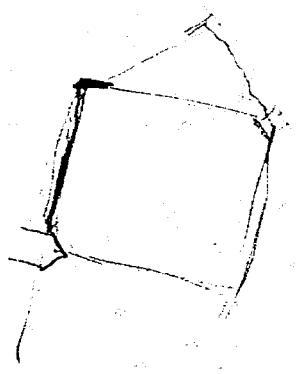
CASE 3607: Application of STOLTZ & CO. for an amendment to ORDER NO. R-3238, Lea County, N. Mex.



Case Number

3607

Application

Transcripts.

Small Exhibits

ETC.

File Case 3601, 1 copy Case 3570

January 8, 1968

Re: Top of the post elevations,
Lane Salt Lake,
Lea County, New Mexico

Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

Attn: Mr. Joe Ramey

Gentlemen:

The following elevations are furnished for your future reference in connection with our monthly reports:

1. Top of the post in the northeast part of the lake is 4155.39 feet.
2. Top of the post in the southeast part of the lake is 4154.53 feet.
3. Top of the post in the southwest part of the lake is 4155.20 feet.

MAIN OFFICE

'68 FEB 14 PM 1 01

Very truly yours,

BURRO PIPELINE CORPORATION

By Jack D. Brown

DHS:wt

cc: Pete Porter
Santa Fe

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. 3607
Order No. R-3238-A

APPLICATION OF STOLTZ & COMPANY
FOR AN AMENDMENT TO ORDER NO.
R-3238, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 28, 1967, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 11th day of September, 1967, 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 by Order No. R-3238, dated May 29, 1967, the applicant, Stoltz & Company, was authorized to utilize a playa lake located in Sections 12 and 13, Township 10 South, Range 32 East, and Sections 6 and 7, Township 10 South, Range 33 East, NMPM, Lea County, New Mexico, for the disposal of produced salt water.

(3) That Order (4) of said Order No. R-3238 provides for the drilling and location of three observation wells.

(4) That Order (5) of said Order No. R-3238 provides for the erection and location of three water level markers.

(5) That the applicant seeks an amendment to said Order (4) to permit the drilling of the three observation wells at the

following locations:

TOWNSHIP 10 SOUTH, RANGE 33 EAST, NMPM
LEA COUNTY, NEW MEXICO

One well to be located 300 feet from the South line and 1100 feet from the West line of Section 7;

One well to be located 600 feet from the South line and 1410 feet from the East line of Section 7; and

One well to be located 2400 feet from the South line and 1100 feet from the East line of Section 7.

(6) That the applicant also seeks an amendment to said Order (5) to permit the location of one marker on the North shore of the lake in lieu of the marker required in the SW/4 SE/4 of Section 6 and one marker on the East shore of the lake in lieu of the marker required in the SE/4 NW/4 of Section 7.

(7) That the applicant has been unable to receive permission to locate the aforementioned observation wells as ordered.

(8) That the alternate locations sought by the applicant will provide as good or better locations for monitoring purposes than the locations provided by said Order (4).

(9) That the composition of the lake bed is such as to make the location of markers in the SW/4 SE/4 of said Section 6 and in the SE/4 NW/4 of said Section 7 extremely difficult.

(10) That the alternate locations sought by the applicant will provide as good or better locations for measuring purposes than the locations provided by said Order (5).

(11) That Orders (4) and (5) of Order No. R-3238 should be amended as requested by the applicant.

IT IS THEREFORE ORDERED:

(1) That Order (4) and Order (5) of Order No. R-3238, dated May 29, 1967, are hereby amended to read as follows:

"(4) That the applicant shall drill three observation wells to the top of the red beds for the purpose of monitoring the quality of the water in the vicinity of said lake.

Said wells shall be located as follows:

TOWNSHIP 10 SOUTH, RANGE 33 EAST, NMPM
LEA COUNTY, NEW MEXICO

One well to be located 300 feet from the South line and 1100 feet from the West line of Section 7;

One well to be located 600 feet from the South line and 1410 feet from the East line of Section 7; and

One well to be located 2400 feet from the South line and 1100 feet from the East line of Section 7.

That the surface elevation and depth to the top of the red beds of each observation well shall be reported to the Commission prior to use of the lake for water disposal purposes.

That water samples shall be taken from each observation well, analyses made thereof, and water levels measured by an independent laboratory or governmental agency and filed with the Commission prior to disposal of produced water into the lake and quarterly thereafter."

"(5) That the applicant shall erect permanent steel water level markers at least four inches in diameter set in concrete graduated in feet and tenths of feet at the following locations:

LEA COUNTY, NEW MEXICO

One marker to be located on the extreme North end of the lake in Section 6, Township 10 South, Range 33 East;

One marker to be located on the East side of the lake approximately in the center of Section 7, Township 10 South, Range 33 East; and

One marker to be located in the SE/4 SE/4 of Section 12, Township 10 South, Range 32 East, and not closer than 300 feet to the high water mark in said quarter-quarter section;

PROVIDED HOWEVER, that each of the aforesaid markers shall be installed at a location designated by an authorized representative of the Hobbs District Office of the Commission."

(2) 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/

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 11, 1967

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

Re: Case No. 3607
Order No. R-3238-A
Applicant:

STOLTZ & COMPANY

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.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of drder also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
Other Mr. Frank Irby

Case 3607
Heard. 6-28-67
Rec. 6-28-67

Grant Stoltz an amendment to Order R-3238. Paragraph (4) and (5) of the order.

(4) Grant observation wells as follows:

300/S & 1100/W,
660/S & 1400/E,
2400/S & 1100 E
Sec. 7-10S-33E.

(5) Grant substitution of water level stakes required in (5) of order for ~~the~~ 1st ~~two~~ locations as follows:

(a) one on north shore of lake in lieu of the one in SW SE/4 sec. 6.

(b) one on the East shore of the lake in lieu of the one in SE SW/4 Sec. 7. 10S-33E.

[signature]

Require water level stakes to be set in cement & using 4" pipe casing, a porcelain U.S.G.S. scale screwed to pipe.

[initials]

Docket No. 19-67

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 28, 1967

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 3598: Application of Dugan Production Corporation for the creation of a new gas pool, special pool rules and three unorthodox gas well locations, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the creation of the North Shiprock-Gallup Gas Pool in Section 14, Township 30 North, Range 18 West, San Juan County, New Mexico and the promulgation of special rules therefor including a provision to authorize exception to the pump-plug method of cementing prescribed by Rule 107 (a). Applicant also seeks authority to meter production from all wells on its Shiprock lease in said pool through one meter and to allocate production from the individual wells on the basis of well tests. Applicant further seeks approval of the unorthodox gas well locations for its Shiprock Well No. 5 located 1650 feet from the North line and 1870 feet from the East line, its Shiprock Well No. 7 located 990 feet from the North line and 2310 feet from the West line, and its Shiprock Well No. 8 located 2310 feet from the South line and 660 feet from the East line, all in Section 14, Township 30 North, Range 18 West.

CASE 3599: Application of Franklin, Aston and Fair, Inc. for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg-San Andres formations through two wells located in Unit E of Section 17 and Unit A of Section 18, Township 17 South, Range 31 East, Grayburg-Jackson Pool, Eddy County, New Mexico.

CASE 3600: Application of Texaco Inc.,for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Cotton Draw Unit Well No. 65, located in Unit G of Section 2, Township 25 South, Range 31 East, Eddy County, New Mexico, to produce gas from an undesignated Wolfcamp gas pool and gas from an undesignated Morrow gas pool through parallel strings of tubing.

CASE 3601: Application of Walker Brothers Oil Company and Tesoro Petroleum Corporation for an exception to Rule 104 C I, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the well location requirements of Rule 104 C I to permit the drilling of more than one well on a 40-acre tract, said wells being located closer than 660 feet to each other and with each 40-acre tract being subject to a single 40-acre allowable. The above exceptions for the South Hospah Upper Sand Oil Pool and the South Hospah Lower Sand Oil Pool, McKinley County, New Mexico, would be applicable to Walker's Hansen Lease comprising the S/2 of Section 6, and Walker's Santa Fe Lease comprising the N/2 and

and SW/4 of Section 7, both in Township 17 North, Range 8 West and to Tesoro's Santa Fe Lease comprising the SE/4 of Section 1, Township 17 North, Range 9 West.

CASE 3602: Application of Amerada Petroleum Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its State WE "K" Well No. 1 located in Unit F of Section 15, Township 21 South, Range 35 East, Lea County, New Mexico, in such a manner as to permit the production of gas from an undesignated Wolfcamp gas pool and gas from an undesignated Morrow gas pool through parallel strings of tubing.

CASE 3603: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Langlie Jack Unit Area comprising 680 acres, more or less, of Federal and Fee lands in Township 24 South, Range 37 East, Lea County, New Mexico.

CASE 3604: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Langlie Jack Unit Area by the injection of water into the Seven Rivers-Queen formations through 8 injection wells in Sections 17, 20, 21, and 29, Township 24 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3605: Application of Walter Duncan for a casing-cementing exception, and for an unorthodox location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to complete his North Hogback 1 Well No. 5 at an unorthodox Dakota oil well location 2466 feet from the North line and 2310 feet from the East line of Section 1, Township 29 North, Range 17 West, San Juan County, New Mexico. Applicant further seeks an exception to the provisions of Rule 107(a) concerning cementing of casing.

CASE 3606: Application of Bell Petroleum Company for salt water disposal and a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to complete its State "K" Well No. 1 located in Unit K of Section 21, Township 11 South, Range 33 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the North Bagley-Lower Pennsylvanian formation and the disposal of produced salt water through the intermediate casing-production casing annulus into the San Andres and other formations included in the open-hole interval from 3845 feet to 7800 feet.

CASE 3607: Application of Stoltz & Company for an amendment to Order No. R-3238, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment to Order No. R-3238, which order authorized the disposal of produced salt water into a playa lake in Sections 12 and 13, Township 10 South, Range 32 East, and Sections 6 and 7, Township 10 South, Range 33 East, Lea County, New Mexico. Applicant seeks to alter the location of the three observation wells required by said order. Alternate locations proposed by applicant are as follows: one well 300 feet from the South line and 1100 feet from the West line; one well 600 feet from the South line and 1400 feet from the East line; one well 2400 feet from the South line and 1100 feet from the East line, all in Section 7, Township 10 South, Range 33 East. Applicant further seeks the amendment to Order No. R-3238 to alter the location of two of the three permanent water level markers required by said order. Applicant proposes one marker on the North shore of the lake in lieu of the marker required in the SW/4 SE/4 of Section 6 and one marker on the East shore of the lake in lieu of the marker required in the SE/4 NW/4 of Section 7.

4164.9
40
4124.9

TEST HOLE NO. 1
Deane Stoltz
1100' FWL & 300' FSL
Sec. 7, T10S R33E
Lea County, New Mexico
6-16-67 by Abbott Bros., Hobbs, N.M.

Elevation @ Hub-Perm. Marker 4165.9'
Elevation @ well site-ground 4164.9'
Elevation @ top 3" casing 4167.08'

Time: Commenced 11:36 AM
Completed-moved off- 3:00 PM

Sample Description

0- 2	Soil, silty
2-18	100% Gray-white soft, slightly bentonitic, calcareous, sandy clay
18-20	100% d.o. inclusions sand
20-26	100% Gray-blue calcareous, sand streated clays
26-31	100% Gray-blue argillaceous quartzitic sand
31-36	100% Gray argillaceous sand with fine gravels
36-40	80% Argillaceous sand with fine gravels; 20% tan silty clay
40-45	100% Reddish brown silty-sandy clay
TD 45	@ TD bailed 15 minutes bailed down Ave.= 6 gpm

Casing: Ran 47' of 3" csg. (3" I.D.), 9 slots 1/8"X12"=44' to 24'

SWL: Top casing 17.2'

Top Triassic (grd level) 40'

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Stoltz EXHIBIT NO. 2
CASE NO. 3607

SOUTHWESTERN LABORATORIES

FORT WORTH DALLAS HOUSTON MIDLAND BEAUMONT TEXARKANA

CONSULTING, ANALYTICAL CHEMISTS
AND TESTING ENGINEERS

Midland, Texas 6-21-67 File No. C-1902-R1

Report of tests on Water

To Mr. Ed L. Reed Date Rec'd. 6-19-67

Received from Mr. Ed L. Reed

Identification Marks Lea Co., New Mexico, Deane Stoltz, #1, Observation well, Sec. 7-10S-33E, bailed 15 min. 6-16-67, sampled by Chester Skrabacz.

	Mg/L
Chloride	283
Sulfate	572

Copies: 3cc Mr. Ed L. Reed

SOUTHWESTERN LABORATORIES

Jack H. Barton

Lab. No. C-3084

TEST HOLE NO. 2
Deane Stoltz
1410' FEL & 600' FSL
Sec. 7, T10S R33E
Lea County, New Mexico
6-17-67 by Abbott Bros., Hobbs, N. M.

Elevation @ Perm. Marker 4174.3'
Elevation @ well site-ground 4173.3'
Elevation @ top 3" casing 4174.9'

Time: Drilled 8' on 6-16-67 - 3:55 PM to 4:30 PM
Completed-moved off- 6-17-67 - 11:30 AM

Sample Description

0- 1	Soil
1-15	100% White sandy calcareous clay
15-20	100% White very sandy calcareous clay
20-24	d.o.
24-28	100% White fine grained, quartzitic slightly argillaceous sand
28-35	100% Tan-yellow fine grained sand
35-40	100% Reddish argillaceous sand
40-43.5	100% Reddish-brown silty clay
TD 43.5	@ TD bailed 15 minutes over 75 gpm

Bailing @ 23' bailed 6 gpm

Casing: Ran 45.20' of 3" csg., slotted 9 holes 1/8"X12" from 42' to 15'

SWL: White drilling @ 25' - 24'
6-17-67 to 3" csg. 16.2'

Top Triassic: (grd level) 40'

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Stolz EXHIBIT NO. 2-A
CASE NO. 3609

SOUTHWESTERN LABORATORIES

FORT WORTH DALLAS HOUSTON MIDLAND BEAUMONT TEXARKANA

CONSULTING, ANALYTICAL CHEMISTS
AND TESTING ENGINEERS

Midland, Texas 6-21-67 File No. C-1902-R1

Report of tests on Water

To Mr. Ed L. Reed Date Rec'd. 6-19-67

Received from Mr. Ed L. Reed

Identification Marks Lea Co., New Mexico, Deane Stoltz, #2, Observation well, bailed at 23 ft., 6-17-67, sampled by Chester Skrabacz.

	Mg/L
Chloride	198
Sulfate	337

Copies: 3cc Mr. Ed L. Read

SOUTHWESTERN LABORATORIES

Jack H. Burton

Lab. No. C-3086

SOUTHWESTERN LABORATORIES

FORT WORTH DALLAS HOUSTON MIDLAND BEAUMONT TEXARKANA

CONSULTING, ANALYTICAL CHEMISTS
AND TESTING ENGINEERS

Midland, Texas 6-21-67 File No. C-1902-R1

Report of tests on **Water**

To **Mr. Ed L. Reed** Date Rec'd. **6-19-67**

Received from **Mr. Ed L. Reed**

Identification Marks **Lea Co., New Mexico, Deane Stoltz, #2, Observation well, bailed from 43 ft. 6-16-67, sampled by Chester Skrabacz.**

	Mg/L
Chloride	184
Sulfate	577

Copies: 3cc Mr. Ed L. Reed

SOUTHWESTERN LABORATORIES

Jack H. Barton

Lab. No. **C-3085**

TEST HOLE NO. 3
Deane Stoltz
2400' FSL & 1100' FEL
Sec. 7, T10S R33E
Lea County, New Mexico
6-17-67 by Abbott Bros., Hobbs, N. M.

4161.4
33
41 28.4

Elevation @ Hub. Marker (60' south)	4162.2
Elevation @ well site-ground	4161.4'
Elevation @ top 3" casing	4164.2'

Sample Description

0- 1	Soil
1-16	100% White-gray calcareous, bentonitic, sandy clay
16-22	100% White argillaceous, calcareous sand
22-26	100% Gray sandy, silty clay
26-31	100% d.o.
31-33	20% Gray-red clay, 80% gray-white fine-medium argillaceous sand, trace gravel
33-35.5	100% Red-brown clay
TD 35.5	

Casing: Ran 3" csg. to 38' Perf. 34' to 14'

SWL: Top Casing 12.1'

Top Triassic: (ground) 33'

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Stolt EXHIBIT NO. 2-B
CASE NO. 3607

SOUTHWESTERN LABORATORIES

FORT WORTH DALLAS HOUSTON MIDLAND BEAUMONT TEXARKANA

CONSULTING, ANALYTICAL CHEMISTS
AND TESTING ENGINEERS

Midland, Texas 6-21-67 File No. C-1902-R1

Report of tests on Water

To Mr. Ed L. Reed

Received from Mr. Ed L. Reed

Date Rec'd. 6-19-67

Identification Marks Lea Co,, New Mexico, Deane Stoltz, #3, Observation well, bailed at 22 ft., 6-17-67, sampled by Chester Skrabacz.

	Mg/L
Chloride	297
Sulfate	556

Copies: 3cc Mr. Ed L. Reed

SOUTHWESTERN LABORATORIES
Jack H. Barton

Lab. No. C-3087

SOUTHWESTERN LABORATORIES

FORT WORTH DALLAS HOUSTON MIDLAND BEAUMONT TEXARKANA

CONSULTING, ANALYTICAL CHEMISTS
AND TESTING ENGINEERS

Midland, Texas 6-21-67 File No. C-1902-R1

Report of tests on Water

To Mr. Ed L. Reed Date Rec'd.

Received from Mr. Ed L. Reed

Identification Marks Lea Co., New Mexico, Deane Stoltz, #3, Observation well, bailed at 35½ ft., 6-17-67, sampled by Chester Skrabacz.

	Mg/L
Chloride	325
Sulfate	330

Copies: 3cc Mr. Ed L. Reed

SOUTHWESTERN LABORATORIES

Jack H. Barton

Lab. No. C-3088

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 28, 1967

EXAMINER HEARING

IN THE MATTER OF:

Application of Stoltz & Company for an amendment to Order No. R-3238, Lea County, New Mexico.

Case No. 3607

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 3607.

MR. HATCH: Application of Stoltz & Company for an amendment to Order No. R-3238, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, appearing for the Applicant. We have one witness, Mr. Ed L. Reed, I would like to have sworn, please.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1 through 3 were marked for identification.)

MR. KELLAHIN: If the Examiner please, this, as the advertising shows, is an application to amend Order No. R-3238 which approved the disposal of producing salt water in a playa lake in Sections 12 and 13, Township 10 South, Range 32 East and Sections 6 and 7 in 10 South, 33 East. At the time of the original presentation it was agreed that certain monitor wells would be drilled and the order also required markers for the determination of the water levels within the boundaries of the lake. Technically I suppose we could have applied for a rehearing on the application but it seemed more appropriate, since all we wanted to do was change two minor provisions of the existing order, to apply for an amendment to the order and that is what we have done in this instance. So, the hearing today is confined solely to the change in the location of the

permanent water level markers which are required by Order No. R-3238.

ED L. REED

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A My name is Ed L. Reed.

Q Are you the same Mr. Ed L. Reed who testified in the case which resulted in the adoption of Order No. R-3238?

A Yes, sir.

Q And at that time you made your qualifications as a hydrologist a matter of record with the Commission?

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir.

Q (By Mr. Kellahin) Mr. Reed, you heard my statement of the intent of the application in Case No. 3607, did you not?

A Yes, sir.

Q Does that correctly state what Stoltz & Company is proposing at the present time?

A Yes, sir.

Q Now, referring to what has been marked as Exhibit Number 1, would you identify and discuss the information shown on that exhibit?

A Exhibit Number 1 is a plat of Lane Lake prepared by John Sherman, which is intended for the dual purpose of providing corrected and accurate elevation date on certain important features of Lane Lake and it shows the location and elevation of three monitor holes which have been drilled by Stoltz & Company. This is the same map which was originally submitted at the hearing with the exception that the elevation work done at that time was done with plain table and aladate in order to provide a large area of elevation data in a short length of time. Since it is obvious that the operation of Lane Lake as a disposal system will be tied to elevations, it was felt that accurate date on the critical elements of the lake would be required. Therefore, Mr. Sherman has run spirit levels from the bench mark recited in the order, being the Sun dry hole in the Southeast corner of Section 6, 10 South, 33, to the elevation of the spring, and this has now been determined by spirit level to have an elevation of 4145.76 feet. Using 4176.0 as the bench marker.

Additionally, Mr. Sherman has set permanent markers along the perimeter of the lake at elevations ranging from 4143.7 to 4148.3. These are permanent bench marks from which the other

elevations can be determined. These are spirit level elevations. Mr. Sherman has added some additional detail within the lake bottom itself and has determined the high water level as of June the 3rd and 4th, 1967, to be 4143.74 feet, which is two feet below the elevation of the spring and is in the same order of magnitude as the original data although the elevations are somewhat higher. And Mr. Sherman has run elevations to the three observation holes and has staked these holes in accordance with footages which we suggested to him. The original suggested locations -- And I'll have to examine the order because I don't recall their precise locations--the original observation holes recited in the order were in Section 17, in the northwest corner, and as I recall, two test holes in Section 18. By reason of the problems in land ownership, it was felt that it would not be practical to drill the three monitor holes at these locations and as an alternative I selected three locations all in Section 7 and all shown on Exhibit --

Q Three.

Q --3. As it has turned out and as I will explain later in the testimony, it is my present opinion that the data obtained from these three locations is preferable, more nearly defines the critical hydrologic and geologic conditions that they were designed to answer, better than the originally selected locations and for this reason I would recommend to the

Commission that they adopt these three locations in lieu of the original locations set out in the order. Exhibit 3 is a revision of the hydrologic and geologic map which was put into evidence in the first hearing. There are enough copies of this to go around. You have the extra ones here?

Q Yes.

A This exhibit shows the locations of the three monitor holes which shows the water level elevations and the quality of water taken from these three holes. I will come back to this exhibit, but at this time I would refer to the logs of the monitor holes that were drilled.

Q Those had been marked as Exhibits 2, 2-A and 2-B?

A 2, 2-A and 2-B. On the logs of the wells, we have shown the location of the well in the section lines, from the section lines, the date the wells were drilled and the contractor, three elevations, the elevation of a permanent hub set by Mr. Sherman, the elevation of the well at the ground and the elevation of the top of the three-inch casing. We have included a microscopic sample description of the drill cutting taken from these wells. They were drilled with cable tools and we had a geologist on the ground during the drilling of the three wells. It shows the Bailey tests taken on the wells, it provides a record of the length of diameter of the casing and it's perforations. It records the static water

level and the top of the triasic. This is true of each of the three monitor holes. These are designed as permanent observation wells for both water level and quality depth. Chemical analyses have been run on a total of five samples from the three wells. Do you have the numbers on those?

Q They are attached to the exhibits.

A I see. In well no. 1, a single sample was taken at the total depth after fifteen minutes of bailing, yielding a chloride concentration of 283 parts per million and the sulfate concentration of 572 parts per million. Well no. 2 was sampled at two intervals at a time when the well had been drilled at a depth of 23 feet. Drilling was ceased and a bailing sample was taken at that depth. The chlorides were 198 and the sulfates 337 parts per million. A second sample taken at 43 feet which represents a mixture of all of the waters in the Ogallala and these are Ogallala waters, show a chloride concentration of 184 parts per million, a sulfate concentration of 577. The chlorides remain essentially the same, the sulfates a little higher. In well no. 3, the opposite phenomenon took place. At 22 feet the chlorides were 297, the sulfates were 556 parts per million. At the total depth of 35-1/2 feet, the chlorides had increased to 325 parts per million, the sulfates had declined to 330 parts per million.

The data indicates that there is no material stratification,

or uniform stratification of water in the Ogallala in these wells closely adjacent to Lane Lake. The quality is generally within the limits of other Ogallala waters in the area both as to chlorides and sulfates, the chlorides being higher in two of the wells and almost the same in one of the wells, as the municipal supply, domestic supply of Mr. Johnson in Section 19.

I think the most important bit of information that has come out of this additional data derived from the drilling of the observation holes is in the identification of the reversal of the hydraulic gradient northwesterly into Lane Lake which was postulated in the original exhibit but based upon some remote data, and for reference, I hand you my file copy of the original exhibit showing a 4150 and 4160-foot contour, both of them representing reversals to the normal southeasterly hydraulic gradient, and we had postulated a divide both on the red beds surface and on the water table some place southeast of Lane Lake.

Water level elevations determined in observation well no. 1 indicated a static level of 4150 feet above the land surface, I mean above sea level, I'm sorry. This data required the shifting of the 4150 contour line some five or six hundred feet northwesterly toward the lake. The water level elevation in observation hole no, 2 was 4159, to the nearest

foot, which required practically no modification of the 4160 contour. The water level in observation well no. 3, which was thought to be very near the pinch-out of the Ogallala for which the data suggests that it is near the pinch-out, was 4152, which required a shifting of the 4150 contour slightly to the northwest. There still remains a reversal of the hydraulic gradient of at least 16 feet and perhaps slightly more than 16 feet. From the divide, passing northeast, southwest and southeast of Lane Lake and the bottom of the lake are the springs feeding the lake.

That there has been historically no discharge of brine from the lake into the Ogallala, is in my opinion demonstrated by the chemical analysis data in the three observation holes and it lends some weight to the suggestion made in the earlier hearing that the high chloride, high sulfate concentration of the spring water is due to movement of the normal Ogallala water to an alluvial of section made up of windblown evaporites from the lake bed itself.

The configuration of the red bed surface has been added to, has been modified by the additional data obtained in the drilling of the monitor holes and by some additional red bed data obtained after the last hearing. There is a divide on the triasic surface passing through the central part, diagonally through the central part of Section 17 into Section

20, and across the southern part of Section 19, 10 South, 33.

In summary, the drilling of the observation holes confirms our original interpretation of the hydrology of Lane Lake and its surrounding ground water in that the Ogallala is discharging into the lake from the southeast to the northwest. The water table is substantially higher southeast of the lake than it is in the springs or in the lake bed and there is room, in my opinion, in Lane Lake, for a substantial amount of salt water disposal, even a substantial depth of water in the lake without modifying the reversal of the hydraulic gradient and causing a leakage of the salt water from the lake into the Ogallala.

Q Mr. Reed, is it your conclusion that the monitor wells located as proposed in the present application and as presently drilled, will as effectively monitor and keep a check on this salt water disposal system as though they had been located as required in the Order R-3238?

A Yes, sir. I think they will in fact provide closer control.

Q As to the location of the permanent water level markers, I don't believe you gave the reason for changing the location, or did you?

A No, I did not. I have discussed this with John Sherman, and to get out into the lake in the first place is a very difficult matter. As you can see from Exhibit 1, he was

not able to even get a rodman into the central part of the lake. And secondly, I am concerned that the thickness of the evaporite section in the bottom of the lake, which from our own examination is a thick, plastic, sulfate mud, the depth may be so great as to prevent the establishment of a permanent marker that could be relied upon. It would of necessity have to be bottomed in the underlying triasic, I believe, and this maybe physically difficult to do.

In view of the fact that there is a line, or a line can be established around the lake which will represent a strand line at any particular elevation that you would choose above the normal flood line, which as I have said, is 41 -- 43.74, it occurs to me that permanent gauge stakes at a given elevation around the lake in two or three or four positions would serve the purpose of determining the depth of the water in the lake at all times or its relationship to the spring and we would respectfully request that the Commission allow us to set such gauge markers at a constant elevation along the margins of the lake on all sides. I would say three or four such markers.

Q Well, the additional information you have been able to obtain by the revised contours and the drilling of the monitor wells, has that additional information in any way changed your conclusion as to the possible damage of the fresh water

zone by disposal water in this lake?

A No, sir.

Q Does it indicate in fact that the lake has a greater capacity than you originally testified to?

A Yes, it does.

Q Were Exhibits 1 through 3 other than the water analysis prepared by you or under your supervision?

A The 1 and 2 were not. They were prepared by John Sherman, 3 was prepared by me. The well logs were prepared under my supervision, and the chemical analyses were prepared by Southwestern Laboratories of Midland.

Q Have you examined the material which was not prepared by you and determined whether in your opinion it is or is not correct?

A I have.

Q In your opinion, does it correctly reflect the facts it purports to show?

A Yes, it does.

MR. KELLAHIN: At this time we offer into evidence --

A Let me say that this data has also, with the exception of the two survey maps, the data has been furnished to the State Engineer's office as of this morning and discussed with them.

Q The entire proposal was discussed with the State

Engineer, is this correct?

A Yes, sir.

MR. KELLAHIN: We offer into evidence the exhibits.

MR. UTZ: Without objection Exhibits 1, 2, 3, 2-A and 2-B as attachments, will be entered into the record in this case.

(Whereupon, Applicant's Exhibits 1 through 3 were offered and admitted into evidence.)

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

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Reed, the reason for removing the well under the land ownership, it actually does move them closer to the lake?

A Yes, sir.

Q Now, as I understand, the 4150 contour here represents the Ogallala water table?

A Yes, sir.

Q And the bottom of the lake is 4145.76?

A That's the top of the spring, no, sir. The bottom of the lake is -- I have assumed an average bottom of the lake of 4142.75. 4143 contour can be drawn apparently completely around, enclosing about 181 acres.

Q The top of the water is at 4150 and you had water

all the way down to 45 feet?

A The top -- The divide is at least as high as 4160 and probably a few feet higher than that. The 4160 contour represents the divide because it is duplicated southeasterly by another 4160.

Q About how thick is the water zone at 4150 contour where the first well was drilled, that is what I'm trying to get at?

A Let me look at the well. The static water level was 17.2 feet. The base of the Ogallala was 40 feet. That would be thirty, twenty-three, 22.8 feet. That's in well no. 1.

Q So, in that well the base of the water zone is actually below the bottom of the lake, is that right?

A Yes, sir, it is, below the bed of the lake.

Q Yes.

A Yes, sir. Yes, sir.

Q If that water was going to be contaminated by well no. 1 by the water in the lake, that should have been contaminated long before now, shouldn't it?

A Yes, sir, it should. We have drawn some theoretical isopotential lines in the reservoir to see just what the movement, what the flow in that should be in this reservoir. And from the divide into the lake there must be movement up the

red bed surface, even though the red bed surface dips to the east, the flow line, the flow net must go up into the lake because of the position of the equalpotential lines. There has been no, what I would call slippage, because normal flow can not proceed in the face of a reversal in the hydraulic gradient regardless of the configuration of the base, and it has to be slippage. We have no evidence of slippage in these monitor holes of any nature because this situation has been going on for many hundreds, perhaps thousands of years. Now, development, major development of the Ogallala in the southeast of this lake, would create an entirely different picture but let me point out that whether salt water is ever put in this lake or not, development of the Ogallala and modification of the water table would result in deterioration of quality under any circumstances. This could not be prevented. This has happened in many places in West Texas from natural changes in the hydraulic gradient or modifications of the hydraulic gradient and natural migration of mineralized water.

Q Now, how much water did you intend to put in this lake, did you say you recommended something like two feet?

A Yes, sir, thereabouts.

Q That's still your recommendation?

A Yes, I think we should stay with the original

language. We were talking about a half a foot below the top of the spring, as I recall, in the order, the limit was placed at a half a foot. I will point out that we were speaking here in terms of average conditions and I think from my calculation, I think even under abnormal conditions we have plenty of room here but I am not prepared to say that with a big flood we might not have two weeks above this point. I don't know. All my calculations were based on average rainfall and average evaporation loses from the lake. My opinion is that within a substantial portion of the reversal of the hydraulic gradient which now appears to be in the order of 14 to 15 feet, there would be no discharge out of the lake. I think we would have limitations, topographic limitations around the southwest end of the lake before we reached that point, however

Q The reason you want to change the water level stakes is because you are afraid maybe the mud in the middle of the lake is even deeper than knee deep to a tall giraffe?

A Yes, sir. I'm quite certain that it is. It could be twenty feet deep.

Q How do you propose to set these stakes on the lake's edge, cement or pipe or --

A They will be aluminum stakes driven to a firm footing.

Q Would there be any danger of cattle and so forth changing them, rubbing on them or tearing them down?

A Cattle don't seem to come into this lake very frequently except across the southwest end, presumably because of an unsure footing. It is possible that this will happen but I will say that with the bench marks that have already been set, they can be reset accurately if this happens and they will be reset. They will have to be maintained just as the monitor holes will have to be maintained.

Q What would be the matter of just setting four-inch markers in cement and get it over with?

A I think this could be done. Probably would be desirable.

Q Then the cows could scratch whenever they want to?

A If it's not to deep to bed rock.

MR. UTZ: Are there any other questions of the witness?

MR. HATCH: Mr. Reed, I believe it was brought out at the other hearing that the rate of the recommended discharge into the lake, it would be extremely questionable as to whether the water level ever reached the limits that you recommend, is that right?

A Yes, sir.

MR. HATCH: On account of the rate of evaporation?

A This is true.

MR. HATCH: Thank you.

MR. UTZ: Any questions? The witness maybe excused.

(Witness excused).

MR. UTZ: Do you have any statements? The case will be taken under advisement and this hearing is adjourned.

I N D E X

WITNESS	PAGE
ED L. REED	
Direct Examination by Mr. Kellahin	3
Cross Examination by Mr. Utz	13

EXHIBIT	MARKED	OFFERED AND ADMITTED
Applicant's 1 through 3	2	13

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JOE B. JAMESON, 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 3rd day of July, 1967.

Joe B. Jameson
Notary Public

My Commission Expires:

June 25, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3607, heard by me on June 25, 1967.

..... Examiner
New Mexico Oil Conservation Commission