

dearnley-meier reporting service, inc.

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-6691 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 28, 1968

EXAMINER HEARING

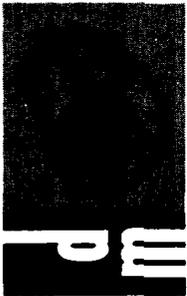
IN THE MATTER OF:

Application of Tenneco Oil Company)
for an amendment to Order No.)
R-3127, Eddy County, New Mexico.)

CASE No. 3728

BEFORE: DANIEL A. NUTTER, Examiner

TRANSCRIPT OF HEARING



MR. NUTTER: We will call Case No. 3728.

MR. HATCH: Application of Tenneco Oil Company for an amendment to Order No. R-3127, Eddy County, New Mexico.

MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant and Christy, appearing on behalf of Tenneco. We have one witness and several exhibits which I would like to have identified.

(Witness sworn.)

MR. HINKLE: Mr. Examiner, we have a report here which has been compiled for this case, and I would like to have it identified as Exhibit A and then refer to the different exhibits that constitute a part of the report and which are already marked Exhibits 1 through 6.

MR. NUTTER: We will just identify the whole thing as Exhibit Number A.

(Whereupon Applicant's Exhibit A was marked for identification.)

JAMES F. CARNES,

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

DIRECT EXAMINATION

BY MR. HINKLE:

- Q State your name, address, and by whom you are employed.
- A James F. Carnes, C-a-r-n-e-s, employed by Tenneco Oil

Company in Midland as district production engineer.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A Yes, sir.

Q Your qualifications as a petroleum engineer are a matter of record with the Commission?

A Yes, sir.

Q Have you made a study of the Grayburg-Jackson West Unit area?

A I have had one made under my supervision.

Q Refer to Exhibit A and without reading the preliminary part of it, state to the Commission what this study covers.

A This study covers the geology and stratigraphy and our secondary recovery program in the Grayburg-Jackson West cooperative unit in Eddy County, New Mexico. It also presents cross-sections and correlations in Continental Cave Pool unit to the north and west and Sunray's Metex flood to the east.

Q When was this cooperative unit formed?

A The original cooperative unit was formed October 1st, 1966, on Commission Order R-3127.

Q You are familiar, of course, with Tenneco's application in this case?

Q It has been expanded since that time?

A Three different expansions on administrative approval.

Q Have any wells been drilled on the 400 acres which you would like to include in the unit?

A Yes, sir, we recently completed the Sinclair "A" State No. 1 in the Northeast, Southwest of Section 16, potentialled January 10th for 350 barrels of oil and 150 barrels of water a day.

Q Do you contemplate any additional depth on the expanded area?

A The unit number, there should be a well that started today. We have three additional locations within the existing unit area and four outside of the area drilled continuously.

Q Would you like to state where they are, the locations?

A Unit Well No. 49 will be drilled next in the Southwest, Southwest of 16; Unit Well No. 50 in the Southeast, Southwest of 16 will probably be drilled next; Unit Well No. 56 in the Northwest, Southeast of 16; then four immediately direct and diagonal offsets to the Sinclair "A" State in the non-unit area, all shown.

Q Do you anticipate that these wells will be drilled within the very near future?

A We plan a near continuous drilling program.

A Yes, sir.

Q What is Tenneco seeking by this application?

A We are seeking to enlarge the Grayburg-Jackson West Cooperative Unit Area by some 400 additional acres of state land in Section 16, Township 17 South, Range 27.

Q Refer to the map which is identified as Exhibit 1 in Monsanto's Exhibit A and explain what this shows.

A This is a base map of the Grayburg-Jackson Unit as it now exists, outlining the acreage to the north in Section 16, which we propose to include, and showing the offset depth within a mile. Also shown on that exhibit are cross-section lines A-A' which run from the center of the Grayburg-Jackson Unit northwest through the Continental Cave Pool Unit, cross section B-B' which runs essentially north in the center of the unit through the eastern portion of the Continental Cave Unit, and C-C' which runs across the Metex flood, the area to be included into the area of the unit.

Q Does this Exhibit No. 1 show the wells which are being used as injection wells at the present time?

A Yes, it does. They're shown marked in the hexagonals.

Q How long has this been under secondary recovery operation?

A The original pilot area started on July 28, 1966. It was approved on Commission Order 3069.

Q Who owns the 400 acres which you, that is the working interest, which you contemplate taking into the unit?

A It's all wholly owned by Tenneco.

Q Is it all state land?

A It's all state land.

Q Is it all one lease or different leases?

A Four different leases.

Q Are these leases all held by production?

A Yes, sir.

Q Has Tenneco made application to the Commissioner of Public Lands to approve this expansion?

A Yes, sir.

Q Now, refer to Tenneco's Exhibit No. 2 attached to Exhibit A and explain what this shows.

A This is a structure map contoured on top of the San Andres Horizon showing the similarity in structural position with Cave Pool unit, the northern portion of our unit, the area to be included in the expansion and Sunray's Metex flood area.

Q What does this portray as an overall picture, does it show a structural condition?

A The overall structural condition as an east plunging anticline and the Artesia Vacuum trend.

Q Now, refer to Exhibit 3 of Exhibit A and explain what

this shows.

A Exhibit 3 is a cross section running from essentially the center of the existing Grayburg-Jackson unit north through the Sinclair "A" State and thence northwest through the area to be included through the Continental Cave Pool Unit. It is not based on a structural position but hung on the top of the Grayburg for more easy correlation of all the zones.

Q Does this show several producing sands or lenses in the area?

A Yes, I might explain for the benefit of the Examiner, Tenneco has broken the Grayburg sand section down for our own purposes into some eight different sand sections for easy coordination. They are described in pages 6 and 7 and marked on the type log. The M-1 or upper section of the Metex is generally gas. It is gas in the old Artesia field. It is gas here. What we term the M-2 or lower section of the Metex is oil productive within the unit area.

The A-1 zone, the upper section of the Anderson, is productive in the upper area, has proved in the Cave Pool unit and is productive, by our correlation, in the Sunray Metex flood to the east. The A-2, 3, 4, 5 and 6 zones have produced throughout the unit area and as far as into the Continental Cave Pool unit. The Premier zone is the flood under

development by Continental. We are now flooding.

Q Are all of these sands zones being flooded at the present time?

A All but the M zone are being flooded at the present time.

Q Are these selectively flooded?

A The injection wells are multi-completed for control.

Q In the respective sands?

A Yes.

Q Now, refer to Exhibit 4 of Exhibit A and explain what it is.

A This is a cross section, again, from the center of the unit, the same four wells as Exhibit 3, then north and east through the Continental Cave Pool Unit, again projecting the same sand sections through the unit area to be expanded, again showing the very good continuity of the individual sand sections.

Q All the electric logs correlate very well?

A Very well.

Q Now, refer to Exhibit No. 5 of Exhibit A and explain what this shows.

A Exhibit No. 5 runs from the east in the Sunray Metex flood zone across the north area of the proposed 400-acre

expand and back into the Continental Cave Pool unit. Again, it's the same sand sections correlated on each of the electric logs projecting the continuity completely across the unit area.

Q It does show a good continuity?

A The logs have very, very easily correlated.

Q Now, refer to the last page of the report, which would be Exhibit No. 6, and explain what this shows.

A This is the production record from the Grayburg-Jackson unit area from the past two years. We commenced injection on July 1st, 1966. During the early and mid part of 1966, we drilled some twenty-six wells, resulting in substantial increase in production in July. Subsequently, in mid 1967 we reworked and recompleted in the sand sections twenty-eight additional wells, some of them newly completed wells. This is the second curve from the bottom. The first curve on the bottom shows our water production from the unit area. The third curve is our water injection in barrels per month, and the uppermost curve is current gas production from the unit area.

Q Now, did Tenneco file with its application a copy of the proposed amendment to the Grayburg-Jackson West Unit so as to include the acreage which you intended?

A Yes, sir.

Q That's a matter of record with the application?

A Yes.

Q What is the status of getting it signed up at the present time?

A It has been signed by all overriding royalty, oil payment, and lessors of record with the exception of Sinclair. We were promised yesterday it would be signed by Sinclair today.

Q So you anticipate all of the overriding royalty owners will sign?

A Yes, sir.

Q And it should be ready for approval within the next few days?

A Yes, sir.

Q Is there anything else you would like to state to the Commission with respect to this matter?

A No, sir.

MR. HINKLE: We would like to offer in evidence Tenneco's Exhibit A.

MR. NUTTER: Tenneco's Exhibit A will be admitted in evidence.

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

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Carnes, I presume that you are going to put the additional wells on injection in the normal course of procedure as outlined in Rule 701?

A Yes, sir.

Q And make the application for administrative approval, or whatever it is, later on?

A Three to six months after completion they will be on injection.

MR. NUTTER: Any other questions of Mr. Carnes?

CROSS EXAMINATION

BY MR. STAMETS:

Q I notice on your application to drill this new well, it was going to be carried to the Glorieta?

A Yes, sir.

Q If you should get a Glorita completion, is the unit now set up to include that as a part of the unit or would you --

A No, sir.

Q -- or would you intend to include that as a part of the unit?

A No, the unit interval is from 2200 to 3600 feet. If this well is productive in the Glorieta, it will have to be

re-named and twinned or dually completed. It's basically a geological test.

MR. STAMETS: That's all the questions I have.

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

MR. HINKLE: That's all in this case.

MR. NUTTER: If there are no further questions of the witness, he may be excused.

(Witness excused.)

MR. NUTTER: Does anyone have anything further to offer in Case 3728?

We will take the case under advisement.

* * *

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
JAMES F. CARNES	
Direct Examination by Mr. Hinkle	2
Cross Examination by Mr. Nutter	11
Cross Examination by Mr. Stamets	11

<u>EXHIBIT</u>	<u>MARKED</u>	<u>OFFERED AND ADMITTED</u>
Applicant's Exhibit A	2	10

STATE OF NEW MEXICO)
) ss.
 COUNTY OF BERNALILLO)

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

Witness my Hand and Seal this 6th day of March, 1968.

Ada Dearnley
 NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Executive Hearing of Case No. 3728, heard by me on 2/28, 1968.

Ada Dearnley, Executive
 New Mexico Oil Conservation Commission



dearnley-meier reporting service, inc.

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-4491 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 28, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil
Company for an amendment to
Order No. R-3127, Eddy County,
New Mexico.

Case No. 3728

BEFORE: Daniel A. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case No. 3728.

MR. HATCH: Application of Tenneco Oil Company for an amendment to Order No. R-3127, Eddy County, New Mexico.

MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant and Christy, appearing on behalf of Tenneco. We have one witness and several exhibits which I would like to have identified.

(Witness sworn.)

MR. HINKLE: Mr. Examiner, we have a report here which has been compiled for this case, and I would like to have it identified as Exhibit A and then refer to the different exhibits that constitute a part of the report and which are already marked Exhibits 1 through 6.

MR. NUTTER: We will just identify the whole thing as Exhibit Number A.

(Whereupon Applicant's Exhibit A was marked for identification.)

JAMES F. CARNES,

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, address, and by whom you are employed.

A James F. Carnes, C-a-r-n-e-s, employed by Tenneco Oil

Company in Midland as district production engineer.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A Yes, sir.

Q Your qualifications as a petroleum engineer are a matter of record with the Commission?

A Yes, sir.

Q Have you made a study of the Grayburg-Jackson West Unit area?

A I have had one made under my supervision.

Q Refer to Exhibit A and without reading the preliminary part of it, state to the Commission what this study covers.

A This study covers the geology and stratigraphy and our secondary recovery program in the Grayburg-Jackson West cooperative unit in Eddy County, New Mexico. It also presents cross-sections and correlations in Continental Cave Pool unit to the north and west and Sunray's Metex flood to the east.

Q When was this cooperative unit formed?

A The original cooperative unit was formed October 1st, 1966, on Commission Order R-3127.

Q You are familiar, of course, with Tenneco's application in this case?

A Yes, sir.

Q What is Tenneco seeking by this application?

A We are seeking to enlarge the Grayburg-Jackson West Cooperative Unit Area by some 400 additional acres of state land in Section 16, Township 17 South, Range 27.

Q Refer to the map which is identified as Exhibit 1 in Monsanto's Exhibit A and explain what this shows.

A This is a base map of the Grayburg-Jackson Unit as it now exists, outlining the acreage to the north in Section 16, which we propose to include, and showing the offset depth within a mile. Also shown on that exhibit are cross-section lines A-A' which run from the center of the Grayburg-Jackson Unit northwest through the Continental Cave Pool Unit, cross section B-B' which runs essentially north in the center of the unit through the eastern portion of the Continental Cave Unit, and C-C' which runs across the Metex flood, the area to be included into the area of the unit.

Q Does this Exhibit No. 1 show the wells which are being used as injection wells at the present time?

A Yes, it does. They're shown marked in the hexagonals.

Q How long has this been under secondary recovery operation?

A The original pilot area started on July 28, 1966. It was approved on Commission Order 3069.

Q It has been expanded since that time?

A Three different expansions on administrative approval.

Q Have any wells been drilled on the 400 acres which you would like to include in the unit?

A Yes, sir, we recently completed the Sinclair "A" State No. 1 in the Northeast, Southwest of Section 16, potentialled January 10th for 550 barrels of oil and 150 barrels of water a day.

Q Do you contemplate any additional depth on the expanded area?

A The unit number, there should be a well that started today. We have three additional locations within the existing unit area and four outside of the area drilled continuously.

Q Would you like to state where they are, the locations?

A Unit Well No. 49 will be drilled next in the Southwest, Southwest of 16; Unit Well No. 50 in the Southeast, Southwest of 16 will probably be drilled next; Unit Well No. 56 in the Northwest, Southeast of 16; then four immediately direct and diagonal offsets to the Sinclair "A" State in the non-unit area, all shown.

Q Do you anticipate that these wells will be drilled within the very near future?

A We plan a near continuous drilling program.

Q Who owns the 400 acres which you, that is the working interest, which you contemplate taking into the unit?

A It's all wholly owned by Tenneco.

Q Is it all state land?

A It's all state land.

Q Is it all one lease or different leases?

A Four different leases.

Q Are these leases all held by production?

A Yes, sir.

Q Has Tenneco made application to the Commissioner of Public Lands to approve this expansion?

A Yes, sir.

Q Now, refer to Tenneco's Exhibit No. 2 attached to Exhibit A and explain what this shows.

A This is a structure map contoured on top of the San Andres Horizon showing the similarity in structural position with Cave Pool unit, the northern portion of our unit, the area to be included in the expansion and Sunray's Metex flood area.

Q What does this portray as an overall picture, does it show a structural condition?

A The overall structural condition as an east plunging anticline and the Artesia Vacuum trend.

Q Now, refer to Exhibit 3 of Exhibit A and explain what

this shows.

A Exhibit 3 is a cross section running from essentially the center of the existing Grayburg-Jackson unit north through the Sinclair "A" State and thence northwest through the area to be included through the Continental Cave Pool Unit. It is not based on a structural position but hung on the top of the Grayburg for more easy correlation of all the zones.

Q Does this show several producing sands or lenses in the area?

A Yes, I might explain for the benefit of the Examiner, Tenneco has broken the Grayburg sand section down for our own purposes into some eight different sand sections for easy coordination. They are described in pages 6 and 7 and marked on the type log. The M-1 or upper section of the Metex is generally gas. It is gas in the old Artesia field. It is gas here. What we term the M-2 or lower section of the Metex is oil productive within the unit area.

The A-1 zone, the upper section of the Anderson, is productive in the upper area, has proved in the Cave Pool unit and is productive, by our correlation, in the Sunray Metex flood to the east. The A-2, 3, 4, 5 and 6 zones have produced throughout the unit area and as far as into the Continental Cave Pool unit. The Premier zone is the flood under

development by Continental. We are now flooding.

Q Are all of these sands zones being flooded at the present time?

A All but the M zone are being flooded at the present time.

Q Are these selectively flooded?

A The injection wells are multi-completed for control.

Q In the respective sands?

A Yes.

Q Now, refer to Exhibit 4 of Exhibit A and explain what it is.

A This is a cross section, again, from the center of the unit, the same four wells as Exhibit 3, then north and east through the Continental Cave Pool Unit, again projecting the same sand sections through the unit area to be expanded, again showing the very good continuity of the individual sand sections.

Q All the electric logs correlate very well?

A Very well.

Q Now, refer to Exhibit No. 5 of Exhibit A and explain what this shows.

A Exhibit No. 5 runs from the east in the Sunray Metex flood zone across the north area of the proposed 400-acre

expanse and back into the Continental Cave Pool unit. Again, it's the same sand sections correlated on each of the electric logs projecting the continuity completely across the unit area.

Q It does show a good continuity?

A The logs have very, very easily correlated.

Q Now, refer to the last page of the report, which would be Exhibit No. 6, and explain what this shows.

A This is the production record from the Grayburg-Jackson unit area from the past two years. We commenced injection on July 1st, 1966. During the early and mid part of 1966, we drilled some twenty-six wells, resulting in substantial increase in production in July. Subsequently, in mid 1967 we reworked and recompleted in the sand sections twenty-eight additional wells, some of them newly completed wells. This is the second curve from the bottom. The first curve on the bottom shows our water production from the unit area. The third curve is our water injection in barrels per month, and the uppermost curve is current gas production from the unit area.

Q Now, did Tenneco file with its application a copy of the proposed amendment to the Grayburg-Jackson West Unit so as to include the acreage which you intended?

A Yes, sir.

Q That's a matter of record with the application?

A Yes.

Q What is the status of getting it signed up at the present time?

A It has been signed by all overriding royalty, oil payment, and lessors of record with the exception of Sinclair. We were promised yesterday it would be signed by Sinclair today.

Q So you anticipate all of the overriding royalty owners will sign?

A Yes, sir.

Q And it should be ready for approval within the next few days?

A Yes, sir.

Q Is there anything else you would like to state to the Commission with respect to this matter?

A No, sir.

MR. HINKLE: We would like to offer in evidence Tenneco's Exhibit A.

MR. NUTTER: Tenneco's Exhibit A will be admitted in evidence.

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

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Carnes, I presume that you are going to put the additional wells on injection in the normal course of procedure as outlined in Rule 701?

A Yes, sir.

Q And make the application for administrative approval, or whatever it is, later on?

A Three to six months after completion they will be on injection.

MR. NUTTER: Any other questions of Mr. Carnes?

CROSS EXAMINATION

BY MR. STAMETS:

Q I notice on your application to drill this new well, it was going to be carried to the Glorieta?

A Yes, sir.

Q If you should get a Glorita completion, is the unit now set up to include that as a part of the unit or would you --

A No, sir.

Q -- or would you intend to include that as a part of the unit?

A No, the unit interval is from 2200 to 3600 feet. If this well is productive in the Glorieta, it will have to be

re-named and twinned or dually completed. It's basically a geological test.

MR. STAMETS: That's all the questions I have.

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

MR. HINKLE: That's all in this case.

MR. NUTTER: If there are no further questions of the witness, he may be excused.

(Witness excused.)

MR. NUTTER: Does anyone have anything further to offer in Case 3728?

We will take the case under advisement.

* * *

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
JAMES F. CARNES	
Direct Examination by Mr. Hinkle	2
Cross Examination by Mr. Nutter	11
Cross Examination by Mr. Stamets	11

<u>EXHIBIT</u>	<u>MARKED</u>	<u>OFFERED AND ADMITTED</u>
Applicant's Exhibit A	2	10

STATE OF NEW MEXICO)
) ss.
 COUNTY OF BERNALILLO)

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

Witness my Hand and Seal this 6th day of March, 1968.

Ada Dearnley
 NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3728 heard by me on 2/28, 1968.

Arthur, Examiner
 New Mexico Oil Conservation Commission