CASE 3846: Application of BCO, INC., AND HARRY L. BIGBEE FOR DOWNHOLE COMMINGLING, SAN JUAN CO

Case Number

3846

Application

Transcripts.

SmaLL Exhibits

ETC.

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

September 25, 1968

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Re: Case No. 3846
Order No. R-3506
Applicant:
BCO & Harry L. Bigbee

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x
Other

CASE 3844: Application of Rice Engineering & Operating, Inc., for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Queen, San Andres and Glorieta formations in the perforated intervals at approximately 3808-3834, 3962-3992, 5248-5261, and 5980-6054 feet in its Hobbs East San Andres SWD Well No. F-30 (formerly the Humble Oil & Refining Company S. E. Cain Well No. 1) located in Unit F of Section 30, Township 18 South, Range 39 East, Hobbs East San Andres Pool, Lea County, New Mexico.

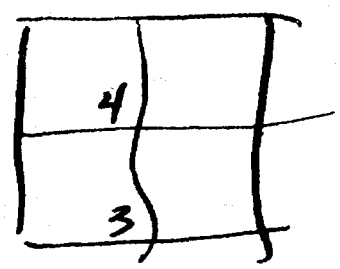
CASE 3845: Application of Rice Engineering & Operating, Inc., for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Grayburg, San Andres, and Glorieta formations in the open-hole interval from 3540 feet to 5616 feet in its Justis SWD Well No. H-2 (formerly the Resler & Sheldon-Bette Sue Well No. 2) located in Unit H of Section 2, Township 26 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3846: Application of Beo, Inc., and Harry L. Bigbee for downhole commingling, San Juan County, New Mexico. Applicants, in the above-styled cause, seek authority to commingle production from the Gallup, Greenhorn, Graneros, and Dakota formations in the wellbores of the Harry L. Bigbee Nancy Wells Nos. 3 and 4 located, respectively, in Units N and F of Section 12, Township 24 North, Range 8 West, Escrito-Gallup Oil Pool, San Juan County, New Mexico. Applicants further seek an administrative procedure whereby said commingling may be authorized for additional wells to be drilled in the area comprising all of Sections 12, 13, and the E/2 of Section 14; said township and range.

CASE 3847: Application of K. K. Amini for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Bough "C" zone of the Pennsylvanian formation underlying the NE/4 of Section 5, Township 10 South, Range 34 East, Lea County, New Mexico. Said acreage to be dedicated to a well to be drilled in the SW/4 NE/4 of said Section 5, adjacent to the Vada-Pennsylvanian Pool.

CASE 3848: Application of Continental Oil Company for a non-standard gas proration unit and an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the approval of a 296-acre non-standard gas proration unit comprising all of Lots 3, 4, 5, 6, 11, 12, 13, and 14, Section 2, Township 21 South, Range 25 East, Springs-Upper Pennsylvanian Gas Pool, Eddy County, New Mexico, said unit to be dedicated to its Levers Federal Well No. 1 located at an unorthodox location 1594 feet from the North line and 660 feet from the West line of said Section 2.

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO



IN THE MATTER OF THE PETITION OF BCO, INC., a New Mexico Corporation, and HARRY L. BIGBEE.

No. 3846

PETITION

Come now the Petitioners, Bco, Inc. and Harry L. Bigbee, and state:

1. That the Petitioners are the owners and operators of the working interest of all material formations and wells which are the subject matter of this Petition, subject to Federal oil and gas leases.

2. That the Nancy 4, which is situate in the Southeast Quarter of the Northwest Quarter of Section 12, Township 24 North, Range 8 West, San Juan County, New Mexico, was first drilled through the Gallup formation as shown by the records of this Commission, and thereafter plugged and abandoned for the reason that the Gallup formation did not indicate sufficient potential to justify completion of said well.

3. That thereafter said Nancy 4 was re-entered and drilled through the Dakota formation, casing run to the bottom of said hole and properly cemented with sufficient cement to cement all areas from the bottom of said hole to above the Gallup formation.

4. That said well was first completed by perforation and sand fracture in the Graneros formation and produced for a period of time as a pumping oil well.

5. That thereafter a drillable plug was set above the Graneros formation and below the Greenhorn and that said Greenhorn was perforated and treated with acid and sand fracture and has since been produced as a

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ATTORNEYS AT LAW
BOKUM BUILDING
SANTA FE, N. M.

DOCKET MAILED
Date 8-8-68

pumping oil well.

6. That the amounts of production obtained from either the Graneros or Greenhorn are insufficient to conduct additional drilling and are such that the maximum recoverable reserves cannot be recovered from either of said formations if produced alone, and that in order to obtain the maximum recoverable amounts of oil, the plug between the Greenhorn and Graneros should be removed and Petitioners allowed to further complete the Gallup formation and thereafter commingle and produce the Gallup, Greenhorn and Graneros formations which, if allowed, Petitioners believe will result in an economic well permitting the maximum recoverable reserves from all of said formations and may also justify the drilling and completion of additional wells, if similarly commingled in said formations, in adjacent areas.

7. That the Nancy 3, which is situate in the Southeast Quarter of the Southwest Quarter of Section 12, Township 14 North, Range 8 West, was first drilled through the Gallup formation and was thereafter plugged and abandoned in that the potential of said Gallup formation was not sufficient to justify the running of pipe and completion of said formation.

8. That Petitioners thereafter re-opened said well and drilled the same through the Dakota formation, ran and cemented pipe using sufficient cement to substantially cement all areas from the bottom of the hole to a point above the Gallup formation, and thereafter, as shown by the reports to this Commission, perforated various zones in the Dakota and Graneros formations, sand-water fractured the same, and are now producing the same as shown by the records of this Commission as a pumping oil well.

9. That the logs run and tests made in connection with the drilling indicate that, as with the Nancy 4, the Greenhorn may be completed and oil and gas production obtained therefrom and that, similarly, the Gallup formation may be completed and oil and gas production obtained from said formation if all

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SANTA FE, N. M.

of said formations are permitted by this Commission to be commingled in producing the same.

10. That allowing the completion and commingling of the Dakota, Graneros, Greenhorn and Gallup formations will permit the recovery of otherwise uneconomically recoverable reserves and is in the interests of conservation of resources in the same manner as stated in relation to the Nancy 4.

11. That subject to this Commission's approval of commingling all formations as heretofore requested, this Commission should permit by administrative order only the commingling of all of said formations or such formations as it may deem proper included within all of said formations in the immediately adjacent areas owned by Petitioners, which include all of Sections 12, 13 and the East Half of Section 14, all in Township 24 North, Range 8 West, San Juan County, New Mexico.

WHEREFORE, Petitioners pray that they be allowed to complete and commingle the Dakota, Graneros, Greenhorn and Gallup formations in the wells previously referred to as the Nancy 3 and Nancy 4, and that this Commission, by appropriate order, require that upon the drilling of additional wells in Sections 12, 13 and the East Half of Section 14 by the Petitioners, or either of them, that commingling of all or part of said zones be permitted by administrative order of this Commission to the extent deemed proper by the Commission without the necessity of further hearings.

Respectfully submitted,

BIGBEE & BYRD

By Harry L. Byrd

Attorneys for Petitioners

BIGBEE & BYRD
ATTORNEYS AT LAW
BOKUM BUILDING
SANTA FE, N. M.

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

1000 RIO BRAZOS ROAD
AZTEC

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

August 20, 1968

Mr. Dan Nutter
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

68 Aug 22 AM 8 ..

Dear Dan:

Enclosed is the information which I agreed to send in connection with Case 3846 wherein Mr. Harry Bigbee proposes to commingle production from the Gallup, Greenhorn, Graneros and Dakota formations.

I have spotted on the plat all wells that I can locate which penetrated the Dakota formation in townships 24 and 25 north, ranges 7 and 8 west. I am also enclosing a list of these wells showing briefly the results of drilling. As you can see, there is one producing Dakota gas well in township 25 north, range 7 west; three producing gas wells in the eastern part of township 24 north, range 7 west; two producing oil wells in section 12, township 24 north, range 8 west (Bco's two Nancy wells about which the hearing was called); and three producing oil wells in township 25 north, range 8 west. You will note that the area under consideration in Mr. Bigbee's application is pretty well surrounded with wells which were drilled through the Dakota and either not completed at all in that zone or later plugged back to the Gallup. Therefore, his contention that the Greenhorn, Graneros and Dakota zones are marginal in the area seems well founded. Production history also shows that the Gallup zone is marginal in the area. If the production from all the small producing zones from the Gallup through the Dakota could be commingled in the well bore, I am sure that the economies effected would make it possible to drill and produce oil and gas reserves which will not otherwise be developed.

The hazard of course is that the Commission may be deluged with applications of similar nature in other areas where the issues are not so clearcut and where commingling of zones could get us into both oil and gas proration problems. For instance, if someone suddenly wanted to commingle the Dakota with the Gallup in the Devils Fork Gallup pool to the east, only God knows what it would do to the volumetric formula in use in that pool. I presume it would be best to cross that bridge when we get there.

All things considered, I would recommend that we approve Mr. Bigbee's application as I do not see how approval will lead to any serious complications in the area he is proposing, and I believe it may lead to further development in an area that would not otherwise be developed.

Yours very truly,

Emery C. Arnold
Supervisor, District #3
ECA:mc

Wells which were drilled through the Dakota formation in Townships 24 and 25 North, Ranges 7 and 8 West.

T24N-R7W

P-7-24N-7W, Compass Exploration, Inc., Federal #1-7, Dakota gas well completion, IP 2485 MCF/D. Was connected 7-14-61 but no test filed. Plugged and abandoned 12-21-62.

F-8-24N-7W, Compass Exploration, Inc., Federal #1-8, was drilled to Dakota, completion attempted. Plugged and abandoned 12-28-60.

O-11-24N-7W, Pan American Petroleum Corp., John S. Dashko "B" #3, was drilled to Dakota but never produced. Plugged and abandoned 8-28-65.

N-12-24N-7W, Paul F. Rutledge, Miller "B" #5, Gallup-Dakota dual (Devils Fork Gallup) Dakota potential 1200 MCF/D, latest deliverability 721 MCF/D.

A-13-24N-7W, Paul F. Rutledge, Miller "A" #1, Gallup-Dakota dual (Devils Fork Gallup) Dakota potential 475 MCF/D, latest deliverability 279 MCF/D.

I-13-24N-7W, Redfern Development, Largo Spur #2, drilled to Dakota but plugged back and completed as Devils Fork Gallup gas well.

P-17-24N-7W, BCO, Inc., Escrito Gallup Unit #14, drilled to Dakota but plugged back and completed as Escrito Gallup Oil well.

H-18-24N-7W, BCO, Inc., Escrito Gallup Unit #8, drilled to Dakota, completion attempted, plugged back and completed as Escrito Gallup oil well.

D-25-24N-7W, Petroleum Consultanta, Inc., Mesa #1, Gallup-Dakota dual, Escrito Gallup pool, Dakota potential 684 MCF/D, latest deliverability 27 MCF/D.

G-26-24N-7W, BCO, Inc., Federal 4-26 #1 was drilled to Dakota, plugged back and completed as Escrito Gallup oil well.

O-27-24N-7W, BCO, Inc., Federal 1-27 #1, drilled to Dakota, plugged back and completed as Escrito Gallup oil well.

K-29-24N-7W, Petroleum Consultants, Inc., Connie #3 was originally a Dakota-Gallup dual (Undes.Gallup) Dakota was marginal and was squeezed off. Now Gallup single.

T24N-R8W

H-3-24N-8W, Noel Reynolds, Paquenche #2 was drilled to Dakota, plugged back and completed as an Undesignated Gallup oil well.

M-3-24N-8W, Thomas A. Dugan, Royal Federal #1 was drilled to the Dakota, plugged back and completed as an Undesignated Gallup oil well.

T24N-R8W

D-6-24N-8W, Century Exploration, Mobil Federal #1-6 was drilled to the Dakota, never produced and was plugged and abandoned 12-19-60.

C-10-24N-8W, Noel Reynolds, Paquenche "A" #3, drilled to the Dakota, plugged back and completed as an Undesignated Gallup oil well.

O-10-24N-8W, Royal Development, Paquenche #1 was drilled to the Dakota, completion attempted and was plugged and abandoned 1-8-58.

F-12-24N-8W, Harry L. Bigbee, Nancy #4, is presently Undesignated Greenhorn oil well, has produced from Gallup, Graneros, and Dakota. Note: This is one of the wells that Bigbee described at hearing.

N-12-24N-8W, Harry L. Bigbee, Nancy #3, presently Undesignated Dakota oil well completion. Note: This well also described at hearing.

A-34-24N-8W, Noel Reynolds, Noel Reynolds #1, drilled to Dakota and plugged back and completed as Undesignated Gallup oil well.

T25N-R7W

P-5-25N-7W, Kay Kimbell Estate, Liberman #1, Basin Dakota Gas well with an IP of 1900 MCF/D, latest deliverability 160 MCF/D, XM.

G-7-25N-7W, Tenneco Oil Company, USA T.J. Foster #1 was drilled to Dakota, completion attempted and plugged and abandoned 4-13-62.

T25N-R8W

F-17-25N-8W, Skelly Oil Company, Mexico Federal J #1 was drilled to the Dakota and completed as a Dakota oil well, has an IP o f 147 BO/D, produced 4 years. Plugged and abandoned 3-16-64.

G-17-25N-8W, Sinclair Oil & Gas Co., Stephenson WN Federal #1, Dakota oil well (producing from Graneros zone) IP is 260 BO/D, latest GOR test 4 BO/D, TSTM.

B-20-25N-8W, Sinclair Oil & Gas Co., Keeling WN Federal #1, Dakota oil well completion (Graneros and Dakota zone) IP 107 BO/D, latest GOR test 5 BO/D, TSTM.

M-35-25N-8W, Benson-Montin-Greer Drilling Corp., Pilgrim #1, Dakota oil well completion, has an IP of 17 BO/D, latest GOR test 14 BO/D, TSTM.

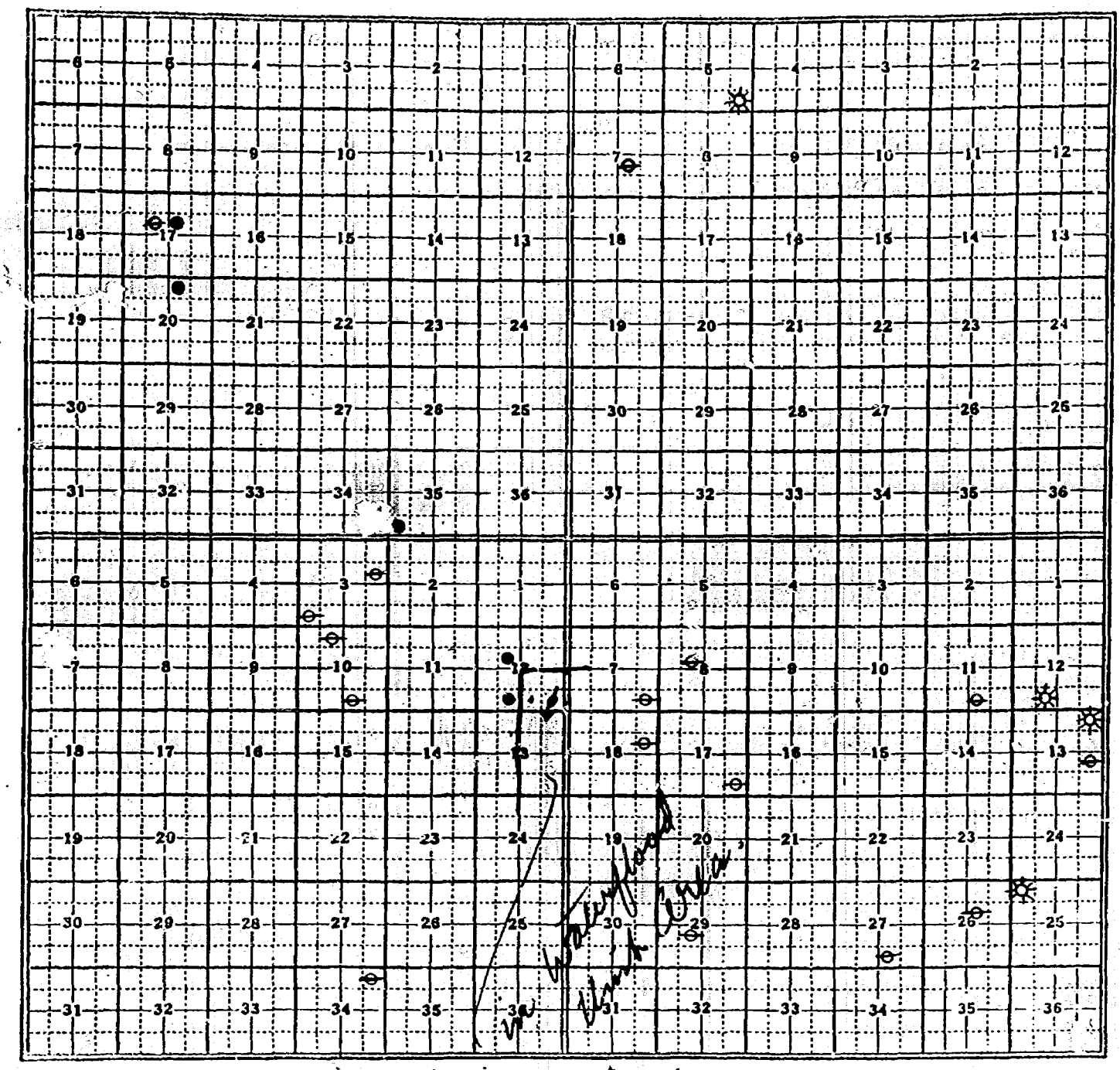
Wells which penetrated Dakota Formation

SAN JUAN & RIO ARRIBA Counties NEW MEX.

Township 25 N Range 8 W Township 25 N Range 7 W

Township 24 N Range 8 W Township 24 N Range 7 W

Form 101—(Four on Township)



Area under Consideration in case 3846

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 21, 1968

IN THE MATTER OF:

Application of Bco, Inc., and Harry L. Bigbee for downhole commingling, San Juan County, New Mexico.

Case No. 3846

BEFORE: D. S. NUTTER
Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call as the next case, Case 3846.

MR. HATCH: Application of Bco, Inc., and Harry L. Bigbee for downhole commingling, San Juan County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin & Fox, representing the Applicant. I have one witness I would like to have sworn, please.

(Witness sworn.)

(Applicant's Exhibit 1 marked for identification.)

* * * * * *

HARRY L. BIGBEE, called as a witness, having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Harry L. Bigbee.

Q Are you one of the applicants in Case 3846?

A Yes, I am one of the applicants and President of Bco, Inc.

Q Mr. Bigbee, what do you propose to do in your application in Case 3846?

A This involves two specific wells. On the one exhibit that has been marked, which consists of, I believe, of 16 pages that I have numbered in the lower right-hand corner in pencil

is the document, I believe, material. Both the Nancy 3 and the Nancy 4 were initially drilled down through the Gallup formation. It was an attempt to extend the Escrito trend in a northwesterly direction. Both of them encountered only marginal Gallup Sands and both were plugged and abandoned. At a later time, as shown on dates indicated in the exhibit, the Nancy 4 was re-opened and deepened through the Dakota formation. At that time, it was completed in the Upper Graneros as an oil producer. Later there was an unsuccessful attempt to get a little additional production in the Dakota formation which was unsuccessful and a plug placed below the Graneros. Later, a plug was placed above the graneros at the depths indicated in the exhibit and the Greenhorn was perforated, treated with acid, fracked and brought in as a producer.

The amount of the production obtained from the two zones since the Greenhorn has been brought in, the Model N plug, I believe they call it separating it from the Graneros, has not been removed and therefore, starting with January of 1968, on Page 7 of the Exhibit, I had the office prepare from the records that's shown the production that would be Greenhorn production in '68 and '67 it would be Graneros production with some frack oil distributions as shown, which primarily related to the Dakota.

It is my belief that while the Gallup is a very tight formation, all these formations very tight, was not just by initially the setting of casing and fracking, that with the casing already set with the cementing schedule that was used on page 10 of the exhibit. We actually cemented this on three stages, starting from the bottom of the Dakota, stage one with some three hundred sacks and there was stage two and stage three. It was estimated that stage one would approach 5390 by Halliburton, I believe a bond log was run on that and there is cement above the Gallup formation. It is believed that the Gallup, while marginal, would pay for the cost of a fracture treatment if commingled. That if the Greenhorn and Graneros cannot be operated together, there will be oil not recovered because it takes a tool at this depth, with a pumping well to actually make an economic aroducer. Very similarly, the exhibit shows the Nancy 3 was later in this year, deepened down through the Dakota. At that time, there were perforations made and the depths of the perforations are given in the exhibit in both the upper Graneros, the lower Graneros and in certain Dakota zones. It has since been produced from that, the indications of the log would indicate the Greenhorn would be marginally produceable, as the Nancy No. 4, and the indications of the log is that the

Gallup would similarly be marginally produceable and would justify the expense of opening up all three formations if commingling is allowed, although none of the single formations will justify drilling in the area. The amount of cement -- this was a one stage cement job -- it's my recollection we used on the one stage 50 more sacks than we used in the one stage on the Nancy 4, which was calculated to bring up the cement to approximately the bottom of the Mesa Verde. The exact amount of cement is shown on Page 3. There are two different types of cement that is set forth, or 225, first paragraph under item 17, 225 sacks of one type of cement and 150 sacks of another type which would make 375 sacks which is actually 75 sacks more than the other, to insure there has been no bond log fun on this, but the calculation would show that it would reach the bottom of the Mesa Verde.

I have also brought with me two separate logs, one is a Gamma Ray Neutron of the Nancy 4, which shows the type of sands, and I believe the tightness which would insure against any possibilities of theft sands due to slightly differing pressures in these. I have also brought for the Nancy 3 a log which is now recommended for the same purpose, both to furnish more information than a Gamma Ray Neutron run by Schlumberger called a compensated density log which

discloses the specific formations. Other logs were run on both wells and are available if additional logs are desired.

Q Mr. Bigbee, what is the present status of the Nancy 3?

A The Nancy 3 at this time is being produced from the Graneros Dakota formation. It has not been perforated or treated or opened in any other zone.

Q Not been dually completed at any time?

A No.

Q What is the status of the Nancy 4?

A The status of the Nancy 4 is there is a Model N plug immediately below the Greenhorn Formation and it is being produced from the Greenhorn.

Q Again, it has not been dualled?

A It has not been dualled nor is the pipe capable of being dualled. It's four and a half-inch.

Q It's your proposal to open the Gallup, Greenhorn, Graneros and Dakota Formations in both of these wells?

A Yes.

Q By perforating?

A Yes, and also request that an order be entered for the same reason as shown here in the Section 12 which is 24, 8, as I recall, where the two Nancys are located as well as

Section 13 in the east half of 14, in the same township where indications would exist that would at least justify me in drilling at least one more well.

Q You are asking for administrative procedure to approve of this same commingling?

A Yes in that limited area, in two and a half sections.

Q In two and a half sections?

A Yes.

Q Are you familiar with the characteristics of the Gallup, Greenhorn and Graneros formations in this area?

A I would say in a general way.

Q Is there any great pressure differential between these zones?

A We have been unable to ascertain any; none of them will produce without a pump jack. Our fluid levels and so forth would indicate that the Gallup, we will not know until we open it what that pressure is, approximately the initial bottomhole pressures of the Gallup formation and it's the Mary Sand that I would propose to open with, maybe a few, couple of feet in the upper Gallup, was initially calculated at some 1900 pounds. Now whether it has reduced in this area or remained about the same, we do not know. The other two formations on rough calculations, would be around 2200 feet.

There seems to be very little difference in the pressure between the Greenhorn and the Graneros Formation; in fact, we suspect the two are commingled underground because the gravities of the oil are almost identical.

Q How do the gravities compare to the other zones?

A I made a spot check of that; I asked from 1967, of May, we were producing from the Graneros Formation. Of course, that is in the earlier spring, the gravities for that month averaged approximately 40.1. Normally, in the summer, you lose a little more of your light ends. The July of 1968, the gravity from the Greenhorn averaged approximately 38.5. For the same month the gravity from the Nancy 3, where you are producing from the Graneros Dakota, averaged approximately 38.4.

MR. NUTTER: Could we go over those three figures again, Mr. Bigbee?

A Yes, in May of 1967, where I will point out that normally you have a slight differential in the colder periods because of the evaporation of your lighter ends in the warmer part, the gravity on the Graneros Formation was slightly in excess of 40 gravity, 40.1 as we calculated. In 1968, from the same well, but producing from the Greenhorn Formation, the gravity averaged approximately 38.5.

Q Now, what month was that?

A That is July of 1968, I got the last on the Nancy 3 and Nancy 4 for current production, I got the latest available; I used July instead of May. Similarly, in July of '68 from the Nancy 3 from the Granceros Dakota, it was almost identical, it was calculated 38.4.

Q What is the production from the Nancy 3 at the present time?

A The production in July was 679 barrels; there were 1818 mcf.

Q What was the production from the Nancy 4?

A Nancy 4, in July, which would be from the Greenhorn formation, was 406 barrels. The decline is indicated by the months.

Q Has the production from these two wells been consistently declining over the last year?

A They have up until now.

Q Do you anticipate that they are reaching their economic limit?

A Yes, they are. I would say the Nancy 4 is very close to its economic limit. The Nancy 3 will not go very much further on a decline and justify continued operation.

Q Unless this application to commingle this production

is granted, will it be necessary to plug and abandon these wells, in your opinion?

A It is my opinion that it would probably, that both wells would probably operate at least a year longer, Mr. Kellahin. I believe I could operate them and could try to at least a year longer. At least I have no immediate plans to abandon them, but I anticipate that within a year, the first time major expense would come up, they would have to be abandoned.

Q Would the approval of this application enable you to produce them for a longer period of time?

A Yes, it would, and it would also permit the recovery of oil and gas from these additional zones that otherwise could not be economically recovered.

Q It is not economically feasible to dually complete these wells, in your opinion?

A It is not.

Q Was Exhibit 1 prepared by you or under your supervision, or taken from the records kept in the ordinary course of your business?

A Yes.

MR. KELLAHIN: I offer in evidence Exhibit No. 1, a multi-paged exhibit.

MR. NUTTER: Applicant's Exhibit 1 will be admitted in evidence.

(Whereupon, Applicant's Exhibit 1 offered and admitted in evidence.)

MR. KELLAHIN: That's all I have on direct examination.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Bigbee, now, you are conducting a water injection project?

A Yes, I am.

Q Somewhere in this neighborhood, how far away is that?

A The southeast quarter of Section 12 is the northwest limit of that project.

Q Now, do you think that if you should open the Gallup Formation in here that you might find substantial reserves of oil would have been pressured by the water injection project to the southeast?

A It is possible.

Q Then you might have top allowable wells and there would be no problem as far as the expense is concerned, of dually completing the wells?

A I will say, though, based on my experience that in

the area, the length of time they are likely to go to water because the Nancy 2 which is the adjacent well, the closest well in the waterflood which is located according to my recollection, in the southwest quarter of the southeast quarter of Section 12, has gone to water.

Q Now, it would be immediately adjacent to one of the subject wells, wouldn't it?

A It would be the Nancy 3, is slightly more, I believe, it is in the adjacent quarter section to the east.

Q It would be the adjacent quarter quarter, actually, wouldn't it?

A I don't believe so.

Q Well, your Nancy 3 is in Unit letter M which would be the southeast of the southwest. Then you said you thought that the No. 2 was in the southwest of the southeast?

A Yes, it is in the southwest of the southeast --

Q So they are adjacent quarters?

A They're situated slightly more than 1200 some odd feet apart there, if you take the precise measurements. They are slightly in excess of a quarter of a mile apart.

Q The No. 2 has gone to water in the Gallup Formation?

A It has gone to water; it actually went to water immediately and we never got any production out of it. I'd

say very small production.

Q Where is the nearest injection well, Mr. Bigbee?

A The northeast injection well is the Nancy No. 1 which is in the southeast quarter of the southeast quarter of Section 12.

Q Of Section 12?

A Yes.

Q So the well that went to water as a direct offset to it, also then, it would be one location east of there?

A Yes, it was a direct offset to it, the Nancy 3 is a direct offset to what went to water --

Q Right.

A -- and knowing that you have got water some place within a quarter of a mile of the Nancy 3, not knowing just where that is, I will say that we did take, use a logging service normally before I would use Baroid where they test the amount of gas in the mud which alone would be material in opening up the Gallup that they found quite a little, they found no indication of water and we don't think it would yet have gone to water.

Q For the most part the Dakota Formation in the San Juan Basin is productive of gas. How far away is the nearest gas production in the Dakota Formation?

A There is no gas production in the Dakota formation in that township to my knowledge. There is no Dakota production of gas in at least the west half of the township to the east. There may be a little in the east half of that township. I am quite sure in the township to the north, there is no Gallup production in at least the bottom two tiers of sections.

Q No gas production, you mean?

A No gas production, yes.

Q So it would be a number of miles, at any rate, to the nearest Dakota gas well?

A Yes, and I don't think it would drain very much because we have got too small to measure in the Nancy 4 and in the Nancy 3, we've gotten 1818 mcf, with 679 barrels of oil, the latest one.

MR. NUTTER: I might read this letter into the record. This is from the Supervisor of the Commission's District Office at Aztec. It's addressed to me and reads as follows:

"Enclosed is the information which I agreed to send in connection with Case 3846 wherein Mr. Harry Bigbee proposes to commingle production from the Gallup, Greenhorn, Graneros and Dakota formations."

"I have spotted on the plat all wells that I can

locate which penetrated the Dakota formation in townships 24 and 25 north, ranges 7 and 8 west. I am also enclosing a list of those wells showing briefly the results of drilling. As you can see, there is one producing Dakota gas well in township 25 north, range 7 west; three producing gas wells in the eastern part of township 24 north, range 7 west; two producing oil wells in Section 12, township 24 north, range 8 west (Bco's two Nancy wells about which the hearing was called); and three producing oil wells in township 25 north, range 8 west. You will note that the area under consideration in Mr. Bigbee's application is pretty well surrounded with wells which were drilled through the Dakota and either not completed at all in that zone or later plugged back to the Gallup. Therefore, his contention that the Greenhorn, Graneros and Dakota zones are marginal in the area seems well founded. Production history also shows that the Gallup zone is marginal in the area. If the production from all the small producing zones from the Gallup through the Dakota could be commingled in the well bore, I am sure that the economies effected would make it possible to drill and produce oil and gas reserves which will not otherwise be developed."

"The hazard of course is that the Commission may be deluged with applications of similar nature in other areas

where the issues are not quite so clearcut and where commingling of zones could get us into both oil and gas proration problems. For instance, if someone suddenly wanted to commingle the Dakota with the Gallup in the Devils Fork Gallup pool to the east, only God knows what it would do to the volumetric formula in use in that pool. I presume it would be best to cross that bridge when we get there."

"All things considered, I would recommend that we approve Mr. Bigbee's application as I do not see how approval will lead to any serious complications in the area he is proposing, and I believe it may lead to further development in an area which would not otherwise be developed.

"Yours very truly, /s/ Emery C. Arnold, Supervisor, District #3."

MR. NUTTER: He is not here for cross examination. You probably wouldn't want to tear him up anyway, would you, Jason?

MR. KELLAHIN: No, I wouldn't and I would say that as far as the Devils Fork, we can face that when we come to it.

THE WITNESS: I might mention one other thing in relation to the administrative procedure that I have mentioned. I have pointed out that the southeast quarter section 12 is in the Bco Waterflood Unit or whatever it is called; also the east half of 13 is similarly situated and, of course,

in those areas as long as you have unitization with other areas, the commingling of the Gallup, I do not see how it could be feasible, but we asked for the administrative procedure in order that at least the Greenhorn and the Graneros could be in upon the abandonment or change of conditions or consent of the underlying royalty owners of some formula, that may be opened in that area.

MR. NUTTER: Have you determined where this third well would be drilled, in the event you did get approval?

THE WITNESS: I have not yet made a decision. I have two locations in mind, one is approximately, I want to space these wells at slightly over a quarter of a mile. The first well is the Nancy 4 and the Nancy 3 is just about three-eighths of a mile, so one location would be approximately three-eighths of a mile to the south of the Nancy 3. The second location, and that would have its advantage, where if I get a marginal Gallup sand to be able to commingle. The next location would be if you got a map of what was originally called the Smith No. 1, which is in the southeast quarter of Section 13, it actually encountered a fair Gallup sand. It is not as marginal as these others; however, at this time we do not have an indication it would be repressured as yet.

Q (By Mr. Nutter) Well, now, that's in the unit area?

A That's in the waterflood area; therefore if I was to drill that next, what I would propose to do would be, if indications were sufficient to justify it, to first open up the Dakota Graneros, test it, put a plug, open up, fracture, you would have to do it separately, the Greenhorn, test it and then put a plug under the Gallup, open it up so you would not have to go through tubing on the others, and produce it through the life of the waterflood, is what I would have it do. So I have got two different economics in here.

Q And then go back into the lower zone later?

A And go back into the lower zone, only after the Gallup would otherwise have been closed.

Q And after the unit was terminated.

A And after the unit was terminated, but still maybe at that time you would have to squeeze off the cement Gallup on account of water and produce the others, but those are the two locations that I have in mind.

Q Directly south of the No. 3 and down to the southeast of Section 13?

A Yes.

MR. NUTTER: Are there any other questions of Mr. Bigh[illegible] We might mention we do have a letter from Dugan Production Corporation, but I note that a copy of this letter

is attached to your exhibit also.

A Yes; I might mention I never talked to Mr. Dugan, I was real surprised to get the letter. However, his firm did, they were actually retained by Cory Laboratories to do the completion work and the recommendations on the Nancy 4 and he supervised the drilling of the Nancy 3 as probably the records would indicate, he did all the supervision.

Q He is acquainted with the area?

A He is acquainted with the area.

MR. NUTTER: Are there any further questions of Mr. Bigbee? The witness may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: Nothing further.

MR. NUTTER: Does anyone have anything in Case 3846? We will take the case under advisement, and take a ten-minute recess.

I N D E X

EXHIBITS	MARKED	OFFERED AND ADMITTED
Applicant's No. 1	2	11

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my hand this 3rd day of September, 1968.

Ada Dearnley

Ada Dearnley

I do hereby certify that the foregoing is a [illegible] record of the proceedings in the [illegible] Examiner hearing of Case No. 3846 held on 8/21, 1968.

[signature], Examiner
New Mexico Oil Conservation Commission

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3846
Order No. R-3506

APPLICATION OF BCO, INC., AND HARRY L. BIGBEE
FOR DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 21, 1968, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 25th day of September, 1968, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicants, Bco, Inc., and Harry L. Bigbee, are the owners and operators of certain leases comprising Sections 12, 13, and the E/2 of Section 14, Township 24 North, Range 8 West, NMPM, Escrito-Gallup Oil Pool area, San Juan County, New Mexico.

(3) That the applicants are the owners and operators of the Harry L. Bigbee Nancy Wells Nos. 3 and 4, located in Units N and F, respectively, of said Section 12.

(4) That the aforesaid Well No. 3 is presently completed as a low marginal pumping well in the Graneros zone of an undesignated Dakota oil pool.

(5) That the aforesaid Well No. 4 is presently completed as a low marginal pumping well in an undesignated Greenhorn oil pool.

(6) That completion attempts, tests, and logs of said wells Nos. 3 and 4 indicate that the Gallup, Greenhorn, Graneros, and Dakota formations will each yield extremely marginal amounts of hydrocarbons in the area of the subject wells and leases.

(7) That the applicants seek authority to produce and commingle in the well-bores of the subject wells the low marginal production from the aforesaid formations.

(8) That the applicants further seek an administrative procedure whereby said commingling may be authorized for additional wells, which may be drilled in the area comprising said Sections 12, 13, and the E/2 of Section 14.

(9) That the applicants propose to drill one additional well to be located in the SE/4 NW/4 of said Section 13, and to re-enter a well located in the NE/4 SE/4 of said Section 13, and to commingle production from the aforesaid formations in the well-bores of said wells.

(10) That the zone presently producing in each of said Wells Nos. 3 and 4, if produced separately to depletion, is near the end of its economic life.

(11) That the reservoir characteristics of the subject formations are such, in the area of the subject wells and leases, that underground waste would not be caused by the proposed commingling in the well-bores.

(12) That further development in the area of applicants' leases by dually completing the subject wells or by the drilling of additional wells as single or dual completions would be uneconomic.

(13) That the proposed commingling may substantially extend the productive life of the subject wells and may make it economically feasible to drill an additional well in the SE/4 NW/4 of said Section 13 and to re-enter and re-complete the well in the NE/4 SE/4 of said Section 13.

(14) That the proposed commingling may result in the recovery of additional oil from the subject formations, thereby preventing waste, and will not violate correlative rights.

(15) That the ownership is identical throughout in the zones proposed to be commingled in the aforesaid Wells Nos. 3 and 4 and in the well proposed to be drilled in the SE/4 NW/4 of said Section 13; that the ownership is not common in all of said zones in the well to be re-entered in the NE/4 SE/4 of said Section 13.

(16) That the applicants should be authorized to complete the aforesaid Wells Nos. 3 and 4 and the well to be drilled in the SE/4 NW/4 of said Section 13 in such a manner as to produce oil from the Gallup, Greenhorn, Graneros, and Dakota formations and to commingle the production from each of said zones in the well-bores of the subject wells.

(17) That the applicants should be authorized to re-enter the well in the NE/4 SE/4 of said Section 13, and upon a satisfactory showing to the Commission that all of the aforesaid zones in said well have been unitized or otherwise consolidated, insofar as all ownership is concerned, should be authorized to commingle the production from said zones.

(18) That the request for an administrative procedure whereby commingling in the well-bore may be authorized for additional wells which may be drilled in the subject area is premature and should be denied.

IT IS THEREFORE ORDERED:

(1) That the applicants, Bco, Inc., and Harry L. Bigbee, are hereby authorized to complete the Harry L. Bigbee Nancy Wells Nos. 3 and 4 located in Units N and F, respectively, of Section 12, and a well to be drilled in the SE/4 NW/4 of Section 13, Township 24 North, Range 8 West, NMPM, San Juan County, New Mexico, in such a manner as to produce oil from the Gallup, Greenhorn, Graneros, and Dakota formations and to commingle the production from each of said formations in the well-bore of each of said wells.

(2) That the applicants shall be authorized to re-enter the well in the NE/4 SE/4 of Section 13, Township 24 North, Range 8 West, NMPM, San Juan County, New Mexico, and, upon a satisfactory showing to the Commission that the Gallup, Greenhorn, Graneros, and Dakota formations in said well have been unitized or otherwise consolidated, they shall be permitted to commingle oil production from said zones in the well-bore of said well.

(3) That any of the above-described wells which may be completed to produce from more than one formation in a common well-bore shall be considered a single completion and shall be limited to a single allowable.

(4) That the request of the applicants for an administrative procedure whereby the aforesaid commingling may be authorized for additional wells which may be drilled in the area comprising said Sections 12, 13, and the E/2 of Section 14 is hereby denied.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

esr/

3746

BCO, INC.

PRODUCTION
NANCY #3
DAKOTA

DATE	OIL	GAS
May, 1968	742	-0-
June, 1968	1118	1938
July, 1968	679	1818
	2539	3756

38.4° G.

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Gyrd EXHIBIT NO. 1
CASE NO. 3846

(1)

Nancy 3

Form C-128 (6-57) NEW MEXICO OIL CONSERVATION COMMISSION

Well Location and Acreage Dedication Plat

Section A. Date

Operator DORFMAN PRODUCTION COMPANY Lease NAVAJO FEDERAL

Well No. 3 Unit Letter M Section 12 Township 24 NORTH Range 8 WEST, NMPM

Located 990 Feet From the SOUTH Line, 1793 Feet From the WEST Line

County SAN JUAN G. L. Elevation 7207.5 Dedicated Acreage 80 Acres

Name of Producing Formation Gallup Pool Escrito

1. Is the Operator the only owner in the dedicated acreage outlined on the plat below?
   Yes ____ No X
2. If the answer to question one is "no", have the interests of all the owners been consolidated by communitization agreement or otherwise? Yes X No ____. If answer is "yes", Type of Consolidation.
   Operating agreement
3. If the answer to question two is "no", list all the owners and their respective interests below:

Owner		Land Description
Louis Dorfman	.36328125	E½ SW¼ Sec. 12, T 24 N, R 8 W.
Sam Y. Dorfman Jr.	.36328125	San Juan County, New Mexico
Elis. F. Dorfman Trust	.24218750	
H. J. Grebing, Jr.	.00781250	
S. L. Florsheim, Jr.	.01562500	
Lawrence J. Reed	.00781250	

Section B.

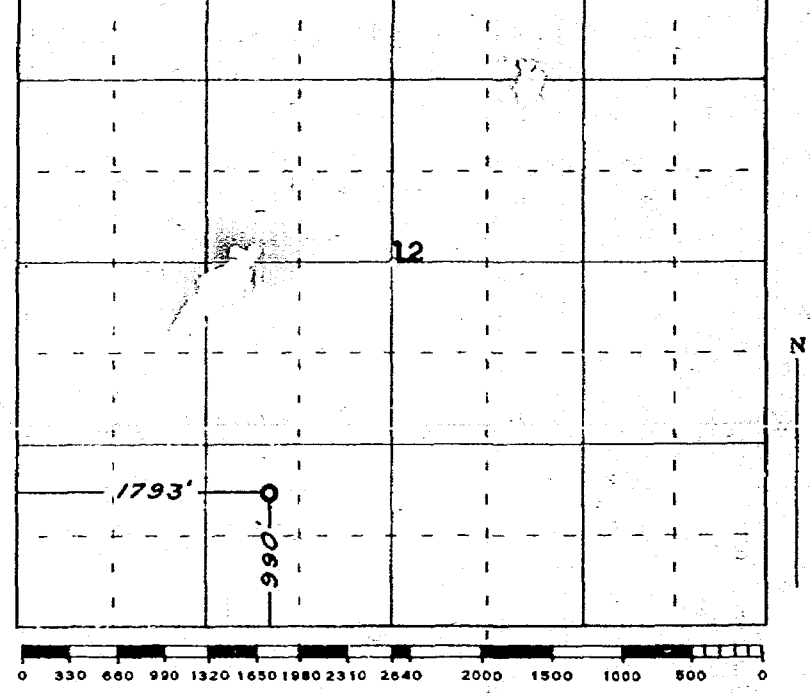
This is to certify that the information in Section A above is true and complete to the best of my knowledge and belief.

Dorfman Production Company
(Operator)

(Representative)
536 Mercantile Dallas Building
(Address)
Dallas, Texas

Ref: GLO plat dated 25 January 1961

Note: All distances must be from outer boundaries of section.



Scale 4 inches equal 1 mile

This is to certify that the above plat was prepared from field notes of actual surveys made by me or under my supervision and that the same are true and correct to the best of my knowledge and belief.

Date Surveyed 6 December 1961

Registered Professional Engineer and/or Land Surveyor
James P. Lease N. Mex. Reg. No. 1463
San Juan Engineering Company

(2)

1 Flint 1 OCC Aztec

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: NM-0557389

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Nancy

9. WELL NO.: 3

10. FIELD AND POOL, OR WILDCAT: Undesginated

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 12-24N-8W

12. COUNTY OR PARISH: San Juan

13. STATE: N.M.

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL [XX] GAS WELL [ ] OTHER

2. NAME OF OPERATOR: Harry L. Bigbee

3. ADDRESS OF OPERATOR: P. O. Box 669 Santa Fe, N.M. 87501

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 990' FSL & 1793' FWL Sec 12 T24N R8W

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GL, etc.): 7202 GL

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[X]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[X]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

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

Opened up old hole to prior total depth. Drilled 7 7/8" hole to 7250'. Set 7246 4 1/2" 11.60# casing. Cemented with 225 sacks of Halliburton light plus 150 sacks of class C 50-50 Posz. 2% gel, 6¼ lbs of Gilsonite 5 lbs of salt and .5% CFRT.

May 10, 1968, perforated 7186-7192, and 7169-7174 with 2 shots per foot. Ran 125 gallons of 15% HF acid. Determined zones were wet.

May 12, 1968, set Model N Bridge Plug at at 7140'. Perforated 6858-6865, 6874-6876, 6948-6952, 6958-6964, 7029-7032, 7040-7056, 7074-7078 with 2 shots per foot. Frac fluid treated with 1% KCl and 3½ lbs per 1000 gallons of FR8 and ½ gallon per 1000 gallons of 5N. Total frac fluid 73170 gallons and 75000 lbs of sand which was composed of 25,000 40-60 sand 25000 20-40 sand, and 25000 10-20 sand. Spear headed frac with 500 gallons of 15% HF acid and 500 gallons of 28% HCl. Average frac pressure 5000 lbs, average injection rate 65 BPM. Breakdown 1700 lbs. Minimum treat pressure 4600 lbs., Maximum treat pressure 6000 lbs. Instant shut in pressure 2800 lbs. Dropped three sets of 10 balls each during frac. Used 7966 horse power.

See attached Halliburton reports for further detail.

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

SIGNED [signature] TITLE Agent DATE 5-21-68

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

(3)

FRACTURING SERVICE TREATING REPORT

HALLIBURTON COMPANY

Ticket To Ticket No. FS 244389

Halliburton District Farmington Stage No. 1

Halliburton Division Midland Page No. 1

Field Undesignated Sec. 12 Twp. 24 Rng. 8W County San Juan State New Mexico

THE FOLLOWING INFORMATION WAS FURNISHED BY THE WELL OWNER OR HIS AGENT:

Date Completed new Formation Dakota

Casing: OD 4½ Wt. 11.6 Depth

Liner: OD From To

Perf.: From 6858 To 65 Shots/Ft. 2

Perf.: From 6874 To 76 Shots/Ft. 2

Perf.: From 6948 To 52 Shots/Ft. 2

Open Hole: Size 6958-64 (2) From 7029-32 (2) To

7040-56 (2) 7074-78 2

Prev. Treat: Date Type

Fluid: Gal. Sand: Lb.

Pres. Treat: Interval: From 6858 To 7078

Tubing: Size Depth

Packer: Type Set at

Max. Allowable Pres.: PSI: Tubing Casing 6000

Treat Thru: Tubing ☐ Annulus ☐ Casing ☒ Tubing/Annulus ☐

MATERIALS USED

Type Job Sandwater

Fluid Water with 1% KCl & 3½# FR-8/1000 gals

Fluid Source Company storage

API Gravity °Viscosity CPS @ °F

Sand: Grade 40-60 Lb. 25,000 Sack ☐ Bulk ☒

Sand: Grade 20-40 Lb. 25,000 Sack ☐ Bulk ☒

Sand: Grade 10-20 Lb. 25,000 Sack ☐ Bulk ☒

Surfactant: Type Gal. in Bbl. Gal.

Acid: Type HF Gal. 500 % 15%

Acid: Type HCl Gal. 500 % 28%

Fluid Loss Add.: Type Gal. Lb.

Perfpac Balls: Type Nylon No. 30

Blocking Agent: Type Gal. Lb.

Gelling Agent: Type FR-8 (3½#) Gal. Lb. 350

Breaker: Type Gal. Lb.

KCl (1%) sks 84

TREATMENT SUMMARY

Trucks (No. and Type) 8 HT-400

Hyd. HP Available Used 7966

Pumps On Tubing Casing 16

AVERAGE RATES—BPM

Treating Displ. Overall 65

PRESSURES—PSI Avg. 5000

Breakdown 1700 Maximum 6000

Minimum 4600 Displacement 5800

Instant Shut-In 2800 5 Min. 2250

VOLUMES:

Load: Bbl. Gal. 1900 Breakdown: Bbl. Gal. 1980

Treatment: Bbl. Gal. 73,170 Displ.: Bbl. Gal. 5000

Total: Bbl. Gal. 82,050

TREATING LOG

TIME	Operation or Amt. and Type Fluid Pumped	RATE	PUMPS	PRESSURE—PSI TUBING	PRESSURE—PSI CASING	REMARKS
	Breakdown		1		1700	
	Pump acid into well					
	500 gal. HF and 500 gal. HCl 28%					
10:50	Pump acid on formation	30	396		3600	
10:55	Shut down as acid hits formation					
11:16	Establish pumping rate	45			3900	
11:17	Start sand at 1/2#	65	16		4600	
11:18	Sand to 3/4#	66	16		4600	
11:20	Sand to 1#	70	16		4800	
11:22	Treating at 1#	70	16		4800	
11:30	Treating	66	16		4700	
11:32	Drop 10 balls	66	16		4800	
11:34	Balls hit	65	16		4900	
11:35	Drop 10 balls	65	16		4900	
11:37	Balls hit	65	16		5100	
11:39	Drop 10 balls	65	16		5100	
11:41	Balls hit	56	16		6000	
11:45	Start flush	57	16		5800	
11:47	Job completed	57	16		5800	

FORM 1367 R2

Halliburton Operator Pulte Company Representative Mr. Flint

CUSTOMER'S COPY

Copies Requested

(4)

PRINTED IN U.S.A.

Company RCO, Inc. Lease Nancy Well No. 3 Date 5-12-68

FRACTURING

Halliburton COMPANY

FORM 1445 R1

CHEMICAL SERVICE TREATING REPORT

Ticket No. CH 158733
Stage No. 1
Page No. 1

Halliburton District Farmington Sec. Twp. Rng. County Rio Arriba State N.M.

THE FOLLOWING INFORMATION WAS FURNISHED BY THE WELL OWNER OR HIS AGENT:

Date Completed Formation
Casing: 4½ Wt. 11.60 Depth
Liner: OD From To
Perf.: From 7169 To 7174 Shots/Ft. 2
Perf.: From 7186 To 7192 Shots/Ft. 2
Perf.: From To Shots/Ft.
Open Hole: Size From To

Prev. Treat: Date Type
Fluid: Gal.
Pres. Treat: Interval: From To
Tubing: Size Depth
Packer: Type Set at
Max. Allowable Pres.: PSI Tubing Casing
Treat Thru: Tubing ☐ Annulus ☐ Casing ☐ Tubing/Annulus ☐

MATERIALS USED

Type Treatment 125 gal. HF Acid
Breakdown Fluid Type Acid Vol. Used 125 gal.
Flush Fluid Type Water Vol. Used 140
Surfactant: Type Concentration
Acid: Type HF Gal. 125 % 15
Acid: Type Gal. %
Acid: Type Gal. %
Acid: Type Gal. %
Fluid Loss Add.: Type Gal. Lb.
Perfpac Balls: Type 7/8" RCN No. 15
Blocking Agent: Type Gal. Lb.
Gelling Agent: Type Gal. Lb.
Other Materials

TREATMENT SUMMARY

Trucks (No. and Type) 7799 HT-400
Hyd. HP Available Used
Pumps On Tubing Casing 1
AVERAGE RATES—BPM
Treating 8 Displ. 8 Overall 8
PRESSURES—PSI
Breakdown 2100 Maximum 2500
Minimum Displacement
Instant Shut-In 2000 5 Min. 1800 Final 1800
ADDITIONAL REMARKS:

TREATING LOG

TIME	TREATING LOG AND REMARKS	RATE BPM	PUMPS	Pressure—PSI Casing	Pressure—PSI Tubing
8:30AM	Un-plug tubing		1		4000
9:00	Circulate hole	5	1		2000
9:30	Spot acid	5	1		2000
4:12PM	Breakdown and pump acid away			2100	
4:14	Flush	8	1	2500	
4:30	Shut in			1800	

Chemical Services Operator Baker
Company Representative Mr. Flint

Customer Company RGO, Inc. Field Escrito Lease Nancy Well No. 3 Date 5-10-68

(5)

1 Flint 1 OCC Aztec

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. LEASE DESIGNATION AND SERIAL NO.: NM-0557389

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Nancy

9. WELL NO.: 3

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: 12-24N-8W

12. COUNTY OR PARISH: San Juan

13. STATE: N.M.

1a. TYPE OF WELL: OIL WELL [XX] GAS WELL [ ] DRY [ ] Other

b. TYPE OF COMPLETION: NEW WELL [ ] WORK OVER [ ] DEEP-EN [XX] PLUG BACK [ ] DIFF. RESVR. [ ] Other

2. NAME OF OPERATOR: Harry L. Bigbee

3. ADDRESS OF OPERATOR: P. O. Box 669 Santa Fe, N.M. 87501

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface 990' FSL & 1793' FWL Sec 12 T24N R8W
At top prod. interval reported below
At total depth

14. PERMIT NO.: | DATE ISSUED:

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
4-19-68	4-28-68	5-14-68	7202 GL	

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
			→	Rotary	

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 6858-7078 Graneros

25. WAS DIRECTIONAL SURVEY MADE: YES

26. TYPE ELECTRIC AND OTHER LOGS RUN: Melton Lithology
Dis Dual Induction, BSL BHC Sonic, FDC COMP Gamma Ray

27. WAS WELL CORED: NO

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
4½"	11.60	7246	7 7/8"	225 sacks Halliburton Light, 150 sacks of class C 50-50 POSZ, 2%gel, 6¼lbs Gilsonite	

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8"	7060	7140'

31. PERFORATION RECORD (*Interval, size and number*)
7186-7192, 7169-7174, 6858-6865, 6874-6876, 6948-6952, 6958-6964, 7029-7032, 7040-7056, 7074-7078 with with 2 SHH HYPER JETS_INTERMEDIATE HEADS PER FOOT

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
&L¢(	
7169-7192	125 gallons HF acid
6858-7078	73170 gallons frac fluid and 75000 lbs sand.

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
5-14-68	Pumping	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
5-20-68	24	OPEN		96	TSTM	48 Frac	

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
			96	TSTM	48 Frac	40.3

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Vented

TEST WITNESSED BY: J. A. Flint

35. LIST OF ATTACHMENTS: Sundry Notice & Reports on Wells, OCC Form C-104, 2 copies of each log.

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED Harry L. Bigbee TITLE Agent DATE 5-21-68

*(See Instructions and Spaces for Additional Data on Reverse Side)

(6)

BCO, INC.

PRODUCTION
NANCY #4

	DATE	OIL	GAS	
(Graneros)	Mar. 1967	863	TSTM	
	Apr. "	1532	900	
	May "	1279	720	40.1° Gr
	June "	782	621	
	July "	(1144)*	-0-	* see letter to OOC of Aug.2/67
	Aug. "	506**	432	**Not production but is recovery load oil.
	Sept. "	402***	975	*** Recovered Load Oil
	Oct. "	206****	654	**** Recovered Load Oil
	Nov. "	214	240	- 314 bbls transfered on this lease from Graneros to Greenhorn formation.
(Greenhorn)	Dec. "	-0-		Recovering frac[redacted] oil
	Jan. 1968	685	TSTM	
	Feb. "	584	"	
	Mar. "	613	"	
	Apr. "	461	"	
	May "	496	"	~~38~~
	June "	429	"	
	July "	406	"	38.5° Gr.

(7)

Nancy 4

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

DATE _____

SECTION A.

OPERATOR Hough & Byles & Karl D Byrd LEASE NM 088040-A

WELL NO. _____ UNIT LETTER F SECTION 12 TOWNSHIP 24 NORTH RANGE 8 WEST NMPM

LOCATED 2310 FEET FROM NORTH LINE, 1980 FEET FROM WEST LINE

COUNTY RIO ARRIBA G. L. ELEVATION 7287 DEDICATED ACREAGE _____ ACRES

NAME OF PRODUCING FORMATION _____ POOL _____

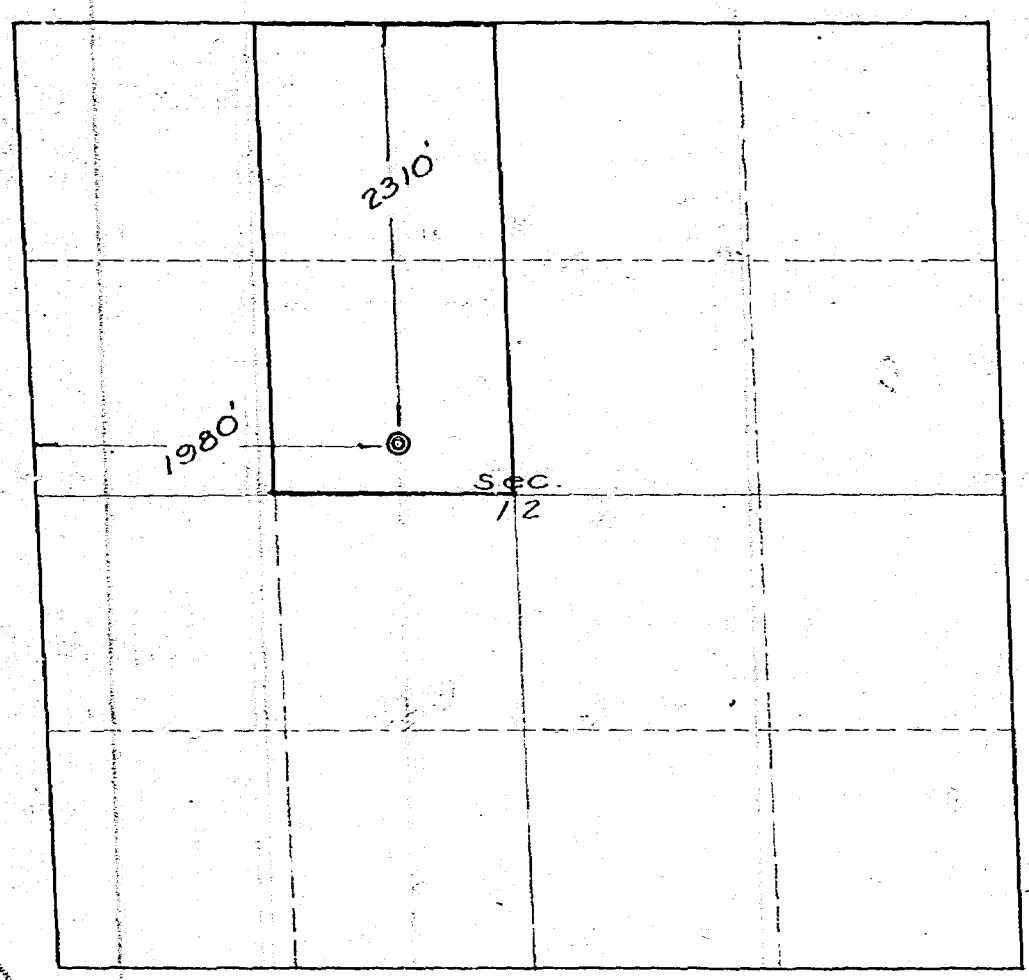
1. IS THE OPERATOR THE ONLY OWNER* IN THE DEDICATED ACREAGE OUTLINED ON THE PLAT BELOW? YES _____ NO _____

2. IF THE ANSWER TO QUESTION ONE IS "NO," HAVE THE INTERESTS OF ALL THE OWNERS BEEN CONSOLIDATED BY COMMUNITIZATION AGREEMENT OR OTHERWISE? YES _____ NO _____ IF ANSWER IS "YES," TYPE OF CONSOLIDATION _____

3. IF THE ANSWER TO QUESTION TWO IS "NO," LIST ALL THE OWNERS AND THEIR RESPECTIVE INTERESTS BELOW:

OWNER	LAND DESCRIPTION

SECTION B.



Scale, 1" = 1000'

THIS IS TO CERTIFY THAT THE INFORMATION IN SECTION A ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

(OPERATOR)

(REPRESENTATIVE)

(ADDRESS)

THIS IS TO CERTIFY THAT THE WELL LOCATION SHOWN ON THE PLAT IN SECTION B WAS PLOTTED FROM FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND THAT THE SAME IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

DATE SURVEYED May 8, 1964

FOUR STATES ENGINEERING CO.

FARMINGTON, NEW MEXICO

Edward V. Echohawk

REGISTERED ENGINEER OR LAND SURVEYOR

CERTIFICATE NO. 3602

(8)

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. LEASE DESIGNATION AND SERIAL NO.: NM-0557389

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Nancy

9. WELL NO.: 4

10. FIELD AND POOL, OR WILDCAT: Wildcat Graneros

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: 12-24N-8W

12. COUNTY OR PARISH: San Juan

13. STATE: N.M.

1a. TYPE OF WELL: OIL WELL XXX GAS WELL ☐ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☒ WORK OVER ☐ DEEP-EN ☒ PLUG BACK ☐ DIFF. RESVR. ☐ Other

2. NAME OF OPERATOR: Harry L. Bigbee by Bco., Inc.

3. ADDRESS OF OPERATOR: P. O. Box 669 Santa Fe, New Mexico 87501

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface: 2310' FNL and 1980' FWL Sec. 12 T24N R8W
At top prod. interval reported below
At total depth

14. PERMIT NO. | DATE ISSUED

15. DATE SPUDDED: 3-6-67
16. DATE T.D. REACHED: 3-17-67
17. DATE COMPL. (Ready to prod.): 3-24-67
18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*: GL 7287
19. ELEV. CASINGHEAD:
20. TOTAL DEPTH, MD & TVD:
21. PLUG, BACK T.D., MD & TVD:
22. IF MULTIPLE COMPL., HOW MANY*:
23. INTERVALS DRILLED BY: →
ROTARY TOOLS: XXXX
CABLE TOOLS:

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 6944-6990 Graneros

25. WAS DIRECTIONAL SURVEY MADE: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN: Baroid Lithology Log
Induction-Electrical, Gamma Ray-Neutron, Cement Log.

27. WAS WELL CORED: NO

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
4 ½"	10.50	7257	7 7/8"	see attached sheet	

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8"	6991	

31. PERFORATION RECORD (Interval, size and number)

6950-6986 with four Density Jet Shots per foot, 144 total shots

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
See attached sheet	

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)
3-24-67	swab and flow	producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
3-27-67	6	OPEN		151	TSTM	18	TSTM

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
			604	TSTM	72	40.5

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.): Vented

TEST WITNESSED BY: J. A. Flint

35. LIST OF ATTACHMENTS: Sheet showing stage cement job and single stage fracture treatment

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED Harry R Bigbee TITLE Agent DATE 3-28-67

*(See Instructions and Spaces for Additional Data on Reverse Side)

(9)

EXHIBIT
Form 9-330
Nancy 4
NM-0557389

Set 7257' 4½" J-55 Casing. Cemented as follows:

Stage 1
300 sacks class C 50-50 Posz Mix. 2% gel, 5 lbs salt and gilsonite per sack. 5390

Stage 2
Tool placed at 5390'. Used 150 sacks class C cement. 16% gel and 100 regular sacks cement.

Stage 3
Tool placed at 3784'. 150 sacks regular cement 16% gel.

Fracture Treatment :
Used 1000 gallons 20% acid. Fracked with 25,000 pounds 20-40 sand with 1% potassium chloride and 3½ pounds FR8 per 1000 gallons water. Break down 2500 pounds. Started with ½ pound sand per gallon water and worked up to 1 pound per barrel. Fracture pressure 3500 pounds, injection rate 41 barrels per minute. Then fracked with 25,000 pounds 10-20 sand with 1% potassium chloride and 3½ pounds FR8 per 1000 gallons water. Started with ½ pound per gallon and worked up to 1 pound per gallon. Fracking pressure 3800 pounds, injection rate 34 barrels a minute.

Total frack 50,000 pounds sand and 63860 gallons water of which 57200 was put in the formation.

(10)

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL [X] GAS WELL [ ] OTHER

2. NAME OF OPERATOR: Harry L. Bigbee by Bco, Inc.

3. ADDRESS OF OPERATOR: P. O. Box 669 SantaFe, New Mexico 87501

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 2310' FNL & 1980' FWL Sec12 T24N R8W

5. LEASE DESIGNATION AND SERIAL NO.: NM-0557389

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Nancy

9. WELL NO.: 4

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 12-24N-8W

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): GL 7287

12. COUNTY OR PARISH: San Juan

13. STATE: N.M.

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[X]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[X]	ABANDONMENT*	[X]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other) Abandonment of Dakota Only			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

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

Perforated 7131-7135, and 7145-7153 with three shots per foot.
Perforated 7179-7180 with 2 shots.

Acidized per attached Dowell Treatment # 15-06-3584

Fracture treatment per attached Dowell Treatment #15-06-3586

Recovered all but 20 barrels of load and lease use oil, however Dakota formation had to much BS in it for economical pumping.

Set $4\frac{1}{2}$" Cast iron bridge plug at 7080'.

Replaced pump and producing Graneros formation

RECEIVED
NOV 27 1967
U. S. GEOLOGICAL SURVEY
FARMINGTON, N. M.

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

SIGNED Harry P Bigbee TITLE Agent DATE 11-24-67

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

(11)

TREATMENT REPORT

DWL-494-H PRINTED IN U.S.A.

DOWELL DIVISION OF THE DOW CHEMICAL COMP.

DATE: July 29, 1967

WELL NAME AND NUMBER: Nancy No. 4	LOCATION: Sec 12; 24N; 6W	CUSTOMER REPRESENTATIVE: J. A. Flint, Jr.	TREATMENT NUMBER: 15-06-3584
POOL: Escrito	FORMATION: Dakota	JOB DONE DOWN: TUBING A ☒ CASING B ☐ ANNULUS C ☐	ALLOWABLE PRESSURE: TBG: CSG: 4500
COUNTY: San Juan	STATE: New Mexico	TYPE OF WELL: OIL A ☒ GAS B ☐ WATER C ☐ INJ. D ☐	
TYPE OF SERVICE: 250 gallons Mud Acid		AGE OF WELL: NEW WELL A ☒ REWORK B ☐	TOTAL DEPTH / CIRC. BHT.
CUST. NAME: B. C. O. Inc.		CASING SIZE: 4½ / CASING DEPTH	TUBING SIZE: 2" EUE / TUBING DEPTH: 7159
ADDRESS: Box 669		LINER SIZE / LINER DEPTH	PACKER TYPE: Baker / PACKER DEPTH: 7096
CITY, STATE & ZIP CODE: Santa Fe, New Mexico 87501		OPEN HOLE / CSG. OR ANRL. VOL.	TBG VOLUME / STATIC BHT.

REMARKS:

FOR CONVERSION PURPOSES 24 BBLS EQUALS 1000 GALLONS

ARRIVED ON LOCATION: 1330

PERFORATED INTERVALS

DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES

TIME	INJECTION RATE	INJECTION BBLS IN	PRESSURE CSG.	PRESSURE TBG.	SERVICE REMARKS
1430				8000	Rig up, check equipment, pressure lines, safety meeting
					Wait on rig to un packer
1601	4			300	Spot 250 gal Mud acid
1609		6		300	Displace acid with oil
1620		29			Shut down, pull packer up to 7096 feet and set
1622	2			2500	Squeeze acid
1632		34		2000	Shut down, let acid soak, 1000 psi after 10 min
1533	2			2000	Injection rate
1534	3	36		2100	Injection rate
1537	4	39		2500	Injection rate
1539	5	43		3100	Injection rate
1541	3	63		2900	Injection rate
		69			Flush complete, shut down

TIME LEFT LOCATION: 1700	AVG. LIQUID INJ. RATE: 2½	ADJ. INJ. RATE (SOLIDS INC.)	TOTAL FLUID PUMPED: 63 OIL / 6 WATER acid	PROPS AND LIQUIDS INJECTED
MAX. PRESSURE: 3100	AVG. PRESSURE: 2450	FINAL PUMP IN PRESSURE: 2900	SHUT IN PRESSURE: IMMEDIATE 2600 / 15 MINUTE 2230	TYPE: Mud Acid / SIZE OR PURPOSE / AMOUNT: 250
DOWELL LOCATION: Farmington, N. M.		DOWELL ENGINEER: J. E. Vattenburger		

CALL BACK	DATE	CUSTOMER REP. CONTACTED	CUSTOMER CONSIDERED SERVICE	PROD. BEFORE TREATMENT	PROD. AFTER TREATMENT
			☐ SATISFACTORY ☐ UNSATISFACTORY ☐ UNKNOWN	☐ TEST ☐ ALLOWABLE	☐ DAYS ☐ TEST ☐ ALLOWABLE

(12)

TREATMENT REPORT

DWL-494-H PRINTED IN U.S.A.

DOWELL DIVISION OF THE DOW CHEMICAL COMI

DATE: July 30, 1967

WELL NAME AND NUMBER: Nancy No. 4	LOCATION: Sec 12; 24N; 8 W	CUSTOMER REPRESENTATIVE: J. A. Flint, Jr.	TREATMENT NUMBER: 15-06-3586
POOL: Escrito	FORMATION: Dakota	JOB DONE DOWN: TUBING A ☒ CASING B ☐ ANNULUS C ☐	ALLOWABLE PRESSURE: TBG: 4800 CSG:
COUNTY: San Juan	STATE: New Mexico	TYPE OF WELL: OIL A ☒ GAS B ☐ WATER C ☐ INJ D ☐	
TYPE OF SERVICE: Slick Oil Frac		AGE OF WELL: NEW WELL A ☒ REWORK B ☐	TOTAL DEPTH / CIRC. BHT.
CUST. NAME: B. C. O. Corporation		CASING SIZE: 4½ / CASING DEPTH	TUBING SIZE: 2" EUE / TUBING DEPTH: 7096
ADDRESS: Box 669		LINER SIZE / LINER DEPTH	PACKER TYPE: Baker / PACKER DEPTH: 7096
CITY, STATE & ZIP CODE: Santa Fe, New Mexico		OPEN HOLE / CSG.OR ANRL.VOL.	TBG VOLUME / STATIC BHT.

REMARKS:

FOR CONVERSION PURPOSES 24 BBLS EQUALS 1000 GALLONS

ARRIVED ON LOCATION: 1300

PERFORATED INTERVALS

DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES

TIME	INJECTION RATE	INJECTION BBLS IN	PRESSURE CSG.	PRESSURE TBG.	SERVICE REMARKS
1400				5200	Rig up, check equipment and pressure lines
					Wait on acid and hold Safety Meeting
1531	8				Spot 250 gallon Acid
1535	8	6			Displace acid
1541	6	36		4800	Start frac
1606	6	86		4500	Start 40/60 sand at 1/4 lb per gal; 8 gal J-105 and 25 lb
					Adomite Mark II per 1000 gallons
1641	6	236		4500	Increase sand to 1/2 lb per gal
1709	8	446		4800	Increase sand to 3/4 lb per gal
1721	7	656			Cut sand, start flush
		736			Flush complete, shut down

TIME LEFT LOCATION: 1830	AVG. LIQUID INJ. RATE: 6	ADJ. INJ. RATE SOLIDS INC: 7	TOTAL FLUID PUMPED: OIL 736 WATER 6 acid	
MAX. PRESSURE: 4800	AVG. PRESSURE: 4700	FINAL PUMP IN PRESSURE: 4700	SHUT IN PRESSURE: IMMEDIATE 3100 / 15 MINUTE 2900	
DOWELL LOCATION: Farmington, N. M.		DOWELL ENGINEER: J. E. Wattenburger		

PROPS AND LIQUIDS INJECTED

TYPE	SIZE OR PURPOSE	AMOUNT
40/60 Sand		10,000
J-105		300
Adomite Mark II		825
Mud Acid		250

CALL BACK	DATE	CUSTOMER REP. CONTACTED	CUSTOMER CONSIDERED SERVICE	PROD. BEFORE TREATMENT	PROD. AFTER TREATMENT
			☐ SATISFACTORY ☐ UNSATISFACTORY ☐ UNKNOWN	☐ TEST ☐ ALLOWABLE	DAYS (13) ☐ TEST ☐ ALLOWABLE

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL [X] GAS WELL [ ] OTHER	5. LEASE DESIGNATION AND SERIAL NO.: NM-0557389
	6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
	7. UNIT AGREEMENT NAME:
2. NAME OF OPERATOR: Harry L. Bigbee by Bco, Inc.	8. FARM OR LEASE NAME: Nancy
3. ADDRESS OF OPERATOR: P. O. Box 669 Santa Fe, N.M. 87501	9. WELL NO.: 4
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 2310' FNL & 1980' FWL Sec 12 T24N R8W	10. FIELD AND POOL, OR WILDCAT: Wildcat
	11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 12-24N-8W
14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.): GL 7287
	12. COUNTY OR PARISH: San Juan
	13. STATE: N.M.

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[X]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[X]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

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

Set Model N packer at 6950' Go 4½" Cast Iron Bridge Plug

Perforated from 6883' to 6927' with Strip Jets with one shot per foot.

Perforated from 6883' to 6927' with Shatter Jets with one shot per foot.

Accidized and sand oil fracked per attached Halliburton treat report FS 247738.

Swabbed oil at rate of approximately 10 barrels per hour and recovered approximately 380 barrels of oil. Installed pump 12-1-67. Waiting to recover all load oil to potential well. Model N packer is still in well at 6950'

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

SIGNED Harry L Bigbee TITLE agent DATE 12-1-67

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

(14)

HALLIBURTON COMPANY

SERVICE REPORT

Attach To Ticket No. FS 247738

Halliburton District Farmington Stage No. 1

Halliburton Division Midland Page No. 1

Field Sec. Twp. Rng. County Rio Arriba State New Mexico

THE FOLLOWING INFORMATION WAS FURNISHED BY THE WELL OWNER OR HIS AGENT:

Date Completed April '67 Formation Greenhorn

Casing: OD 4½ Wt. 10.5 Depth 6950 BP

Liner: OD From To

Perf.: From To Shots/Ft.

Perf.: From To Shots/Ft.

Perf.: From To Shots/Ft.

Open Hole: Size From To

Prev. Treat: Date Type

Fluid: Gal. Sand: Lb.

Pres. Treat: Interval: From To

Tubing: Size Depth

Packer: Type Set at

Max. Allowable Pres.: PSI: Tubing Casing 4100

Treat Thru: Tubing ☐ Annulus ☐ Casing ☒ Tubing/Annulus ☐

MATERIALS USED

Type Job Sandoil

Fluid Lease Crude

Fluid Source Customer

API Gravity °Viscosity CPS @ °F

Sand: Grade 20-40 Lb. 20,000 Sack ☐ Bulk ☒

Sand: Grade 10-20 Lb. 6,000 Sack ☐ Bulk ☒

Surfactant: Type Gal. In Bbl. Gal.

Acid: Type HF HCl 5000 gal Gal. 500 % 15 28%

Fluid Loss Add.: Type Gal. Lb.

Perfpac Balls: Type No.

Blocking Agent: Type Gal. Lb.

Gelling Agent: Type Gal. Lb.

Breaker: Type Gal. Lb.

TREATMENT SUMMARY

Trucks (No. and Type) 5 HT-400

Hyd. HP Available 5000 Used 1909

Pumps On Tubing Casing 8

AVERAGE RATES—BPM

Treating 19 Displ. 18 Overall 19

PRESSURES—PSI Avg. 4100

Breakdown 3900 Maximum 4100

Minimum 4000 Displacement 4100

Instant Shut-In 3300 5 Min. 2700

VOLUMES:

Load: Bbl. Gal. 470 Breakdown: Bbl. Gal. 6300

Treatment: Bbl. Gal. 45,700 Displ.: Bbl. Gal. 4620

Total: Bbl. Gal. 50,950

TREATING LOG

TIME	Operation or Amt. and Type Fluid Pumped	RATE	PUMPS	PRESSURE—PSI TUBING	PRESSURE—PSI CASING	REMARKS
1:06	Load hole with oil					
1:16	Pump acid	12	8		4000	
1:47	Start sand at 1/2#	20	8		4200	
1:52	Sand on formation	18	8		4000	
2:10	Treating	19	8		4100	
2:26	Treating	20	8		4100	
2:36	Start 10-20 sand	19	8		4100	
2:43	10-20 on formation	18	8		4000	
2:45	Sand to 1#	18	8		4000	
2:46½	Start flush	18	8		4000	
2:51	1# on formation	16	8		4100	
2:51½	Job completed					

FORM 1387 R2

Halliburton Operator Johnson

Company Representative Mr. Bigbee & Mr. Flint

CUSTOMER'S COPY

Copies Requested

(15)

Company BCO, Inc. Well No. 4 Lease Nancy Date 11-27-67

POST OFFICE BOX 234
Zip Code 87401

TELEPHONE: 325-9184 *Office*
325-5694 *Home*
Area Code 505

DUGAN PRODUCTION CORP.

THOMAS A. DUGAN, *President*

709 BLOOMFIELD RD.
FARMINGTON, NEW MEXICO

August 19, 1968

Mr. A. L. Porter
Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

We have read with interest the application of Bco, Inc., and Harry L. Bigbee for downhole commingling in the Escrito-Gallup Oil Pool. As a producer in the San Juan Basin, we wish to encourage the New Mexico Oil Conservation Commission to approve the application. We believe the results of progressive approaches such as this would be beneficial to royalty owners and producers in the San Juan Basin, and would result in the recovery of oil and gas that is economically unfeasible under the present orders.

Sincerely,

Thomas A. Dugan

Thomas A. Dugan

dw

(16)