had to pick-up power swivel to work past. Continued in hole setting down on hard cement at 786'. Drilled out hard cement from 786' to 885'. Took a gas kick. Bleed-off gas slowly while circulating to kill well. Continued RIH setting down at 1037'. Circulated and reamed down to 1085' when lost returns. Conditioned mud with LCM to regain returns. Continued circulating and reaming down to 1214'. Hard drilling from 1214' to 1306' with partial returns. Circulated hole clean. Pulled bit to 562'. Secured well and rig. Rig hours 0630-1830.

1/11/19	Held JSA. Found well with 0 psi. Conditioned mud with LCM. Lowered bit back down to 1306', no fill. Pumped 30 bbls to break circulation. Well kicked gas bubble then lost all circulation. Attempted to treat mud with LCM to regain circulation, no good. Pulled up to 871' and broke circulation easily. Lowered bit to 996' and broke circulation easily. Lowered bit to 1120', unable to break circulation. Lowered bit back down to 1306'. Conditioned mud with Drispac and LCM. Drilled with no circulation from 1306' to 1368' when regained very good circulation. Continued drilling to 1617' and circulated hole clean. POOH with bit to 1492' when well blew out up the tubing. Unable to stab in with TIW valve to close well in. Had to drop tubing string in hole in order to close the blind rams. Well built up to 300 psi shut-in pressure. Conditioned mud in pit to 40 vis and 10.2 PPG. Bull headed mud away @ 200 psi. Shut down pump and pressure jumped back to 300 psi and rose to 360 psi over the next hour. Started bleeding gas back slowly until midnight.
1/12/19	Continued monitoring well from 12:00AM until 6:30AM with constant pressure of 340 psi while bleeding to frac tank. Rigged-down power swivel and moved rig floor and pitcher nipple out of way for coiled tubing (CT) unit. Off load 120 bbls 10.0 ppg mud. Rigged-up coiled CT unit and BOP. Tested to 2,000 psi. Rigged-up choke manifold to frac tank with steel lines. RIH with CT working up and down carefully. While picking up at 486' had to pull 5K over (unit jumped when free). Decided not to go any deeper. Pumped 80 bbls 10.0 ppg mud at 450'. POOH with CT and found parted with 20' left in hole. Attempted to secure well with 12" blind rams but rams leaking severely. Had to secure well with CT BOP. Rigged-down CT unit. Continued monitoring well until 12:00PM with 340 psi while bleeding to frac tank.
1/13/19	Held JSA. Continued monitoring well from midnight to midnight. Pressure remaining fairly constant at 340 psi.
1/14/19	Held JSA. Continued monitoring well from midnight until 2:00 PM. Conditioned mud in pit to 9 ppg with LCM and Drispac. Rigged-up pump truck to BOP stack. Attempted to pump at 1/4 BPM but kept losing prime. Found we could pump fine at around 0.8 BPM without exceeding max pressure of 400 psi. Alternated between pumping 1 to 10 bbls of mud and bleeding pressure until pressure came down to 100 psi. Pumped in 90 total bbls of mud well holding at 100 psi at end of job at 9:00 PM. Monitored well until midnight, still holding 100 psi.
1/15/19	Held JSA. Continued monitoring well from midnight to 6:30 am. Well pressure steady all night at 100 psi. Rigged-up pump truck. Pumped 50 bbls of 10.2 mud in lube and bleed sequence (5 bbl cycles) until well dead. Rigged-down pump truck and monitored well until midnight. Well remained static with zero psi at surface.
1/16/19	Held JSA. Continued to monitor well from 12:00 AM until 9:00 AM waiting on exchange BOPE. Well dead and static. Removed coiled tubing BOPE and found coiled tubing fish wadded up on inside blind rams of 13-5/8" BOPE. Removed fish. Installed 7-1/16" Class III BOPE on top of 13-3/8" double gate BOPE. Closed blind rams. Reinstalled rig floor. Made-up 2 joints tubing on ground with TIW valve on top. Picked-up stand and made-up Lock-set bridge plug on bottom of stand. RIH and set bridge plug at 69'. POOH with setting tool. Topped-off BOPE stack with mud. Closed 7-1/16" blind rams and tested against bridge plug to 600 psi for 5 mins solid. Removed rig floor. Unbolted 7-1/16" BOPE and swung out of way. Crane lifted off 13-3/8" BOPE and loaded out. Reinstalled 7-1/16" BOPE. Ran one joint tubing with TIW valve and secured well with both pipe rams and annular. Monitored well until midnight.
1/17/19	Held JSA. Continued to monitor well from 12:00 AM until 9:00 AM waiting on tubing head. Called out Weatherford mechanic to trouble shoot accumulator. Open well. Laid down 2-7/8" joint of tubing. ND 7-1/16" BOPE stack and set aside. NU 13-5/8" x 7-1/16" tubing head and DSA. NU 7-1/16 Class III BOPE. Set up work floor and pitcher nipple. MIRU pump testing unit. Pressure test/chart BOPE to 1500 psi for 5 minutes, good (witnessed and approved by Paula Maat of DOGGR). Remove tubing hanger and laid down. Make-up power swivel with TIW valve in top of tubing. Held safety meeting. CHP secured and blocked traffic on street. RIH with BP setting tool, latched onto BP. Closed annular. Open H-valve to equalize across BP. Checked tubing and casing for pressure, zero psi. Released BP, open annular and waited 5 minutes. POOH with tubing and laid down BP. Secured well with blind rams. Monitored well until midnight.

1/18/19	Held JSA. Continued to monitor well through the night. Measure and pick-up one joint of 5-1/2" wash pipe and 5-5/8" external cutter. RIH with wash pipe over top of fish and tag down at 157' (end of wash pipe, top of fish above this point). Pull cutter up to find tubing collar. Circulate well for 10 minutes, well static. Rig up power swivel. Break circulation and cut the 2-7/8" tubing. Rig down power swivel. POOH with tubing and laid down cutter. No tubing in cutter. RIH with a 5-3/4" overshot, 4-3/4" jars, two 4-3/4" drill collars, and 4-3/4" intensifier. Latch onto fish @ 125'. Pulled 30k on tubing and came free (likely partially cut), POOH with fish. Laid down overshot, recovered 2' piece of tubing fish. RIH with external cutter again and tag down at 159'. Pulled up on tubing to find collar, no good (problem with spring assembly on cutter). POOH with cutter. Monitored well until midnight (no pressure, hole full). Secured well with blind rams. Notes: hole was full all day and night. Mud weights fluctuating (to be expected until we can circulate thoroughly from deeper in the well) but average 9.5 ppg. Will now have mud man on location 24/7.
1/19/19	Held JSA. RIH with external tubing cutter with 55' of wash pipe. Installed TIW valve on top joint. Installed upper kelly cock valve on bottom of power swivel. Worked over top of tubing fish at 128' and continued to RIH to next tool joint and tripped cutter to cut tubing at 163' but cutter would not maintain hold on tool joint to cut tubing. POOH with cutter. RIH with over shot/packoff and jar assembly and latched onto fish at 128'. Attempted to jar free with jars at 120K over string weight unsuccessfully. Attempted to pump down tubing, pressured-up to 2000 psi before plugging blew free. Pumped 15 bbls high vis mud, would not fill. Continue to jar on fish for 1 hour fish moved up hole 40'. Pumped 20 bbls high vis fluid with LCM down tubing, would not fill.
1/20/19	Held JSA. Rigged-up wireline and made dummy run with 1-7/8" sinker bar and tag down at 1568'. Ran free point tool which found tubing 100% free at 1230' and 70% free just above collars at 1402'. RD wireline. Vacuum truck delivered pre-mixed mud at 9.6 ppg with 35 lbs per bbl LCM. Rig up vac truck directly to suction. Pump 20 BBLs down tubing at 1.6 BPM with 0 psi. Let stand 5 minutes, pump 3 bbls at 1.6 BPM with 5 psi. Let stand 10 minutes, pump 6 bbls at 1.6 BPM with 35 psi (immediate pressure when pump engaged indicating pipe is standing full). Let stand 15 minutes, pump 15 bbls at 1.6 BPM with 45 psi with immediate pressure. Rigged-up wireline with lubricator and grease injection. Tested to 1000 psi. Ran gyro and temperature/GR logs. Rigged down wireline. Rigged-up swivel and filled tubing with 1.5 bbls. Secured well. Monitor well until noise tool arrives EOT 7:00 am. Note: casing full all day, no pressure.
1/21/19	Conditioned mud and monitor well until wireline arrival. Rigged-up wireline and lubricator with grease injection and tested to 1000 psi. RIH logging temp profile and noise coming up. RIH with chemical cutter and made cut on 2-7/8" tubing at 405'. Rigged down wireline. Pulled cut free at 30K over. Filled hole with 9.6 bbls of 9.6 ppg mud at 1730 hours. POOH and laid down fishing tools. Filled hole at 1830 hours with 3.6 bbls of 9.6 ppg mud. Crew change and JSA. Shut blind rams, remove joint from overshot, redress overshot. Open manifold outlet, well on vacuum, open blind rams, fill hole at 2000 hours with 6 bbls of 9.6 ppg mud. Made-up fishing assembly. Latched on to fish at 405'. Filled hole at 2230 hours with 3.6 bbls of 9.6 ppg mud. Filled tubing with ~1/2 bbl of 9.6 ppg mud. Jarred on stuck pipe to 120K at end of day. No movement. Pumped 1/4 to 1/2 bbl of 9.6 ppg mud down tbg every hour while jarring Note: no pressure on tubing or casing throughout the day.
1/22/19	Continued jarring on fish to 120K. No movement. Crew change. Held JSA. Continued jarring operation until wireline arrived, no movement. Rigged-up wireline and lubricator. RIH with chemical cutter and cut tubing at 1245'. Pulled tubing loose, dragging out of mud for 2 singles. Laid down 4 joints and attempted to circulate unsuccessfully after pulling each joint (pumped total of 12 bbs of 9.2 ppg mud). Pulled one stand, well u-tubed fluid out of tubing due to casing mud weight being heavier than tubing. Stabbed safety valve and closed pipe rams with pipe at 1029'. 150 psi on tubing, 2 psi on casing. Tried to circulate, no good but tubing pressure dropped to 0 psi. Opened pipe rams, well dead (no pressure on tubing or casing). Pumped 100 bbls 9.2 ppg mud with LCM trying to get circulation at rates from 3/4 to 5 BPM. Start building mud in pit until 9.2 ppg mud with LCM arrived on location. At 2100 hours, SITP at 100 psi, casing at 0 psi. Pumped 2 bbls of 9.2 ppg mud, tubing pressure at 0 psi. At 2200 hours, SITP at 110 psi, casing at 0 psi. Pumped 6 bbls of 9.2 ppg mud with 25# per bbl of LCM, pressure went to 0 psi. Filled casing with 1/2 bbl of 9.2 ppg mud. POOH laying down fishing tools while keeping hole full.

1/23/19	Crew change. Held JSA. With jars at surface, tubing pressure spiked to 160 psi with 6 psi on casing. Conditioned mud to 9.4 ppg and pumped 10 bbls down tubing and established circulation. Zero psi on casing and tubing. POOH with remaining fishing tools. RU king swivel and circulate well with 9.4 ppg mud with good to partial returns with pipe depth of 840'. POOH with tubing fish. RIH with 6-1/4" full opening bit and float sub on tubing to 439'. Circulated and secured well. Emptied and cleaned-out pit. Performed maintenance on centrifugal pump. Waited on first load of 9.2 ppg mud to arrive and offload to pit.
1/24/19	Crew change. Held JSA. Waiting on two more loads of mud. Last load was premixed with LCM at 25#/bbl. Total mud brought in 150 bbls. Mixed in additional LCM to get entire system up to 25#/bbl. Rigged-up power swivel and RIH reaming/circulating well clean from 439' to 843' (worked tight spot between 812'-840) with full returns. Circulated/reamed with full circulation from 439' to 958' and started taking weight. Drilled ahead with light weight on bit and got back lots of LCM with full circulation. Continued circulating/reaming to 1007', lost circulation. Pumped 20 bbls mud attempting to gain circulation, no good. Pulled up to 905' and were able to establish full circulation after pumping 8 bbls of mud. Waited for Schlumberger to arrive. RIH with tubing and tagged down at 1140'. Rigged-up circulate but tubing plugged, unable to clear at 2000 psi. Pulled up and hung tubing at 1123'. Crew Change. Held JSA. Rigged up lubricator with grease injection and tested to 1000 psi. RIH with RST and logged from 1097' to 90'. Rigged down wireline. Started POOH with tubing while keeping the hole full with 9.2 ppg mud.
1/25/19	Held JSA. Continued to POOH with tubing, break out bit and sub, found drill bit and bit sub plugged with lcm material, clean out bit, replaced float, RIH w/ 6 1/4" drill bit and 2 7/8" PH-6 tbg to 439', circulated well for 30 minutes. Cleaned up location, monitor well and keep hole full, crew change. Held JSA. serviced rig and pump. Continued to monitor well. Cleaned out and moved frac tank to make room for vertical tank in am. Emptied and cleaned out pit, unplugged gun lines of LCM. Refilled pump. Organized Location.
1/26/19	Continue to organize / clean location, monitor well, crew change. Held JSA, serviced rig and pump. Moved in and set up vertical tank. Continued to monitor well while waiting on mud pump monitoring equip. Well remained static. Crew change held JSA, continue to monitor well while waiting on equip. Note: both daylight and night crew performed blow-out drill.
1/27/19	Continue to monitor well, while waiting on monitoring equip. Start to set up monitoring system. Crew change. Held JSA. Continued to monitor well while mud pump monitoring equipment was installed. Trouble shoot monitoring equipment.
1/28/19	Commission monitoring equipment. Circulated well for 20 minutes with 9.2 ppg mud until 9.2 ppg in and out. RIH a stand at a time, circulating each stand down checking mud weight and flow back. Tagged down at 955'. Rigged-up power swivel. Cleaned out to 968'. Crew change. Held JSA. Cleaned-out from 968'-1021' and lost circulation. Pulled up 10' and conditioned mud to 9.0 ppg, 50 vis. Regained circulation with 20 bbls. Continued to rotate and circulate very slowly to 1130'. Appeared to be setting down on fill. Cleaned out to 1135' and lost circulation again. Able to regain partial circulation, continued to clean-out to 1240' (5' above fish). POOH to 409' while pumping 4 bbls down tubing every 2 stands. Secured well. Cleaned-out suction on pump. Crew change. Held JSA. Check well for pressure, 0 psi. Open BOPE and filled hole with 2.5 bbls. POOH with bit. RIH with overshot/packoff, jars, four 4-3/4" drill collars and accelerator. Installed check valve one joint above drill collars. RIH with tubing circulating bottoms up every 5 stands.

1/29/19	<p>Continue to RIH, tagged down at 883'. Rigged-up power swivel and worked over-shot through tight spot. Rig down power swivel. RIH with tbg and tagged down at 927'. Rigged-up power swivel and worked through tight spot, continue down to 965' and lost circulation, pulled tubing to 934' and attempted to circulate, no good. RIH and laid down 10 jts. from derrick. Rigged-up power swivel and rotate in the hole to 1027', no circulation. Crew change. Held JSA. Continued in hole and latched on to fish at 1,245' while pumping at 1.5 BPM. No increase in pump pressure while engaging fish (assume pumping through bottom of fish). Attempted to jar fish free, no movement. Released fish at 1,245' and picked-up to 1,232'. Rigged down power swivel. Rigged-up wireline and attempted to retrieve check valve with 2.25" OD tool at 1,048'. Retrieval tools stacking out at 31'. Pulled wire line retrieval tool. Run gauge tool of 1.91" OD to top of plug at 1,048'. Pulled gauge tool. File burrs from plug retrieval tools. Attempted to rerun the retrieval tool, no good, catching on each connection while running through tubing. Pulled retrieval tool. File chamfer on leading edge of retrieval to help clearance, did not help. While waiting on a retrieval tool with smaller OD, picked-up 10' pup joint and re-engage fish at 1,245'. Monitored wellbore fluid, static at surface. Rigged-up wireline and run in tubing with 2.16" OD retrieving tool. Latch on and unseat check valve, pull out of tubing with same. Made-up and run in tubing with sinker bars. Tagged drill bit at bottom of fish at 1,581', pull out of tubing. Made-up and attempted to reinstall check valve at 1,048', would not seat properly. Pulled valve. Pumped 10 bbls 8.9 ppg mud down tubing. Able to set check valve at 1048'. Released wireline unit. Crew change. Held JSA. Released fish. Laid down 2-7/8" pup joints. Pick-up power swivel and 1 joint of tubing. Re-engage fish at 1,245'. Jar on fish at 1,245' to 90-120K over.</p>
1/30/19	<p>Continued to jar on fish. Kept annulus full of 8.9 ppg mud. Lost 8 bbls of mud from mid-night to 6:30 am. Crew change. Held JSA. Released overshot from fish and laid down swivel. Subbed-up tubing and re-latched onto fish. Rigged-up slickline. RIH with retrieving tool for check valve and retrieved on second attempt. Note: pumped 15 bbls of mud down tubing between attempts to clear tubing of debris. RIH with memory temp/spinner tool. Rigged-up wireline and ran free point. Found tubing 100% free at 1289', 70% free at 1318', 60% free at 1360' and 15% free at 1388'. POOH and rigged down wireline. Crew change. Held JSA. Rigged-up slickline unit and attempted to set check valve in tubing at 1071', no good. POOH and pumped 20 bbls of 8.9 ppg mud down tubing. RIH and successfully set check valve at 1071'. POOH and rigged down slickline unit. Monitored well, keeping annulus full.</p>
1/31/19	<p>Continue to monitor well, keeping annulus full of 8.9 ppg mud, used 2 bbls to fill the annulus. Waiting on directions based on review of risk matrix with MDR and DOGGR. Scheduled services for AM. Crew change. Held JSA. Continued to monitor well. Casing remained full. Pumped down tubing every 3 hours with 5 bbls of mud to check check valve clean. Crew change. Held JSA. Continued pumping down tubing every 3 hours. Total mud pumped 15 bbls.</p>
2/1/19	<p>Continue to monitor well, keeping annulus full of 8.9 ppg mud, used 2 bbls to fill the annulus as of 6:30 am. Crew change, safety meeting and JSA. Pump 15 bbls down tubing at 4 bbls/min, RU W/L to retrieve float valve, RD W/L. RU to run tracer survey, RIH with tracer and pump mud @ 1.5 bbls/min. pumped a total of 44 bbls. POOH, RD W/L tracer, monitor well. Spot cement trucks and crew change. Safety meeting, JSA to RU cement equipment and cement line to tubing. Pressure test lines to 2750 psi, good test. Perform injection rate with mud, 1 bbl/min @ 138 psi, 2 bbls/min @300 psi, 3 bbls/min @ 560 psi, total mud pumped 32bbls of 8.9 ppg mud. Pump 10 bbls of water lead of cement, mixed and pump 170 sacks, 226 cu ft, 40.3 bbls of 14.8 ppg Type III cement @ 2.5 bbls/min, 320 psi. Displaced cement with 2 bbls of water and 18 bbls of 8.9 ppg mud. Final pump pressure was 430 psi, closed tubing, shut in tubing pressure was 330 psi. Annulus was full with no pressure observed during the injection test and while pumping the cement job including displacement. RD cement lines and cementers, monitor tubing pressure and wait on cement.</p>

2/2/19	Continue to wait on cement and additional 2 hours at 0200 tubing pressure is 0 psi. RU to pump down tubing, filled tubing with 4 bbls of mud, 1 bbl/min @ 180 psi pumping away mud, stopped pump and pressure test @ 180 psi. RU W/L make a gauge run to 1577' with no issues or restrictions. Pulled 40K on tubing string and made WL cut at 1408', lost weight to 35K and POOH with W/L. Worked cut 50K up and 10K down, fish free, pulled 1 stand of tubing. Pumped 5 bbls down tubing, no returns, keeping annulus full. Pumped 15 bbls down tubing and RU W/L to set check valve in the string. Float set, POOH with W/L and RD W/L. POOH with tubing, At 840' had gas in the mud, 928 units on monitor. Pumped a bottoms up, had returns over shakers. Pumping 3 bbls every 2 stands on trip out of hole. Laid down fish (106' tubing) and fishing tools, pumped 53 bbls, held safety meeting. Make up bit with insert float and RIH to 438', circulate well with 9 ppg mud good returns. Continue to RIH and circulate every 2 stands. Gas spikes in mud at 438', 563', 749', 874'. RU swivel and circulate down to 904'.
2/3/19	Continue to RIH to 975', lost circulation, and then to 1029' with no circulation. RD swivel and laid down 5 joints. Gas spikes seen at 904', 935' and 967'. RIH with tubing from derrick, pumping down without circulation. Tagged at 1276'. RU swivel and pumped at 2 bbls/min, 200 psi. Pumped 21 bbls without returns. Rig down swivel and pulled up to 1246', rig up to pump down tubing to attempt circulation. Crew change. Held JSA. Pumped down tubing at 3 BPM with no returns. Pulled to 811', 625', 438', 252', attempting circulation at each depth, no circulation. Established circulation at 66'. POOH with tubing and laid down bit. RIH with 10 stands of tubing with check valve on bottom. POOH laying down tubing while keeping hole full. RIH with 6-1/4" jetted milled tooth bit with flapper style float and drill collars. Circulated and reamed down to 173' with good returns. Crew change. Held JSA. Conditioned mud to 8.8 ppg, 52 vis and continued circulating and reaming down to 326' with good returns pumping at 3 BPM.
2/4/19	Continued to circulate and ream in hole to 482' with good returns pumping at 3 BPM with 85 psi tubing pressure. Crew change. Held JSA. Continued circulating and rotating down from 482' to 699'. Laid down 20 jts. of tubing. RIH with tubing from derrick to 823', circulating hole every 3 stands. Conditioned mud to 8.7 PPG at 823'. Continued circulating and rotating from 823' to 1010'. Had partial returns at 1041' and lost full returns at 1055'. Pulled bit to 916' and conditioned mud with poly vis. Circulated and rotated back down from 916' to 1196' with full returns. Crew change. Held JSA. Continue rotating and circulating in hole at rate of 3 BPM from 1196' to 1390' with full returns. Mud weight at 8.6 PPG 42 vis. Circulated bottoms up. Spot high vis pill on bottom. Laid down power swivel and one joint. POOH pumping down tubing every two stands at 3 BPM.
2/5/19	Continued to POOH. Made-up fishing tools and RIH breaking circulation every 3 stands. Set down at 1363'. Circulated and rotated down to 1275'. Rigged-up slickline and retrieved check valve. Rigged down slickline. Circulated and rotated down to and over fish at 1408', tubing pressured up to 1000 psi. Latched on to fish and jarred at 85K over until crew change. Held JSA. Attempt to release from fish to no avail. Engage tongs and rotate to release from fish. Circulated bottoms up. Laid down power swivel. Tool joint 5' below pitcher nipple. Installed pup joints, re-engaged fish. Rigged-up wireline.
2/6/19	RIH with gauge ring, unable to pass top of fish. POOH and made-up poor boy and pump down tubing at rate of 1/4 BPM at 1,000 psi. Pulled to 80K and slack off to neutral. Rigged up wireline with safety valve, pump-in sub, W/L BOP, lubricator and pack-off. RIH with gauge ring below top of fish. RIH with perf guns and shot 4 HPF from 1443' to 1445'. POOH. Installed poor boy and pump down tubing at 1/4 BPM at 1000 psi with no returns. Bleed down tubing pressure. Rigged-up wireline as before and RIH and shot 4 HPF from 1474'-1476'. POOH and rigged down wireline. Make-up poor boy and latched on to tubing. Pumped down tubing at 1/2 BPM at 1000 psi and got returns after pumping 6 bbls and pressure dropped to 250 psi. Increased rate to 2 BPM at 400 psi. Getting back some old drilled-up cement and barite in returns initially but then cleaned-up. Crew change. Held JSA. Jarred at 100K over with no movement. Rigged up wireline and RIH with free point tool and found top collar 67% free and the next collar 100% stuck. POOH with free point. RIH with string shot and backed-off between 1st and 2nd collar. Laid down 2 jts. Rigged-up slickline, RIH and set check valve in tubing. Rigged down slickline. POOH with tubing and fishing assembly filling hole every 2 stands. Crew change. Held JSA. Continued to POOH with tubing filling hole every 2 stands. Recovered top 4-3/4" drill collar.

2/7/19	<p>Make-up BHA with 3-1/2" IF screw-in sub. Spider in hole with tubing. Crew change. Held JSA. Circulate hole with full returns at 1420'. Rigged up slickline and set check valve in tubing. Rigged down slickline. Circulated and rotated down to fish. Screwed into fish. Established circulation through holes in drill collars from 1474'-1476' at max rate of 3 BPM at 700 psi. Continued circulating while jarring at 100K over with no movement. Rigged-up wireline. RIH and perforated drill collar from 1506' to 1508' at 4 HPF. Continued to work pipe at 100K over while circulating at 4 BPM at 500 psi with no movement. Ran free point tool and found fish 100% stuck at 1510', 10% free at 1478' and 30% free at 1468'. Crew change. Held JSA. Attempt to back off at top drill collar of fish at 1,478', no good. Screw-in sub backed off at 1,447'. Pull out of hole with wire line. Make up new string shot. Run in hole from surface to 1,447'. Put right hand torque in string. Set string shot off across screw-in sub to tighten. Pull out of hole with wire line. Made up new string shot. Run in hole from surface to 1,478'. Put left hand torque in string. Attempt to back off top drill collar of fish at 1,478', no good. Pull out of hole with wireline. Rig down wireline. Rig up poor boy swivel. Circulate at 0.5 BPM at 750 PSI. Rig down poor boy swivel. Rig up wireline. Made-up new string shot. Run in hole from surface to 1,478'. Put left hand torque in string. Attempt to back off top drill collar of fish at 1,478', no good. Rig up and run in hole with perf gun and shot 4 HPF from 1,482' to 1,484'.</p>
2/8/19	<p>Rig down wireline. Rig up poor boy swivel. Circulated at 3.4 BPM at 500 PSI. Pump small viscous sweep every 20 minutes. Rig down poor boy swivel. Rig up wireline. RIH with free point tool stacking out inside tubing at 557', POOH and laid down free point. RIH with sinker bar and tag at 557' and then work down to 668'. POOH and rig down wireline. Rig up slickline. RIH with two prong wire grab tool. Worked tool at 668'. POOH and recovered electrical tap from string shots. Crew change. Held JSA. Continued w/ 9 clean out runs before able to RIH to 1588'. Rigged down slickline. Attempted to pump down tubing to no avail. Pressured-up to 1000 psi and held. Rigged-up wireline and attempted to back off drill collar fish at 1478' w/string shot to no avail. Rigged down wireline. Jarred at 100k over for 1-1/2 hours. Able to break circulation w/ max rate @ 3 bpm @ 500psi. Rigged up wireline and RIH w/ free point tool, showed 60% stuck at screw in sub. RIH w/ string shot and backed out screw in sub. Circulated bottoms up. Rigged up slickline. RIH and reinstalled check valve. Crew change. Held JSA. POOH with tubing keeping hole full at all times. Laid down drill collars, pick up and make up 4-3/4" drilling jars.</p>
2/9/19	<p>Attempt to make up BHA, screw in sub was not making up correctly. Called out new sub and waited on sub to show up. Monitored well and kept hole full. Made-up new sub. RIH picking up 4-3/4" drill collars. Crew change. Held JSA. Continued picking up and RIH w/ jarring assy. Set down at 1437'. Picked up power swivel and rotated and circulated down to top of fish at 1447'. Screwed into fish and torqued to 5000 ft/lbs. Jarred down on fish while circulating, no movement. Pumping down tubing MW In 8.6ppg at 3bpm at 600psi with 40% returns. Recovering old drilling mud with formation shows, color change and strong smell. Indication of possible circulation up 11 3/4" X 17 1/2". Crew change. Held JSA. Continued to jar down on fish until 7:00 PM, no movement. Pumped 20 gallons of TorquEase down tubing. Rigged down power swivel. Rigged up slickline and retrieved check valve. Rigged-up wireline. Ran free point tool. Found bottom of first drill collar 100% stuck at 1447' and 100% free at 1432'. POOH and rigged down wireline. Rigged-up slickline and set check valve in tubing at 930'.</p>
2/10/19	<p>Rigged down slickline. Rigged-up power swivel, circulate bottoms up and monitored well. Crew change. Held JSA. Rigged-up slickline and retrieved check valve. Rigged down slickline. Rigged-up wireline. RIH with string shot to back off screw in sub but sub backed-off prior to setting off shot. Rigged down wireline and rigged up slickline and re-installed check valve. Rigged down slickline. POOH with jarring assembly, circulating hole every two stands. Laid down jarring assembly. RIH with screw in sub and up jarring assembly checking all connections for max torque allowed. Crew change. Held JSA. Continued to RIH with jarring assembly. Tagged fish at 1452'. Rigged-up poor boy swivel and circulated bottoms up at 3 BPM at 250 psi. Rigged-up power swivel and screwed into fish and torqued up with power tongs to 5000 psi. Circulate well at 1 BPM at 250 PSI.</p>

2/11/19	Continue to circulate well at 1 BPM at 250 psi. Crew change. Held JSA. Rigged up slickline and retrieved check valve. Rigged down slickline. Jarred on fish while circulating at 1.5 BPM, no movement. Crew change. Held JSA. Rigged down power swivel. Rigged up wireline and ran free point. Stacked out at 1,496'. Pulled up to 1,392' and calibrated free point tool. Run in from 1,392' to connection between top and second drill collar on fish at 1,477', fish 0% free. Pulled up to 1,467', fish 5% free. Pulled up to screw-in sub at 1,447', fish is 50% free. Rigged down and release wireline. Rigged up slickline. RIH with two prong wire grapple and worked down to 1,530' and POOH. Recovered clay and small gravel pieces (no tape). RIH with conventional bailer and worked down to 1,530' and POOH. RIH with bailer and worked down to 1,546' and POOH. Recovered clay and small gravel pieces. RIH with bailer again and worked down to 1,547' and POOH. Bailer empty. RIH with bailer again with same result. Rigged down slickline. Rigged up poor boy swivel. Pumped 10 bbls of 8.7 PPG mud down tubing at 3.5 BPM at 500 PSI. Rigged down poor boy swivel.
2/12/19	Rigged up slickline. RIH and set check valve in tubing at 933'. Rigged down slickline. Rigged up poor boy swivel. Pumped down tubing and circulate bottoms up at 3.5 BPM. Reduced rate to 1 BPM at 100 PSI. Continue to circulate and monitor well for gas and or losses.
2/13/19	Continued to circulate and monitor well for gas and or losses. Shut down pump at 4:00 am in preparation of noise log. Crew change. Held JSA. Rigged up wireline. Ran noise log. Rigged down wireline. Filled well < 5 bbls and re-established circulation at 1 BPM at 200 psi. Attempted to stroke bumper sub, stuck open. Crew change. Held JSA. Rigged-up power swivel and attempted to free-up bumper sub while circulating at 3 BPM, no good. Continued to circulate well.
2/14/19	Continued to circulate well at 1 BPM at 200 psi. Crew change. Held JSA. Rigged up slickline and ran 1.75" sample bailer to 1549', soft tag. Recovered minor amount of fill. Reran bailer to same depth. Hard tag. Worked bailer. No progress, no recovery. POOH and rigged down slickline. Rigged up wireline and RIH and set plug at 1525'. Crew change. Held JSA.
2/15/19	RIH with free point, calibrate tool at 1232', good. Top of first collar at 1296' found to be 50% free. 100% stuck at 1328' and 1447'. RIH with string shot and backed-off at pup joint at 1302'. Rigged down wireline. Laid down one single. Rigged up power swivel and circulated bottoms up at 4 BPM at 200 psi. Rigged up slickline and set check valve in tubing. POOH slowly with fish. RIH with 6 1/4" bit on 2 7/8" PH-6 tubing and a float sub and valve above bit. Circulated well every 2 stands. Tagged down on drill collar fish at 1302'. Circulated bottoms up. POOH with bit assembly circulating every 2 stands. Crew change. Held safety meeting and fill out JSA. Continued to monitor well and keep hole full.
2/16/19	Continue to monitor well and keep hole full. Crew change. Held safety meeting and fill out JSA.
2/17/19	Continue to monitor well and keep hole full. Crew change. Held JSA. RIH with 6-1/4" bit with float sub to top of fish at 1302' while circulating hole every 3 stands. Circulated hole on bottom for 30 mins at 4 BPM. Shut down pump and dumped 6 bags black die tracer down tubing. Circulated 43 bbls mud at 3.2 BPM to bring die tracer over shakers. Circulated hole clean. POOH with bit, circulating hole every 3 stands. Crew change. Held JSA. RIH with tubing out of derrick and laid down 64 jts.
2/18/19	Continue to monitor well and keep hole full. Crew change. Held JSA. RIH with screw-in sub, bumper-sub and jars to top of fish at 1302', circulating hole every 3 stands. Rigged-up slickline, retrieved check valve and POOH. Screwed into fish at 1302' and established circulation at 2 BPM at 1000 psi. Circulated for 30 minutes. RIH with 1-3/4" bailer and cleaned out electrical tape and small amount of fill from 1510' to 1522'. Mixed and pumped 5 gal black die tracer followed by 46 bbls mud at 3.2 BPM at 200 psi to bring tracer back over shaker. Backed-off at screw-in sub. RIH and set check valve in tubing. POOH circulating hole every 3 stands. Crew change. Held JSA. Monitored well and kept hole full.
2/19/19	Continue to monitor well and kept hole full.
2/20/19	Continue to monitor well and kept hole full. Crew change. Held JSA. Made-up 6-1/4" bit with float and measured in hole while picking-up 2-7/8", 6.5#, N-80, EUE 8rd tubing to 1246'. Filled tubing every 5 jts while RIH. Circulated well for 1 hour at 2 BPM, 300 psi. POOH with tubing.
2/21/19	Continued to POOH with tubing and laid down bit. Monitored well and kept hole full. Perform trip/BOP drill with each crew.
2/22/19	Monitored well and kept hole full
2/23/19	Monitored well and kept hole full, Held safety meeting and JSA review at both AM/PM 630 crew changes.
2/24/19	Monitored well and kept hole full, Held safety meeting and JSA review at both AM/PM 630 crew changes.

2/25/19	Monitored well and kept hole full, Held safety meeting and JSA review at both AM/PM 630 crew changes.
2/26/19	Monitored well and kept hole full, Held safety meeting and JSA review at both AM/PM 630 crew changes.

Appendix H

CWS Well Control Training Certifications

RCA, Item f) - California Well Services Well Control Training Certifications

██████████ (Rig Supervisor), ██████████ (Rig Operator) and ██████████ (Rig Hand) are the three crew members who worked between 10/23/18 and 1/13/2019 that had previously obtained well control certifications. All three of their certifications had expired and only ██████████ and ██████████ had a copies of the expired certification (see below).

IADC WELL CONTROL ACCREDITATION PROGRAM

Certificate of Completion

Certificate Number
A372533



The Individual Below has Successfully Completed
a FULL COURSE In Well Control Instruction at an Institution Accredited
by The International Association of Drilling Contractors

Name _____

ID Number 0934TP Stack Qualification Surface Only

Course Name & Level SUPERVISOR - Drilling/Workover/Completion - FULL

Training Provider AMERICAN WELL CONTROL & SAFETY LLC Telephone Contact 661-631-2927

Course Location American Well Control & Safety LLC - Bakersfield - USA Program ID Number W580

Completion Date 21-Jul-11 Expiration Date 21-Jul-13

Authorized Signature *Clark*

This Certificate is Valid Only When Signed and Dated.
IADC procedures permit a 90-day "grace period" for retaining following listed date of expiration. See form WCI-1.

IADC WellCAP® Completion Card

Name _____

Course Name S/DWOC/Full

Stack Qualification Surface Level Supervisor

Completion Date 26-Feb-15 Expiration Date 26-Feb-17

Training Provider American Well Control & Safety

Authorized Signature *Clark*

WSE609275

Appendix I

InterAct Well Control Training Certifications

May 22, 2019

L. Brun Hilbert, Jr., Ph.D., P.E.
Kelvin N. Abaa, Ph.D., P.E.
Exponent Failure Analysis Assoc., Inc.
149 Commonwealth Drive
Menlo Park, CA 94025

Gentlemen:

We understand that DOGGR has asked Exponent to address several additional items in its Root Cause Analysis report concerning the Dow RGC 10 well and has extended the deadline for submission to this Friday, May 24, 2019. To address a few points raised in DOGGR's April 23, 2019 letter, please note the following:

Requirement (f) – Training records. The Draft RCA includes only the formal training certifications of the CWS rig crew. It does not include any in-house or on-the-job training of rig crews which are recognized as other acceptable methods of well control training in DOGGR's November 3, 2005 Notice to Operators guidance document. It also fails to include the well control training records provided for InterAct's personnel including the Well Site Manager (WSM), who was on-site at the time of the Jan 11th incident, the Project Manager/Lead Engineer and our engineering staff, all of whom hold formal well control certifications from reputable schools. Attached are InterAct's training records for your reference. The fact that the rig crew and WSM responded appropriately during the incident, ensuring the safety of personnel, the public, and protection of the environment by dropping the pipe and activating the BOP to shut in the well within minutes indicates that the training was adequate and was *not* a causal factor.

Requirement (g) – BOP drills. As previously noted, BOP drills were held and the BOP was closed daily even though documentation of these exercises is lacking. The fact that the field personnel responded appropriately and the BOP functioned as designed indicates that the drills were effective and the crew was adequately prepared to close in the well as needed.

Requirement (h) – Risk assessment. As noted in Appendices F and I of the Draft RCA, the assessment and mitigation of risk are fundamental to InterAct's planning efforts when developing a well abandonment or re-abandonment program. This starts with a review and analysis of available records and preparation of a detailed well-bore schematic. The well history is considered when developing the steps of the abandonment program, determining equipment needs, the cost and schedule for completing the work, and preparing the Notice of Intent for DOGGR approval. The site conditions are considered and special circumstances, in this case

proximity to area residents and coordination with simultaneous operations of hotel construction, are addressed. As the RCA aptly states, the well records were limited and in certain instances, erroneous, however InterAct used the available information to prepare a program that met regulatory requirements and obtained DOGGR approval.

In addition to the documents already provided which summarize InterAct's well control practices and Dow RGC 10-specific plans, conditions on the well were assessed daily and adjusted as necessary. Following the Christmas day well control event, InterAct's Sr. Drilling Technical Advisor, Jim Chaconas P.E., was consulted to review the situation, assess well control risks going forward, develop mitigations to reduce the probability of another broach to the surface, and implement the selected mitigation of cementing the 7" casing sleeve, thereby establishing shallow casing integrity. Notes from these meetings and discussions are attached.

Sincerely,



Michelle Pasini
President

cc: Mr. Kenneth Harris, State Oil & Gas Supervisor, California Dept. of Conservation, DOGGR
Mr. Michael Hale, Executive VP of Construction, MDR Hotels, LLC

Attachments:

- A - InterAct Well Control Certifications for L. Nodolf, M. Giuliani, V. Lerma, D. (Jim) Chaconas, A. Scoging
- B - Notes of discussions between Jim Chaconas and Mike Giuliani following Christmas Day Event

ATTACHMENT A

Well Control Certifications for InterAct Personnel

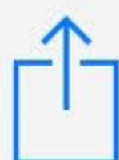


Certificate of Completion

The individual below has successfully completed a well control course at American Well Control and Safety

[REDACTED]	9828LN
Recipient Name	ID Number
DRILLING/WORKOVER/COMPLETION FULL	SUPERVISOR
Course Name	Level
12-Apr-18	11-Apr-20
Completion Date	Expiration Date
American Well Control and Safety	Surface
Training Provider	Stack Qualification
Bakersfield - USA	661-631-2927
Course location	Telephone Contact
Don Clark	
Instructor Name (Print)	
	
Authorized Signature (Corporate Official or Instructor)	

Certificate number: AME0491





Certificate of Completion

The individual below has successfully completed a well control course at American Well Control and Safety

[REDACTED]	5605MG
Recipient Name	ID Number
DRILLING/WORKOVER/COMPLETION FULL	SUPERVISOR
Course Name	Level
5-Apr-18	4-Apr-20
Completion Date	Expiration Date
American Well Control and Safety	Surface
Training Provider	Stack Qualification
Bakersfield - USA	661-631-2927
Course location	Telephone Contact
Don Clark	
Instructor Name (Print)	
	
Authorized Signature (Corporate Official or Instructor)	

Certificate number: AME0475

Well Control Training Program



Certificate of Completion

About this Certificate

This certificate verifies classroom hours, simulator training and successful completion of testing at the level specified on this certificate, and wallet card. Records include, but are not limited to test grades, kill sheets and worksheets.

Supervisor trainees are trained to:

Recognized the warning signs of a kick. Know how to shut a well in using either the hard or soft shut in method. Determine slow pump rates and pressures. Correctly complete a kill sheet. Properly initiate kill procedure (Drillers & Wait and Weight Methods). Maintain proper Bottom Hole Pressure (Static and Dynamic). Recognize and properly handle unusual well control issues. Control Bottom Hole Pressure as gas exits the choke. Determine if the well is free of kick influx. Understand the U-Tube concept.

Accepted industry standard for re-training is every 2 years. Verification of training can be accomplished by e-mail or by telephoning the provider listed on this certificate. Training records are retained 5 years.

Course Content in accordance with (but not limited to) the following documents:

Publication M07
Blowout Prevention in
California Equipment
Selection and Testing.
Division of Oil, Gas, and
Geothermal Resources.
California Department of

***API RP 53** Recommended
Practices for Blowout
Prevention Equipment Systems

***API RP 59** Recommended
Practices for Well Control
Operations.

***30 CFR** (Federal Offshore Orders)
Bureau of Safety and Environment
Enforcement.
ecfr.com



IADC
WELLSHARP

IADC Well Control Accreditation Program

Certificate of Completion

The individual below has successfully completed a well control course at an institution accredited by the International Association of Drilling Contractors.

[REDACTED]
Trainee Name

Drilling Operations, Supervisor, Surface
Course Name

Drilling Operations, Workover Completions, Supervisor
Supplement Name

29 June 2018
Completion Date

29 June 2020
Expiration Date

Wild Well Control Inc
Training Provider

00084250
ID Number

1-281-784-4700
Telephone Number

Brandon Patterson
Instructor Name



Certificate Number: **25876-FC1217**



Certificate of Completion

The individual below has successfully completed a well control course at American Well Control and Safety

[REDACTED]	7598ML
Recipient Name	ID Number
DRILLING/WORKOVER/COMPLETION FULL	SUPERVISOR
Course Name	Level
5-Apr-18	4-Apr-20
Completion Date	Expiration Date
American Well Control and Safety	Surface
Training Provider	Stack Qualification
Bakersfield - USA	661-631-2927
Course location	Telephone Contact
Don Clark	
Instructor Name (Print)	
	
Authorized Signature (Corporate Official or Instructor)	

Certificate number: AME0476

Well Control Training Program



Certificate of Completion

About this Certificate

This certificate verifies classroom hours, simulator training and successful completion of testing at the level specified on this certificate, and wallet card. Records include, but are not limited to test grades, kill sheets and worksheets.

Supervisor trainees are trained to:

Recognized the warning signs of a kick. Know how to shut a well in using either the hard or soft shut in method. Determine slow pump rates and pressures. Correctly complete a kill sheet. Properly initiate kill procedure (Drillers & Wait and Weight Methods). Maintain proper Bottom Hole Pressure (Static and Dynamic). Recognize and properly handle unusual well control issues. Control Bottom Hole Pressure as gas exits the choke. Determine if the well is free of kick influx. Understand the U-Tube concept.

Accepted industry standard for re-training is every 2 years. Verification of training can be accomplished by e-mail or by telephoning the provider listed on this certificate. Training records are retained 5 years.

Course Content in accordance with (but not limited to) the following documents:

Publication MO7
Blowout Prevention in
California Equipment
Selection and Testing.
Division of Oil, Gas, and
Geothermal Resources.
California Department of

***API RP 53** Recommended
Practices for Blowout
Prevention Equipment Systems

***API RP 59** Recommended
Practices for Well Control
Operations.

***30 CFR** (Federal Offshore Orders)
Bureau of Safety and Environment
Enforcement.
ecfr.com



**IADC
WELLSHARP**

IADC Well Control Accreditation Program

Certificate of Completion

The individual below has successfully completed a well control course at an institution accredited by the International Association of Drilling Contractors.

[REDACTED]
Trainee Name

Drilling Operations, Supervisor, Surface

Course Name

Drilling Operations, Workover Completions, Supervisor

Supplement Name

22 June 2018

Completion Date

22 June 2020

Expiration Date

Wild Well Control Inc

Training Provider

00084250

ID Number

1-281-784-4700

Telephone Number

Brandon Patterson

Instructor Name



Certificate Number: **25875-CEAD82**

Appendix J

CWS BOP Drills



California Well Services, LLC

1746- F South Victoria Ave. #382 – Ventura, CA 93003

BOP Drills

During the time leading up to well DOW RGC 10 blow-out, BOP drills were held on a regular basis but were not logged in the daily rig report as required by the DOGGR report. This requirement was an oversight.

It should be noted that the procedure for securing a well at the end of each day with a BOP is the same procedure that is used during a BOP drill, thus this drill is done daily. The Rig Operator or Rig Supervisor decides on the timing of the procedure, the TIW valve is installed in the tubing and the well is closed in. All crew members are familiar with the procedure to secure and close in a well under any scenario.

Appendix K

InterAct Risk Assessment Protocol

InterAct Risk Assessment Protocol

Risk assessment is an ongoing part of doing business for InterAct. Each project is unique and must be evaluated individually. The Interact model of risk assessment is to assess each project prior to execution, and continually evaluate risk throughout the duration of a project. At the conclusion of each project, where appropriate, meetings are held to discuss lessons learned.

Following is a summary of risk assessments conducted during the course the of the DOW RGC 10 re-abandonment.

Pre-job

The DOGGR well history was reviewed and the prior blow-out during re-abandonment in 1956 was noted as a key risk component of this job. This event in the well's history was subsequently discussed at a site visit on 7/26/2018 with Mike Giuliani (Project Manager), Loren Nodolf (InterAct WSM) and Randy Moskal (CWS Rig Manager) and later with key contractors and employees.

DOGGR approved the permit to conduct the re-abandonment on 6/5/2018. The permit contained the following well control requirements that were complied with:

1. Blowout Prevention Equipment (BOPE), 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 II2M, with hydraulic controls, during downhole operations. All casing annuli control valves must meet, or exceed, the same minimum pressure rating as the BOPE. The pipe safety valve must be suitable for all pipe in use, including casing.
 - b. A 2M lubricator for wireline operations.

BOPE requirements for critical wells must also comply with the following:

- c. Any and all control lines common to the BOPE and installed within 25 feet of the well bore must be shielded properly and insulated so the temperature rating is equal to or greater than 450 degrees Fahrenheit.
- d. Separate controls must be connected to each preventer in the BOPE stack. All control stations must be capable of providing complete opening and closure of each preventer in the BOPE stack.
- e. A minimum of one control station must be located at least 25 feet from the well bore.
- f. An emergency backup system must be installed that utilizes an independent, explosive-safe source of actuating energy. The source of energy and all controlling mechanisms associated with the backup system must be located at

least 25 feet from the well bore, and in close proximity to the control station described above.

- g. An access line of 2-inch minimum outside diameter must be installed below the preventer(s). In addition to the control valve installed at the wellhead, the access line must have a minimum of one control valve located at least 10 feet outside the cellar. The valve outside of the cellar will be the primary control valve for well work operations. The part of the access line located between the well bore and the control valve outside of the well cellar must be shielded properly and insulated so the temperature rating is equal to or greater than 450 degrees Fahrenheit.
2. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet (these were done but not always documented by CWS). A practice drill may be required at the time of the test/inspection.
3. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.

Due to the well control risk inherent to this well, the selection of the mud pump for this job included mud mixing capability to enable mud to be mixed from scratch if needed and to also adjust mud weights as required for optimal well control. Extra storage capacity was available on location to ensure more than enough mud was on hand in the event of severe loss circulation.

Early signs during execution of the project

During excavation and removal of the surface stove pipe down to about 25', constant gas bubbling was noticed emanating from the excavation pit. This was a reminder of the 1956 blow-out and the need to remain vigilant while drilling-out below the surface.

Secondly, the condition of the surface pipe was such that integrity could not be attained for the BOPE. A tied back sleeve to the 11 ¾" pipe was designed and installed to provide for adequate BOPE support.

During the Re-abandonment

11/2/2018 – Drilled into a gas pocket at 165' which was safely circulated out of the well. This was an early reminder of the gas blow-out potential in this well.

12/5/2018 – First occurrence of lost circulation at 836'. The fact we were nearing the bottom of documented cement at 887' reinforced the need to be on high alert for gas kicks.

12/20/2018 – Noticed mud surfacing outside of casing while circulating. Lost circulation started to become chronic when circulating. When not circulating, the hole would stand nearly full of fluid. At this point we began experimenting with different lost circulation materials (LCM) recognizing the importance of sustaining a mud column in the well for hydrostatic control.

12/21 & 12/24 – Noticed static fluid level in well only 20' from surface, took just 2.5 bbls of mud to fill. Well appeared static and safe.

12/26/2018 – Discovered the well had blown-out outside of the wellbore where the mud had previously surfaced and had killed itself by bridging off. This event put everyone on the highest alert where multiple discussions were held daily regarding how to safeguard against another release. The initial on sight discussion following the discovery is documented in a separate document.

12-27 through 1/2 – Cemented the 7" sleeve in place to shore up the wellbore to 466' for the purpose of reducing the risk of another gas broach behind the casing to the surface.

1/7/2019 – Started getting back "gassy" mud at 590'. Another warning prompting well control discussions (not documented).

1/8/2019 – Took a gas kick at 996 with 9.0 ppg mud. Shut-in well and conditioned mud. Bled-off gas bubble at surface. Lost all returns at 1120'. Attempted to regain circulation with LCM, no good. The day's events prompted group discussions which led to a proposal to spot cement across the window in the casing from 883'-887' in an attempt to remedy the lost circulation problem.

1/9/2019 – RIH with tubing to do a cement job across window in casing from 883'-887'. Took another gas kick at 880' (cement job unsuccessful). Bled down gas at surface while changing over to an 8.4 ppg mud. Successfully killed the well. Second consecutive day with a gas kick, held discussions of how to the control well (not documented).

1/10/2019 – While drilling out cement at 885' took another gas kick, third consecutive day. Continued battling lost circulation through the rest of the day. Continued discussions regarding well control. At this time, the InterAct management team became uncomfortable with the ability to control the well due to the concurrent lost circulation and gas kicks. Offset geology was studied and identified several shallow shales that could act as a subsurface barrier, and an abbreviated well P&A was discussed. Temperature and Pressure surveys from SoCalGas 8, the mud log and E-log from Riegle 1, and a survey from Covington 1, along with the core descriptions from DOW RGC 10 were reviewed to identify potential sources for the gas kicks.

1/11/2019 – Based on the above, an e-mail was sent to DOGGR at 6:15 a.m. recommending abbreviating the abandonment to mitigate the risk of a blow-out. DOGGR asked for more justification. Another email was sent to DOGGR at 12:30 p.m., documenting that another gas kick was taken at 1306'. Meanwhile the crew was able to find the right combination of mud weight and LCM to regain full circulation and subsequently were able to drill with full returns from 1368' to 1617'. The hole was circulated clean with no losses. Circulation was discontinued to enable the tubing to be pulled and the hole remained full. After pulling the second stand of pipe off bottom, the well blew-in up the tubing. The casing/tubing annulus remained full.

The above chronology illustrates how the sequence of events were recognized, assessed and appropriate actions taken to mitigate well control risks.