CASE NO.

6222

APPLICATION,

TRANSCRIPTS,

SMALL EXHIBITS,

ETC.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
State Land Office Building
Santa Fe, New Mexico
2 March 1979

EXAMINER HEARING

IN THE MATTER OF:

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico.

CASE 6222

BEFORE: Joe Ramey

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Lynn Teschendorf, Esq.
Legal Counsel for the Division
State Land Office Building
Santa Fe, New Mexico 87503

For the Applicant: No Appearance

MR. RAMEY: The hearing will come to order. Call first case 6222.

MS. TESCHENDORF: Case 6222, Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. It's a re-hearing continued from August 23rd Commission Hearing.

MR. RAMEY: We had a request that that hearing be continued to March 15th and it will so be continued, same time, same place on March 15th.

(Hearing Concluded.)

REPORTER'S CERTIFICATE

I, STEFANIE XANTHULL, a court reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge and skill, from my notes taken at the time of the hearing.

Stefanie Xanthull, C.S.R.

Nye Reporting Service, Inc.
Certified Shorthand Reporters
621 Old Santa Fe Trail — Suite 7
Santa Fe, New Mexico 87501

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION
State Land Office Bldg.
Santa Fe, New Mexico
9 August, 1978

COMMISSION HEARING

IN THE MATTER OF:

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico.

CASE 6222

BEFORE: Commissioner Phil Lucero, Chairman
Commissioner Emery C. Arnold
Commissioner Joe D. Ramey, Secretary

A P P E A R A N C E S

For the Commission: Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Bldg.
Santa Fe, New Mexico 87501

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
730 Bishop's Lodge Road • Phone (505) 986-3404
Santa Fe, New Mexico 87501

COMMISSIONER RAMEY: The hearing will come to order.

Call first Case 6222.

MS. TESCHENDORF: Case 6222. Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico.

The applicant in this case has requested it be continued to the Commission Hearing to be held on August 23rd, 1978.

COMMISSIONER RAMEY: This case will be continued until August 23rd, same time, same place.

(Hearing concluded.)

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
730 Bishop's Lodge Road • Phone (505) 988-3404
Santa Fe, New Mexico 87501

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, Notary Public and Certified Shorthand Reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill from my notes taken at the time of the hearing.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
730 Bishop's Lodge Road • Phone (505) 988-3404
Santa Fe, New Mexico 87501

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
MAY 10, 1978

COMMISSION HEARING

IN THE MATTER OF:

Application of Paul Hamilton for salt water disposal well shut in, Lea County, New Mexico.

Case 6222

BEFORE: Joe D. Ramey

TRANSCRIPT OF HEARING

APPEARANCES

For the New Mexico Oil Conservation Commission:

Lynn Teschendorf, Esq.
Legal Counsel for the Commission

LANPHERE REPORTING SERVICE
P. O. BOX 449
58 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

I N D E X

		Page
1.	Appearances	2
2.	Reporter's Certificate	5

* * * * *

MR. RAMEY: Call next Case 6222.

MS. TESCHENDORF: Case 6222. Application of Paul Hamilton for salt water disposal well shut in, Lea County, New Mexico.

The applicant has requested the hearing to be continued until May 31, 1978.

MR. RAMEY: This case will be continued to the Commission Hearing at this same place, same time on May 31st, 1978.

(WHEREUPON, Case 6222 continued.)

REPORTER'S CERTIFICATE

I, BETTY J. LANPHERE, CSR-RPR with offices in Santa Fe, New Mexico, do hereby certify that the foregoing transcript is a complete and accurate record of said proceedings as the same were recorded by me stenographically and reduced to typewritten transcript by me or under my supervision.

DATED at Santa Fe, New Mexico, this first day of June, 1978.

Betty J. Lanphere, Court Reporter

LANPHERE REPORTING SERVICE
P.O. BOX 449
58 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
State Land Office Building
Santa Fe, New Mexico
15 March 1979

COMMISSION HEARING

IN THE MATTER OF:

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. CASE 6222

BEFORE: Commissioner Ramey
Commissioner Arnold
Commissioner Armijo

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Commission: Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico 87503

For the Applicant: Alvin Jones, Esq.
and
Donald Brown, Esq.
Roswell, New Mexico

For Texaco, Inc.: Harold Hensley, Esq.
HINKLE, COX, EATON, COFFIELD & HENSLEY
Roswell, New Mexico

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3120 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3018 Plaza Blanca (505) 471-8462
Santa Fe, New Mexico 87501

I N D E X

STEPHEN SCHLARB

Direct Examination by Mr. Hensley 3

Cross Examination by Mr. Jones 9

DONALD F. SCHUTZ

Direct Examination by Mr. Hensley 12

Cross Examination by Mr. Jones 22

Cross Examination by Mr. Ramey 28

Cross Examination by Mr. Nutter 30

J. V. GANNON

Direct Examination by Mr. Ramey 32

E X H I B I T S

Texaco Exhibit 1, Document 16

Texaco Exhibit 1-A, Document 17

Texaco Exhibit 2, Graph 18

Texaco Exhibit 3, Data 20

MR. RAMEY: The hearing will come to order. We'll call the case on the docket.

MS. TESCHENDORF: Case 6222. Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico.

MR. RAMEY: I assume the appearances are as we have on record?

MR. HENSLEY: Yes, sir. In addition, Mr. Bob Tibo (sic), attorney for Texaco in Midland, Texas, is jointly appearing with me.

MR. RAMEY: Do you have some new witnesses who haven't been sworn?

MR. HENSLEY: Yes, sir.

MR. RAMEY: All right, I'll ask them to be sworn at this time.

(Witnesses sworn.)

STEPHEN SCHLARB

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. HENSLEY:

Q. Would you please state your name, occupation,

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
Santa Fe, New Mexico 87501

and by whom you are employed?

A. Stephen Schlarb, Petroleum Engineer for Texaco.

MR. RAMEY: Would you spell your last name, please?

A. S-C-H-L-A-R-B.

Q. And where is your office, Mr. Schlarb?

A. Hobbs, New Mexico.

Q. Have you had occasion to previously testify in the past before this Commission?

A. Yes.

Q. And on that occasion were your qualifications as a petroleum engineer accepted?

A. Yes.

MR. HENSLEY: If the Commission please, are the qualifications of the witness as a petroleum engineer acceptable?

MR. RAMEY: Yes, they are.

Q. (Mr. Hensley continuing.) Have you been involved with the tracer test which has been conducted in connection with the salt water disposal well, which is the subject matter of this hearing?

A. Yes.

Q. And is that the New Mexico State "BO" Salt Water Disposal Well No. 3, located in Unit D of Section 24,

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1010 Paseo Blanco (505) 471-2463
Santa Fe, New Mexico 87501

Township 11 South, Range 32 East, Lea County, New Mexico?

A. Yes.

Q. Is this test a test which has been run in conjunction with, and cooperation with, the Oil Conservation Division of New Mexico?

A. Yes.

Q. And has this test been coordinated with their District Office from its inception?

A. Yes.

Q. And have the results of the testing procedure been furnished directly the District Office?

A. Yes.

Q. If you will, Mr. Schlarb, will you please describe the location of the injection well. Is that the same well as the salt water disposal well No. 3, which you previously identified?

A. Yes.

Q. Is that where the isotope was injected?

A. Yes.

Q. And what observation well, or wells, were utilized in connection with this tracer test?

A. An Ogallala observation well approximately 50 feet southeast of the injection well, "BO" No. 3.

Q. Is this the observation well which the applicant, Mr. Paul Hamilton, desired to be designated for

SALLY WALTON ROYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza, Blanca (505) 471-2462
Santa Fe, New Mexico 87501

this purpose?

A. Yes.

Q. And to your knowledge, Mr. Schlarb, was this the well that was completed by Mr. Hamilton immediately prior to the commencement of the testing procedure?

A. It was, as I understand it, a few months prior.

Q. I see. Were any third party services necessary in connection with this pressure test?

A. Yes.

Q. What third party services were contracted for in connection with the testing procedure?

A. Teledyne Isotopes, Incorporated, Westwood, New Jersey, was the primary third party involved, and through them Petroleum Tracers, Incorporated, out of Dallas, Texas, was also involved.

Q. Okay, if you will, sir, will you please relate for the benefit of the Commission the responsbilities of each of these third parties in connection with the testing?

A. Petroleum Tracers out of Dallas was responsible for ejecting the radioactive isotope in the injection well.

Teledyne Isotopes in New Jersey was responsible for analyzing the fluid samples collected from

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3128 Plaza Blanca (505) 471-2465
Santa Fe, New Mexico 87501

the observation well, to ascertain if any radioactivity showed up.

Q. What type of radioactive isotope was utilized in connection with this tracer injection?

A. Iodine isotope 125.

Q. Was that isotope prescribed by one of the third parties who were contracted to supervise and run the test?

A. Yes, Teledyne Isotopes.

Q. How was sampling from the observation well handled, to your knowledge?

A. The sampling began the day after the isotope was ejected into the salt water disposal well.

Q. Do you remember that date?

A. The day after the injection was September 29th, 1978.

Q. And the ejection then started September 28th?

A. Yes.

Q. All right.

A. The sampling continued every day through October 6th, and thereafter every Monday, Wednesday, and Friday through November 24th.

Q. How was the sampling physically accomplished?

A. With the cooperation of the Oil Conservation Division samples were collected from the observation well

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

by means of a bailer, and put into sampling containers.

For Texaco there were three quarts each sampling day collected and these samples were then taken by Texaco and by the Oil Conservation Division and by Mr. Paul Hamilton together to the nearby post office and mailed to New Jersey for analysis.

Q. Is it your understanding, Mr. Schlarb, that Mr. Hamilton also had these samples analyzed by an independent laboratory?

A. Yes. He had samples collected every other sampling day and I believe they were of a volume, 8 liters, as I understand it, and were sent to Eberline in Albuquerque.

Q. How much salt water volume was injected during this tracer analysis? Into the salt water disposal well?

A. Okay. The average rate of injection for the test was 11,860 barrels per day; however, for the first ten days or so, we achieved rates of approximately 13,000 barrels per day.

Q. Okay.

MR. HENSLEY: We pass the witness for cross examination.

MR. RAMEY: Any questions of the witness?

MR. JONES: Yes.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1010 Plaza Blanca (505) 471-2461
Santa Fe, New Mexico 87501

CROSS EXAMINATION

BY MR. JONES:

Q. Mr. Schlarb, in performing your duties as a petroleum engineer for Texaco in Hobbs, did you have anything to do with the design of this tracer test?

A. Yes.

Q. What? What did you -- what was your contribution to this test procedure that was established?

A. Okay, I had to furnish the physical characteristics, the sizes of the equipment involved, and the physical circumstances of the test area and the test facilities to Teledyne Isotopes in order for them to design an appropriate test to perform a valid test.

Q. What did you -- what did this consist of?

A. The size of the pipe and the depth of the well in question. The distance to the observation well. The character of the injection; description of the Devonian injection interval; the Ogallala fresh water zone. The pressures and rates that we injected at. That sort of data.

Q. Did you have anything to do with the manner in which the isotope was injected into the well?

A. I furnished the information of the physical setup, and this was pretty much directed to us by Petroleum Tracers, Incorporated, and Teledyne. They had their estab-

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
Santa Fe, New Mexico 87501

lished procedures.

Q. Were you present when the isotope was placed in the well?

A. Yes.

Q. Can you describe the process by which this was done?

A. Okay. First, injection was continued normally prior to the test date at approximately 700 pounds injection pressure.

Then Petroleum Tracers, Incorporated, had us shut down the well long enough for them to install their ejection tool on the wellhead. They have a special tool for this purpose.

Subsequent to that both injection pumps at the plant were turned on and ejected at a maximum rate of between 12 and 13,000 barrels per day. Injection continued for 33 minutes at which time Petroleum Tracers told us it was okay to stop injection long enough for them to get their tool off the hole.

They did this. We re-installed our connections and re-established injection and maintained it throughout the test.

Q. Was the well on vacuum when the isotope was injected or was it -- or ejected?

A. It was. It was for less than a minute from

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
2010 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

the moment that he ejected the isotope until the time that the well was pressured up again; it was less than a minute.

Q. Now I take it information concerning the bottom hole pressure and the formation, and the Devonian, all this was furnished to Mr. Schutz -- Dr. Schutz?

A. The bottom hole pressure?

Q. Yes, the characteristics of the Devonian formation in terms of bottom hole pressure?

A. As far as the injection pressures involved, vacuum and then pressuring up, yes. I don't know what you mean about bottom hole pressure in the Devonian. I don't know what it is right now. I couldn't toll him that.

Q. Were there any interruptions in injection from September the 28th through the 24th of November?

A. There were two, as I understand it, for a period of hours, something in that neighborhood, but otherwise -- that was for mechanical reasons, but otherwise the test continued with both pumps running flat out for the entire test and beyond.

Q. Do you know when these interruptions occurred and what the duration was?

A. No, we attempted to document them after the fact, and we could not. It was just part of the normal mechanical operations of the field.

They were of very short duration.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1010 Plaza Blanca (505) 471-2412
Santa Fe, New Mexico 87501

MR. JONES: That's all.

MR. HENSLEY: We have nothing further.

MR. RAMEY: Any other questions of the witness? He may be excused.

MR. HENSLEY: We'll call Mr. Don Schutz.

DONALD F. SCHUTZ

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. HENSLEY:

Q. If the Commission please. Will you state your name, please, sir?

A. I'm Donald F. Schutz.

Q. What is your occupation, Mr. Schutz?

A. I'm President of Teledyne Isotopes.

Q. And where is your place of business?

A. Westwood, New Jersey.

Q. What is your formal education?

A. I have a Bachelor's degree in geology from Yale and a Master's degree in geology and geochemistry from Rice, and a PhD in geology and geochemistry from Yale.

Q. Has your work experience as president of Teledyne involved in the past, radioactive tracer analyses

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-8462
Santa Fe, New Mexico 87501

in oil and gas wells?

A. I've been with Isotopes since 1964 and since that time I've been participating in these projects for essentially the entire duration of that time.

Q. The conduction of this particular tracer injection test on the Moore Salt Water Disposal Well No. 3, then, was not a new experience for your company?

A. Not at all.

MR. HENSLEY: Are the qualifications of the witness acceptable?

MR. RAMEY: Yes.

Q. (Mr. Hensley continuing.) Would you briefly describe, Mr. Schutz, the design of this tracer injection test?

A. Okay. Basically, in designing a test, there is -- an attempt is made to optimize between the relationship between detectability and avoiding any radiological hazard. Therefore, we like to put as much isotope in as we can to assure detectability but we like to restrict it to as little as possible to avoid any problems with environmental concerns.

What we determined was that in designing the project we would put enough tracer in to be easily detectible in a volume of water encompassed by a cylinder which was 10,600 feet in height, which was the depth of the

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1011 Paseo Blanco (505) 471-2448
Santa Fe, New Mexico 87501

well, the salt water disposal well, and 60 feet in radius with a diameter of 60 feet.

The assumption was that the tracer -- that we would put enough tracer in to mix in all of the water in that cylinder and still be ten times our limit of detection.

The further assumption was that the average porosity of the formations between the bottom of the well and the surface was 0 percent. That meant that we had to tag 9.6-million barrels of water at ten times our level of detection.

The nominal level of detection that we use was one picacurie per liter, that's 10 to the -12 curies.

The final -- the calculations based on all these assumptions led us to inject 5 millecuries of Iodine 125, which again, making the assumption that these dilutions would occur, this would leave us a factor of 10 below the NRC guidelines for release of Iodine 125 to the -- an uncontrolled environment, so we were essentially 10 times our detection limit and 1/10th of the limit which would cause some possible concern if it were released to the environment. So we felt like that was a -- quite a nice optimum in our design.

Now, all right, the other aspect of the design was the selection of a tracer. Iodine 125 is essentially, or is chemically identical to Iodine 131, which

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
8020 Plaza Blanca (505) 471-2461
Santa Fe, New Mexico 87501

has been used in many tests, and we have used both Iodine 131 and Iodine 125. There is, from a chemical, geochemical standpoint, there is no difference. There is only a physical difference of the half life of the radionuclide and the character of the radiation. So we are aware of articles in the literature, which substantiate the use of Iodine 131, which we have an exhibit here as an example of many such papers, which substantiated the use of that isotope.

We have, ourselves, carried out research studies for the -- what is now the Department of Energy, it used to be the AEC, and they were concerned about the transport of Iodine as a result of entering groundwater systems from underground nuclear explosions. We carried out research for the AEC on the movement of Iodine through the geologic media, and we also used Iodine 125 in several oil and gas field situations and have found it to be an effective tracer.

So given the time scale of the experiment that was -- that was used, and the character of the formations, and so forth, we determined that Iodine 125 was the tracer of choice.

The only other parameter that went into the test, or the experiment design, was the length of time for the test to take place, and it was determined that an examination or revealing a direct communication between the

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
2010 Plaza Blanca (505) 471-8462
Santa Fe, New Mexico 87501

well and the observation well would be revealed in two months, and so that was the time scale that was used for the test.

So that's it.

Q. Was the information which Mr. Schlarb testified was furnished to you by Texaco sufficient for your purposes of making this design?

A. Yes.

Q. What were the mechanics, Mr. Schutz, of the isotope injection and dispersion technique?

A. Okay. If you look at the -- let's see, what is it, Exhibit Number One, the third page of that exhibit gives a step-by-step procedure for the release of the radioisotope into the well, and essentially in step one we prepare the tools, we install the tools in the wellhead, and test at the injection pressure. We apply some detergent to the tools so that the cleanup is more efficient. We take the vial of radioactive material, which has been shipped to us by our supplier, place it in the injection tool, place the injection tool in the well, tighten up the threads to seal the system. In the process of doing that the vial is crushed and releases the material to the bottom of the tool.

Then the water flow is opened up and begins to flush the material out of the tool.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

Essentially what you have there is a 1-1/4 inch pipe with some holes in it and a cap in the bottom of that pipe with crushed glass vial and the isotope in solution there, and then as the water is turned on, the turbulence cleans that isotope and flushes it down the well.

It generally takes at least a half hour to get the tool completely clean so that we can remove it without radiological hazard to our workers. So when you say dispersion of the isotope, the dispersion takes place over a period of several minutes as the water is flushed past the broken vial down the pipe, and of course there's a great deal of turbulence and mixing within the 3-1/2 inch tube, which is over two miles deep in this case.

The well is allowed to flow to clean up the tool, shut in the well, remove the tool, take smears around the well to insure that there's no radiological hazard, and that's the end of the injection.

Q Is there any research information which is customarily relied on in the industry in conjunction with this type of tracer analysis?

A Yes. We have an example in Exhibit One-A. This is an exhibit as an example of many such papers which have been published in the literature.

I will just call your attention to the first sentence, which says, and this is in reference number 359

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2413
Santa Fe, New Mexico 87501

Hazzaa, et al, on the Investigation of Ground Water Radial Flow Using Radioactive Tracers.

"A study of the effectiveness of various radioisotopes in investigating the porosity of water-bearing formations, with Iodine 131, Chromium 251 and Bromine 82, in comparison with Tritium, showed that Iodine 131 was most useful for this purpose."

I want to make it clear that for the purposes of our test, Iodine 125 and Iodine 131 are identical except for the half life of the radionuclides. From a chemical standpoint they are identical.

Q Have you caused any data analysis to be made, Mr. Schutz, to determine the precision of the isotope detection?

A Yes. We have -- in the measurements which we made on the samples submitted to us by Texaco are plotted on Exhibit -- what's the number of this one?

Q Two.

A Exhibit Two. The solid curves in the graph are the levels of activity which would have been present in the water in this hypothetical cylinder 10,600 feet high and 60 feet in diameter, had the tracer been immediately mixed throughout that cylinder, and down at the bottom -- and that's a function of time from the injection September 28th extended out through January, and then starting over

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
2010 Plaza Blanca (505) 471-2463
Santa Fe, New Mexico 87501

again in the lower curve it just picks up at the end of this curve. It goes -- keeps on going.

These marks down here are the measurements that we made. We never detected any Iodine 125 in any sample, and those levels are the levels at which we can say with 95 percent confidence that there was nothing, there was no acitivity above those levels.

Now, if we wanted to say with 99 percent confidence the levels would only be slightly higher than what we have, and you could extend it up to one chance in a million, and it still would not be anywhere close to the design concentration which is represented by the curves.

Q Considering the type of isotope which was used, Iodine 125, do you have an opinion, Mr. Schutz, as to whether or not eight weeks testing is an adequate length of time for detection of direct communication between the injection of the tracer and the samples at the injection well?

A It is adequate for the detection of direct communication. There was ample amount of tracer in the waters so that if it reached the observation well within the two months, it would have been easily detected.

Q Mr. Schlarb in his testimony indicated that you utilized a company named Petroleum Tracers in connection with the field operations of this test, is that correct?

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
Santa Fe, New Mexico 87501

A. That is correct.

Q. And what has been your experience with this company in connection with this type of testing procedure?

A. They've been our subcontractor on this type of project for almost twenty years and we have had a very close working relationship and I have every confidence in their ability to carry out the project.

Q. I'd next like to hand you, Mr. Schutz, what has been marked for identification as Texaco Exhibit Number Three, and ask you, sir, if you will please identify this exhibit for the benefit of the Commission.

A. Okay, Exhibit Number Three is a summary of all the data which we submitted to Texaco on the samples that were sent to us by them for analysis.

Q. What does this exhibit reflect?

A. It, as I mentioned in describing the graph, this is the data which is plotted on the graph, and it shows that our limit of detection was well within what isotope should have been there had there been direct communication between the well and the observation well.

Q. As I understand it, then, it is your opinion that there was no communication between the injection into the salt water reservoir and the samples which were taken from the observation well?

A. That's correct.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1010 Paseo Blanca (505) 471-2462
Santa Fe, New Mexico 87501

Q. Were you aware, or are you aware at this time, that the Eberline Industries, I believe, Instrument Corporation, was also analyzing the samples which were taken from the observation well?

A. I was aware of this, yes.

Q. And have you examined the results of their analysis?

A. Yes, I have.

Q. I'll hand you, Mr. Schutz, what has been marked for identification as Exhibit Four.

MR. BROWN: Excuse me. To respectfully -- we submit this is pure hearsay in its very purest form, unless it has some background as to the circumstances under which those tests were conducted, or unless he was a person present, we would object to those being introduced.

MR. HENSLEY: Well, they are your own analyses.

MR. BROWN: They're our work product, that's right. We can do what we want to with them.

MR. HENSLEY: Well, the results were furnished to the Commission. They're public information, the same as our results were, and I assume that the Commission would like to hear the opinion of the expert with respect to this analysis to see if it confirms his analysis.

MR. RAMEY: This information was submitted,

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
Santa Fe, New Mexico 87501

what, to the Hobbs District Office?

MR. JONES: Yes. We submitted this to the Hobbs Office. As far as we know, it's genuine and valid. I don't know what Mr. Schutz knows about it, but I think as far as a foundation for this document is concerned, this looks like a copy of what we received from Eberline.

MR. HENSLEY: Well, if the Commission has no questions about it, we certainly don't, so we'll pass the witness for cross examination, then.

I assume that this exhibit indicates that if there was any communication contrary to the results of Mr. Schutz analysis, that some testimony will be proper.

We pass the witness for cross examination.

MR. RAMEY: Any questions of the witness?

MR. JONES: Yes.

MR. HENSLEY: If I may, please, Mr. Jones, at this time, Mr. Ramey, we offer Texaco Exhibits One, One-A, Two, and Three.

MR. RAMEY: They will be admitted.

CROSS EXAMINATION

BY MR. JONES:

Q Mr. Schutz, as I understand your testimony, the amount of tracer that was determined suitable for this test was based on your calculation of the volume of a

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2468
Santa Fe, New Mexico 87501

cylinder of 10,600 feet by 60 in diameter or is it radius?

A Radius.

Q And you assumed a uniform, average porosity of 8 percent within that volume?

A Yes.

Q Now, in deriving this test parameter, was any consideration given to the Devonian formation and its characteristics that, I guess, would furnish one end of the this cylinder? It's kind of open-ended at the bottom, in other words, it seems to me.

A Yes. I think it probably is.

Q Well, was there any weight given in deriving this volume, or determining the amount of isotope that ought to be given as a result of this open-ended characteristic of the cylinder, or --

A Well, I guess the assumption was that if it was open-ended and that if it were taking the water from the well, that that was -- would not be a problem. I think what we were trying to get at was if water is not the water going into the Devonian, but the water that wasn't going into the Devonian, so if there were water moving upward into the near surface environment, it was that water that we were concerned with.

Q But the test as it was structured assumed then that all of the water would be going back up into the --

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
2010 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

into this cylinder.

A. No. It assumed that if the water were going up into the cylinder and the tracer were mixed in that volume of the cylinder, that we'd have a certain activity level in that volume.

Q. Well, you had a known, defined, specified quantity of your tracer that you put into this volume.

A. That's right.

Q. And your testimony regarding the levels of activity that you expected to result from that was based on the assumption that all of that tracer remained in that volume.

A. That's right.

Q. So if some of the water went into the Devonian and some of it remained in the volume, you'ld have a lower --

A. That's right.

Q. -- level of tracer present.

A. That's right.

Q. Now, this may seem kind of naive, Mr. Schutz, but how do you know there was any I-125 in that little glass bottle that was put on the wellhead?

A. Okay. In our Exhibit -- let's see, which one is this? I don't have it marked on there.

MR. HENSLEY: Exhibit One.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-1462
Santa Fe, New Mexico 87501

A. In our Exhibit One the last sheet of that shows the assay by our supplier, New England Nuclear, which certifies that there was 5 milliliters of solution, Sodium Iodine solution, 1 millicurie per milliliter, which made a total of 5 millicuries of activity.

On the second page of -- in the report of Mr. Fletcher, who did the injection for Petroleum Tracers, there was a verification at the time of the opening of the container in the field, where his field survey detector examined the outside of the lead shield and saw 10,000 counts per minute; opened the shield and saw 400,000 counts a minute. This is not quantitative but this is a qualitative demonstration that there was a substantial amount of radioactivity present in the bottle, which he did, in fact, insert in the well and broke inside of the well, so we're -- we're confident that radioactivity was injected into the well and it was certified by our supplier to be Iodine 125.

Q. If I-131 is commonly used for this type of test, why was I-125 selected for this test?

A. Because the Iodine 131 has an 8-day half life and we would have had to have injected over 100 millicuries rather than 5 millicuries in order to extend the tim e out to a two-month period.

So rather than handle large quantity of activity at the outset, we preferred to handle 5 millicuries

SALLY WALTON (BOYD)
CERTIFIED SHORTHAND REPORTER
[illegible] Plaza Blanca (505) 471-2402
Santa Fe, New Mexico 87501

rather than 100 millicuries of activity and still achieve the same level of detection ability.

Q. Were you furnished with the physical characteristics of this well in terms of the casing strings, and tubing strings inside the well, all of this information?

A. We were essentially given the diameter of the tubing, the depth of the well, and the flow rate of the injection stream.

We did not have any details of the well completion, nor do I feel we needed it for our design.

Q. Have you made a report regarding this test to anyone?

A. Only the report of the data which is -- has been submitted as Exhibit Three.

Q. Where did your 8 percent average porosity figure come from?

A. Well, Mr. Schlarb gave that to us.

Q. That was something he derived?

A. Yes.

Q. Did you personally perform these tests or were these performed under your supervision?

A. They were performed in our Environmental Analysis Department.

Q. I asked Mr. Schlarb about the bottom hole pressure in this well. Are you aware of that parameter re-

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2412
Santa Fe, New Mexico 87501

garding this particular well?

A. Well, it was not really relevant to our design of the project.

Q. How isn't it relevant? Doesn't it make a difference that a certain amount of water would pass into this formation without injection as opposed to --

A. Without -- I don't believe I --

Q. In other words, I understand that a certain amount of water will enter this Devonian formation just under gravity or vacuum, as was discussed, and I believe you stated earlier that the end aspects of this cylinder were neglected or ignored in structuring this test. It seems to me that it ought to have given some consideration. One aspect of that would have been the pressure at the bottom of the well.

A. Well, I guess the feeling was that if it's going into the Devonian, it's not causing any problem.

Q. Certainly, but if some of it is and some of it isn't, it would seem to me that ought to have affected the amount of tracer you would have -- would have wanted to use.

A. Well, as I understand the natural water table from that Devonian formation is about 1500 feet deep, so if you let water stand in the well without any injection, I think it's about 1500 feet down, so I don't quite see that

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
2020 Plaza Blanca (505) 471-2463
Santa Fe, New Mexico 87501

the fact that the water was going into the formation, or some of it was going into the formation, is a problem with the design of the project.

If the design of the project was for a direct identification of direct communication with the observation well, and to get that direct communication you have to have a substantial amount of water flowing upward, or from some place from the well.

Q Now, in --

A So I --

Q -- in structuring your test, the information you had was limited to the physical characteristics of the well, this average porosity figure, and the distance of the observation well from the well?

A That's right. That's correct.

Q You weren't given any information with regard to circumstances that the evidence that had been presented to this Commission had raised some questions about the integrity of the well?

A No.

Q You didn't know anything about those factors?

A No, not in any detail.

MR. JONES: That's all.

CROSS EXAMINATION

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
Santa Fe, New Mexico 87501

BY MR. RAMEY:

Q Mr. Schutz, let's do a little assuming. We're injecting 1100 barrels into the well and maybe ten barrels of that 1100 is escaping upward. Do you think the test you conducted would detect this small amount of water escaping upward?

A Well, okay, you're referring to I believe you say 1100 barrels. Is that --

Q That's what's injected in the well per day.

A What, 11,000?

Q Or 11,000. Say 10 barrels from 11,000.

A Say 10 barrels of that 11,000, if that escaped and made its way upward, one would have to calculate the time that that would take, and one can conceive that it would take longer than the design period of two months to do this.

I think that you would just have to deal with that quantitatively to see whether that would be a significant situation.

A very -- a very small leak would be very hard to detect. I think you'd have to go backwards and say what -- what size leak would be required in order to produce the effect that is allegedly being observed.

Q Okay, thank you.

MR. RAMEY: Any more questions of the wit-

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3128 Plaza Blanca (505) 471-2463
Santa Fe, New Mexico 87501

ness? Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q. Dr. Schutz, I'm a little confused as to the size of the cylinder. I heard radius and diameter both. It's 10,600 feet long and is it 60 feet radius or 60 feet --

A. Radius.

Q. -- diameter?

A. Radius.

Q. So it's 120 foot diameter circle, then, or --

A. That's right.

Q. -- cylinder?

A. Right.

Q. Okay. Now, you also mentioned that the half life of the Iodine 131 was 8 days.

A. That's right.

Q. What is the half life of the Iodine 125?

A. 60 days.

Q. So that's why you selected the 60-day here.

A. Right.

Q. It has a much longer half life.

A. Right.

Q. Now, I'm having a little bit of difficulty

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3018 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

reading the back of -- or sheet two of Exhibit One.

Would you go through that, you're probably more acquainted with the terms.

A. Right. Okay, these are notes that were made in the field, and the first sentence says, Reading of lead shield using a Model 11 Ludlum, which is a gamma ray detector, this Iodine 125 is a gamma ray emitting radionuclide, and with the -- what this is, is a little lead -- call it lead pig. It's just a cylinder of lead with about a half inch thick wall and a close fitting top on it that is used to ship the isotopes in.

And with that cover on he's getting essentially a natural background reading of 10,000 counts a minute.

Q. This is what we'd have anywhere.

A. Yeah, right.

Q. So there's no radioactivity escaping from that container?

A. Very little; very little.

Q. Okay.

A. And then when he opened it, he saw 400,000 counts a minute.

Q. I presume that next line says lead open.

A. Lead open, Model 11 Ludlum, 400,000 counts a minute.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

And then reading at the wellhead, he took a reading and got 10, 12,000 counts a minute, and this material is of such a low energy radioactivity that it is not detectible when the vial is put inside the wellhead; there's sufficient shielding there so we'd not see any difference on the outside of the wellhead when we had the isotope in there.

And then the rest of it says injected the tracer at 10:45 a. m., 9-28-78; removed tool at 11:15 a. m., and the -- he has a pocket dosimeter, which reads the direct radiation -- is a direct radiation reading device, and his dosimeter read 3 at the start and read 3 at the finish, which indicates that he received a negligible dose of activity by the process of making injection.

Q Fine, thank you.

MR. RAMEY: Any other questions of the witness? He may be excused.

MR. HENSLEY: We have nothing further, Mr. Ramey.

MR. RAMEY: I'd like to call Mr. Gannon to the stand for a couple questions.

J. V. GANNON

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
[illegible] Plaza, Blanca (505) 471-2462
Santa Fe, New Mexico 87501

DIRECT EXAMINATION

BY MR. RAMEY:

Q. Mr. Gannon, you've testified in this case that there was never any workover done on this well except for perhaps tubing, replacing tubing.

A. That's correct.

Q. So I think you've testified that you have no knowledge of the well ever leaking?

A. That's correct.

Q. But yet you do have a mound of contaminated fresh water around this well.

A. I haven't seen any mound.

Q. Well, the testimony of several witnesses has attributed a mound of water around this well, or stated that there is a mound of contaminated water nearly of the same concentration of chloride as the water injecting, is that not correct?

A. Yes. We've drilled a number of test wells and the Commission also has drilled test wells in the vicinity of this well; yes, there are chlorides that approximate the chloride content of the Devonian water, yes.

Q. How do you account for this water being in there?

A. I don't account for it.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

Q You have no idea that's where it might have come from?

A. I have some ideas, but I have no valid substantiation of them, so they wouldn't be worth much.

Q For what they are, would you expound on them right here?

A. Yes. I think that from past experience and experience in other fields that oftentimes the Ogallala has been contaminated by leakage from surface pits.

Q But isn't it -- well, leakage from surface pits, on the studies I've seen, there is normally a mound of contaminated water and then radiated out from that, why, less -- less chlorides. In other words, the mound that is found from pit contamination is always less than what was injected into the pits, or disposed of in the pits.

A. I couldn't say that for sure, but it may be true.

MR. RAMEY: Thank you, Mr. Gannon. Any other questions of Mr. Gannon?

MR. JONES: No.

MR. RAMEY: Do you have anything further, Mr. Hensley?

MR. HENSLEY: No, sir.

MR. RAMEY: Mr. Jones, do you have anything further?

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2463
Santa Fe, New Mexico 87501

MR. JONES: We don't have any witnesses, Mr. Chairman.

MR. RAMEY: Any statements? Mr. Hensley? I guess you're last and Mr. Jones should go first.

MR. JONES: Well, Mr. Chairman, the Commission has heard my speech on this situation a number of times and I don't really have any embellishments to it.

We asked for this rehearing for several reasons. The Commission did find that, in its order after the first hearing, that there was no evidence of any leakage in this well.

We felt that contrary to the Commission's finding at that time, there was abundant evidence of leakage in the well, and we have brought back before the Commission further evidence of the leakage of the well. We've presented further testimony regarding the distribution of chlorides around the well; testimony regarding red bed configuration, and also testimony regarding water levels, all of which, in the opinion of the gentlemen who appeared before the Commission in August, indicated, I believe, as one of them characterized it, overwhelming evidence of leakage of the well.

Now, there is a question at this time as to whether or not the well was still leaking. I think we have acknowledged that the well has been subjected to a number of

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1010 Paseo Pinos (505) 471-2462
Santa Fe, New Mexico 87501

tests that appear appropriate to the circumstances, which would on the surface, at least, indicate that the well is no longer leaking; however, as the Commission has just highlighted in the Chairman's questions to Mr. Gannon, there is no evidence of any repairs, any remedial steps taken to correct whatever problem the well had.

Under the circumstances it seems to me that the Commission is left on the horns of dilemma. It must, I believe, on the basis of the record -- we would concede that the witnesses who testified at the first hearing and at the hearing in August were severely cross examined but nonetheless, their evidence -- their testimony regarding the leakage of the well is all that's in the record that's not rebutted by anything.

The Commission must first find that there is evidence that the well has leaked. There is evidence in the record, and again there was some cross examination, but this is not in any manner refuted directly that the well has never been repaired, and there's evidence in the record that the well, if it is leaking at a diminished rate or perhaps no longer leaking.

Now, given that slate of facts, which seems to me to be the only facts before this Commission, why, it seems to me the Commission is confronted with this dilemma of what to do with this well,given the risks that it poses

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
2020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

to the environment, and given the unexplained nature of this contamination that has occurred around this well, and given the fact that the contamination is unquestionably attributable to that well, would seem that the Commission really would have no alternative in light of the record as it exists before it, to direct that some other disposal well be put into use in that field, and that use of this well be discontinued because of the risks it imposes to the environment.

MR. RAMEY: Thank you, Mr. Jones.

Mr. Hensley?

MR. HENSLEY: Well, I feel the same way, Mr. Ramey. I think that the statements which I've made before need not be repeated or embellished, but I would like to say that I feel that the evidence before the Commission now is theoretically and practically speaking considered conclusive on the fact that this well is not leaking at the present time.

I think that there has been more tests run on this well than any one that I've ever seen, and I imagine probably the same is true with respect to the staff, who are experts in this field. Every type of casing integrity test has been run, flow tests, and now a tracer test, and there has never been any evidence at all, not a scintilla of evidence, that there is any communication between this injection into this wellbore, and the Ogallala formation. None

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2468
Santa Fe, New Mexico 87501

There is no evidence of any repairs ever having been done, which would have given this well an opportunity to have communicated salt water from the Devonian with the Ogallala.

I'm satisfied with the credibility of Mr. Gannon, and I trust the Commission is also. If tests and repairs had been run in the past, I am certain that the records of Texaco Hobbs office would have reflected that, and I just don't feel that anything can be implied about the fact that maybe a repair was made in the middle of the night, or something else, whatever the inference is. There just is no evidence to support it.

We believe that the testimony as to the mounding, which the Commission referred to in questions to Mr. Gannon, is far from being conclusive that this salt water disposal had any contributory effect.

I believe, my recollection of the State Engineer's testimony in that regard is that they themselves testified that for the mounding to the south of the well to have occurred in the density that is indicated from water samples, that this salt water from the Devonian would have had to have jumped the red beds which are shown to have a high elevation immediately south of the wellbore, and I think that if anything is physically impossible, that is, and so I think that all that can be said from a realistic and fair

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3010 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

apparisal of all the evidence which has been considered, and as Mr. Jones indicated, has been substantial, is that there is no inference, direct, indirect, or otherwise, of any communication between the wellbore of the Morroe No. 3 Salt Water Disposal Well and the Ogallala water formation, which overlies it. To the extent that there may be a geological anomaly present, as was indicated by one witness for the State Engineer, the explanation for that necessarily must come from some other source.

Based on all of the evidence which this Commission must consider, I don't believe that there's any other physical means by which tests could be conducted to indicate other results different than what the results of this detailed and very time consuming analysis indicates, and that is that the injection of the radioactive tracer showed no communication in the Ogallala reservoir from samples taken from the observation well.

Thank you.

MR. RAMEY: Thank you.

Does anyone have anything further to add to this case?

If not, the Commission will take the case under advisement, and this hearing is adjourned.

(Hearing concluded.)

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3120 Plaza Blanca (505) 471-2463
Santa Fe, New Mexico 87501

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Court Reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the Oil Conservation Division was reported by me; that said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill, from my notes taken at the time of the hearing.

Sally W. Boyd, C.S.R.

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
1010 Pharm. Bldg. (505) 471-2463
Santa Fe, New Mexico 87501

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. ____, heard by me on _____ 19__.

_____, Examiner
Oil Conservation Division

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
MAY 11, 1978
31

COMMISSION HEARING

IN THE MATTER OF:

Application of Paul Hamilton for salt water disposal well shut in, Lea County, New Mexico.

Case 6222

Before: Joe Ramey, Chairman

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission:

Joe Ramey, Chairman
Emery Arnold, Commissioner
Phil Lucero, Commissioner
Richard L. Stamets, Staff Member

Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

LANPHERE REPORTING SERVICE
P. O. BOX 449
50 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

For the Applicant Paul Hamilton:

Donald Brown
Alvin C. Jones
Attorneys at Law
P. O. Box 776
Security National Bank Bldg.
Roswell, New Mexico

For the Respondent Texaco:

Hinkle, Cox, Coffield & Hensley
Attorneys at Law
P. O. Box 10
Roswell, New Mexico
By: Harold L. Hensley, Jr.

MR. RAMEY: Call next Case 6222. Application for Paul Hamilton for salt water disposal well shut in, Lea County, New Mexico.

Ask for appearances at this time.

MR. HENSLEY: Harold L. Hensley, Jr., of the firm of Hinkle, Cox, Coffield and Hensley, Roswell, New Mexico, for the Respondent, Texaco, Inc.

MR. BROWN: For the Petitioner, Donald Brown and Alvin C. Jones, P. O. Box 776, Security National Bank Building, Roswell, New Mexico, for the Petitioner.

MR. RAMEY: We have subpoena's in this case and I would like to determine if all these people are here. John Runyan, Jim Wright, Herschel Moore, Vince Balderez, Less Clements, Sherman Gallaway, John Gannon, Billy C. Jones.

(All present.)

MR. RAMEY: How many witnesses do you have, Mr. Brown?

MR. BROWN: Mr. Jones will take the lead in this thing. We have, go ahead and make the announcement.

MR. JONES: I believe every one of the subpoenas that were issued by the Commission was issued to our witnesses. We may have one or two in addition to

those.

MR. RAMEY: Mr. Hensley?

MR. HENSLEY: If the Commission please, the only witness we will call will be Mr. John Gannon. He has also been subpoenaed by the Applicant.

MR. RAMEY: I ask that all witnesses stand and be sworn at this time.

(WHEREUPON, the witnesses were duly sworn.)

MR. RAMEY: Mr. Jones, you may proceed.

MR. JONES: Okay. We call Mr. Gannon.

JOHN V. GANNON

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A John Gannon.

Q What do you do for a living, Mr. Gannon?

A I'm District Superintendent for Texaco, Inc., Hobbs, New Mexico.

Q How long have you been so employed?

A Thirty years.

Q In Hobbs?

A Six years in Hobbs.

Q Were you served with a subpoena in this cause?

A Yes, sir.

Q Was it a subpoena duces tecum?

A Yes, it was.

Q Did you bring the records that Texaco has on this salt water disposal well No. 3?

A Yes, I did.

Q Do you have them with you?

A Yes, I do.

Q May I see them?

A (Complies.) This is a well file, normal well file. This is the lease file on the State of New Mexico BO lease and this is a file on the Moore Devonian Salt Water Disposal System.

Q Are there any other records maintained by Texaco at your office on this well?

A No, sir.

Q This is everything that you have?

A Yes, sir, with the exception of some very recent correspondence with our legal department in Midland.

Q During the last six years, Mr. Gannon, has this well been repaired in any way at all?

A Yes, it has.

Q When was this?

A On three occasions we have pulled tubing from the well. On March 24, 1974 we pulled our tubing and packer and replaced several joints of 3 1/2 inch tubing.

On February 7, 1976 we attempted to pull tubing. Our packer was stuck and we have to cut off above the packer and then wash over to retrieve the packer from the hole, after which we reran a new string of 3 1/2 inch tubing.

In February, 1978, we pulled the 3 1/2 inch tubing and packer to check their condition, found both to be in good condition and reran tubing and packer back in the hole.

Q What direct involvement do you have, Mr. Gannon, with any of these activities? Do you go to the site?

A On one occasion I did visit the site, however nearly always is done by other people under my direction.

Q Who, under your directions, is responsible

for taking care of the well?

A All wells in this field are under the supervision of Mr. A. Cronandt who is the field foreman in our Lovington field. The producing operations in this particular area under the supervision of William Zann and various drilling activity are supervisied by drilling foreman, who we have a variety of them. They may come from any area.

Also on occasion we temporarily promote people from our field forces to the position of drilling foreman to supervise this type of work.

Q Was any of this activity that you've described in regard to the well in '74, '76, '78 reported to the Commission?

A No, sir.

Q Was any of it the type of activity that you thought ought to be reported to the Commission?

A No.

Q Do you have any first hand knowledge with the circumstances that arose that required the maintenance to the well in March of '74?

A Yes, sir. It's our custom to monitor the pressures on our tubing and casing and in this instance

we had an indication that we possibly had a leak in our injection string tubing and this is what caused us to move on the well to inspect the string of tubing.

Q What are you monitoring that tells you that there may be a leak in the injection string tubing in this instance?

A In this instance the--normally the annulus between the 5 1/2 inch casing and the 3 1/2 inch tubing is filled with an inhibited fluid. And normally this fluid is pressured to make sure that the annulus is full.

In this particular instance I believe the casing annulus went on a vacuum when the injection pumps were shut down, indicated to us there was communication between the 3 1/2 tubing and the 5 1/2 casing.

Q How was this discovered? Who, on behalf of Texaco noticed this condition and reported it?

A The pumper who visits the well daily noticed this condition and report this condition.

Q Is the monitoring the movement of the gauge, what was he looking at?

A In this case he is noticing a gauge and in some instances we actually have it further checked by

pressuring on the well with a pump truck.

Q Was that done in this case?

A Not to my knowledge. In this case I believe the casing tubing annulus went on a vacuum.

Q Now you say the tubing was pulled on March 24, 1974?

A That's correct.

Q Do you know who handled that for Texaco?

A No, sir, I don't.

Q Do you have any records that would show it? Would it be in these files?

A No.

Q You have no records that would indicate who operated the pulling unit or whatever, to handle this?

A No, sir.

Q Do you have any records that indicate where the problem was?

A No, sir. Other than at several joints of 3 1/2 inch tubing were replaced. In this instance it was noted that there were collar leaks in the tubing string.

Q What was the injection pressure doing March of '74?

A The injection pressure varied depending

on the volume of water that is coming into the system. It will vary from a vacuum to approximately 650 pounds surface pressure.

Q Does it ever get above 650 pounds?

A It's possible but that's close to the maximum range, both of our injection pumps running pressure is about 650 pounds.

Q Is there any monitoring of the injection pressure on that well in March of '74?

A Yes, sir.

Q What sort of device was monitoring the injection pressure?

A Pressure gauges, I believe.

Q There are no recording strip indicators or anything as to the injection pressure on that well during that interval?

A I do not believe so in 1974, no.

Q What happened to the well in February of 1976?

A Here again, it's detected that the casing went on a vacuum and here again, we attempted to pull the string of tubing in order to inspect it and check it. In this instance the packer was stuck we couldn't unseat the

packer and it was necessary to cut off immediately above the packer and then wash over to retrieve the packer, which was done.

Q Do you have any records to indicate who handled this particular work for Texaco?

A Yes, during the latter part of the workover Billy C. Jones supervised the work.

Q Who handled the earlier phase, do you know?

A To the best of our knowledge it's R. G. Jenkins.

Q Is he still an employee of Texaco?

A Yes, he is.

Q Is he still in southeast New Mexico?

A Yes, he is.

Q What caused the packer to stick?

A This is not an unusual situation. This packer is set fairly deep in the hole, fluids that we're handling are pretty hot and these packers have a rubber packing element and often times the rubber packing element or the metalic slips that hold the packer to the casing do not retract the way they're supposed to. This is not an unusual situation for packers that have been in service

of this type would be hard to get from the well.

Q Who's pulley unit did you use on this occasion?

A In this particular occasion it was Permian Well Service.

Q Do you have any records to indicate where the problems with the tubing were on this occasion?

A No, sir.

Q Do you have any records of the number of joints that needed to be replaced on this occasion?

A Yes. In this case we installed a complete new string.

Q The entire length of tubing in the well was replaced on this occasion?

A Yes.

Q What became of the old tubing?

A It was junked.

Q How long was the well down on this occasion?

A The well was down from February 7, 1976 until April 1st.

Q Did any complications arise during this workover or is this an ordinary delay that attends the

change of tubing in a well like this?

A No, sir. The workover did become considerably more complicated than simply washing over a packer. After the packer was washed over we then went in to clean out the open hole section, the section in which we dispose of water. And in the process of cleaning this out we stuck a bit and drill collars and got involved in an additional washover job to recover.

Q That was the extent of the problems you had on this occasion?

A Yes, sir.

Q So the well in '76 was down for most of February and all of March of 1976, is that right?

A Yes, sir.

Q Were any leaks detected in the casing on this occasion?

A No, sir. After the conclusion of the workover, when the new string of tubing was run and this is another normal procedure, after the tubing had been run in the hole the annulus between the tubing and the casing was loaded with an inhibited fluid, the packer set and the annulus pressured to 600 pounds and it held okay.

Q Was the material circulated out of the hole

on this occasion pursuant to cleaning it out with a bit?

A Yes, sir, I'm sure there was.

Q How much material? Do you have any idea?

A No, sir.

Q You wouldn't have any idea where the material came from?

A Yes, I can speculate. The water that handles, that comes from several different sources and it comes through a rather long flow lines and a variety of treating equipment and so forth and in the process it picks up some iron with the hydrogen sulfide in the water, well normally there's some iron sulfide carried along with the water to be disposed of. And I would guess that some material circulated out of the holes is iron sulfide.

Q This in some manner collects in the bottom of the holes, is that what you're saying?

A It's possible. However, in this case we think that probably most of it came about during the work we were doing on the well. That is, some of it collects on the wall of the tubing and then the process of working on the well this was knocked loose, some of it.

Q There was no problem with the function of the well in February of '76 that brought attention to it,

just a drop in the pressure between the--the annulus between the casing and tubing?

A Yes, sir.

Q Have records been maintained of the injection pressure on this well since it began operations as a salt-water disposal well?

A I'm not sure that they have.

Q Are any records being maintained on the injection pressure now?

A Not to my knowledge.

Q It was not regularly reported to Texaco, to you by the pumper or by someone else?

A No.

Q Where did the injection volumes come from?

A We meter the fluids.

Q You don't have a recording meter of some type to read or how do you do it?

A I'm sure of that either. There are a variety of ways this can be done. One from the capacity of the pump. The other is from a summation of the well test data from the well producing into the system or the other one is metering. And I'm not sure whether we do have a meter on that system.

Q Where does the information come from that goes on the 120-A?

A This is reported to our district office by our field personnel.

Q They use those combination of methods you described of inferring saltwater production from oil production and other ways of arriving at a figure to put down on a monthly report?

A Well, sir, in some instances it's not from oil production but from test of individuals, summation of individual wells test.

Q Now the 120-A form does have a space on there for injection pressure and my understanding of the Commission's rules and regulations seems to be that's supposed to be reported along with injection volume. Do you know if the injection pressure was ever reported on this well?

A Oh, yes, yeah.

Q The practice was discontinued at some point?

A It's not reported directly to me. That is I don't have a daily knowledge of the injection pressure. But it's reported regularly by our field people to our

controllers department that prepare the forms that are submitted to the State.

Q Where is the individual located that signs these 120-A and sends them in?

A That would be Mr. Blevins who is one of my assistants.

Q He's in Hobbs?

A In Hobbs, yes.

Q On this occasion in February, can you pinpoint the date, the day of the week or rather the day of the month in February, February of '78 when you pulled the 3 1/2 inch tubing?

A Yes, sir. This was on February 7th we moved in on the well and on February 9th returned the well to injection.

Q Whose pulling unit did you use on this occasion?

A I do not know.

Q Who represented Texaco at this inspection of the tubing?

A I don't know that either.

Q You weren't personally involved in it?

A No, sir.

Q You do know that someone determined that the tubing was sound?

A Yes, this was done under the supervision of Mr. A. Cernandt, the field foreman. And whether he was personally on location I'm not sure.

Q There was no indication on this occasion malfunction of the well, is that correct?

A No, no real indication of any malfunction. But we did want to be absolutely sure. There had been some pressure variations noted on the monitor gauge on the casing. And just to be sure that our tubing was in good condition we did pull it.

Q You were aware, of course, at that time of Mr. Hamilton's claim?

A Yes, sir.

Q Does a pumper daily monitor these pressure casing fluctuations?

A If not daily, at least twice a week.

Q Does he make any written record of these or is this just something he reports?

A No, sir. He just notes and then if there is anything unusual he reports that to his foreman.

Q Have you been aware that there appeared to

be some sort of leakage out of the 5 1/2 inch casing on the ground around the well through the valve of the well head?

A No, sir.

Q Were you aware that someone was racking the ground around the well apparently regularly beautifying the site where this valve vents?

A No, sir.

Q None of this was done at your direction or with your knowledge?

A No, sir.

Q You do know that there is a gauge now installed in the end of that line of the 5 1/2 inch casing that monitors casing pressure on that well?

A I'm not sure I follow this line that you're speaking of.

Q Well, I don't know much about oil wells but there's this big thing that sits on top of an enormous flange bolted to something. It comes up and on this particular well, as I recall there's a thing going right down through the center of it and I believe there's a gauge right on top of that elbow where it makes a 90 degree bend to go down into the well.

A Yes, sir.

Q And then there's something that I would call a riser, for lack of any sophistication in this business, comes at a right angle out of the well head and in this particular well points west.

A Yes, sir, I'm with you now.

Q It has a gate valve on it, I believe, about a 1/2 inch pipe on the end. So for some period of time salt water or some fluid, looked like salt water, was coming out of that. And then as I understand within the last two or three weeks the Commission has put a gauge on that. There's a flexible line now that runs out of the end of that pipe up through a stand, there's a stand near the well and there's a gauge put up there with some cloth ribbon, just tied up there. Did you install that gauge?

A Yes, this well is equiped where we can not only monitor the pressure on the 5 1/2 inch casing, but also the pressure on the other two strings of casing. That is the 8 5/8 inch casing and the 13 and 3/8 and since the outlets that connect these casing strings are down in the cellar, it was necessary to install these risers so that we could install gauges on them, right.

Q There are two risers out there that I think

you can identify from metal tags as being on the surface and intermediate strings, right?

A Yes.

Q There's no riser cut of the ground on the production casing?

A It really shouldn't be necessary.

Q Right. You just take that off the well head?

A Yes.

Q Then that gauge monitors the production string pressure now, as I understand it?

A We monitor tubing pressure, 5 1/2 inch casing pressure, 8 and 5 pressure and 13 and 3/8.

Q What I'm trying to say, there is a dial-type gauge attached to about a three or four foot flexible line and it now seems to be plugged into the end in that 1/2 inch pipe that comes off of the well head. And there's a little ramshackle metal stand on the north side of the well and this gauge has been tied up there with a ribbon or something, a dial gauge that reads 200, 300 pounds I believe, on the plus side and something on the negative side. Which I understood to be monitoring the pressure on a 5 1/2 inch.

A It might very well be.

Q If this well is working as it ought to what pressure ought there to be on the 5 1/2 inch casing?

A Well, this can vary. That annulus is filled with inhibited water as I mentioned before, and depending on the most recent work done on it this annulus can be pressured to 200, 300, 400, 500 pounds. Whatever we desire to put on it.

Q Do you know what the desire was in this case?

A No, sir. I do know that in February when the tubing was pulled and checked, then the tubing and packer rerun, the 5 1/2 casing was pressured to 600 pounds.

Q Was that done as a test or was it to remain at that pressure?

A Yeah, this is a normal practice, first to guarantee the integrity of the casing and also to check that the packer is properly set.

Q It was left at 600 pounds or it was let down or what?

A Here again, the practice varies. Sometimes that pressure is left on the 5 1/2 annulus and in other cases it's bled down.

Q What was done in this case, do you know?

A I'm not positive.

Q What range of fluctuations in this 5 1/2 inch casing pressure is considered tolerant?

A 300, 400 pounds.

Q A range from , say, zero to 300, 400 pounds back down to zero?

A Um-hum.

Q What accounts for that fluctuation, do you know?

A Well, there is a variety of things that might cause it. For one thing the fluid that we're handling in this disposal system comes from a variety of wells and the wells are pumped in a variety of ashions, that is with different types of pumping equipment. And consequently the temperature of the fluid coming from the various wells that furnish water to its sytem varies considerably.

From being pumped wells who produced relatively cool fluid to submergible pumped wells that produce hotter fluid. Then again, this water comes to this system through a long gathering system, mainly consisting of lines laid on top of the ground. And the atmospheric conditions here can change the temperature of the water. And as this temperature, the water being

injected into the well changes, why it causes some expansion and contraction of tubing string, which can affect the volume and the annulus and consequently affect the pressure.

Q You're talking about expansion from some range around a 3 1/2 outside diameter, is that what you're talking about?

A Yes, sir.

Q What temperature ranges are we dealing with?

A Yes, in extremely cold weather it's possible, depending on the conditions that exist up at the salt water disposal system, how long the water has been in storage before being transported up to the disposal tank. Or if water is coming to us from wells being pumped or pumped by submergible, the range will be approximately 100 degress Fahrenheit, the difference, maximum spread probably.

Q Is it of any significance that the well in this 300 or 400 pound pressure fluctuation would go on the negative side of the gauge? In other words, the range would include some pressure less than atmospheric backup to something over, or even perhaps less than zero?

A I don't think that's unusual because the

zone that we're disposing of water into, the Devonian, is an extremely permeable and when the pumps were shut down the tubing goes on a very strong backing and consequently the tubing string can contract somewhat, which is conceivable that you could go on the negative side on the casing.

Q How do you detect significant leaks or significant pressure differentials such as necessitated looking into the tubing on the two occasions you described?

A Well, in those instances the casing would go on a strong vacuum, that is a vacuum that's easily detectible at the surface. Whenever an unusual pressure is detected and it is suspected that we may be losing fluid in the annulus, then a pump truck is called in to fill the annulus, to repressure it to check it by positive pressure tests.

Q What is a strong vacuum? Do you have any idea what numbers you're talking about?

A No, sir. We don't often measure that in inches of water columns.

Q This comes to you through the pumper?

A Yes, sir.

Q He notes some indications of something that's reported, I would imagine, and what would that be?

A Well, that's what he would report that it's on a strong vacuum.

Q He wouldn't give you any figures, he would just say it's on a strong vacuum?

A Right.

Q Are you aware of the range of the gauge on this 5 1/2 inch casing is fluctuating around?

A Yes, sir.

Q About what range is that, as you understand it?

A From maybe zero to 300 pounds or so.

Q That's perfectly within the limits the way it ought to be operating so far as you can tell?

A Yes, sir.

Q Do you keep any record of the temperatures that this system is exposed to?

A No, sir.

Q Have any other tests on the integrity of this system been performed since about August of '77, other than the pulling of the casing you described in February of '78?

A Yes, sir. There have been a number of tests conducted on this well. The first test was in

September of 1977 and this test was conducted on the order of the Oil Conservation Commission by a letter addressed to us and signed by Leslie A. Clements, oil and gas inspector, in which he outlined the procedure to be followed in conducting this test. He also set out the procedure of notifying the Conversation Commission prior to running the test and so forth.

We did this, not only on this well, but on all wells in the field, it was a field-wide test. And we did test this well on September 22, 1977.

In this instance the test was witnessed by Melvin Crossland of the Oil Conservation Commission and we submitted this form, C-103 covering the results of that test. And our evaluation of the test was that there was no leaks in the well at that time.

Then on December 8, 1977 we conducted an injectivity profile survey. This is a survey conducted by Western Wire Line Services which consisted of tracing the flow of the fluids to be disposed of through the 3 1/2 inch tubing string and to their ultimate point of disposal.

This survey, first of all showed that there was no loss of fluid within the 3 1/2 inch tubing and there

was no loss in fluid at any point in the wellbore until after the open hole section in the Devonian had been reached.

After the radioactive material was injected into the Devonian interval, the detectors were left in place for a considerable period of time to determine if there was any channel up behind the 5 1/2 inch casing and the reports of this survey are that there was no channel and no leaks in the 3 1/2 inch tubing. And that all fluids were being injected into the Devonian zone.

Q Do you know how long the injectors were left in the bottom of the hole to detect the channeling or was that left up to the company that ran the test?

A This was left up to the company that performed the tests. However, at the rates at which we are injecting, that is in the neighborhood of 11,000 barrels per day and in this case the rate was actually was being metered and it was close to 12,000 barrels a day. A few minutes of the detectors being in place would certainly reveal any channel.

Q Any other test on the integrity of the well since this tracer?

A Yes. On March 28th we ran a series of tests.

These involved installing pressure recorders on all strings of casing and also on the 3 1/2 inch tubing. In this case we applied a pressure of 500 PSI to the 5 1/2 inch casing string.

These tests were conducted over a period of two days, three days and our conclusions from these tests were that there were no communications between any of the strings in the well.

Q Any other tests?

A On April 20, 1978 we conducted another test, very similar to the tests that was conducted in March. And this test was conducted at the request of the Oil Conservation Commission.

The only difference between this test and the one conducted in March was it was a slightly shorter duration. But in our opinion, the results were the same and it showed no leaks in any casing strings, or any tubing strings.

On May 4th we conducted another test and this was conducted in a slightly different manner. In this instance the 5 1/2 inch casing was pressured to 200 PSI and the fluid level measured in the 3 1/2 inch tubing by means of a sonic fluid sounder.

We made sonic measurements of the fluid level inside the 3 1/2 inch tubing immediately after shutting down the injection pumps. And this test showed that in the period of seven hours the fluid level inside the 3 1/2 inch casing declined from the surface to a depth of 1,550 feet.

In the meantime the pressure on the 5 1/2 inch casing remained essentially constant. And this, to us, indicated that there was no communication between the tubing and the casing.

We similarly pressured the 8 5/8 inch casing to 100 pounds and during the conduct of the test the pressure declined on the 8 5/8 string from 100 pounds to approximately 45 pounds. And since the 5 1/2 inch casing remained essentially constant, this indicated to us that there was no communication between the 5 1/2 or the 8 5/8.

Q You have written reports on all these tests?

A Yes, sir.

Q Do you have copies of them with you today?

A Yes, sir.

Q May I look at your copies?

A Do we have extra copies?

MR. HENSLEY: Yes, we have extra copies.

Q (By Mr. Jones) Those aren't included in the materials that we discussed earlier, those files.

A The memorandum covering the results of the test on March 28th is included. The original of the survey conducted by Western Wire Lines Services is part of the well files. The copy of the C-103, which was conducted in September, '77, I believe all of this is in the well file.

MR. HENSLEY: It's all in the files.

MR. BROWN: Whose files?

MR. JONES: I would like to simply mark the whole batch as our Exhibit 1 and made a part of this record.

MR. HENSLEY: They're all stamped individually, Mr. Chairman, but we can just make one exhibit, it would be fine. Whatever the Commission pleases on that.

MR. BROWN: Are you sure those are complete now.

MR. HENSLEY: I'm sure they are. He testified from these well records.

MR. BROWN: A different copy?

MR. HENSLLY: We can mark it, they're

identical.

MR. JONES: I don't have any more questions.

MR. RAMEY: Any questions of the witness? Are you going to recall the witness later, Mr. Hensley?

MR. HENSLEY: I don't think so, Mr. Chairman, I believe the testimony is already in the record.

MR. RAMEY: Mr. Gannon, one question. If you don't maintain pressure on this annulus between the 3 1/2 and 5 1/2 at all times some pressure, how can you be sure the well is intact, the tubing string is intact?

MR. GANNON: Would you restate that for me?

MR. RAMEY: If you don't have a continuous pressure will fluid in the annulus between 5 1/2 and the injection tubing is not under pressure at all times, how can you be sure that your tubing and packer is intact?

MR. GANNON: You have to take periodic readings. You would also have to periodically check by physically loading the annulus. But even if there were no pressure held on it, in the event that a leak developed between the tubing and casing because of the injection pressure, this would be noted at the surface.

MR. RAMEY: By that, I would take it that everyday your pumper goes by and opens the valve to see if

there is a vacuum on it?

MR. GANNON: I'm not absolutely certain about the pumper's individual procedure in these wells. He goes by the well everyday and makes certain checks. The exact procedure he uses on those checks I'm not positive.

MR. RAMEY: Any other questions of the witness?

MR. JONES: No.

MR. HINSLEY: No, no questions.

MR. RAMEY: The witness may be excused.

MR. JONES: I would like for him to remain in attendance.

MR. RAMEY: All right. Would you remain in attendance, Mr. Gannon?

MR. GANNON: You bet.

MR. JONES: We call Mr. Runyan.

JOHN RUNYAN

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you please state your name?

A John W. Runyan.

LANPHERE REPORTING SERVICE
P.O. BOX 449
58 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

Q What is your profession or business, Mr. Runyan?

A I'm a geologist, District 1, Oil Conservation Division.

Q How long have you been in this particular position?

A 22 years.

Q Are you familiar with this salt water disposal well No. 3 of Texaco's Moore Devonian Pool?

A Yes, sir.

Q Have you been involved in a salt water contamination study in that area?

A Yes, sir.

Q When did you start work on this?

A About August of '77.

Q What did your initial participation in this study involve? What did you do?

A At this particular time it was called to our attention that there was a possible water contamination problem existing in the motor pool on Mr. Hamilton's property. And my actual function in the contamination problem didn't begin until November 2, 1977, when we started to drill test wells in this property.

Q What did you have to do with the test hole drilling?

A The first 13 test wells were drilled or supervised the drilling was by me and in cooperation with the Water Resources Division.

Of the total wells drilled, the first 13, in other words, I help set the locations and try to find the water contamination outlet.

Q Did you find evidence of water contamination?

A We sure did.

Q Now, how did the State Engineer get involved in this stuff?

A Well, all fresh waters are under the control of the State Engineer and this is apparent oil field salt water contamination the Oil Commission is involved in.

Q Now, after the test hole drilling was completed you had some further function in this test?

MR. HENSLEY: If the Commission please, I'm going to lodge an objection at this time into the record. Because it appears to me that the Applicant is seeking to go into great detail in the contamination studies which may have been conducted by Mr. Runyan and I believe it

is apparent from the call of the Docket in these proceedings and also in the regulations and rules of the Commission that this is beyond the scope of this hearing.

There is pending in the Federal District Court of the United States a suit for water contamination by the Applicant Hamilton against the Respondent Texaco, Inc. and that is the proper form for any consideration of contamination of fresh water.

As I understand it, the sole and only scope of these proceedings is whether or not the Texaco BO Salt Water Well No. 3 is leaking at the present time, which would subject it to an order of shutdown by the Commission in order to avoid further economic loss or waste.

If there is no evidence, and I don't think there is any evidence, there certainly isn't any in the record at this time and I feel reasonably certain that there will be none of any leak at the present time, then I would suggest that this is far beyond the scope of the jurisdiction of the Commission and the scope of the call of the docket in these proceedings.

MR. JONES: I think there is going to be abundant evidence that the well has undoubtedly leaked extensively. The evidence in the record indicates nothing

has been done to rectify any condition that would account for this great deal of salt water that is out there around that well. And we will further present evidence of tests and so forth that have been testified to and introduced as exhibits are by no means conclusive as to whether or not the well is still leaking.

MR. RAMEY: Mr. Hensley, we are going to overrule your objection, and we will ask for one thing, it says Applicant alleges that said well has leaked salt water in shallow fresh water acquifers. I think that to determine that there is contamination of fresh water would be proper in this case.

MR. HENSLEY: I would like to make one response to that, Mr. Chairman for the record. I realize that the Commission has already ruled on the objection. It seems to me that if there is no evidence of any leakage at this time, regardless of what may have happened in the past, that to shutin all these producing wells on state leases, it would result in substantial economic waste. So for whatever purpose that serves I would like that to be included in the record, anything that may have happened in the past is not relevant to these proceedings.

Q (By Mr. Jones) I can't recall the question,

Mr. Runyan. I believe it was something to the effect that after the test hole drilling was completed and so forth, I was asking you what else you did in regard to this investigation?

A Well, after the 13 I took all the information and a map and a report of the information that we found from drilling the test wells.

Q Did you issue a report in January, 1978?

A Yes.

Q And in that report did you identify a substantial area of chloride contamination in the area of this salt water disposal well?

A Yes, sir, I did.

Q Did you have any conclusion in that report with regard to the source of that salt water contamination?

A Yes, sir. At that time I felt the Texaco salt water disposal well was apparently not leaking at that time but had leaked. There was indication from the information that it had leaked.

Q You, in fact, stated that that well was the source of the salt water?

A Apparent source.

Q Now there has been some subsequent test hole

drilling activity around that well, hasn't there been?

A Yes, there has.

Q As a result of this activity there has been another area of salt water contamination identified, is that right?

A Yes, sir.

Q First I'm going to mark a map here, Mr. Runyan, and we will call this 2.

I'm handing you what I have marked as 6 and ask that you look that over and tell me if that's a copy of the map that you prepared pursuant to this investigation?

A Yes, sir. This is the map that was constructed after the first 13 wells were drilled.

Q What basis did you have for concluding that the well had stopped leaking?

A The basis of the main conclusion on the chloride map is the fact that the water movement is apparently to the east and to the southeast. And on this particular map test well 12 lies some 300 feet due east of the salt water disposal well has a chloride content of 11,615. This figure is very low compared to produced water. And if the well was leaking at the time the test wells were drilled,

this particular test well did have chlorides in the neighborhood of produced water.

Q What do you mean by neighborhood of produced water?

A Well, it's a little ways off of the well and the chlorides, typically as the chlorides move away from a source of contamination they decrease in value, the chloride content does due to the fact that your salt water specific gravity is very heavy. It will tend to drop out and also you have mixing of fresh waters. Like I say in this case, this lies some 300 feet away and it's 11,615 parts per million which indicated that the well is not leaking at this time, it should have been much higher almost produced water, in my opinion.

Q I'm going to hand you another map, Mr. Runyan, it's marked 7.

MR. RAMEY: Mr. Runyan, could you tell me what the Chloride content of the produced water is?

A It varies. We have two figures, they're not quite the same. The latest figure we have from the Amarada's Unit P 14-11-32, 26,600 plus. And the other figure we have was a little over, 26,400 which was out of the salt water disposal battery.

Q (By Mr. Jones) What is Exhibit 7?

A Exhibit 7 is a final map which I prepared after the total of the 37 test wells had been drilled.

Q That includes a number by Texaco and then three more by Mr. Hamilton?

A Yes, sir. 21 by Texaco and three more by Hamilton. I was going to say there is an error on this map.

Q Is the error in the location of Mr. Hamilton's No. 16?

A That is correct.

Q It should be down there on the spur where you have your little arrow?

A Yes, sir. I do have another map.

Q That will do. Now was there an additional area of chlorides identified in this last series of test hole drillings?

A Yes, sir, there was.

Q That was essentially unknown to you at the time when you prepared the earlier maps, number 6?

A That is correct.

Q Where was this located with regards to the disposal well?

A Located south and southwest from the disposal

well.

Q What level of chlorides were found near the disposal well?

A Near the disposal?

Q Yes.

A The closest--well, 26,176 was test well, Texaco test well number 4 which is very close to the salt water disposal well. And then Texaco test well number 12, 28,613 parts per million. This is the highest.

Q Do you know where the chloride level is much higher in the ones in the sample prior to your January report?

A Yes, sir. The ones to the south were, yes, sir, quite a few were. Some were lower.

Q Did you come to some conclusion about the source of that salt water?

A Yes, sir. On this one?

Q Yes, sir, Pursuant to your latest revision, I believe that map was revised when?

A May 24, 1978.

Q That embodied the results of the last test hole drilling that you had been informed of?

A Yes, sir.

Q What did you decide had been the source of the salt water after this?

A Well, there were--apparently could have been two sources at this time. One of them was based only on rate movement and volume to water. The chloride map though again shows that Texaco Salt Water Disposal No. 3 apparently again is not leaking at this time. Again the water movement is basically east. The test wells which are drilled around the salt water disposal wells are all lower than produced water, which indicates that the well is not leaking at this time.

Q Has it ever leaked, Mr. Runyan?

A The map indicates so.

Q It has leaked rather extensively on some occasions, isn't that right?

A The map so indicates, yes. Because there is a chloride anomaly sits around the well.

Q Now that 26,178 chlorides off of No. 4 which you say is the closest to the well, that's what, about 200 parts per million off of produced water?

A About 5.

Q Now I think you said Amarada's water tested 26.4, didn't you?

A 26,600 plus. I don't remember the last two.

Q There was another test of 26,4?

A Yes, that was off the injection pumps.

Q Now you heard Mr. Gannon talk about this well this morning, didn't you, Mr. Runyan?

A Yes, sir.

Q Did you hear him discuss any mechanism which would conceivably account for all this salt water being in the ground around that well and evidently expelled from that well that's been remedied or otherwise taken care of?

A The only thing is the fact that the tubing had been replaced. He does not report any casing leak repairs.

Q If Mr. Gannon's state of affairs is to be accepted, that well has never leaked, isn't that right, Mr. Runyan?

A Well, it appears so.

Q If what he says is true, there would be no leakage at all from that well and yet it has obviously leaked extensively, hasn't it?

A Well, from the information we have it so indicates it has leaked extensively. But from his--

Q What water rate movement did you have in mind when you identified your second source of contamination?

A The rate I had in mind was water rate, which is the best we could come up with was 8.8 feet per day. This did not take into any amounts the rate at which Mr. Hamilton's well had pumped which could influence.

So the rate itself is a figure based almost on gravity without any additional outside influence.

Q Where did you get your 8/10 of a foot a day figure, Mr. Runyan? Is this something you empirically derived from--

A The State Engineer furnished this as the best estimate they could come up with with the information that was available at the time.

Q Now, have you been since advised that that estimate is not any good as far as they're concerned?

A Due to pumpage of Mr. Moore's well and also on the basis of their water level map, it indicates water rate is greater than point 8.

Q Now have you been informed of the existence of an apparent point of recharge at the location of the salt water disposal well?

A I have been informed that there apparently is

one.

Q So that would influence the rate of movement as well, wouldn't it?

A Possibly, yes, sir. I'm not a hydrologist but if it is a higher water table it would increase it somewhat. To what figure I would have no idea.

Q Now aside from the materials or the matters Mr. Gannon testified to and I assume you are aware of those from your investigation of this situation in the Hobbs office, do you know of any other reason why you can say that well isn't now leaking?

A Isn't now? From the test I'm familiar with that we're taking.

Q The pressure tests on the casing and casing surveys and so forth?

A Casing surveys, yes, sir.

Q Is that 26,178 there at Test Well No. 4 consistent with the well still leaking?

A If it is still leaking, no, sir.

Q What would the figure be at Test Well No. 4 if the well was still leaking?

A It would be approximately I would think, somewhere around 26,600 plus. I understand also there are other

wells which are putting water into the system which are Pennsylvanian and they're being put into in slugs. As I understand it is stored and then moved occasionally. And Pennsylvanian water runs 50,000 to 60,000 part per million. And if this water were to be mixed it would certainly raise the chloride content periodically.

Q How precise are your chloride calculations, Mr. Runyan?

A The chlorides?

Q Yes.

A The chlorides in the wells, of course, are-- obviously cannot be lower than what we've taken but some could be higher. It depends on how well the water test wells are developed. In other words, how long they were pumped before the final chloride analysis or the sample was taken. It can vary considerably if you take a sample first, pump it for a short period of time; take another sample and that particular sample could be low unless you really developed the well and pumped it through a fair period of time.

Q This technique is fairly sensitive to the sampling procedure involved in each case, is that right?

A In this particular case it is, fairly

sensitive, although I would have to look at the chart to see how well the two samples compared to each other, the first and second, to be able to tell how well the well had developed.

Q What information have you got that any Pennsylvanian water goes down this test well, or this disposal well, pardon me?

A Well, it's the only disposal well in the pool and I believe that there is 200 Pennsylvanian wells being produced. As I understand it, from Amarada they do tank it and periodically ship it up. But it's very low rates of water, low volumes of water.

Q Someone at Amarada informed you that Pennsylvanian water is occasionally delivered into the system?

A Tied into the system.

MR. JONES: We would move the admission of 6 and 7.

MR. RAMEY: They will be admitted.

(WHEREUPON, Hamilton's Exhibit No. 6 and 7 admitted into the evidence.)

MR. JONES: That's all, Mr. Runyan.

MR. RAMEY: Any questions of the witness?

MR. HENSLEY: I have a couple of questions, Mr. Ramey.

CROSS-EXAMINATION

BY MR. HENSLEY:

Q Mr. Runyan, you indicated that you were familiar with the various tests which has been conducted on the casing surveys here to see whether or not the casing has leaked since the Commission entered its letter back in September of '77.

There is no evidence, is there, of any casing leaks on this well as a consequence of any of that testing?

A In my personal opinion, no.

Q As I understand it, your conclusion that this well has leaked or may have leaked in the past, is a conclusion which you have reached from the fact that there is a chloride content evident in close proximity of this well bore?

A Plus the chlorides did contour out and an anomaly around the well, which is really unusual.

Q What type of anomaly is there present around the well? Are you talking about an anomaly insofar as the red beds are concerned?

A No, sir. An anomaly as far as the chloride map is concerned.

Q I see. By the way, did you review the contours of the red beds?

A I had a chance, on Monday get to see the red bed map which was incomplete at that time.

Q Do you know what the directional flow is in the red beds?

A In this particular area, unless there is a change since I've seen it, the flow is from west to east.

Q Is there a valley right in the vicinity of that salt water disposal well which runs on a downdip basis from west to east?

A Yes, sir, there is two. There is a valley to the south of the salt water disposal well. There's also a valley to the north and according to the red bed map the salt water disposal well sits on a south slope of the north valley.

Q So the valley is basically takes in the salt water disposal water, but most of it would be immediately to the north of that, is that correct?

A Yes, sir. The valley that is sitting on the slope would be to the north.

Q Is the slope of the red bed in this area also from west to east?

A Yes, mainly. In general it is in the immediate area.

Q Does the directional flow of water normally follow the contour of the red bed structure?

A It would strictly depend on the lithology between the surface and the red beds. And also the lithology of the material between the two. I believe up here in a particular case the bigger gravels lie on the bottom, top of the red beds and your water would tend to move through the gravel more rapidly than through a sand zone.

Q You say at the base of the Ogalala you would find your highest concentration of these gravels?

A Not the base, the top.

Q The top, okay. Where is the highest concentration of chloride?

A The highest?

Q Is it at the base?

A Yes, sir. All of the samples except some that were reentered were taken right at the top of the red bed.

Q Is this directional flow or the rate of flow

which you indicated the State Engineer had concluded was 8/10 of a foot per day, affect in any respect by the slope of the beds which are at the base of the fresh water reservoir?

A The point 8 again was an estimate on a rate due to rough calculation of the slope and of course, the porosium permeability which was just estimated also, was without any outside affect. In other words, the drilling of the irrigation well which is contaminated closest are the apparent mound in the water table map, would definitely change that particular rate.

Q What is the rate of flow on that irrigation well?

A I have no idea. The State Engineer has an estimated figure, I believe, or a series of them, I believe they testified to. I believe they have been subpoenaed. So they can better explain they did the red bed map themselves and of course, they could explain it much better.

Q Does your geologic study, Mr. Runyan, indicate that whatever contamination exists in the Ogalala formation has moved, at all times, material from a west to an easterly direction?

A The last 21 test wells indicate there was

some southward movement. But apparently to what extent we don't know.

Q How do you explain that geologically or hydrologically?

A Well, the best explanation I can come up with, the Water Resource Division may have a better explanation, but I felt that the water has spilled over into the second valley across the ridge. Some more test wells were drilled on this particular high, south of the salt water disposal well I feel that we would find some more chloride value between test well 12 and 13.

Q If any water spilled over the top of the ridge the chloride concentration in that water being in the uppermost part of the Ogalala would be only slight compared to what it would be at the base of the Ogalala, isn't that correct?

A Well, in all the well tests we do, we always find out that the chloride content as you go up the hole decreases in any particular test well.

Q So if you tried to explain any flow in a southerly direction from the basis of a spill over ridge, you wouldn't expect to find very high chloride readings, as a consequence of any overflow?

A It depends on the condition of the ridge, I imagine. If it was a natural flow over the ridge, it could possibly be fairly high. If it's pushed over at a particular time, if it moves away from that well or away from the contaminated source, move quite a ways downdip, say, and it spills over I expect it would be lower.

Q Actually it's a hydrological fact, is it not, that any injection of chloride contaminates into a fresh water reservoir will immediately sink to the bottom?

A If it does a great deal of mixing it would sink but also move. Otherwise, we would not have an area of contamination if it sank in the sand.

Q It does move, but it moves from the base of the reservoir not from any upper--

A Generaly, yes, but there is mixing.

Q Is there any other explanation that you would have how this contamination could have moved in a southerly direction with the directional flow through a valley being from the west to the east?

A No, sir. Except it spilled over. This map doesn't show it but the red bed map, if it's superimposed would show a ridge on the map. And the only possible thing I can see would be that it would have had to flow over the

ridge.

Q Have you examined the structural conditions on that ridge?

A Not very closely because they were contouring at the time we were looking at it.

Q So the actual structural contours on that ridge would have a lot to do with either supporting this theory or disapproving it, this theory of overflow?

A I believe it would.

Q In your experience as a geologist, Mr. Runyan, are you able to say on a basis of expert opinion, that the disposal well such as this BO No. 3 well ever had experienced a casing leak, that that leak would not have repaired itself of its own volition, it would have had to have mechanical repairs in order to remedy any defect?

A Well, I'm not too sure about how this whether it could or couldn't being a geologist and not a petroleum engineer. I don't, in my personal opinion think it could, but it could be possible I imagine for some material to come in and to block.

Q You don't know of any such circumstance?

A Personally, not offhand.

MR. HENSLEY: I pass the witness.

LANPHERE REPORTING SERVICE
P.O. BOX 449
58 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

MR. RAMEY: We will recess the hearing until one-thirty.

(WHEREUPON, a brief recess was held, after which time the following proceedings were had:)

MR. RAMEY: Any other questions of Mr. Runyan? The witness may be excused.

MR. JONES: We call Mr. Sherman Gallaway.

SHERMAN GALLAWAY

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Sherman Gallaway.

Q Mr. Gallaway, what is your business or profession?

A I'm employed as an engineer by the Department of Water Resources--Division of Water Resources.

Q With the State Engineer's office?

A State Engineer's office.

Q Are you a licensed practicing engineer?

A Yes.

Q In the State of New Mexico?

A Yes, sir.

Q How long have you been working for the State Engineer?

A 25 years.

Q What types of work do you customarily do?

A I, basically am a technical investigator, I'm part of the Technical Division of the State Engineer's office and assigned to District 2 in Roswell. I work basically on investigations in support of the Water Rights Division.

Q In that regard have you had contact or been involved in an investigation of contamination of ground waters on Mr. Hamilton's farm?

A Yes, sir.

Q What, generally, if you can describe it, have you done in your participation of this investigation?

A Well, following the request of the O.C.C., the State Engineer came into this primarily through Mr. Wright of the Water Rights Divison in Roswell. He's a field engineer there for the Water Rights Division. And as drilling progressed and so forth, Mr. Wright asked me to assist them by preparing the maps and so forth, basically

the water table and the top of the red beds in the vicinity of Mr. Hamilton's property.

Q Beginning with the map of the water table, can you describe the manner in which you constructed this map? Just generally tell me how you go about making one?

A Well, in order to make the water table map, as far as the field information is concerned, two factors were involved. Well, three factors involved.

One, the locations of the holes were chained in in order we might know exactly where they were located. The elevations were run by leveling to each hole; elevation is geared 2/10 feet. And then we measured water levels in each hole. We measured them to hundreds feet and rounded them off to tenths, giving us an elevation on the water table at that particular point two-tenths a feet.

Upon obtaining this information in the field, these are plotted on the map and from that information I contoured the configuration of the water table.

Q I'm going to hand you a map that's been marked as Exhibit 8 and ask you if that is a map of the water table in this area that you prepared?

A Yes, sir. This is a map prepared by me.

Q What does it show, Mr. Gallaway?

A This is a map entitled Altitude and Configurated Water Table in the vicinity of Section 24, Twonship 11 south, Range 32 East NMPM. This is in Lea County, New Mexico.

There are various features marked on this map. First of all there's a red dot, that is the well that is alleged to be contaminating the water. It shows the contours on the water table. And as I pointed out, the information, we measured the water levels and were able to determine the elevation on the water table two-tenths a feet.

Once this data was plotted, then I countoured this. Now I might say, that in contouring this I sat down and graphically prorated between these points, since I felt it was critical, we're dealing with extreme details here. So by my interpolation is not eyeball, it is by, it's done graphically to prorate the distances between the various points.

By connecting the resulting points I came up with this pattern of contours. Now this shows basically that the general movement of the water table in the northwest quarter of Section 24 is towards the east-southeast. It shows some wobbles in the water table. I might point out that the heavy lines, these are contours on the water table,

sea level datum at five foot intervals. In the vicinity of the problem area I inserted one foot contours. So these fine lines you see, that's at a one foot interval.

Q What are the red lines on the map, Mr. Gallaway?

A The red lines were derived from my map at the base of the Ogalala formation, or some might call it the top of the red beds.

These red lines represent the drainage system. I might point out that the base of the Ogalala formation is an erosional surface. And these lines represent the lines of drainage. This is a drainage pattern that existed on top of bed rock before the depostion of the Ogalala formation. These lines represent the low points in the valley as determined on the map in the top of the red beds.

Q Is there a point of recharge or an anomaly in the water tables shown on your map there?

A Yes, sir. In general the contours on the water table wobble back and forth and it's normal. But there is a point in the vicinity of the Texaco's disposal well in which I get a bulging out of the water table contours indicating that there is a point of recharge to the shallow

water aquifer in the vicinity.

Q Mr. Gallaway, I'm going to ask you to put another map up and I've marked it No. 9. Can you identify No. 9 for me?

A Yes, sir. This is a map I prepared entitled Altitude and Configuration of post-mesozoic sediments in the vicinity of Section 24, Township 11 South, Range 32 East, NMPM.

Q Can you describe the preparation of that map?

A This map shows the configuration of the base of the Ogalala formation. This map, it incorporates the data from all the oil wells from which we could obtain logs that would show the thickness of the material on top of the post-mesozoic sediment for the Ogalala formation. It utilizes the data from all these test holes that have been drilled in the area, up to date. And it further utilizes information from sizmic shock holes, which the State Engineer has been collecting for several years from the petroleum industry.

Q Did this map, No. 9. serve as a basis for the red lines that you drew on No. 8?

A Yes, sir.

Q Can you locate the disposal well on this map?

A The disposal well is right there (indicating).

Q What relationship does it occupy with regard to the topography of those beds?

A Basically the disposal well is located on a little northeastward trending nose on the south side of a northeastward trending valley, which the axis lies to the north of the disposal well.

The slope on the red beds from the well is basically northward to slightly northeastward.

Q Now you mentioned that an erosional surface composing the surface of these sediments, is there any such surface in the area of this disposal well in your opinion?

A Would you restate your question, sir?

Q What type of materials immediately overlie the highs in this area, in the red beds?

A Well, in general it varies. In parts of the area we have some gravel lying on top, not at the base of these post=mesozoic sediments, in other places it's sand. At the precise point, sir, I would have to look at the logs, which I do not have with me, specific log to see exactly what the log says.

Q In any event, either substance is permeable,

is that right?

A Yes, sir.

Q Now there has been a good deal of discussion that I'm sure you listened to this morning about the fact that the well, as you describe it is on the north side of a peak, sloping to the north and east, is that right, or valley?

A It's on top of a northeast trending ridge.

Q Is there any way that salt water, as such, was coming out of that well could go south or southwest from that well, or south or southeast?

A Well, there are two ways that I see it can be done. First of all I would like to point that inasmuch as the surface I have drawn is an erosional surface, there is a zone of weathering on top of this surface. Now I did not include the zone of weathering in the bed rock as part of the overlying material. My map is on the top of that zone of weathering.

In that weathered zone, which in this vicinity ranges from something like six to ten feet thick, there are indications there is some sand and so forth in there that could carry some water.

Q So the salt water could travel through this

weathered zone to the south and southwest, is that right?

A I believe, sir, it is possible.

Q What is the significance of this point of recharge that you identified in the water table? What does that mean? What's going on?

A Well, basically to get that little mound there, I'm of the opinion that there has to be an addition of water to the shallow aquifer at that point in order to mound it up. Basically the reason the mound is up is because the water level builds up around the well faster than the formation allows it to move away from the point. But there is a point of recharge in my opinion, in the vicinity of that well.

Q We'll call this map 10. Did you put any lines on or make any additions to this map that we've marked as Exhibit 10, Mr. Gallaway?

A This is Mr. Runyan's map which he has testified to previously. The only thing I did to this map was add the red lines shown on the water table map and these were taken off the red bed map. Those red lines on this map are identical to the ones that are shown on the water table map.

Q This map 10 that was prepared by Mr. Runyan,

shows a distribution of the so far ascertained chlorides in the vicinity of that well and in the area of discussion, doesn't it, Mr. Gallaway?

A Yes, sir.

Q Now looking at that map and looking at the--and bearing in mind your analysis of what some people call red beds and also the water table map you prepared, would you be able to state as to whether or not the salt water in question emanated from that disposal well?

A Well, based on the information shown on this map there is general agreement between the configuration of the top of the so-called red beds and the distribution of chlorides in the aquifer. There's a general correspondence between the two. And there's also a general correspondence between the distribution of the chlorides with respect to the gradients on the water table in the vicinity.

Q With the disposal well being the source of the chloride, is that what you're saying?

MR. HENSLEY: I object to that question. That's not what the witness stated.

MR. RAMEY: Objection sustained. Rephrase your question.

Q (By Mr. Jones) Where did the chlorides come

from, Mr. Callaway, in your opinion?

A Well, based on the map prepared by Mr. Runyan, there an anomalous condition as far as chloride content in the water is concerned in the vicinity of this disposal well. And it seems to extend outward basically following the lows in the red beds in that vicinity.

If you have the water following along red beds, as has been testified to previously, the bryons tend to settle to the bottom because of the density. If they would move down along the lows in the red beds then you superimpose the sweeping action of the water table, this pattern of chloride distribution follows the pattern of chloride distribution that I would expect.

Q If what was taking place?

A If there is a discharge of water from the disposal well.

MR. JONES: That's all, thank you.

MR. RAMEY: Any questions of the witness, Mr. Hensley?

MR. HENSLEY: Yes, sir.

CROSS-EXAMINATION

BY MR. HENSLEY:

Q Mr. Gallaway, as I understand it, Exhibit 8

is that underneath Exhibit 10?

A That's the water table, sir?

Q Yes, sir. We will call it the water table exhibit. In your opinion reflects that the bulging out of contours in the vicinity of this disposal well, is that correct?

A Yes, sir.

Q Will you point out again exactly where you think this bulging out occurs?

A Beginning right in this area, let's take this 4275, now the contour back of it is bulging a little bit out. Of course, now when the--if there's leakage from that well it basically spread it out regularly from the well. As you come you will see a bulge outward like that and it drops back down.

This pattern continues down slope here for some five or six contours. It kind of sweeps down in this direction. Right in here the most pronounced displacement I have is on the 42-75 which is just upslope from the well.

Q Well, it's upslope and actually it would be west of the subject well?

A Well, the 42-75 is, sir. But the 42-74 is east of the well. The elevation of the water table at the

disposal well is about 4274.5 feet above sea level.

Q Let me ask you this, what data do you have to confirm that bulging contour?

A This map, sir, is based on all the control, every point that I had to base the water table map on is shown on this map.

Q But I don't see any control point in the vicinity of those contour lines except the disposal well itself.

A I have a control point right there, sir, which is to the southwest of the well. I have one due south of it, one due east of it and one to the southeast of it.

Q How about immediately to the north and immediately to the east--I mean immediately to the west?

A There are no observation wells in that vicinity, sir.

Q And that's where you indicated the largest bulging affect?

A Correct. But I do have points--that is correct, sir. But I do have points to the west here, I have several points. As I pointed out now these contours, the position of these contours was determined by graphic

interpolation between the points of known elevation. I mean I used graphic interpolation to establish the position of those lines.

Q Would this that there was an injection of water into this fresh water reservoir would be radial, wouldn't it, to extend over a broad area?

A Yes, sir.

Q It wouldn't just be in one direction?

A Well--

Q And as a matter of fact, considering the topography of the red beds it wouldn't be to the west of the well any way?

A Okay, sir. In the vicinity--if this well was leaking water the discharge outward into the shallow aquifer will be radial. But whenever you superimpose a cone, or shall I say a mound, a cone-like mound on top of a sloping surface, if you combine those two surfaces you tend to get a bulge in the sloping surface.

Q Accutally, assuming that your interpolation of this bulge is correct, for purposes of this question, Mr. Gallaway, that bulge would only appear in the water table if that injection of formed water into that reservoir was continuous, isn't that correct? It couldn't reflect on

the water table if it had happened some time ago?

A It depends, sir, on how much water was discharged--if water was discharged from this well to the shallow aquifer, if you discharge a great deal of water finally that mound that is produced would dissipate. With time it would dissipate, it would depend on where you're caught in the time of how extensive that mound would be.

Q Well, that's the point I'm trying to make. If you assume that the tests which have been made for casing leaks on the subject well, under the jurisdiction and under the supervision of this Commission have all indicated that there are no casing leaks and there has not been any casing leaks, physically it's impossible to explain the presence of the bulge, is it not? And relate that bulge to this well?

A Well, of course, I've heard testimony that the well was not found to be leaking. But a bulge like I have on this water table, like I found, plus the chloride anomaly in the vicinity of that well says to me that that well has been leaking.

Q It says to you as an Engineer that it's leaking right now I suppose?

A Not necessarily, sir. It says it has leaked

at some point in time. Now whether or not it's leaking now, sir, I can't say.

Q Are you familiar with the casing program on this well?

A No, sir.

Q If I tell you, to assume for purposes of this question, the 13 3/8 and the 8 5/8 has cement circulated all the way to the surface, would you think there would be any possibility, based on the surveys that have been conducted, that that well has ever leaked, any physical possibility? If the surveys are all negative?

A I'm not at all familiar, Mr. Hensley, with the casing surveys. This is not within my normal operations to work on that type of thing. This is something that is more or less unique to the petroleum industry.

Q I appreciate that, but there's been interpretations that there's a leak in the well and yet the physical tests which were made to determine whether or not there was a leak were negative. I suppose the question, ultimately then, assuming that your interpretation is correct for purposes of this question, what other explanations do you have for this contour anomaly?

A Well, based on the information that I have,

sir, I am forced to conclude that by some means there has been leakage from that well.

Q Is it just as valid to say that there's been an injection of foreign water or some substance into that reservoir from some source? You can't actually pinpoint the source, can you?

A Well, pinpoint, exactly pinpointing the source, but I think there are two factors that I think are significant. One is the anomalous condition we have on quality of water in the vicinity of the well, plus the anomalous condition we have on the water table, one of which superimposes right over the other.

Q You don't believe that that water, based on the topography of the red beds could travel south and west, do you?

A There's a possibility, as I pointed out earlier, Mr. Jones questioned me, my map on top of the red beds reflects the actual top of the red beds. As I pointed out there's a zone of weathering. There's some material down in that zone of weathering, as a matter ofact I get the idea that may be some rocks, weathered rocks of cretaceous age involved here. In looking at the samples, but they're pretty highly weathered. And there are some indications

of some of the material in this weathered zone could carry water.

And then there's another possibility. That if we had a severe amount of leakage and the water level built up in the vicinity of this well, it might be possible depending on the quanity of discharge to actually have raised this mound high enough that the water could discharge over the top of this red bed high right here. Now this is 4240 contour and the elevation of the red beds to that well is 4233.

Now I don't know, the highest point that I have is 4200, I do not know what the elevation might be in the center of what I've contoured as the red bed high. So it looks like something like seven to ten feet of buildup could, if you had radial discharge from the well, could shove water over the top of that hill, if you raise it high enough temporarily.

Q Well, this map Exhibit 8 suggests to me that you, based on your interpretation of the red bed subsurface data, the topography, you feel--and also considering the water table levels, you feel that this anomaly is south of that ridge. And you're trying, is it not correct, sir, that you're trying to come up with some feasible explanation

as to how, physically this water can jump over the top of this topography and be deposited south of the well?

A I am not sure, Mr. Hensley, why you have water south. I merely pointed up two possibilities. Whether or not--I do not know how much water or at what rate water is being injected into that well. This would have a bearing on how high the mound is.

Now the quantity of water that you would inject into it, if you were injecting it into that well--say you got the--whatever, if it were indeed leaking, whatever quantity was leaking, when you superimpose that on the formation and depending on hydrolic properties of the formation you would develop a mound there. The tighter the formation the taller the mound and the morepermeable formation, the flatter the mound.

Q All that assumes there is a leak in the casing, correct?

A Assuming there is a leak in the casing.

Q If there isn't a leak in the casing then that theory just will not stand up, will it? That cannot be a viable explanation of that water level anomaly.

A With this anomaly here the only reasonable explanation that I can see is the fact that we must have a

point of natural discharge of water into the shallow aquifer in the vicinity of this bulge in the contours.

Q Well, you could have a channel in those lower rocks in the Ogalala, you could have any number of situations which could result in an influx of water, isn't that correct?

A Under normal conditions, sir, the water would be moving through the Ogalala in the direction that I've indicated generally to the east-southeast. I do not think that under normal conditions that you could develop a sudden localized bulge like this based on the changes in permeability in the Ogalala.

Q Is there any way that the topography of the red beds in that area, or at the base of the Ogalala itself, can explain the difference in the water level content?

A Well, ordinarily your contours will tend to bulge out on top--they will followsto some degree the configuration of the bed rock. But the significance in fact, Mr. Hensley, that the point in which my bulge occurs on the water table is out off of my red bed high and out on the slope of this east-northeast trending valley.

The bulge there does not coincide with the red bed high.

Q Let me ask you this. This theory, you keep using the word possibility that this could happen, this theory of yours that you might have a wash over over that ridge in some way, somehow get some water south of that well and even west of the well, which to me I can't understand. Nevertheless that's your theory.

Aren't you assuming a number of factors here, as an Engineer, Mr. Gallaway, about which you have no data? For example, the rate of injection, the pressure injection, the casing program you did not understand what that was, the fact that you had circulated two casing strings; the fact that if you cut your pumps off on this injection the well immediately goes to vacuum. Now how do you explain all these variables with the conclusions which you are speculating here, if I may use the word, or saying possibly not existing?

A I will admit that with the casing program that you have indicated, if they have got a proper casing program it should hold. But I also know, Mr. Hensley, that all casing programs are not what they should be and all cement jobs are not what they should be.

But I do not know what the history was on this and I certainly would not be qualified to comment on

the construction of that injection well.

Q Let me ask you this, are you familiar with the procedures used to test the integrity of casing strings as sufficiently to know that if these tests are negative then that string is not leaking?

A I am not familiar sir, with the test that were used. I would presume that inasmuch as these are accepted as standard by the industry that they would indicate the facts.

Q So we indeed have a true anomaly here? No leak, yet we have, according to your contour a bulge in the water table?

A Well, whether or the well is--I have a bulge, I have an anomalous condition on the water table that coincides with the location of the well. We have an anomalous condition as far as quality is concerned that coincides both with this anomalous condition on the water table and also with the location of the well. And from that in my opinion it indicates that this anomalous condition is somehow related to that well.

Q In order for there to be a relationship, it's clear isn't it, physically, Mr. Gallaway, that there's got to be a casing leak?

MR. JONES: I am going to object to the continual harping on the casing leak. I think the witness has stated over and over again that he is not qualified to discuss these matters and I don't think doing anything but arguing with the witness.

MR. HENSLEY: I will withdraw the question, Mr. Chairman. Again I think these answer are all couched in terms of possibilities and I think the answer speak for themselves.

Q (By Mr. Hensley) What data did you examine, Mr. Gallaway, that showed this water table anomaly?

A This is based, sir, on water level measurements and all the points that are indicated on this map. These are all actual measured depths to water level, it's measure with a steel tape.

Q Did you then just interpolate from data points to come up with your contour showing a bulge to the north and to the west of the subject well?

A These in a necessity, sir, in some cases the points fall right on the contour.

Q I thought that the points that are to the north and to the west of the well were the main contour bulge occurs?

A Okay, sir, I interpolated graphically. I did not eyeball, as you -- pardon the statement, the position of those contours. I actually took and determined graphically exactly where those contours should fall and I did this on purpose in order to get away. This is a graphical solution to get away from the possibility of misguessing where the contour would go. Ordinarily I might say, Mr. Hensley, I do that contour this way. But I did it on purpose this way because of the fact that we did have--it appeared to be an anomalous condition and I wanted it pretty well established where those contours should go.

Q Have you revised that contour of the red beds in the last two or three weeks or has this been your interpretation for some period of time?

A This water table, I might say, sir, this red bed map here was completed Monday night. I was drawing this map--I drew this map up Monday afternoon, Monday night. The water table map was drawn a couple of day before.

By my saying these two maps reflect the data that was available through a week ago yesterday.

Q Okay. Does presence of chloride in the water volume affect the water table?

A Well, certainly--well, first of all I would

like to point out that the chloride is a measure of sodium in the water. It's a measure of something else. But certainly if the reflection of the amount was salt in the water, basically in most cases, and of course, when you have water as you increase the salt content of it, the density of that water increases.

Q Okay. Did you make a correction on these contours for that density?

A No, sir, I did not.

Q What's the effect that that's going to have on this interpretation of the bulge being present?

A Inasmuch, sir, as the salt water is on the bottom of the formation and these contours--they're on the base of the water bearing formation and my contours are on top of the water bearing formation, on top of the water bearing part of the formation, that means that the salt water is separated from this map by some 40--something like 45 feet of saturation, sir, in this area.

Q I thought you had already indicated that there's a general area of radial mix. It's not all concentrated in the base?

A But when you inject water into that formation, sir, when it goes into that formation you're adding water

in the vicinity of that well and certainly you're going to mound the water table in the vicinity of that well. The salt water, because of its density tends to concentrate on the bottom of the aquifer.

Q If I understand your mapping of the red beds, this salt water disposal well, I believe you indicated in the course of your direct testimony, is located on the south side of the northeast trending valley?

A That is correct, sir.

Q Isn't it a fact that you would normally, under those topographic conditions expect your rate of flow, considering the general characertistics of the Ogalala, in the area to flow from a west to an easterly direction?

A Fresh water, sir or salt water?

Q I'm talking about fresh water.

A The fresh water, the general movement of fresh water is generally east-southeast in this area.

Q Are you suggesting that the flow of any saline water would be in a different direction?

A Normally with the configuration of the red beds that we have, I would expect as the saline water settled to the bottom of the red beds, not the red beds, as it settled down to the top of the red beds to the base of the

Ogalala formation, I would expect that water to more or less follow the drainage lines that were developed on that erosion surface. In other words, basically when that water settles to the bottom, because of its density settles to the bottom of the formation, I would expect it to move out of the area, say, in that direction. Basically I have a line coming out right there. These red lines, these are the low points in the red beds.

I would expect the densest water to fall along those lowest points in the red beds.

Q Geologically and hydrologically there would no reason in the world under normal circumstances for that water to take any course other than the course of the Ogalala fresh water reservoir trend?

A You can have the red beds--you can have movement of water, sir, due to density that is different from the movement of water due to the general hydrolic gradient.

Q But there is no evidence that that's occurring here, is it?

A With the concentration of salt that we have in this water I would expect the salty water at the base of the formation to follow the low points in the red beds. The

fresh water, of course, is going to sweep on through in a generally east-southeast direction. But I think, and it's been my experience in working on other contaminated-- contamination problems that basically the salt water goes to the lows in the top of the red beds and follows those down, not necessarily in the direction of the general movement as shown by the general water table in an area.

Q Let me now direct your attention to what has been marked as Exhibit 10. Is that the map of the top of the red beds or is that Mr. Runyan's map? I'm sorry, 10 is Mr. Runyan's map.

A This one over here, sir?

Q Yes. Did you have any input in the preparation of those contours, floride contours?

A No, sir.

Q You indicate that it shows the distribution of chlorides in the vicinity of the wellbore of the dispoal well?

A Yes, sir.

Q There's a distribution of chlorides elsewhere too?

A Yes, sir.

Q You indicated that, in your opinion as an

expert, that there was some general agreement, I believe you said, between the distribution of the red beds and chlorides, what do you mean by that statement?

A I don't recall saying as a general agreement between the distribution of the red beds--oh, okay. Let's take, I have superimposed these drainage levels. These are merely the bottom of the trough. For instance, okay, let's take this line right here. That's the point connecting the lowest point in that trough is up here around the area in question.

Right here I have a line that goes through there, this line right here that follows the lower part of that trough. But basically when water in this general area, now this whole area, water tends to move up around this way and then sweep down, there's two draws. There's a draw down here and tends to come down these draws. I might point out the reason for that. This right here is one of Mr. Hamilton's irrigation wells.

But in general the red beds in this area, the drainage is like this and this is the general pattern that the chloride distribution follows.

Q I believe that you also answered that question in terms of--I believe that you said if there was a discharge

chlorides in the vicinity of this well that that would be consistent with these readings with respect to higher reading in chlorides.

A Yes, sir.

Q But that doesn't necessarily mean there has to be a discharge of chloride. All I mean is that if there was it would be a consistent geological interpretation, is that not true?

A Well, sir, there has to be somewhere in the vicinity here, there has to be a discharge of very saline water into the Ogalala because the chloride content of the normal--chloride content of uncontaiminated Ogalala water is generally less than 50 parts per million.

Q Yes. I understand that.

A And now I come up with a closed contour basis that Mr. Runyan has drawn, this is his work. He comes up with a concentration of the vicinity of this well of 25,000 and more.

Q Which again requires radial distribution to the south and west, assuming that this well had anything to do at all with the source?

A No, he shows a fairly--the way the contour shapes there is a considerable volume of highly saline water

down to the south across this red bed high. It's right in this draw right here.

Q But that's all it shows, is that it's there?

A It shows that it's there, yes, sir.

Q Where it came from you cannot interpret from that?

A Sir, I don't know where it came from.

MR. HENSLEY: No further questions.

MR. RAMEY: Any other questions of the witness?

MR. JONES. No. We move the admission of 8, 9 and 10.

MR. RAMEY: Mr. Stamets, would you like to ask a question.

MR. STAMETS: Yes. Mr. Gallaway, do you have any other explanation to tie this well, this disposal well into the anomalies that you've shown on your exhibit, other than a casing leak?

MR. GALLAWAY: At the moment, sir, I can't think of where else the water could come from based on a point of natural discharge of water. I mean not natural discharge but based on the anomalous conditions on the water table and the anomalous condition on the chlorides, I don't know where else the water could come from except out

of this well by a casing leak.

MR. STAMETS: Now you didn't answer my question. What I asked was, can you tie this well into the problem in any other way than a casing leak?

MR. GALLAWAY: I can't think of any other way, sir, that you could get the water out of it.

MR. STAMETS: That's all I have.

MR. JONES: Let me ask a question or two if I might. Mr. Gallaway, are you considered an authority on the various ways in which salt water disposal wells can fail or communicate salt water into the Ogalala or any other fresh water aquifer? In other words, could there exist other mechanisms besides the hole in the casing that could account for this, as far as you know?

MR. GALLAWAY: This, sir, is something, as I pointed out, you're dealing with something here that I don't normally deal with. Now I don't think that I'm qualified, sir, to say.

MR. JONES: That's all. I would renew my request that these three maps be admitted, 8, 9 and 10.

MR. HENSLEY: We have no objection, Mr. Chairman, subject to the continuing objection which I made at the beginning of this, proper proof.

MR. RAMEY: They will be admitted.

(WHEREUPON, Hamilton's Exhibits 8, 9 and 10 admitted into the evidence.)

MR. RAMEY: The witness may be excused.

MR. JONES: We call Mr. Jim Wright.

JAMES WRIGHT

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A James R. Wright.

Q What is your business and profession, Mr. Wright?

A I'm a field engineer for the New Mexico State Engineer.

Q How long have you been engaged in this occupation?

A About 24 years.

Q Are you a registered professional engineer in the State of New Mexico?

A Yes, sir.

Q Have you been participating in this investigation

of the source of the salt water contamination in the area of Mr. Hamilton's farm?

A Yes, sir, I have.

Q Would you generally describe your activities in that area?

A Well, basically, what I did was assess the Oil Commission with the test drilling and the collection of water samples in locating where the test holes should be placed.

Q Was this on the first series of test holes or on all of them?

A Well, it was on all the test holes that was drilled with the exception of Texaco's. I had nothing to do with Texaco's holes.

Q Were you involved in the location and the citing of the holes that were drilled by Mr. Hamilton?

A Yes, sir. Mr. Runyan and I, one or the other of us picked the locations or we did it together.

Q Have you sampled in any way the formations of the material that compose the formation and what's been discussed as the Ogalala aquifer in this vicinity?

A We collected some drill cuttings from some of the test holes that were drilled out there.

Q What was the purpose for collecting these samples of the cuttings?

A Primarily just to have the records of the cuttings in hand in case there was some question on what the formations were.

Q Were you requested to make a computation as to the rate of water movement in this area?

A Yes, sir, I was.

Q Was this request by the Oil Conservation Commission?

A I believe so, but I can't swear to that.

Q Have you made that calculation, Mr. Runyan?

A Yes, sir, I've made some calculations.

Q What figure have you arrived at as a rate for the movement of this ground water in this area?

A Well, based on the data that we have in our files the permeability of the water bearing formation out there appears to fall between 700 gallons per day per square foot to 1300 gallons per dav per square foot.

Q This would result in a rate range of what, Mr. Wright?

A Well, that would range from about two to three and a half feet per day, base on the hydrolic gradient

that exists in Section 24, Township 11 South, Range 32 East.

The hydrolic gradient is determined from, I don't know what--but anyway it was taken from the water table map.

Q Does that reflect consideration of the--what Mr. Gallaway testified to as the anomalous high near the disposal well that he identified?

A Yes, sir. That's a direct determination from those values given on that map.

Q It doesn't reflect any consideration for a possible draw-down at this irrigation well of Mr. Hamilton's, is that right?

A Well, it does take into account the residual draw-down. It wouldn't take into account the additional he would have when he pumped his well.

Q Have you heard all of the testimony that's been produced in this hearing so far, haven't you, Mr. Wright?

A I believe so.

Q I believe you heard testimony from Mr. Runyan and Mr. Gallaway whereas the salt water disposal well was identified as part of the source of the salt water contamination and it is shown on this map number 10, haven't you?

A Yes, sir.

Q And you've heard the testimony concerning the fact that the well hasn't ever apparently leaked or been repaired. Have you had any experience with the mechanisms or means by which salt water disposal wells can transmit salt water into the--into a fresh water aquifer?

A Well, I haven't had a whole lot of experience with salt water disposal wells. But I've had a lot of experience with construction of oil wells and stuff like that.

Q What sorts of mechanisms are generally involved in that kind of a problem?

MR. HENSLEY: I'm going to object to the form of the question. Are we talking about oil wells or are we talking about the BO No. 3 well which is the subject matter of this lawsuit? I think it's injecting a collateral track, if we're going to talk about wells just anywhere which might have developed some type of mechanical problem which caused some type of reservoir contamination in a shallow zone.

MR. JONES: We hope to eventually focus this on the well, but I think, particularly in light of the cross-examination of Mr. Gallaway, this kind of inquiry is appropriate.

MR. RAMEY: Mr. Wright, what is your experience in the construction of oil wells? Have you ever worked with an oil company or have you ever been associated with?

A No, I've never worked for an oil company. I was in charge of the supervision of the oil well drilling in the Roswell-Artesia Basin for several years, before the Oil Commission took over that particular task. We actually witnessed all the casing that was run for several years in the Roswell-Artesia Basin.

MR. RAMEY: Mr. Hensley, I'm going to overrule your objection and listen to what the man has to say.

Q (By Mr. Jones) Do you recall the question?

A No, sir, I don't believe I do.

Q I was asking you what various mechanisms have you encountered in your experience with these matters that involved or had occurred where oil wells or disposal wells have contaminated a fresh water aquifer?

A Well, you can have a casing leak which would be one way of doing it. Another way would be channeling through your cement behind your casing. And conceivably under certain conditions you can have fracturing of the formation when the well sand fraced or something, or

fracturing of the cement job at that time.

Q Could there be, in your opinion, channeling involved in this particular well, this BOW 3?

A Well, it's possible. I don't have any evidence that there is channeling.

Q Well the evidence so far, I believe, Mr. Wright, I might be unfairly characterizing it. But I believe so far the evidence is that there is substantial or overwhelming evidence that this well has leaked extensively, yet that the casing is sound, does that mean, in fact, that this well hasn't put any, does it just absolutely exclude the possibility of any salt water getting from that well to the fresh water aquifer?

A No, I don't think it positively excludes it.

Q Is there an explanation for the contamination that it is compatible with the state of the casing as it evidently exists and the contamination of the fresh water aquifer?

A Well, there are possibilities it would be channeling behind the casing or actual fracturing of the formation. Because there's been several casing leak surveys around and all of them indicate no casing leaks.

Q Do you have any familiarity with the tracer

surveys on these wells?

A Not really. I know basically what they do when they run a tracer survey but I don't know how reliable they are or anything.

Q You're not familiar with the limitations of these surveys?

A No, sir.

Q Have you ever heard of a well that was leaking more or less spontaneously seeking to leak without the intervention of some human being into the problem?

MR. HENSLEY: That question, I think, is a bit comprehensive, I don't understand it.

A I didn't get it either.

Q (By Mr. Jones) Have you ever heard of a salt water disposal well that leaked and leaked extensively, just suddenly and spontaneously seeking to leak without somebody fixing it?

A I still don't understand your question. Have I ever heard of a well that leaked without somebody making it leak?

Q I'm asking you if you have ever heard of a situation in which a leaking well spontaneously cured itself?

A No, sir, I've never heard anything like that.

Q Is something like that probably in your experience with these matters?

A I certainly would not expect it to fix itself

Q Is there, in your opinion, any other possible source of the chloride and contamination other than the salt water disposal well?

A Well, from the testimony that's been presented and everything, I can't see any other explanation for anomaly, other than your recharge point at or near the salt water disposal well.

Q Now if this well was channeling behind the casing, Mr. Wright, would the water have to pass through what's called the salt section?

A Not necessarily.

Q How would it avoid passing through the salt section?

A It could move between the--up through the cement that's behind the casing string. In other words, come through a hole in the conduit, the concrete. You'd have --what I'm trying to say you would have stringers of cement behind the pipe but you would not have solid cement around the casing. So it's conceivable that you could get

it through there without going through the salt section. Without being in contact with the salt section.

Q I'm sure you've heard this well described in testimony as a well that goes on vacuum when there is no pressure on it. Does that possibility, in your opinion, eliminate channeling as a possible explanation for this contamination?

A Well, I don't think so. Still it would be possible to migrate fluids, I think.

Q Are you familiar at all with the Devonian formation that this is being injected into?

A Just in a very general way.

Q You wouldn't know what bottom whole pressure might be there or whether or not there would be any fracturing in those zones?

A No, sir, I certainly don't.

MR. JONES: That's all.

MR. RAMEY: Any questions of the witness? Mr. Hensley?

MR. HENSLEY: Yes, sir, just a few.

CROSS-EXAMINATION

BY MR. HENSLEY:

Q You don't have any indication at all, Mr. Wright,

as to whether any of these other possible things that we've been talking about have, in fact, occurred with respect to this well, do you?

A No, sir. All I said was it was a possibility.

Q It may have happened somewhere in the world sometime, but there is no evidence that it ever happened here?

A I have no evidence on this particular well.

Q You indicated that you were familiar with injectivity profiles or tracer surveys?

A In a general way, yes, sir.

Q Do you understand that the purpose of those is to have a tracer on the flow of fluid into the well bore?

A Yes, sir.

Q Are you familiar with the fact that an injectivity profile was run on this well in December of last year?

A Yes, sir, I am.

Q Have you looked at the results of that injectivity profile?

A I have.

Q And it's a fact, is it not, Mr. Wright, that

based on your experience as an engineer that that tracer survey established that there was no upward channels in this well at all?

A That was the operator's opinion.

Q Do you question that from the results of this test?

A The only thing that I'm saying is that I don't think it's conclusive evidence that there's no movement behind the casing.

Q Have you looked at the tracer log that was made?

A Yes, I've looked at the tracer log.

Q And every ounce of fluid that was pumped into this well bore went into the Devonian formation, did it not?

A Yes.

Q And if it hadn't gone in there would be some possibility of a casing leak, is that correct?

A That would be correct.

Q That's why it was run and it showed that every bit of it went into the injection formation?

A I think I stated that there is no casing leak in this well.

Q I'm talking about channeling behind the casing.

The conclusion of the service that ran this test was also that there were no indications of any channeling.

A Yes, sir. I agree with that statement, there's no indication.

Q Okay. Now you indicated that there was some possibility in your mind that even though a well went on vacuum when you stop injecting fluid that possibly when you start injecting fluid at a pressure that this could cause the fluid to migrate between the casing string and the cement?

A Yes, sir.

Q That's just the channeling that you're talking about, isn't it?

A Yes, sir.

Q Again there's no evidence of any channeling with respect to this cement job on either 13 3/8 or the 8 5/8?

A I don't believe I said there was any.

Q Okay. Well, you were just talking about things that could happen then?

A That's right.

Q Okay. Now you indicated that based on your calculations, permeability in the Ogalala, that you felt that

an accurate estimate of movement of ground water would be at a rate of two, two and a half feet per day in this area?

A I think I said two to about three and a half a day.

Q I'm sorry, I misunderstood you. If I understood the testimony of Mr. Runyan, I belive he predicated his findings that there was a rate of flow eight-tenths of a foot per day, is that right?

A The way that he uses the figures that I give him which is general for ground water movement in Lea County.

Q Well, it's general for ground water movement in Lea county, but it's not the movement that occurs in the reservoir right in this well site?

A No, sir, because the gradient is different here.

Q Okay. So the consequences of that any calculations on directional flow and rate of flows were on an assumed movement factor of eight-tenths foot per day are just not accurate?

A They wouldn't be accurate at this point, no, sir.

MR. HENSLEY: No further questions.

MR. RAMEY: Mr. Wright, let's go back to this permeability. You said the permeability was such that the water would move two to three and a half feet a day.

A Yes, sir. We just don't have any cores of the formation, inflex cores or anything, but we've run pumping tests and determined specific capacity and stuff like that. And they indicated, like I said, a permeability somewhere between 700 gallons a day per square foot to 1300 gallons a day per square foot. And if you apply this to Dorsey's law you can calculate the ground water movement if you know the hydrolic gradient and the porosity.

MR. RAMEY: I just wanted to be clear about that. I never heard permeability expressed in gallons per foot.

A This is common on water.

MR. RAMEY: Any other questions of the witness?

MR. HENSLEY: No, sir.

MR. RAMEY: You may be excused.

MR. JONES: We call Mr. Charles Joy, please.

CHARLES JOY

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Charles Joy.

Q Where do you live, Mr. Joy?

A Artesia, New Mexico.

Q What is your business presently?

A Consulting engineer.

Q Do you consult in any particular kind of engineering?

A In reservoir engineering and well completions, and the evaluation of properties.

Q In this regard you deal in oil and gas, is that right?

A Correct.

Q Can you briefly tell the Commission what experience you have had in these matters, beginning with your professional education?

A Well, I was in charge of high water floods for six years. I worked in reservoir section for Arco for five (p116)

six years, then in Dallas for three years in reservoir engineering and I was with NuMont ten years and I worked for David Faskin three years, was their reservoir engineer and completion engineer with Ernest Evans who was utility engineer for Faskin at that time.

And I've worked for various floods, I've been running tracer surveys since 1964. I imagine I was one of the first people to ever run tracer surveys. I run them with Wellex when they first came out.

Q Have you had any professional education in any area of engineering?

A Yes, I have a B.S. degree in petroleum engineering from the University of Alabama in 1954. And I've been before the Commission here since 1962 here in New Mexico. I've been a witness numerous times.

Q Mr. Joy, have you had occasion to examine a tracer log--

A Yes, I have and I've reviewed this very closely and from my investigation the log is of little value. I also checked this with Mr. Wright, Western Wire Lines' representative in Artesia Monday morning and he agreed with me 100 percent.

Now there's three reasons you cannot put any

validty into log. One is time. Two, the loss of radioactive material. Three, the rate of investigation.

Let's go on this rate of investigation first. The maximum or the optimum condition this tool investigative is not over 18 inches from the well bore. Normally they figure nine to ten inches.

MR. RAMEY: Mr. Joy, could you slow down a little bit.

A All right.

Q (By Mr. Jones) Let's go back up a second. This log you have been examining, this is a log run by Western--

A --on the New Mexico State B03 well. I have a copy of it here.

Q That was run on December 8 of '77, is that right?

A Correct.

Q And it does bear the opinion of the analyst that there is no channeling?

A Not according to this log. You can't prove whether there was channeling or not. This well could very easily be channeling behind the casing.

Q But it does state there somewhere, I believe--

A Right, in the remarks. But their representative

in Artesia agrees with me, this well is--

MR. HENSLEY: I move that comment be striken. It's rank hearsay what anybody told him.

A All right. I've investigated these and interpreted these logs. I've been on probably at least a 100 of these wells or more.

MR. RAMEY: Please strike it from the record.

Q (By Mr. Jones) Mr. Joy, have you been able to locatedthat portion of the log wherein the channel upcheck was run?

A Yes. It was run at 10,490 feet. But let me go back into this investigation. The tool was only run in investigation at optimum condition at 18 inches, and normally I don't feel like I can get over about 10 inches investigation.

Q What limits the range of the tool?

A The tool itself, gamma ray and the radioactive material, itself. You can't put in a real hot material, it's got a long half life and you may contaminate fresh water zones and other zones which you never would get below the radioactivity intensity that would be safe.

Q Now looking at that portion of the log for a minute that deals with the request for channeling, can you

describe what was done as revealed by the log to determine whether there was channeling up high in the casing?

A They sat the tool at--the tool was set at 10,490 1/2 feet and calculated out to the length of time they left the tool there, and the tool was only there five minutes and six seconds. Now the length of time it took the fluid to move from that tool down to where the first displacement was was a minute and thirteen seconds, which means then that this fluid, if it did channel around it would have to be back up within three minutes and fifty-three seconds and outside of the casing.

And if you had a slow leak or a real large volume this tool was not there long enough to monitor any radioactive material. I've had to sit on these as high as three or four hours before I would get fluid to come back into the well bore up there.

Let me go into a little more information on this. Material can go into the pay zone and leave and not come up right by the casing and return through the pay. And this is a highly fractured reservoir. And I've encountered it many times, sometimes I will find the fluid come back in the casing in three or four hundred feet up the hole.

Now this is from the Roswell Geological

symposium and for the Texas-Mora 1B, the lithology is a white to tan, thermomatic with minor amount of white. Pores taken in the trench of the devonian to be vertically and horizontally fractured.

Also in this reservoir, because of this you have a fault. And this is one of the geological maps put out by them. You see the fault right down here. This reservoir is highly fault and it is not unusual, you have your cement job right around the well bore and around the casing. But the fluids will move out in there and return above where they had the tool setting, and it would take a much longer time for the material to return.

Like when you're coming back through the formation like this, it's not unusual for your radioactive material to drop. I've seen this drop out in a collar and be there six month later and the radioactive material would still be in that collar. Since you're going through the reservoir with this you could be loosing this radioactive material and it would be so weak you could not pick it up with a detector.

Q You read a portion of the Roswell Geological Society symposium on the pay zone in this field?

A Right.

Q Does this give an initial field pressure?

A Yes, it does. It's 4,099 feet. This reservoir is an active water drive and Mr. Gannon quoted my calculations. With an original bottom hole pressure of 4,099 feet and with the water that you have right now could drive 1.031 gives you a fluid gradient of .446 pounds per foot, which if calculated out this reservoir pressure would hold a column a foot of 9,191 feet from the reservoir back, which means the fluid would stand within 1,589 feet of surface. They say this morning that they run a test and at seven hours it dropped down to 1,500 supports my theory.

And you know the water is approaching from the southeast in this cause it's an active water drive and it's already flooded this well out. And in an active water drive like this type of reservoir you will sustain the original bottom hole pressure. This is from a reservoir standpoint. And it's very easy for water to communicate around out in the pay and come back up in this well.

Now let's go back to this theory on the casing. Now this is going back on these wells for ten or fifteen years and not find a cement job on these things. Cement got contaminated and never did set up. In fact, I run into one last year, a man fractured treated 8,000 feet

from his plugged hole and it blew out and had cement all over on the ground out there and it was still soft. And I have been back in the wells, myself, in Texas and in other areas here in New Mexico and found they did not have cement jobs that never did set up. It would be very easy to communicate between casing or go up in communications and then throw it out.

But I would say it wouldn't be unnatural becausey if you get down 700 pound pump pressure, you have to look at this and I'll go back over this. In the reservoir pressure the fluid was 1,589 feet, when you're pumping you would have a column of 1,570 feet which would put the top of the fluid at 10,761 feet or 19 feet from the surface which is above the Ogalala.

Another thing, if this well were to go on vaccumn I say it definitely has a channel around it. There's only one way--cause the reservoir pressure being as high as it is the water will not go into the formation, it's got to go on the path of the least resistence. I could not put no validity into this log whatsoever.

Q Are there any tests that you know of that can be run on this well that hasn't already, that would determine whether or not it is channeling behind the casing?

A There's a possibility of running a temperature survey wich would give you much more accurate information, in conjunction with this plus a noise tool. At this time I couldn't say whether the well was channeling or not. It could very easily be channeling.

Q You heard the testimony with regard to the pressure that was being used in this casing integrity was being tested. Is a 500 pound pressure, in your opinion, sufficient--

A No, it's very inadequate. The first thing you're injecting, from my information, around 700, now you told me this morning you had evidence they were injecting 700.

Q I believe that it states on that tracer.

A They didn't even check the pressure of the injection system.

Q What pressure is customarily used?

A Normally, 1500 to 2000 pounds when they in to check packers and casing for leaks. But there's a possiblity that you may have a hole in this, you can open it up and it will close up on you. I've run into this many times. Try to get in, wouldn't take it at 500, get above that and I'll start having communications around.

MR. RAMEY: Mr. Hensley?

CROSS-EXAMINATION

BY MR. HENSLEY:

Q Mr. Joy, as I understand your first answer to the first question, it's your opinion that this tracer log is incomplete, is that what you said?

A Definitely.

Q You don't know what it means?

A I don't know, no.

Q So what you're saying is, in effect, that Wire Line Services, who was asked to perform this tracer survey for Texaco at the request of the Oil Conservation Commission of New Mexico, failed to discharge a proper test?

A That's correct. And I find the interpretation to be wrong in the past and have sat down with the engineers and gone over with them and changed their opinion on it.

Q The balance of your testimony relates to various defects or possibilities that might have occurred, although you don't have evidence on it?

A You could have channeling also by natural fractures up there or stimulated fractures in the reservoir, you don't know how many these zones are fractured out there. It's a highly faulted area.

Q You're just speculating, aren't you?

A I'm not speculating, I'm going by reservoir engineering. I've been a reservoir engineer for nine years.

Q Well, but fracturing is unique to every specific area?

A Well, if you've got proof that the area is faulted, it's a geological interpretation here. You've also got the reports that says the formation is highly fractured.

Q What formation lies immediately above the Devonian in this area, do you know? Tell me about the vertical fractures?

A I don't know that any other formations are fractured up there. I'm just going along with you, I'm saying that they could be.

Q They're not, are they?

A I don't know, if you--how far this fault stand up, if it goes above the Devonian. Above the Devonian you will have the Mississippian, above that you will have your Wolf Creek, the San Andres, the Yates.

Q Did you investigate these situations in the zones above the base--

A I don't think anyone has ever recorded those

areas. You either have to have a core or you're going to have to run some type of log in order to check it out. I don't know whether they're run one.

Q Well, you're just basically saying there is a lot of questions here and you don't have any answer for them?

A All I'm saying is this interpretation, there is no conclusive answer on this one.

Q Are you also suggesting that these casing sruveys and these pressure tests that were prescribed by the Commission are not proper tests for the integrity of this testing?

A You've only run it at 500--

Q You didn't answer my question. Are you suggesting that the tests prescribed by the Commission are not conclusive as to the integrity of this?

A I would say that's correct, it's inconclusive.

Q So that the rules that they have for testing these casing strings, in your opinion, are just not proper?

A Right. I think they should go up to what the injection pressure is to double check this.

Q Are you talking about communication in oil strings as opposed to salt water disposal wells?

A I'm talking about injection wells period. I've run disposal wells, I was in charge of five floods in six years. And I was in charge of floods for Faskin.

Q Are you familiar with the cement program--

A On yes. I've gone in many times. I've had where they set up 8,000 feet and they had to go in and drill out. This is not unusual. And it's not unusual to have cement be contaminated by some of the formations.

Q Mr. Joy, I can't even get the question out before you engage in some type of discussion about something that doesn't even relate to my question.

Are you familiar with the casing strings or the casing program that was employed in this salt water disposal well?

A Definitely.

Q All right. Then you're familiar then with the fact that there was cement circulated on both the 13 3/8 and the 8 5/8?

A That's definitely correct, I read that. You don't always have a full string of cement unless they run a bottom log to prove it out. bond

Q Wait a minute, Mr. Joy, you're doing a lot of speculating. Do you have any evidence that what

Mr. Cannon said is incorrect?

A Oh, he circulated but you got any evidence that there's not space that you would have a column of concrete all the way up.

Q You're not questioning the fact that this cement was circulated in this well--

A No, I'm not questioning it was circulated 'cause it was probably circulated. I agree with you.

Q You're suggesting again another speculative possibility, you may have a void in the cement--

A You could, you definitely can have.

Q Well, you can have a lot--

A --or you can have contamination from the fluids in the hole, they won't set up.

Q You have no evidence at all that this, casing in this well has ever leaked?

A I didn't say it was leaking. I said channeling.

Q Do you have any evidence that it's channeling?

A I didn't say--I didn't make the statement--I said it could channel.

Q Do you have any evidence that it is?

A Is all I said is all the evidence I had is that you can't say it wasn't channeling in this log.

Q As the answer to my question, you have no evidence?

A On what?

Q That there is channeling in this well?

A I have no evidence to go in there and prove that there is channeling or that there isn't channeling.

MR. HENSLEY: No further questions.

MR. RAMEY: Mr. Joy, you stated that you have run a number of tracer surveys?

A Yes, sir.

MR. RAMEY: And yet you say they're no good?

A I'm not saying--if these are run properly, if they sit on these maybe three or four hours to prove this out, I would put some validity into it. But they only sat on it five minutes.

MR. RAMEY: On cementing wells, is it customary when an operator cements a well that he immediately goes in and runs a bond log?

A Usually after the set up time on your cement. I also run in and run a temperature both. I always run both strings.

MR. RAMEY: You run a bond log immediately?

A No, not until after the cement sets up.

MR. RAMEY: I mean on all wells you've completed you ran a bond log?

A Not on all. Years ago we didn't have the bond log.

MR. RAMEY: How long have they had the bond log?

A Oh, let's see, I imagine about 15 years.

MR. RAMEY: In the last 15 years on all wells you've run--

A I haven't run it on all, not on all, no.

MR. RAMEY: So it's not a normal procedure?

A No, not normally it's not.

MR. RAMEY: Particularly on surface pipe and immediate casing?

A Right, right, unless you had a zone of trouble that you wanted to check out to be sure you had the cement job proper.

MR. RAMEY: When you said the bottom hole pressure of the Devonian, this pool was 4,099 feet--

A --99 pounds.

MR. RAMEY: Any other questions of the witness? Mr. Stamets.

MR. STAMETS: Mr. Joy, is channeling of the

injected water from the disposal zone up to the Ogalala the only theory that you've put forth here as to how the water got into the disposal zone, into the Ogalala?

A There's numerous ways it could have gotten there.

MR. STAMETS: Is that the only one put forth so far today?

A That's the only one I've put forth today.

MR. STAMETS: Would this channeling occur near the well bore?

A It may occur near it the well bore. The thing is that it probably would occur right next to the well bore.

MR. STAMETS: Now if there is channeling occurring near the well bore are there other logs that could show this?

A Yes, the temperature survey and the noise log would probably pick it up.

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

MR. RAMEY: Mr. Joy, if there were channeling fromthe total depth up to the Ogalala in this well, wouldn't it be close to the salt section? Wouldn't youthink it

would be?

A Well, it definitely would come through the salt section.

MR. RAMEY: Wouldn't that change the characteristics of the water somewhere?

A It definitely would, it would be same as--you couldn't tell whether it was from produced water or from--I mean you're going to pick up your sodium chlorides in there.

MR. RAMEY: If you were injecting 2,600 part per million chloride water and it washed through the salt section, wouldn't you expect--

A I would expect it--I don't know that just depends on where it was coming through. Now if you had a hole between the cement and you come up, it wouldn't be exposed.

MR. RAMEY: Wouldn't that be very unusual?

A I don't think so. I've run into places where I felt like they had--

MR. RAMEY: Of all the channels you've seen--

A I've had some I think that was in the cement, itself, right in the holes.

MR. RAMEY: Holes right in the cement?

A Right. Which would let it come through the salt section.

MR. SEXTON: What kind of pressure would you have had had an inch sheet in a half inch hole? What kind of pressure would you have to have to get water through there?

A You have what?

MR. SEXTON: Like you go in right next to the pipe, what kind of pressure would you expect in the reservoir?

A It all depends on your velocity. You would have to calculate it out. If it was a slow leak you're not going to have enough velocity to come through.

MR. SEXTON: You think, like a half inch--

A I know it varies, probably less than that. It doesn't take a very large hole, to communicate. I've gone in and aqueezed wells with glynite and it's not very large pieces, it's real small and plugged it off. Glynite will go right on through but it plugged off.

MR. SEXTON: You think there's that kind of bottom hole pressure to get a large volumn?

A Well, you got your bottom hole pressure will hold it up there, plus when they're pumping it will support

a column within 19 feet of the surface. I'm not saying that a channeling is in there. I'm just saying you can't depend on this log to determine whether there's channeling or not.

If they had sat down there maybe three or four hours, they could have proved this out. All I'm saying is that there was no radioactive material out into the formation, high fracturing coming back to the casing. I've had this happen many times. You take three or four hours before you pick it up. 300 or 400 feet--

MR. SEXTON: You've seen channeling 12,000 or 10,000 foot?

A A I didn't say that. I say I have never been into this. All I'm saying is--I'm not saying whether there's channeling or not channeling. I'm saying you can't put any validity into this log, is all I'm saying.

Now if you go in and run the other surveys and support this. I think they could prove it out very easily with a temperature survey or noise survey.

MR. RAMEY: Mr. Hensley?

MR. HENSLEY: One other question of the witness, Mr. Chairman. I believe he indicated that his study reflected that the reservoir pressure in this area was

close ot its original pressure.

My question is, Mr. Joy, if you had a fracturing here or channeling, do you have any explanation as to why you don't have hydrocarbons presently in the Ogalala?

A If you're coming around, I've seen areas where you get very little oil film on it and I don't know whether they've ever prove they've never gotten any--I'm not a hydrologist, I haven't checked their water samples.

MR. HENSLEY: No further questions. By the way, one other question, Mr. Chairman.

These calculations you've made concerning fluid levels, did you take into account any friction loss?

A Oh, well, if you get the friction loss you couldn't even get into the pressure you're pumping right now. 'Cause your reservoir pressure is--let's see, your reservoir pressure, let's see, right now you would have 9,191 feet. And if you're going in at 600 pounds, you're 700 pounds--okay, your friction loss would be 1,345 pounds according to this, if you calculate it out, a three inch pipe. You couldn't even pump in it, 600 pounds.

So evidently friction is not correct in there. You couldn't, theorethically, you pump into the reservoir

at 600 pounds, if that's correct.

MR. HENSLEY: Well, you made no allowance for that?

A If I did, then you can't get in. Not now under 600 pounds.

MR. HENSLEY: No further questions.

MR. JONES: Nothing further.

MR. RAMEY: The witness may be excused.

MR. JONES: We call Herschel Moore.

HERSCHEL MOORE

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Herschel Moore.

Q Where do you live, Mr. Moore?

A I live in Tatum.

Q Are you any relation to the Moore Devonian Pool?

A Yes, it's named after my father, John H. Moore.

Q Do you work out in that pool?

A I'm a contractor for San Medan Oil Corporation.

Q How long have you been out there?

A I've been there since February of '53.

Q You've been there since this salt water disposal well we've been talking about, went into use, is that right?

A Sure have.

Q Do you recall every personally witnessing any problems in that well, or it being worked over?

A Yes. In '76 of February they worked it over and I was concerned about it because I was looking after San Medan's interest and wanted to know whether they would get it back on production, so I could get my wells back on.

Q What did you observe taking place during this work over?

A Well, I was up there one day visiting with the crew. They were having trouble getting their packer and their tubing back into the hole. They would have to come in, circulate out, come out with their packer and tubing, then they would go back in the hole, hit a bridge or something and circulate some material out again. I was up there and they did that, oh, two or three days and I never did go back no more until they finished with it.

Q What material circulated out of that hole, Mr. Moore?

A Well, it looked like to me it was grindings from some formation in the well. I don't know where it come from or how it got there.

Q Where was this material put after it was taken out?

A Well, it circulated out of the well into a steel pit and some of the formation was dropped on the ground. Made a stack about two foot high and about two foot round.

Q There was a stack of this material there?

A It was there still some time back. It's been removed and the location was cleaned up.

Q When was it removed, do you know?

A Approximately six months to a year ago, between six months and a year ago when they cleaned the location up.

Q Fairly recently?

A Yes, sir.

Q Have you had any other--noticed any problem with this disposal well besides this occasion when you saw the material circulated, this formation material?

A Well, I was talking to their pumper, it had pressure on it approximately 1,000 pounds. I checked it on the gauges and then he told me the pressure had dropped to 600 pounds. And that was an indication to me that something happened down hole.

Q When was this, do you recall?

A Oh, in August, about a year ago, this last August.

Q Where did this conversation take place?

A We were at the Caprock Store and I was going to my mother to town.

Q Mr. Moore, do you know the difference between formation grinding and iron sulfate?

A No, I'm not familiar with those materials. I just knew it was some kind of material.

Q And the material is no longer there, is that right?

A No, sir, it's sure not.

Q Have you ever observed any raking going on at the well site, someone out there very nicely raking the ground?

A Yeah, they had a gang up there and cleaned up around the well, raking it.

Q Have you noticed it lately, in the last three or four months, somebody regularly goes out there and rakes it?

A Yes, sir. Rakes around the location and cleaned it up. After they work it over they generally go out there and clean it up and level it up.

MR. JONES: That's all.

MR. RAMEY: Mr. Hensley, any questions?

CROSS-EXAMINATION

BY MR. HENSLEY:

Q Mr. Moore, you indicated that you've observed from time to time a roustabout gang out there policing up around the location?

A Well, they cleaned up around the location. I've noticed them, I'm in the field everyday and I see them up there.

Q Is there anything wrong with that?

A No, sir.

Q As a matter of fact that's good operations, isn't it?

A Well, everybody ought to do that, sometimes they all don't do it.

Q Texaco does a pretty good job of cleaning

those locations up around there? I'm talking about the well in question.

A It's been cleaned up pretty good.

Q Now back in '76 when this work over was done, I still don't understand what you said was on the ground. Something that was--

A They circulated it out of the hole and they were circulating the cutting or grindings, whatever was in there to keep them from getting back in the hole with the packer and tubing. They circulated that into steel pits and part of it fell off here on the ground.

Q These were just cuttings?

A It was cuttings, but I don't know what it was.

Q And they were removed when the work over was completed?

A No, they wasn't. They stayed there a good little while till this investigation started up in the salt water doing. They stayed there from '76 till about a year ago.

Q You're saying they stayed there, what a year?

A Yeah, from '76 up till this here come up.

Q What about this conversation you had at the Caprock Store in August of '77 with the pumper?

A The pumper was there, he said that they found approximately 1,000 pound pressure on the salt water well.

Q Did he say where?

A The salt water disposal well.

Q I mean the pressure where?

A It was on top of the well where you've got your gauge set on top of the well.

Q You mean you were injecting it at a 1,000 pounds?

A That's what he said and he said it dropped down to approximately 600 pounds.

Q It indicated what?

A That indicated there was something wrong with it.

Q Well, you just had less volume that would explain that.

A Yeah, but it's been carrying--I've been by there several times during the week, it would be carrying out and I've never seen it below 1,000 pounds. They dropped to 600 and it's been carrying that way ever since.

Q Well, injection pressures vary from time to time, doesn't it, just depending on the volume you inject?

A Well, I never have observed it that close.

Q That's correct, isn't it? That's what causes the pressure to go up or go down?

A Very possible.

Q Do you have any other explanation for that?

A I thought there might have been a bridge or formation down there in the lower part of it, something broke and let the pressure go.

Q That wouldn't have any affect on the well head pressure?

A Well, I don't know. But my impression is that the water goes somewhere. The pressure drops anyway.

MR. HENSLEY: No further questions.

MR. RAMEY: Any other questions of the witness?

MR. JONES: I don't have any.

MR. RAMEY: You may be excused.

MR. JONES: Mr. Bill Jones.

BILLY JONES

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Billy C. Jones.

Q Where do you live, Mr. Jones?

A Lovington, New Mexico.

Q Do you work for Texaco, Mr. Jones?

A Yes, sir.

Q How long have you been employed by Texaco?

A 18 years.

Q Were you involved with this problem of the well back in February of '76?

A Yes, sir.

Q How did you become involved in this problem?

A I was sent to the well to recover the work string and bit.

Q Did you have anything to do with the decision to go into the well?

A No, sir.

Q Did you have anything to do with the well up to the point the bit and work string got stuck in the well?

A No, sir, I did not.

Q Do you recall what level they were stuck?

A Oh, not to the round number. Probably around 10,400.

Q Around 10,400 feet?

A Yes, sir.

Q What did you do to recover the stuck bit?

A We rigged up a wire line service, backed the 2 12 tubing off that we were using for a work string. And went in with an inside clean out tool. Cleaned out inside the collars down to the bits. And the purpose for doing this was, of course, to free the bit. Which at this time we were able to go inside and back off right above the bit.

Q Do you have any idea why the bit got stuck to begin with?

A Well, the sole purpose for running the bit to start with was to clean out the open hole that we were disposing water in. And we had gone in with a bit or they had gone in with a bit to clean it out. And as they cleaned out the open hole section, if you understand they were in the process of circulating out the open hole of the reverse unit. This is obtained by the pumping down the 5 1/2 annulus and returning the fluids back up inside the 2 and 7/8 work string.

As they got the open hole cleaned out and the well went on vaccum, the cuttings that they were circulating out inside the 2 and 1/2 tubing, as the 5 and 1/2 annulus

went on a vaccum so did the 2 and 7/8 work string, which pulled the cuttings that they had trapped in the 2 and 7/8 back down around the bit and it became stuck.

Q Was the bit stuck below the hole, where you said 10,400, is that where it was stuck?

A Like I said before, I don't remember exactly where the bit was. It was in the open hole.

Q So it was below the bottom of the casing?

A Yes, sir.

Q Did you have anything more to do with this well after you retrieved the bit, after you got it out of the hole?

A After I got the bit and everything out of the hole, then I did stay on location until I ran 3 1/2 injection tubing in the packer.

Q Were there any further problems between the time you got the bit out and you started running the tubing, or did you just immediately place the tubing or was there some other step or procedure that you went through, do you recall?

A I'm not positive as to whether when I got the fish out, I went back with another bit and tried to clean the hole out further or not, I don't remember.

Q Do you know what condition caused the well to go on vaccum when they were drilling? Why it hadn't occurred before this particular time, the result of the bit being jammed by the cuttings?

A I doubt if I would be qualified to answer your question.

Q This occurred after they had it pumping fairly successful, is that right?

A Yes, sir.

Q Done enough drilling to generate, they had circulation at that time I suppose, didn't they?

A (No response.)

Q Was this a defect in the way the thing was handled by the driller? Was it his fault?

A No, sir.

Q A natural occurance took place beyond his control?

A No, any time you're cleaning out a disposal well, it has a nature of going on a vaccum when you get the well cleaned up. You stand a great risk at all times of getting the bit stuck.

Q In other words, the well was--by going on vaccum, responding to the improved conditions resulting from

drilling and cleaning out, is that right?

A Yes, sir.

Q Did you ever note where the fluid level was in the well when it was static?

A Course, when I arrived on location the fluid was at surface on both sides of the string.

Q What do you mean both sides of the string?

A Well, in the 5 1/2 casing and the 2 7/8 tubing also. They had lost all means of circulation as far as trying to pump around.

Q Well, the level was at the top when you started and did you ever experience any other fluid level, did you get it straightened up when you were running your tubing?

A I'm sure not in the practice that we take as far as getting the well in condition to flange the well up and start injecting water. As we pump down the back side with inhibited waters, then at some point there, if you were pumping at a high enough rate you would probably be able to project where the fluid level was standing.

Q How do you get rid of that fluid after you set the packer? What do you do to get rid of that stuff where you can put your inhibited water in there?

A You leave the packer swinging free, displace the volume of fluid that it takes between the strings, between your casing strings and your injection strings. When you pump that volume of fluid at that point, then you set the packer. And then you continue pumping until you fill the casing annulus and then pressure up on it.

Q Have you had anything to do with the well since you went out there in February of '76?

A No, sir.

Q Do you recall when the tubing was set and you were finished with your work over?

A Not the exact date, no, sir.

MR. JONES: That's all, thank you.

Q (Mr. Jones, continuing) Mr. Jones, is this business of the fluid level on the well something that you ascertain from the way your tools react to the entry into this fluid bit or tubing?

A At the point, if you were running your packer and your injection tubing at a high rate of speed, yes you would encounter the time that you hit the fluid. But this is a practice that we try to follow in order not because you run into the fluid level with your packer running at a high rate of speed, you stand a chance of

tearing the packer up.

Q So you wouldn't have any recollection in this case of where the fluid level stood when your packer entered the fluid?

A No, sir.

MR. JONES: That's all.

MR. RAMEY: Mr. Hensley?

MR. HENSLEY: No questions.

MR. RAMEY: Any questions of the witness? You may be excused.

LESLIE CLEMENTS

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Leslie Clements.

Q You work for the Commission, do you, Mr. Clements?

A Yes.

Q The Division?

A Yes, sir.

Q You've been out to this well on a number of

occasions, haven't you?

A Yes, sir.

Q Do you recall the first occasion since this problem arose that you were sent out there?

A It was back in August or September. I could look it up.

Q Did you go out there to monitor a pressure test on the well?

A That come later, in April.

Q What were you out there for in September or August?

A Just to talk to Mr. Hamilton.

Q But you did go to the acreage?

A Yes.

Q When were you first out there for some sort of test on the function of the well?

A September 8 is when I went out there the first time. I believe it was April 20th, 1978.

Q You went out there on April 20th, 1978 to witness a pressure test?

A Yes, sir.

Q The early pressure test was witnessed by someone else?

A Yes, sir.

Q Were you out there at any time in the fall of '77 to witness any other test?

A No, sir.

Q Have you been out there to observe the condition of this well in the last three or four weeks?

A The last three or four days, yes, sir.

Q What have you been monitoring the last three or four days?

A The tubing and the casing pressure.

Q What have you observed on the tubing and casing pressure?

A I don't have these transposed on the field notes, I've just got my notes here. Let's see, the first time was the 23rd of this month. I went out and observed the--each string was open, the surface where the riser comes from the surface was open.

The riser from the intermediate was opened and there was absolutely nothing coming from these two things. The connection on the production string or the long strings, the 5 1/2 was opened. It has a copper tubing fitting in the end of it, comes down from a switch from a gauge one inche down to a 1/4 inch and there was some treated

water coming out of this at the time that I got there.

Q What do you mean, treated water?

A This is the water that they put on the back side or loaded this 5 1/2 casing with.

Q How do you know it was treated water?

A How do I know it was treated water? Well, I picked a smple of it.

Q Did you have it analyzed?

A Yes. We run the chlorides on it, that's all we're capable of running.

Q Did it have any chlorides in it?

A Yes, sir. 2,000 parts per million.

Q Is any chloride put in there as part of the treated water?

A I would assume that it may be some in there with it. I'm not real sure what composition it is.

Q There were chlorides in the water behind the tubing?

A Yes, sir.

Q Did you make any other observation on the 23rd of May in regard to the well?

A No, sir.

Q When did you next go out to look at the well?

A The 25th of May.

Q What did you go out to observe that time?

A I had requested that they install pressure gauges on both the 5 1/2 and 3 1/2 inch tubing. And I guess there was a misunderstanding between me and someone else that they only had one on the 5 1/2 casing.

Q Did you observe the readings?

A Yes, sir. It was 140 pounds.

Q How long did you observe it, just this one time?

A No, sir. From 10:45 to 12:00 noon.

Q Were there any fluctuations?

A No, sir.

Q Do you know whether the well was injecting at that time?

A Yes, sir.

Q How could you tell?

A It was jarring the ground.

Q Did you observe anything else about the well on the 25th of May?

A No, sir.

Q When did you next go out to the well?

A The 28th of May.

Q What did you observe then?

A Okay. We had, I believe we got out communication lines straightened out and then they had a gauge upon the 3 1/2 tubing and also, still on the 5 1/2. The injection pressure on the tubing was 650 pounds. The pressure on the casing at that time was 185 pounds.

MR. RAMEY: Would you read those again, Mr. Clements?

A 650 pounds on the tubing and 185 pounds on the 5 1/2 casing.

Q (By Mr. Jones) How long did you observe the well in this case?

A Well, let's see, just a quick as I could get up there and back. Just a routine.

Q Did you ever monitor it any further that day at all?

A No, sir.

Q Did you look at it any time after that?

A I believe that was a Sunday and I was wanting to go back home.

Q You haven't look at it since then?

A Yes, sir. Two other times. The 29th and the 30th, both.

Q Okay. What did you see on the 29th?

A The 29th the tubing had 660 pounds and the casing 55 pounds.

MR. RAMEY: Was it injecting at this time?

A Yes, sir. And on the 30th it had 670 pounds on the tubing and 52 pounds on the casing.

Q (By Mr. Jones) You, on the 29th and 30th, just looked at it and noted the indications of pressure?

A Right, yes, sir.

Q Did you observe on any occasion, other than the 23rd of May, whether or not there was any of this treated water coming out of the well?

A No, sir. That's the only time I've noticed it.

Q Do you recall the pressure test that was run back on April 20th?

A Yes, sir, or I have notes here. What specifically do you want?

Q What happened?

A We rigged up on the--we had a recorder--where this connection is, a recorder hooked up on the --where I told you the copper tubing connected to that, to record the pressure that we put on the 5 1/2 casing. We

shut the injection down and we pressured up on the 5 1/2 to 600 pounds and there was a small leak in the packing laying around the tubing, between the 5 1/2 and the tubing. The pressure dropped off to 40 pounds in thirty minutes. We had to tighten this packing up and we repressured it to 560 pounds and it stablized at 530 pounds and held it for 40 minutes with no drop on it.

Q. The packer was tightened?

A The packing, yes, sir, around the tubing.

Q On the surface?

A Yes, sir.

Q Were you present when the tracer survey was run?

A No, sir.

MR. JONES: Okay, that's all, thank you.

MR. RAMEY: Mr. Hensley?

MR. HENSLEY: No questions.

MR. RAMEY: Mr. Clements, was anyone present from the Commission when the tracer survey was run?

A Yes, sir. Mr. Clag was.

MR. RAMEY: And he reported the results to you?

A No, sir. I think he reported it to Mr. Sexton.

I have his trip sheet somewhere.

MR. RAMEY: There was somebody from the Commission?

A Yes, sir.

MR. RAMEY: Any other questions of the witness? You may be excused.

MR. JONES: We call Mr. Vince Balderez.

VINCE BALDEREZ

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Vince Balderez.

Q Where do you live, Mr. Balderez?

A Lovington, New Mexico.

Q You work for Texaco, is that right?

A Yes, sir.

Q In what capacity do you work for Texaco?

A I'm a pumper.

Q Were you, at any point, looking after this salt water disposal well at any time?

A I did from July 9th of '73 till October 1st,

I have his trip sheet somewhere.

MR. RAMEY: There was somebody from the Commission?

A Yes, sir.

MR. RAMEY: Any other questions of the witness? You may be excused.

MR. JONES: We call Mr. Vince Balderez.

VINCE BALDEREZ

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Would you state your name, please?

A Vince Balderez.

Q Where do you live, Mr. Balderez?

A Lovington, New Mexico.

Q You work for Texaco, is that right?

A Yes, sir.

Q In what capacity do you work for Texaco?

A I'm a pumper.

Q Were you, at any point, looking after this salt water disposal well at any time?

A I did from July 9th of '73 till October 1st,

'77.

Q You heard Mr. Moore testify regarding the discussion of injection pressure and the sudden drop in injection pressure, do you remember that?

A Yes, sir, I do.

Q Will you tell us what happened, your version?

A This was very unusual for this to happen and it caught my attention. When I went by the well and I noticed they had come up and then the--when I took my gauge off it went down. Then I stayed there with it to see if it would do it again and it never did.

Q What was it up to when you had your gauge on it, do you remember?

A Right at about 850.

Q What did it go down to?

A 650.

Q You've never seen anything like this happen before, have you?

A It would do it but not--like I said, it was unusual for it to go up that high.

Q Was the well injecting at that time?

A It was pumping normal rhythm.

Q You have a gauge of some sort you could hook

to something and read these things, is that right?

A Yes, sir.

Q Were you supposed to note these things down or anything, or did you just remember them or what did you do?

A I would note them on my production book.

Q You have a production book?

A. Yes.

Q Is this something furnished to you by the company?

A It's furnished to us.

Q What do you do with your production book?

A We keep record of production for the whole month.

Q Then what do you do with it?

A Then we would file it.

Q Where would you file yours?

A I have a small office there by the company house where I would keep it.

Q You have been watching the injection pressure on this well since July of '73, is that right?

A Right.

Q And noting it down each month?

A Note it dow every month, unless something unusual happened, then I would note it at that same day on the remarks section.

Q Did you do this daily, or how often did you go by?

A We would, normal procedure would be twice a week.

Q And that's what you were following, the normal procedure?

A Yes.

Q Now you were, I guess, kind of surprised when this sudden drop occurred while you had your gauge on the well? Is that right?

A That's right.

Q And you did talk to Herschel about it?

A I kind of told, you know, we had come up a little on our well and had gone down. And I said, I don't know what did it.

Q Is this something you felt you ought to bring to the attention of the people you report to?

A No, it's just that it's unusual and we always talk.

Q Were you looking after the well in March of

'74?

A That's right.

Q Did you observe anything unusual about the pressure on the well head at that time, do you recall?

A I noticed that we had gone on vaccum on our 5 1/2 and I reported to my production foreman on Saturday. The following Monday when I came back to work, there was this pulling unit on it ready to work on it.

Q You noticed that it had gone on vaccum?

A Okay--

Q What kind of reading did you get on your gauge, do you remember?

A On the vaccum?

Q What did the gauge look like when it goes on vaccum?

A You don't have a vaccum gauge, you just hear it blow. You put your hand on it and it will pull you in.

Q What did you hear blow?

A A valve to the 5 1/2.

Q You just open that and you could feel it?

A You can feel it.

Q Okay. Did this occur also in February of '76?

A No, sir.

Q What happened in February of '76?

A It was spewing small amounts of water out of this same valve.

Q On this gauge the water was coming out of the valve in February of '76?

A Yes.

Q You reported this as being something wrong?

A Something was not right.

Q Now, do you remember how long after you reported this that someone got out to look at it?

A I usually called in about 5:30 and I had my production foreman there about 6:00.

Q Who was your production foreman?

A At that time it was V. T. Johnston.

Q Do you recall roughly how long the well was down at that time?

A It was a matter of just pulling the tubing and going back with replacing the damaged part.

Q Were there any other occasion in March of '74 or Februayr of '76, that something, in your opinion of what you could observe, happen to the well?

A No.

Q Mr. Balderaz, were you monitoring the injection volume out there?

A The volume would be calculated by test on well. We would say this well makes so much water and this makes so much and we would add them up and that's what I use.

Q Did you do that on a monthly basis?

A Yes, sir.

Q And you turned this in every month as the injection volume, is that right?

A I would turn in the test whenever I got it.

Q You don't recall, or do you, whether or not you turned in an injection volume for August of '77?

A I would not turn in on one hole. I would say I have a test on a certain well and I would turn in oil and water and that would be handled by the Lovington office.

Q They somehow know to figure out the volume based on what you give them?

A Yes.

Q Do you recall this pile of material that Herschel talked about coming out of the well?

A Yes, sir.

Q What did you observe?

A To me it was cement, sir.

Q Do you recall when that pile disappeared?

A We tried to get most of it while I was there but at this time, but at this time we never did get real after it and I left and it was still there when I left.

Q It was after that, this pile or whatever it was, was there when you left in August of '77? Someone got rid of it afterwards?

A That's true.

Q Did you ever go out there with a little hand rake and rake around that well?

A Well, not with a hand rake but I would pick up the things I could pick up and put them in the trash can.

Q You would kind of pick up the bigger pieces?

A Old gloves and things like that, we would pick them up.

Q You rake around the wells you're looking at now?

A No, sir.

MR. JONES: That's all.

MR. RAMEY: Mr. Hensley?

CROSS-EXAMINATION

BY MR. HENSLEY:

Q Mr. Baldoraz, the occasion in March of 1974 where you noticed the casing on vaccum, that's when several joints of the casing were replaced, is that correct?

A That's right.

Q Then occasion in February of '76 that you discussed, that's when the entire tubing string was replaced?

A That's correct.

MR. HENSLEY: No further questions.

MR. RAMEY: Any other questions of the witness?

MR. JONES: Could we have a short recess, about five minutes?

MR. RAMEY: Okay. No more than five minutes.

(WHEREUPON, a brief recess was held, after which time the following proceedings were had:)

MR. JONES: We call Mr. Jerry Sexton.

MR. RAMEY: Have you been sworn, Mr. Sexton?

MR. SEXTON: No.

MR. RAMEY: Let the record reflect this is the same Jerry Sexton that appeared in Case 6234 and he has

been sworn.

JERRY SEXTON

the witness herein, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JONES:

Q Mr. Sexton, you're head of the District Office in Hobbs, is that right?

A Yes.

Q I think you have, in your position down there, have been following this salt water disposal well carefully for the past few months, haven't you?

A Yes.

Q You were aware of some reports of water coming out of the valve on the production string and other things that resulted in this gauge being put on the production string, is that right?

A Yes.

Q You heard the testimony and I'm sure you've seen the reports Mr. Clements has given as a result of his observations of those gauge readings, injection pressure and casing pressure and that sort of thing?

A Yes.

Q I believe it's been testified to at this hearing that fluctuation of 300 to 400 pounds in a range over the casing pressure is not indicative of anything now, do you agree with that?

A I think that's probably a little bit more than I would like to consider normal. You're going to have some changes. I wouldn't expect it to be quite that much.

Q Wouldn't you ordinarily find even the readings reported to you by Mr. Clements to be indicative of some kind of communication between the tubing and the casing?

A Our test indicated, and I thought the radioactive test, especially for tracking the tubing leaks, were good. The bottom there, some question whether on time may have definitely showed at that time the tubing wasn't leaking. I think we may be seeing a slight tubing leak because it, I think Mr. Hamilton had some pictures showing substantial water come out at times. But it doesn't do this all the time.

To me, it's really too early to tell. A lot of time you can have a small tubing leak and stays apparently one way. Because if it was a large enough leak to go both ways, why it would go on a vaccum when the well

went on a vaccum. And I think if it is a leak it will show up in the near future. But everything is happening so fast that right now it's hard to say, other than I would expect during the next month or two it might show a definite leak there. All our tests indicate that if it is, it's so small I don't think we could find it.

Q Are you familiar with the contents of this inert water that's been discussed?

A Yes.

Q Is chlorides used as a constituent part of that water?

A Well, I think the one thing is an experience factor, chromate is kind of a yellow and people who have worked around this stuff is more or less able to tell when it's an inert fluid. And I assume that this is more than a chromate from experience, they knew there was chromate in it.

MR. GANNON: I'm not sure the type of inhibitor, it's an inhibitor of some kind.

A I think it was more, chlorides itself is not an indication of whether it is an inhibitor.

Q The purpose of the inhibitor, as I understand it, is to prevent or at least try to slow down the intense

corrison of the company's salt water disposal well?

A Yes, protect the casing.

Q Now you've seen these photographs that Mr. Hamilton has that show a folding around the flange and that sort of thing on this well?

A Yes.

Q Is that common on this kind of well?

A I'm really not that familiar with it. The first time I went up there I think there was just a puff there, which isn't unusual for wells that have never been shut in, it's not uncommon to never open up an casing valve on intermediate, a lot of times you will have a puff of water and some pressure on it. It's not indicative of--that there is water. If it leaked out there all the time, which our tests show it doesn't, why it would indicate a problem. But one time doesn't mean there's a problem.

MR. JONES: Okay. That's all. Thank you.

MR. HENSLEY: No questions.

MR. RAMEY: The witness may be excused.

MR. JONES: We don't have anything further.

MR. RAMEY: Do you have anything further, Mr. Hensley?

MR. HENSLEY: No, sir. I think the record

speaks for itself.

MR. RAMEY: Mr. Jones?

MR. JONES: I just have a few comments. I think the Commission is facing kind of an interesting question here. I believe it's fair to characterize it as overwhelming evidence is that the well has leaked extensively, chlorides all over. These two maps show you have a substantial volume of chlorides up there.

The Commission's geologist has testified that the well one or two possible sources of chlorides. The gentleman from the State Engineer's office has been a little less equivocal.

Being reasonable about this situation, this is supposed to be an industry of people trained in science, engineering and all sorts of advance technology. It's incredible to suppose that water is of any other source than that well.

Absolutely no evidence of any remedial measure, in any way, could be seen as alleviating the condition that undoubtly put all of the chloride into that ground water. The Engineer's water table map shows a point of recharge out there. The evidence on behalf of Texaco establishes that if it is all to be believed, and

undoubtly these tests are what they claim to be, that now the casing isn't leaking and it never has. And the tubing isn't leaking and has on just a few very limited occasions leaked a little.

Under the circumstances it seems to me that the Commission is faced with having to suppose on one hand that this well just suddenly errupted a great deal of salt water and then all of the sudden just quit putting out any salt water. That without any active intervention of anyone it's just no longer putting out any salt water.

These situations, I'm sure, the rules and regulations of the Commission that governs salt water disposal clearly reflect, I think, a great deal of concern about this kind of problem. This salt water in the Ogalala aquifer on this occasion has most immediately visited the-- itself on Mr. Hamilton. And he is, of course, without any more water to irrigate and that it's going to be his problem, perhaps his total loss, I don't know.

But that water is going to persist for generations to come and I don't think there can by any question about that it's more or less a permanent arrangement. It will move, as all these do, south and east and it will trip throughout people's backyards as time goes on.

In other words, this is a serious, permanent situation. In giving the uncertainty and doubt, it must attend what's going on around that well. And given the relatively simple and easily reached expedience of finding out once and for all what's going on with that well or simply using a different well to inject salt water. It seems to me that the Commission ought, in this kind of a case, to be somewhat conservative and cautious in its approach to this kind of problem and act to protect the ground waters.

I realize that petroleum, oil and gas and all of that are precious industries in New Mexico and it undoubtly a barrel of oil is worth more than a barrel of water. But there is that thing about water, that you have to have it to live and considering the overwhelming evidence, the well has leaked, the absence of any evidence that it has been corrected.

It seems to me that nothing can be done except to exercise prudence and caution in this situation in an order that the well be closed down and finally determined if it is, in fact, by some mechanism putting this salt water into the aquifer or not.

MR. RAMEY: Thank you, Mr. Jones.

MR. HENSLEY: Mr. Chairman, in view of that statement I would just like to make a couple of brief comments.

First of all, I don't agree at all that there's any overwhelming evidence this well has leaked. I think quite to the contrary, there's absolutely no probative evidence of a leak in this well.

The record to the Commission reflects that there has never been a repair of any casing. I suppose the only thing that could be suggested is that Texaco, some way, somehow made some repairs and didn't report it. And I think everyone knows that would be an impossible situation to occur, due to the fact of their reputation in the industry.

The only evidence that's been introduced in this record is a bulging occurrence in the vicinity of the well bore, which Mr. Gallaway says possibly might explain that a leak had occurred sometime in the past. But the only way he can get to that conclusion is to have this salt water, this high chloride salt water which automatically becomes a residue at the base of the Ogalala, jump over a barrier which he, himself acknowledges is present. And I submit that it's a physical impossibility for that to occur.

The fact of the matter is, I think, that there are chlorides in this reservoir but I think clearly the uncontroverted evidence in this proceeding is that there has never been any casing leak on this well and most certainly there isn't at this time. And I think in view of that record, that any order of the Commission which would have as its consequence to shut in this disposal well and an automatice shut in to the eight producing wells which are connected to the system, would certainly cause economic waste to occur with that injustification.

MR. RAMEY: Anything further to be added to the case? If not, the Commission will take the case under advisement and the hearing is adjourned.

(WHEREUPON, hearing was concluded.)

* * * * *

REPORTER'S CERTIFICATE

I, BETTY J. LANPHERE, Court Reporter with offices in Santa Fe, New Mexico, do hereby certify that the foregoing transcript is a complete and accurate record of said proceedings as the same were recorded by me stenographically and reduced to typewritten transcript by me or under my supervision.

DATED at Santa Fe, New Mexico, this twenty-fifth day of July, 1978.

Betty J. Lanphere, Court Reporter

LANPHERE REPORTING SERVICE
P.O. BOX 449
58 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

I N D E X

	Page
1. Appearances	2
2. The Witness - JOHN GANNON	
Direct Examination by Mr. Jones	5
3. The Witness - JOHN RUNYAN	
Direct Examination by Mr. Jones	34
Cross-Examination by Mr. Hensley	50
4. The Witness - SHERMAN GALLAWAY	
Direct Examination by Mr. Jones	57
Cross-Examination by Mr. Hensley	67
5. The Witness - JIM WRIGHT	
Direct Examination by Mr. Jones	89
Cross-Examination by Mr. Hensley	98
6. The Witness - CHARLES JOY	
Direct Examination by Mr. Jones	104
Cross-Examination by Mr. Hensley	113
7. The Witness - HERSCHEL MOORE	
Direct Examination by Mr. Jones	125
Cross-Examination by Mr. Hensley	129
8. The Witness - BILLY JONES	
Direct Examination by Mr. Jones	132
9. The Witness - LESLIE CLEMENTS	

LANPHERE REPORTING SERVICE
P.O. BOX 449
58 SOUTH FEDERAL PLACE
SANTA FE, NEW MEXICO 87501

Index cont.

Direct Examination by Mr. Jones 139

10. The Witness - Vince Balderez

Direct Examination by Mr. Jones 147

Cross-Examination by Mr. Hensley 155

11. The Witness - Jerry Sexton

Direct Examination by Mr. Jones 156

12. Reporter's Certificate 165

13. Exhibits 168

* * * * *

E X H I B I T S

	Identified
(Hamilton's Exhibits:)	
1. File	33
2. File	33
3. File	33
4. File	33
5. File	33
6. Map	40
7. Map	42
8. Map	59
9. Map	62
10. Map	65

(All exhibits retained.)

* * * * *

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
State Land Office Building
Santa Fe, New Mexico
23 August 1978

COMMISSION HEARING

IN THE MATTER OF:

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico.

CASE 6222

BEFORE: Commissioner Joe Ramey and
Commissioner Emery Arnold

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Commission:	Lynn Teschendorf, Esq. Legal Counsel for the Commission State Land Office Building Santa Fe, New Mexico 87501
For the Applicant, Paul Hamilton:	Donald Brown, Esq. and Alvin C. Jones, Esq. P. O. BOX 776 Security Nat'l. Bank Bldg. Roswell, New Mexico 88201
For Respondent Texaco:	Harold Hensley, Esq. HINKLE, COX, EATON, COFFIELD, & HENSLEY P. O. BOX 10 Roswell, New Mexico 88201

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

I N D E X

SHERMAN E. GALLOWAY

Direct Examination by Mr. Jones	6
Cross Examination by Mr. Hensley	42
Cross Examination by Mr. Ramey	73
Cross Examination by Mr. Stamets	84
Recross Examination by Mr. Hensley	98

JIM WRIGHT

Direct Examination by Mr. Jones	103
Cross Examination by Mr. Hensley	113
Redirect Examination by Mr. Jones	123
Recross Examination by Mr. Hensley	125
Cross Examination by Mr. Ramey	127
Recross Examination by Mr. Hensley	131
Recross Examination by Mr. Ramey	132

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

E X H I B I T S

Applicant Exhibit One, Plat	103
Applicant Exhibit Two, Plat	103
Applicant Exhibit Three, Plat	103
Applicant Exhibit Four, Graph	103
Applicant Exhibit Five, Document	103
Applicant Exhibit Six, Plat	103
Applicant Exhibit Seven, Sketch	103
Texaco Exhibit One, Ozlaid print	

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

COMMISSIONER RAMEY: Call next Case 6222.

MS. TESCHENDORF: Case 6222. Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico.

This case is coming on for rehearing.

COMMISSIONER RAMEY: We will ask for appearances at this time.

MR. JONES: The record should show that Donald Brown and Alvin Jones of Roswell, New Mexico, appear on behalf of the Applicant.

MR. HENSLEY: Harold L. Hensley, Junior, Hinkle, Cox, Eaton, Coffield, and Hensley, Roswell, for Respondent Texaco, Inc.

COMMISSIONER RAMEY: We issued two subpoenas for Sherman Galloway and Jim Wright, and I see that they are here.

I think it would be proper at this time, we had a motion from Mr. Jones, and I think it would be proper to hear arguments on the motion.

MR. JONES: If the Commission please, we would like to present a little testimony during the course of this rehearing regarding the matter raised in the motion, and we think it would be appropriate to take it up after that testimony has been presented.

There are a number of things. For one thing,

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

we've pretty much abandoned any -- any thought that a flourescent dye ought to be put in the well. We've also, I understand the Respondent's position is that a radioactive tracer of some sort should be used. There are several problems with that from our point of view. The primary one, I think, is expense. We don't have the money to go through that kind of a procedure.

I understand that Mr. Wright has made some inquiries regarding a test that could be performed at relatively nominal expense but at the same time would be rigorous and meaningful, and I think it would be beneficial for the Commission to hear from him before we get into whether or not we ought to go ahead and order some type of test on the well.

COMMISSIONER RAMEY: Okay, Mr. Jones, why don't you proceed?

MR. JONES: Okay, we'd call Mr. Sherman Galloway.

COMMISSIONER RAMEY: Yes, let's have all witnesses stand and be sworn.

MR. JONES: And Jim Wright, please.

MR. HENSLEY: We have no witnesses so far as I know at this time.

(Witnesses sworn.)

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

SHERMAN E. GALLOWAY

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. JONES:

Q. Would you state your name, please?

A. Sherman E. Galloway.

Q. Mr. Galloway, did you appear earlier before the Commission with regard to this study of the contamination of Paul Hamilton's irrigation wells?

A. Yes, sir.

Q. Have you continued work on this study since the Commission Hearing on May 31st?

A. Yes, sir.

Q. Has there been any additional test hole drilling in the area since that time?

A. Yes, sir. Mr. Hamilton has drilled four additional holes in the study area.

Q. How was the site or location of these holes determined?

A. It was determined basically through conferences between Mr. Hamilton and the State Engineer's Office. Mr. Hamilton's attorneys, too.

Q. Is there an Exhibit Number One that shows the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

location of the four new wells?

A. Yes, sir.

Q. Would you please indicate with the pointer on Exhibit One the location of the test wells?

A. Okay, sir, four wells were drilled and these are numbered 17, 18, 19, and 20. On the exhibit these particular points have been colored in red. The other control on the map is identical to the map used in the previous hearing.

This is merely a revision to update the older map; Number 17 right here, there are two lines -- two holes in a line from east to west; Number 17 is to the west; Number 18 is to the east. Then we have Number 19, which is drilled over in Section 23 down toward the Amerada oil well, and then we have Number 20, which is drilled fairly close to the brine disposal well.

Q. Is Number 20 completed as an observation well?

A. Yes, sir, it is.

Q. That well is cased, is that right?

A. Yes, sir.

Q. Do you -- can you give the Commission any insight into the reasons for the locations of wells 17, 18, and 19?

A. Yes, sir.

Q. Why were those particular locations selected?

A. Well, in the previous hearing, sir, considerable

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

discussion arose and then Mr. Hensley questioned me considerably concerning a Red Bed high that we had between the disposal well and an area of considerable saline water in the Ogallala down to the south. We had a Red Bed high. Consequently, holes number 17 and number 18 were drilled to check on whether or not that high was actually there. This was the primary purpose of those two.

There was also a question as to whether or not some of this saline water might be related to this abandoned Amerada well, consequently, number 19 was drilled down there to check on the quality in that area.

And then number 20 was drilled for the primary purpose of being used as an observation well and to be equipped with an automatic water level recorder, and it -- well, we already had two holes in essentially the location, but this was drilled for the specific purpose of installing a recorder.

Q. On the drilling of test wells 17 and 18, was the Red Bed location noted when those wells were completed?

A. Yes, sir, it was.

Q. And what was it?

A. Whereas I had a contour that looped up to show a hill, I found that the Red Beds were lower than I had previously mapped and in holes 17 and 18 my previous map had shown the elevation of the Red Beds there to be something

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

in excess of elevation 4240. I believe that's correct.

Yes. It was shown to be in excess of 4240.

The result of drilling hole 17 and 18, however, it was found that the elevation on the top of that Red Bed high in these two holes was 4236. So in effect we found that the Red Beds were somewhat lower than we had anticipated from the previous control.

Q. Is the -- is the Red Bed data obtained from wells 17 and 18 on Exhibit Two?

A. Yes, sir.

Q. It is revised to reflect the actual findings of the completion of those two wells, is that right?

A. Yes, sir.

Q. Are you familiar with the results obtained from well 19, as far as contamination from the Amerada well?

A. No, sir, not -- I really haven't worked on the quality part of this at all.

Q. Were the water levels measured in the four wells that we've been discussing?

A. Yes, sir.

Q. Were those water levels plotted by you on the water level map?

A. Yes, sir.

Q. Would you indicate for the Commission on Exhibit Three the points of location of the water levels plotted

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

on your water level map?

A. Yes, sir. This is well number 17 here. I might indicate that on these exhibits these additional control points are all colored in red, so you can find them readily.

But right here is number 17, number 18, number 19, and number 20. Now, these are added on, as I say, and have been colored in red to indicate their location.

Q. Does the plotting of these four additional points require any revision of the water table map from the map submitted to this Commission at the earlier hearing?

A. In general, in my opinion, it was not necessary to revise the map because these points fell within the right contour interval.

Q. It was not necessary to re-contour the water table as sumitted at the earlier hearing based on these four new controls?

A. In my opinion, sir, it was not.

Q. You testified at the earlier hearing to the existance of a point of recharge or a high in the water table at the location of the salt water disposal well of Texaco. Is there anything about these four new points that in any way shakes or changes that position?

A. No, sir, there is not.

Q. What is this Exhibit Four, Mr. Galloway?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Exhibit Number Four, this is a plot of the theoretical rise of water levels in the vicinity of a point source based on the best information we have concerning the hydraulic characteristics of the Ogallala in the vicinity of the study area.

Here we know from the data we have that the permeability in there ranges from something like 700 gallons per day per square foot to something like 1300, and so what I did, we plotted -- we calculated from the Theis non-equilibrium formula the curves.

Q. What do those curves represent?

A. These curves represent the theoretical rise of water level in the vicinity of a well for various periods of time, based on the conditions that we believe exist in the vicinity of the study area.

Q. This will be assuming a recharge; in other words, fluid being added through the well as opposed to being extracted from the well?

A. Yes, sir, being added from a point source, whether it be a well or some other point source.

Q. What is the "Q" you have on there?

A. These particular curves, sir, are plotted for a "Q" or a discharge of 100 gallons per minute.

Q. What is the "T"? What are the four different curves that you have on it?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Okay, sir. We used two "T's". Now "T" is transmissivity, which is permeability times the thickness of the aquifer, and I might point out that the saturated thickness of the Ogallala in this area is about 45 feet.

If you go from 700 gallons per square foot, you come up with a "T" somewhere in the neighborhood of 30,000. We considered this to be the probably low value of "T". And if you go up to, say, about 1300 GPD, or gallons per day per square foot, we get up to something like 60,000.

So we felt that the rise of water level in the vicinity of a point source would be -- should be based on a "T" in the range of 30 to 60,000 gallons per day per foot. And we calculated this. We also, from the data we had, we felt that the storage coefficient should be somewhere between point .010 and point .0 --- 0.20. Consequently --

MR. BROWN: Mr. Galloway, would you repeat that? I'm not sure that everybody understood it. Give us the last theorem again, if you would, please.

A. The storage coefficient, we assume was between --- in the range of 0.10 and 0.20. This is one of the parameters we use in calculating the effects of adding or discharging water from an aquifer.

We calculated this, then, based on 100 gallons per minute. Now on my particular charts here we have -- we

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

have -- this is the rise of water level in feet. The line here would be -- represent the point source. The dotted -- the solid line on the top in every case represents the effects of -- well, we have a legend out here in the case of -- let me back up.

In making this calculation time is also a factor. Consequently, we calculated how much the water level would rise at the end of one day, at the end of one month with 31 days, at the end of one year, or 365 days, and at the end of five years, or 1826 days.

On the top curve the "T" equals -- well, we used a transmissivity of 30,000, a storage coefficient of .10. This is indicated by the solid line, the solid curve. I might point out that from right to left is the scale of feet, being zero here and these -- and the distance in feet out from the point source.

And these curves indicate the calculated rise of a water table due to discharge of water from a point source for a "Q" of 100 gallons per minute for these periods of time; namely, one day, one month, one year, and five years.

I might point out that we calculated this for 100 gallons per minute. Now, from these curves, if you had a discharge, say, of 200 gallons per minute, the rise in water level shown by these curves would be exactly double.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

If it's 300 gallons per minute you'd triple it, and so forth. It's strictly proportional.

COMMISSIONER RAMEY: Mr. Galloway.

Q. Yes, sir.

COMMISSIONER RAMEY: Now, your "Q" is -- would that be the discharge from your point source that you're talking about?

A. Yes, sir.

COMMISSIONER RAMEY: Or a discharge from the aquifer?

A. This would be the discharge from a point source. Now, we're assuming, Mr. Ramey, that the aquifer is being recharged from a point. If we want to turn this upside down, I mean, we were dumping water down a well, down a recharge well, we would get a rise of water levels in the vicinity of that well, just the same as you get a cone of depression from a discharge well. It's exactly the reverse here.

Q. For the purposes of discussion, or a hypothetical question, Mr. Galloway, if a recharge had been taking place in the location of the disposal well in the Red Beds, referring to the Red Bed location, with a "Q" in this amount or greater, would there be sufficient mounding of the well to account for distribution of water to the south and to the southwest of the well?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

MR. HENSLEY: I object to the form of the question. It asks for a hypothetical opinion from Mr. Galloway as an expert based on assumed facts, which is not permitted under the Rules of Evidence.

Unless there is a foundation laid that the facts which this witness is asked to assume, including the discharge pressures, discharge volume, and the point source, are -- can be identified as the subject well, then it is an improper hypothetical question, and we object to it.

MR. JONES: The question is, that if this well had leaked at that location and was flowing that amount of water, or a greater amount, would it surmount, perhaps, the topographical difficulties imposed by the Red Beds as contoured, and it's a perfectly proper question.

A. In as much, sir, as the additional test drilling indicated that the Red Beds were lower -- I mean they were lower than we anticipated, I might point out that we -- the elevation of the Red Beds at the disposal well was 4233; my elevations of this high of the Red Beds is 4236. I've had to raise water level about three feet, and I have no idea of -- if we assume the well was leaking, if we assume, as you've theorized, that the well was indeed leaking, then the amount of water -- it is conceivable to me that there could be enough rise to push this water across that Red Bed high, yes, sir. It's within the realm of reason.

But what kind of a discharge you might have, I could not say because I don't know.

Q. Well, do you know in terms of gallons per minute how many gallons per minute would flow if you had a discharge rate of 12-to-13,000 barrels a day?

A. Well, that would be something in excess --

Q. It would exceed 100 gallons a minute, wouldn't it?

A. Yes, sir, it would seem to be somewhere in the neighborhood, I believe, of about 350 gallons per minute.

Q. Have you prepared some other exhibits ---

A. Yes, sir.

Q. -- for this hearing, Mr. Galloway?

COMMISSIONER RAMEY: Mr. Galloway, let me ask a question or two.

You say there -- they're disposing of around 350 gallons per minute?

A. As I remember the testimony last time, it was something like 11,500 or 12,000 barrels per day.

COMMISSIONER RAMEY: Okay, and they would have to have -- an approximate third of this water would have to be leaking to the Ogallala for the water to flow over this high? Was that your testimony?

A. No, sir. I think that 11,500, if I remember my calculation clear, figures out to something like 330 --

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

I think 11,500 is 330-some gallons per minute.

These curves merely show what it would do, or what the spread would be and how it would mound with 100 gallons per minute. Now, if you're only getting 50 gallons per minute, you'd only get half the amount shown by the curve, or you, say, you had 300 gallons per minute, you'd get three times as much rise as shown by the curves.

COMMISSIONER RAMEY: What's your vertical scale there?

A. In feet?

COMMISSIONER RAMEY: Yes.

A. This is feet of rise of water level.

COMMISSIONER RAMEY: I can't see what it is.

MR. JONES: Would the Commissioner like to come around --

A. The scale on here, I might indicate, each one of these divisions is half a foot; it's 5/10ths of a foot. So here's -- well, on this one, take this bottom one, here's a foot, two feet, three feet, four feet. The scale is identical on all of them.

COMMISSIONER RAMEY: So your bottom curve is what, five years?

A. Is five years, yes, sir.

Q. So the well would have had to leak 100 gallons a minute for five years to -- to rise four feet, which is

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

what, the highest there?

A. Well, the four feet is pretty close in the vicinity of the well for a 100 gallons per minute. As a matter of fact, the four feet would occur somewhere in the vicinity, well, in round numbers, 100 feet out, a little less than 100 feet.

At 1000 feet the rise of water level would be essentially 2 feet, based on a transmissivity of 30,000 and a storage coefficient of .10.

Now if you --- if the "T" is higher, namely 60,000 and a storage coefficient of .20, which is indicated by the dashed curve, a distance of 1000 feet would be 1.0 feet at the end of five years.

Now, of course, if this curve were applicable, I feel, in my opinion, somewhere between these two curves is the probable correct value that you would get if you had this happen. So if we had more than 100 gallons per minute, let's say we had 200 gallons per minute at a distance of 1000 feet, we could have four feet of rise.

COMMISSIONER RAMEY: And you have a four foot rise in the Red Beds from --

A. Three feet.

COMMISSIONER RAMEY: Three feet from the well to this particular high in the Red Beds?

A. Well, the high at the points -- now let me point

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

out, sir. It's conceivable that -- these are points on the -- elevations at points on the Red Bed. It's conceivable, too, that the Red Beds could be even lower if you drilled in between these two control points, but we know that the elevation, based on drilling data, on the Red Bed high, we know that we do have elevations on there that are only three feet in excess of the elevation of the Red Beds at the disposal well.

COMMISSIONER RAMEY: You have a three foot high?

A. Yes, sir.

COMMISSIONER RAMLY: How far, this abnormalty in the water table, how far does it extend from the disposal well? Would you review that for me, please?

A. Well, the scale on this map, Mr. Ramey, is one inch equals five hundred feet. We actually have a -- we actually have a mounding out here, well, it depends on where you want to call it. If you want to take the extent of that point where it rounds out there, we're talking about something approaching five hundred feet on either side of the disposal well, or the disposal well area.

COMMISSIONER RAMEY: Thank you, Mr. Galloway. Mr. Jones, you may proceed.

Q. (Mr. Jones continuing.) Mr. Galloway, if you will just step up to I believe it's Applicant's Exhibit Five, and if you would explain that exhibit for the Com-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

mission, including the manner of its preparation and the collection of the data from which it's based, and so forth.

A. This map shows the change of ground water levels in the study area from the spring of 1978 to August the 11th, 1978. I hope you won't laugh at my art. This is affectionately known as the anteater in our office.

This -- when I say spring of 1978, the initial drilling of test wells took place in March, April, and May, 1978. And this represents the change in water levels. These are measured from the time of the initial static water level measurements in the test holes up to August the 11th.

Now the period of time for this particular map is not the same over the entire map. It depends on when the hole was drilled, because these were drilled over a period of time; consequently, this is why I called is spring.

But this is the change from the initial static water level measurement up to August the 11th. This is the change in feet of water levels in the area.

Q. What interval is covered by spring, so we can have a way of -- from what month to what month are we talking about?

A. March. The initial measurements, the initial static water level measurements there were made in either March, April, or May of 1978.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. How are these water level measurements made?

A. They were made, sir, with a steel tape.

Q. Were they made by members of the staff of the State Engineer, and who makes these measurements?

A. These measurements, sir, were made by employees of the State Engineer Office.

Q. How precise are these measurements as far as you folks care to treat them?

A. Well, we measure them. We record our records in hundredths of feet. I feel that the records are probably correct, the measurements should be -- well, there's other factors, but they should be well within the limits of a tenth of a feet, probably less than that.

Q. How is the elevation of the test well site determined?

A. The elevation, sir, was determined by a leveling.

Q. This was shot by members of the State Engineer staff, also?

A. Yes, sir, this measurement was accomplished by the staff of the State Engineer.

Q. On all of the wells?

A. Yes, sir.

Q. And have the levels been checked?

A. Yes, sir.

Q. They've been checked and verified, is that cor-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

rect?

A. Yes, sir.

Q. Okay, if you would continue, then, with your description of the various zones shown on the exhibit.

A. Okay. For this period I have three colors indicated on the map. The red is the area in which the altitude of water table decreased or declined.

Now, then I have the yellow, which is the area in which the altitude of the water table remained essentially unchanged, and then the blue is the area in which the altitude of the water table increased, or it came up.

Now, we have here zero lines. This is a line -- I contoured these data, I have a zero line here, and you will note that I have colored for one contour interval on either side. That means that the change of water level in here, within the yellow zone, is plus or minus one-tenth of a foot. Now this is not much of a fluctuation and this is -- this would take care of, perhaps, errors in our observations.

So in this area I feel that for all practical purposes the water levels remained essentially unchanged.

In the area of the red, however, the water levels there exceed a rise of one-tenth of a foot in that period of time. As a matter of fact, they go on up; there are more contours indicated in there. The interval is one-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

tenth of a foot.

Now, in the --

Q. Just a minute, Mr. Galloway. You said rise. Are you using that to indicate a -- you meant that to indicate a downward change, didn't you, in excess of a tenth of a foot?

A. I'm sorry, sir. This is a decline. The red is a decline; the blue is a rise. I'm sorry.

Q. Is there any trend so far as you can determine in the extent of the decline in the red area?

A. This red area, based on this map, indicates that we have water levels declining in the vicinity of the disposal well, and that outward in the surrounding area, the water levels are rising.

Q. What was the amount of decline over what interval noted adjacent to the disposal well?

A. At the disposal well we had a decline -- and I might say, this is the maximum decline we measured, of .38 feet, a little over a third of a foot.

Q. In what -- over what interval of time?

A. I believe, sir, that would be from March. I believe that was a hole that was drilled in March.

Q. So would this be from the latter part of March up until August 11th?

A. This would be from the latter part of March

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

up to August 11th.

Q. Was any greater decline noted at any other well in the field, test well?

A. Within the area in which we measured water levels, sir, that is the greatest decline that was noticed. I might say, sir, that water level was measured in March, 1978, on this particular map. The date, the month that the measurement was made in is indicated in smaller letters.

Q. Was the density of this salt water in the vicinity of the disposal well considered in these measurements of decline?

A. In the case of these measurements, these were made in open, uncased holes. Consequently, no correction was made for density.

Q. Now when you say "these", Mr. Galloway, you're referring to what?

A. To the observation wells in which the water levels were measured.

Q. The colored area?

A. Well, the color coding, sir, indicates whether the water levels went up or down.

Q. Now, the observation well is cased, isn't that right, Mr. Galloway?

A. Yes, sir.

Q. And is it saline from top to bottom?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Inasmuch as the water was pumped up inside the casing, I would assume that we have a saline water column from top to bottom, because it is cased.

Q. And that would be compensating for density, is that right?

A. Yes, sir, you'd have to compensate for density in that particular well.

Q. Now, is this an anomalous condition, Mr. Galloway?

A. In my opinion, yes, sir.

Q. Why ought there be a decline in the water table in the vicinity of this well, or should there be?

A. Well, normally I would not expect a decline because water level declines ordinarily are associated with pumpage, and to the best of my knowledge, and to the best of the State Engineer's knowledge, there's no pumpage in this immediate area. There's no pumpage here. Now, we've had some irrigation pumpage over to the east and we have some pumping farther south, but as I recall, the closest well to this is something in excess of half a mile, and it's a domestic water well.

COMMISSIONER RAMEY: Mr. Galloway, on the basis of your Exhibit Five here, do you think this well is leaking at this time?

A. I think the well has leaked, sir, and it's either quit leaking or else it's leaking at a reduced rate.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

But in my opinion, this well has leaked.

COMMISSIONER RAMEY: If it were contributing water to the Ogallala, wouldn't you have some kind of a mound there instead of a depression?

A. We really don't have a depression, sir. We still have a mound, because this is merely change. Basically our mound is just lower. It's not -- the hill is not quite as high as it was.

COMMISSIONER RAMEY: Okay.

Q. (Mr. Jones continuing.) You're testifying to a rate of change, aren't you, Mr. Galloway?

A. Yes, sir, this is change in a period of time.

Q. You're not testifying that there's no longer an anomalous high in the vicinity of this?

A. No, sir, because our water level data indicates an additional table, and so forth. I mean basically we still have the mound there. It hasn't changed enough to erase it.

Q. Now, Mr. Galloway, just to generally talk about these techniques that you've been using, are they accepted in the water resources work, or is this something that you derived for the purposes of testing this situation?

A. Water level change maps, sir, have been drawn for -- well, I've seen reports that go back to where they have had them for forty years, nearly. It's a standard

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

procedure, and as a matter of fact, they're published by the Geological Survey regularly, and they're used generally all over ground water investigation.

Q. Is their precision, or your claimed accuracy in these measurements, untypical or is this also typical in this --

A. Well, ordinarily in -- well, ordinarily. I mean I can speak, I can only speak for New Mexico -- well, I could speak for Arizona, since I used to work in Arizona, but it's standard procedure to measure water levels with a steel tape to 100 foot, and typically water level changes, they give the changes in hundredths of feet. This is the standard unit.

COMMISSIONER RAMEY: Are these measurements made from the top of the hole or the bottom of the hole?

A. They're made from the top of the hole, sir. These are made from land surface.

MR. BROWN: How do you do it? Just describe the technique.

A. Okay, sir. Inasmuch as these are uncased holes what we did, we took a -- well, in one case, in one set of measurements -- well, in July 11th we used a two-by-four. I'm referring to this Exhibit Six, but we used a two-by-four about somewhere between three and three and a half feet long, and we laid it out across the hole to get away

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

from the problem you have of erosion right at the mouth of the hole. Normally, you measure them at the top of the casing or from some point like that, but in this case we laid a two-by-four down and measured from the bottom edge of the two-by-four.

When we did in August, this procedure was the same. We had a piece of angle-iron that was somewhere in the neighborhood of three to three and a half feet long which was laid across to try to get the land surface in the vicinity of the hole and get away from the problem of any erosion you might have had right at the mouth of the hole.

I feel these measurements are as accurate as they can be made.

Q. Is this a sensible approach to this problem in your opinion?

A. In my opinion, yes, sir.

Q. Is there anything unusual about attempting to analyze this problem in terms of water levels that are measured?

A. No, sir, not to me.

Q. Would you step up to Exhibit Six, please, Mr. Galloway, and describe it for the Commission, please?

A. Yes, sir. This exhibit is essentially the -- it's the same type of exhibit as the previous exhibit, except this map shows the change in water levels from July

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

14, 1978, to August the 11th, 1978.

Q. Why was this particular map prepared, Mr. Galloway?

A. Well, as I pointed out, Mr. Jones, this map, the initial water level measurements were not made on the same dates.

Q. You're referring to Exhibit Five?

A. To Exhibit Five, yes, sir. These were made -- these were the static water level measurements that were made after the drilling of each hole and these measurements, the initial measurements spread over a period of about three months.

We got a pattern here, but recognizing the fact that this pattern could be influenced by the difference in time interval, we decided to go out -- and we had an extensive set of measurements on July 14th, so we go back on August the 11th. Now, a month's period is a pretty short time, but we go back and we decide to check to remeasure to see if we had any kind of a pattern of water level change within this month. And these -- this change is from July 14th until August the 11th. So all these measurements are compatible as far as period of time is concerned.

Q. Are the colors, the red area and the yellow and the blue, are they of the same significance in this exhibit as they were in Exhibit Five?

A. Yes, sir.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. And can you just generally describe for the Commission the findings as far as the rate of change of the water level as noted in this Exhibit Six?

A. Again, as I stated, the red indicates the area of maximum change. In this case, now, my interval, my contour interval, is different because we're dealing with a shorter period of time.

But my maximum water level change, again, my maximum water level decline again occurred adjacent to the disposal well.

Q. That is the pink area that you've noted there?

A. Yes, sir.

Q. Why are there three separate areas that are pink in this map, Mr. Galloway? Is there any explanation of that?

A. Well, our mound, I think, may be getting low and it may be that -- well, in my opinion, it perhaps is related to permeability, because we do have -- we do have thicker saturation here. Then we have a valley coming across south of the well on either side of that Red Bed high, and in my opinion it has something to do with permeability, but to get real specific, sir, I can't do it.

Q. Now, I note that in your map, your Exhibit Six, the greatest change noted was nine-hundredths of a foot, wasn't it, Mr. Galloway?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Well, yes, sir.

Q. Now is this a measurement that in your opinion is of some significance in light of your decision to disregard the yellow zone on your Exhibit Five? Can we attach any significance to that nine-hundredths of a foot?

A. Well, again, this is the maximum -- this is the maximum decline that we noted in this particular period of time.

Q. Were other smaller changes noted in the water levels radially outward from the well?

A. Yes, sir. In the area outside the red, the area colored yellow, well, then the changes there are less out to the zero. Out to the zero this part of the yellow between the inside the zero-zero, this is -- this is a decline. The yellow outside the zero, out here, this represents a plus, and again I worked with this range here, plus and minus one contour interval, the same way that I did here, and considered this within this area right here to be essentially unchanged. It's plus or minus one contour interval.

Q. Now is the area, so far as you can determine, around this disposal well gaining, the water level?

A. Well, based on our information, we have rises of water level to the northwest. We have them to the southwest and we have them to the east and southeast. I do not

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

have the control, but I feel that this same picture would extend -- well, I have a plus, I have a plus to the north and I believe that the pattern of water level rise is occurring completely around the area of decline.

Q. Now you have a point, Mr. Galloway, off the bottom there that isn't plotted in that shows a decline of two-hubdredths of a foot. That's not included in your map.

A. No, sir, I did not include that in my map. I stopped my contour up here on my control point. That's why I didn't bring the blue on around.

Q. Is this again an anomalous condition, in your opinion?

A. To me it seems a little strange that I can have a water level decline in an area of no pumping and have that area completely surrounded by water level rises.

Q. Did you encounter anything in your investigation of this area that would explain this lose or this decline in water level?

A. Well, sir, from our mapping of the water table, our map, and it's been previously testified, that we have a mounding of the water table in the vicinity of this disposal well, consequently, if the well ceased to leak and if we assume that this is the source, if the source ceased to exist, then the mound would dissipate and literally, it

sid morrish reporting service
General Court Reporting Service
525 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

would amount to the water flowing off the top of a hill and down on the side slopes. In that case, as the water moved off the top of the hill, off the top of the mound, then you would get a lowering on top of the mound. You'd get a minus water level.

Q. Well, Mr. Galloway, you sat through that hearing at the end of May, didn't you?

A. Yes, sir.

Q. And you heard the testimony of Mr. Gannon that there hadn't been anything done to remedy leaks at that well, didn't you?

A. Yes, sir.

Q. So you really haven't got any basis for saying that it ceased to leak, have you, other than the diminished rate that you've observed here?

A. That's correct, sir.

Q. You don't know that it has stopped leaking, do you?

A. As I said, sir, it's either stopped or else it's leaking at a reduced rate. Either way the effect would be the same and I could not say which.

Q. Okay. Why don't you sit down a minute?

Are there any -- are there any native salt deposits in the Ogallala in this area, Mr. Galloway?

A. Not to my knowledge.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Has any other source of this contamination been suggested to you? At any point during this investigation?

MR. HENSLEY: I'm going to object to that question. That's beyond the scope of the call of the docket in this hearing. We're talking about the "BO" Salt Water Disposal Well No. 3 in the hearing and the hearing relates solely to that well.

MR. JONES: I think we're entitled to discuss, Mr. Commissioner, whether or not, Mr. Chairman, any other -- any other possible source could exist in the opinion of the witness, for this contamination.

We have the burden under this docket call of establishing first, that the well has leaked, and second, that it is continuing to leak. It's testified to without objection that there are no native salt deposits in the Ogallala, so it obviously was put into the Ogallala by some manmade intervention, and I think we're entitled to have the record clear on whether or not any opinion of this witness, there is any other activity of man in that field that would account, in his opinion, for the contamination of the test well that's been observed.

COMMISSIONER RAMEY: Overrule the objection. Answer the question, Mr. Galloway.

A. Well, as I pointed out, the Well Number 19, test hole 19, we drilled it because we were wondering about

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

that Amerada well to the southwest. I don't remember the numbers, but the chloride down there was less. I don't remember the numbers. I think Mr. Runyan may have those numbers. I've heard -- I've heard some discussion about a pit there to the west.

Q. In your opinion is this compatible with what you know of the pit problem?

A. Well, I know we've had lots of problems with pits and I'm of the opinion that most pits have contributed salt water to the Ogallala aquifer.

Q. Are you aware of the location of the pit that is being discussed? As a possible source of this contamination?

A. Well, let's see, I believe --

Q. Can you step to one of the exhibits and indicate that location?

A. Well, I'm not -- here it is, right here. Up in the northeast quarter of Section Number 23. This is on Exhibit Number Two.

Q. Do you want to mark that with something so that perhaps we can find that location later?

A. Okay.

Q. Have you circled the pit in question in green pencil, Mr. Galloway?

A. Yes, sir.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. And this is on Exhibit Two?

A. Yes, sir.

Q. In your opinion is that -- any possible contamination from that pit consistent with what you observed with regard to the water levels and the saline distribution, chloride?

MR. HENSLEY: I'd like for the objection to be a continued objection, Mr. Ramey.

COMMISSIONER RAMEY: Would you repeat the question?

Q. Mr. Galloway, for purposes of discussion, is the distribution of chlorides that has been determined to exist in this area, and the water level measurements that you've made in this area, consistent with that pit being the source of this salt water contamination problem?

A. In part, I believe that -- I believe it would be possible to connect it in part with the pit. In other parts of it I don't believe I can really connect it with the pit.

Q. Well, can you explain your answer, please, Mr. Galloway?

A. Well, you're going to have to look at the configuration of the Red Beds. Ordinarily the salt water is going to follow the Red Beds lows. Some of the -- now, that pit, based on the latest revisions of the Red Bed map, I

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

would expect the water from that pit to move to the northeast.

Q. Are you familiar with the interval of time during which that pit was used, Mr. Galloway?

A. I'm not familiar with it. It's my understanding, though, sir, it's been abandoned for a long time.

Q. Would that have any effect on whether or not it could have caused the contamination we're dealing with in this case?

COMMISSIONER RAMEY: I don't think he can answer that question, Mr. Jones, if he doesn't know how long the pit has been abandoned.

A long time, maybe two years, Mr. Galloway.

Q. How long did you mean, Mr. Galloway?

A. Well, it's my understanding it was abandoned something like fifteen years plus ago. I really don't know, sir. I really haven't concerned myself with that pit because my principal concern is putting together the data.

Q. Would the pit cause a rise in the water levels around the well?

A. No, sir.

COMMISSIONER RAMEY: If it were leaking and the water were going to the northeast, in that direction, isn't that the direction of the well from the pit?

A. With twenty years -- with fifteen plus years of

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

time, sir.

COMMISSIONER RAMEY: You don't know that, though, Mr. Galloway.

A. I don't know that, no, sir.

COMMISSIONER RAMEY: But if there were water going out the bottom of that pit and you said it would go to the northeast, wouldn't that in essence raise the water level around the well?

A. I think, sir, that you'd have a -- you'd have a -- the mounding, I don't believe that the pit leaking could mound the water table in the vicinity of the well, no, because the mounding would be a t the pit, not at this disposal well.

Q. Mr. Galloway, have a seat a minute, if you would.

Suppose the Commission's records, Mr. Galloway, were to show that the pit was discontinued in use twenty years ago. Suppose that's a matter of record before this Commission. What effect would that have on your opinion, if any, as to whether or not that pit caused the salt water contamination we're dealing with?

A. Well, that pit, if it -- I mean if it had leaked, I would expect -- and I would expect that it did leak -- that water would have moved to the northeast and perhaps, well, there's a possibility it could move down to

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

the south, to the southeast there, too. It wouldn't have moved out away from the well in a period of twenty years. I mean moved out from the pit in a period of twenty years.

Q. Would it still be lingering in the vicinity of that well? Do you have any opinion on that?

A. This depends, Mr. Jones, on what you want to assume on the philosophy of ground water movement.

Q. Well, does the Ogallala move?

A. Certainly.

Q. Do you know how fast it moves in this area?

A. I don't have -- I don't have the figures right at the moment from the top of my head what the velocities are, because I don't concern myself with that.

Q. Now you stated your opinion several times during the course of your testimony, Mr. Galloway, that in your opinion this well, "BO" 3, was the source of the contamination we're dealing with, is that right?

Didn't you state that in your opinion the well had leaked?

A. I'm of the opinion that the well has leaked.

Q. Would you very succinctly and carefully state for the record the basis of that opinion?

A. Well, I have -- there is three reasons why I think the well has leaked.

One, we have a saline water anomaly that is

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

concentrated in the vicinity of this well. Basically, the well is the locus of an anomaly. We have a water table mound which coincides with the saline water anomaly in the location of the well, and now we have an anomalous water level change that also coincides with the location of the well, the saline water anomaly and the mound on the water table.

And I think when you take these four different factors, the fact that all these coincide indicates to me that the well is -- has contributed salt water to the Ogallala.

Q. Do you know anything about a possible mechanism of this leak, Mr. Galloway? Are you aware of the casing tests and the tubing tests, and so forth, in the fall of '77 and the spring of '78, aren't you?

A. Well, I remember from the previous hearing, Mr. Jones, that there was testimony concerning casing surveys and the like.

Q. Suppose this well had been fixed in March of 1976, Mr. Galloway, would there be any residual mound remaining, in your opinion?

MR. HENSLEY: I object to that question on the basis that there is no evidence in this record whatsoever that the well had been "fixed" in March, 1976.

If the question is intended to imply that the casing leak existed, because it did not, all of the evidence

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

is to the contrary, and the witness cannot speculate upon facts which are not in the record.

MR. JONES: Well, if I might respond. I think we're entitled to show that this water table mound, if we can, that is dissipating can be a residual mound from some earlier period of time, including March of '76. There is, I think, a rather sharp conflict in the testimony. We have the testimony of Mr. Gannon, who unequivocally is willing to swear thatthe well has never leaked, based on whatever access to information he had.

But I think Mr. Galloway can testify that in his opinion a residual mound would remain some two or two and a half years later, if in fact that's what happened.

MR. HENSLEY: Well, I think this line of inquiry, Mr. Ramey, has gotten to the point where it involves simply an inference on an inference on an inference without any foundation in fact.

COMMISSIONER RAMEY: I agree with you, Mr. Hensley, and I'm going to sustain the objection.

MR. JONES: I don't have anything else.

COMMISSIONER RAMEY: Ten minute recess.

(Thereupon a recess was taken.)

COMMISSIONER RAMEY: The hearing will come to order.

Mr. Hensley, do you have any questions of Mr.

arid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Galloway?

MR. HENSLEY: Yes, sir.

CROSS EXAMINATION

BY MR. HENSLEY:

Q. Mr. Galloway, it's my understanding that since the date of the last hearing, when this observation well was drilled, which I believe you identified as Well No. 20, that well was in fact cased and a recorder was put on it, is that correct?

A. That is correct.

Q. Now, what was the purpose of putting the recorder -- recording device on that observation well in the vicinity of the wellbore of the "BO" Salt Water Disposal Well No. 3?

A. Well, the primary purpose was to see if we could observe any fluctuation in the water levels that might tie in with periods of injection, or something like that. It was merely another tool for us trying to get the answer to the problem.

Q. Is it correct, sir, that the hydraulics of these water changes are such that if there was in fact communication between the Devonian and the Ogallala through this injection well, that that water table would fluctuate with injection?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. I would expect it to, yes, sir.

Q. It's just like putting water into the end of a hose, it's going to run out the other end, isn't it?

A. Yes, sir.

Q. And isn't it a fact, sir, that the drum which was placed on the recording device which measured these water levels immediately adjacent to the wellbore reflected no significant change at all in water level during injection?

A. Mr. Hensley, I have not worked with that set of records. Mr. Wright, of our office, has been working with that recorder, and I believe Mr. Wright will testify concerning the recorder and that well, and so forth, because he did it. This was handled under his -- by his people under his supervision. I did not participate directly in it.

Q. If there had been any change in the water level, that would have been significant to your water level study, would it not?

A. Yes, sir. Well, as far as I'm concerned, no fluctuation, or fluctuation either positive or negative data. I mean this is part of the process of trying to get the answers to the problem.

Q. Right.

A. It's just another tool.

Q. But based on your experience as a hydrologist,

arid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

if there had been any noticeable change, and it would have been noticeable at 10,000 gallons a day, if that change had occurred, then you could have established some communication, could you not?

A. Well, if I had -- if I worked with the recorder chart and I saw a fluctuation that tied in with injection, I would assume that the well is leaking. I think you'd have a pretty good foundation for it.

Q. I understand that Mr. Wright is predominately responsible for this experiment, but let me ask you, have you seen the chart that came off the well?

A. Just briefly, sir. The charts were pulled day before yesterday in the afternoon and some of the people were working on the charts yesterday morning in Roswell. I have seen them; I have not examined them in detail, no, sir.

Q. Okay. All right, now Exhibit Number Two is, as I understand it, is a re-map of the Red Bed topography, is that correct?

A. Correct, sir.

Q. And basically re-mapped to show that the mounding is -- is not as pronounced immediately south and west of the well as was shown on the topography map introduced at the first hearing, is that correct?

A. Well, I don't believe I'd call it mounding, sir.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

The Red Bed high is not as high as I had previously mapped it.

Q. Okay. There is a high of the Red Beds, though, in the area?

A. There is a slight high, yes, sir.

Q. Wouldn't the high in the Red Beds in and of itself explain this mounding anomaly, which you -- you've concerned yourself with, without anything else?

A. If the mounding were further south,yes.

Q. The high in the Red Beds is right in the area where you say the mounding in the water table occurs, is it not?

A. Well, basically the Red Beds, the well, the disposal well, is located on a slope down off the highest part of that mound. I mean down off it's basically on the north slope of that Red Bed high. I mean there's some wiggles back and forth in the contour, but basically it's north -- it's down on the slope. I would expect the water table high, the mound, to exactly coincide with the highest point on the Red Beds, and it doesn't quite do it.

Q. But it's -- there's an anomaly in the Red Beds. By that I mean a high in the same area as the mound. It's not exact, but it's in the same area.

A. Well, basically. I believe the ground water mound is to the north of the high on the Red Beds.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. What about the fact that immediately south of this well there's a trough indicated in the Red Beds? Would that fact in and of itself explain this mounding anomaly in the water level?

A. I don't believe I quite understand you, Mr. Hensley.

Q. Is there a trough in the Red Bed topography immediately south of the well and west?

A. No, sir, I don't believe so.

Q. Is there indicated to be a trough in the water table at that area?

A. We have a little troughing in the water table. There's a saddle; there's a saddle in here. Our highest Red Beds are right here, which I closed as 4240. There's a -- we have a low point of 32 -- 4236;in between there's a slight -- there's a slight saddle. Basically the Red Beds are relatively flat in this area.

Q. Is there a ridge which runs through the well to the north and to the east? In the Red Beds?

A. It's on a little Red Bed nose, yes, sir.

Q. Would the presence of that ridge in and of itself explain this anomaly in the water table?

A. Possibly, but in my opinion, no, because when I look at the configuration of the water table elsewhere where we have even greater differences in elevation in the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Red Beds, it doesn't show. It doesn't show these sharp breaks that I get in there.

Q. Actually, though, what you have done by the re-mapping of the Red Beds is to go south and west from the subject well into the area of the mounding anomaly in the water level, you have to go uphill, don't you, Mr. Galloway?

A. From the disposal well to the south you're going uphill, yes, sir.

Q. And conversely, if you go to the north and if you go to the east from the subject disposal well, you're going downhill.

A. That is correct, sir.

Q. Is there any explanation on your part as a hydrologist as to why this well didn't -- if it had leaked, didn't cause these waters to be radially dispersed so that you have the same mounding affect north and east as you do south and west?

A. Well, I believe, sir, that based on subsequent water level measurements, that that mound is more pronounced and has more extensive than what, perhaps, the water table map would indicate.

Q. Well, do you think that it extends to the north and to the east?

A. Based on the water level changes, sir, if my conclusions are correct, the mound has to -- that mound

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

would have extended out virtually in all directions from that well.

Q. Well, actually, as far as the water changes are concerned, which you've shown in your Exhibits One through Five, the water has decreased. The water level has decreased; it hasn't increased at all.

A. That's the significant fact, sir, it has decreased instead of come up like all the rest of the water levels around it. That's the significant fact in that exhibit.

Q. Well, I know it's a significant fact, but how do you correlate that, Mr. Galloway, with the fact that you claim that the source, the source point for the contamination in the Ogallala, is the subject well?

It would be just the reverse, wouldn't it, sir? The water level would increase.

A. No, sir.

Q. If there is communication in that salt water disposal well between the Devonian and the Ogallala formation, and you're injecting 10,000 gallons a day into it --

COMMISSIONER RAMEY: Barrels, Mr. --

Q. 10,000 barrels a day, the water level, if there is communication, is going to increase, is it not?

A. That is correct, sir.

Q. And it has in fact done just the opposite.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. At the moment in time, sir, within the period we have made our study, the water levels are declining.

Q. While we're talking about water levels, are you familiar with the status of Mr. Hamilton's irrigation well?

A. Yes, sir.

Q. Has it been pumping?

A. Not to my knowledge, sir.

Q. How long has it been shut down?

A. Something over a year, I believe, sir.

Q. What was --

A. I can't give you the exact dates.

Q. What was the volume on that well before it was shut in?

A. I don't know, sir. It's an irrigation well.

Q. When an irrigation well is pumping out of the Ogallala, do you have a cone of depression around the well?

A. That is correct, sir.

Q. And what happens when you cut the pump off? What happens to that cone of depression?

A. The cone -- the water level rises and the cone of depression, if you leave it long enough, will eventually essentially disappear; disappear.

Q. And if that water rises, it's got to come from some place, doesn't it?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 983-9212

A. That is correct, sir. It comes from the area outside the cone of depression.

Q. And doesn't that -- a physical fact, the fact that it's got to come from somewhere and the fact that when the cone of depression radially disperses, the water level increases, isn't it a fact that that explains the reason on Exhibit Five why your water tables in the vicinity of the irrigation well have increased and yet in other areas which are in communication the water level has decreased?

A. No, sir.

Q. Why?

A. For one thing, normally this would be correct, sir. But we're faced with a problem. Now we have irrigation over here something over a mile to the east. These wells I do not believe have been pumping for about a year.

Mr. Hamilton is located down in this area. His wells haven't been pumped, I believe, for a couple -- for a year or more. Mr. Hamilton's place, he's got a domestic well. Texaco has a well down here. Amerada has a well in here. Up here toward the highway there's some more irrigation wells.

Now, these wells, when they ceased to pump, certainly, as you would expect the water levels to rise in the cone of depression created by those wells, but we have a rise in water levels, normally this rise, in such

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

a case, would have decreased outward from the point which was pumping. Now, the heaviest pumping, I think, that would affect this, would be right in here, Mr. Hamilton's wells and the wells to the east.

Now, basically in this pattern, here I have a rise of one foot and my rise goes from one foot down to zero. Then I have a decline and then I get up here and the water level starts rising again.

I have the same pattern down here. My greatest rise is down toward these irrigation wells, but I have a rise in water levels, then I have a decline in water levels, and I have a rise in water levels, and I have a rise in water levels that way. And I do not believe, sir, that if you attribute this strictly to recovery of water level due to the cessation of irrigation pumping, that you can say that that rise of water levels should have occurred all over this area. This should all be blue, and inasmuch as there is no pumping in this area, I do not believe that you would scalp water off of just that one point; it should come from entirely around the pump area; not just in one segment of that pump area.

Q Well, I didn't mean to suggest to you that it was going to increase. My suggestion was just the opposite, that it was going to decrease. The water has to come from somewhere.

and courtroom reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Okay, sir. If it decreased,--

Q. And it has decreased, has it not?

A. It has decreased in this area.

MR. JONES: I hate to interrupt, but for the record, Mr. Galloway, when you point to Exhibit Six, would you talk about Exhibit Six, and when you point to Exhibit Five, would you talk about Five, sir?

A. Okay, sir.

Q. I'm addressing my question, sir, to Exhibit Five.

A. Okay, sir. Okay. This -- some of this rise in here, certainly this blue, I would attribute that to the cessation of irrigation pumping. This is a normal rise in water level.

And then I get a decline in water levels but yet the water levels rise up here.

Q. Well, can't that --

A. I would have expected this rise to gradually, shall I say, taper down from one foot down to something like a hundredth of a foot more or less at an even taper over that entire area.

But I have -- I have a rise in water levels that goes out to zero and then the water levels start declining and then the water levels come up, and if this is due to cessation of irrigation pumping, I would think that

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

this rise should continue right on across this area, since I have this rise up here.

Now, I might point out, that out in this yellow, and these yellow -- these are not very big declines, but I cannot -- I would expect this rise to extend on and not suddenly have declines right in the middle of it in just one patch of the aquifer.

Q. Well, but for that normal decline gradient to occur, you'd have to have uniform permeability throughout that section. You'd have to have uniform travelways, or transmissibility in the bedrock, and that just doesn't exist, does it?

A. Based on the results we've had from our test drilling, I do not believe, sir, that you can attribute the observed -- the observations we have made in regard to these changes of water levels to that -- to such drastic changes in permeability.

Q. It's one explanation, though, that is a factor.

A. Well, if you want, sir, to limit it, but you're going to have to limit that drastic change of permeability to one local area, and I cannot conceive of that being true.

Q. What about change in barometric pressure? What affect does that have on water tables?

A. Well, water levels fluctuate with barometric

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

pressure.

Q. Have you taken that into consideration?

A. We have not run barometric tests, but this is a -- this is basically unconfined water. Consequently, barometric pressure is not a major factor in it.

If I were dealing with an artesian system, that's something else.

But I do not believe that the barometric pressure -- and even then, our barometric pressures, they should be -- well, we're dealing with a local area, they should be about the same all over.

Q. Well, if you have a substantial change in barometric pressure, though, or a substantial decrease in barometric pressure, won't that have a pronounced change on that water level?

A. Not necessarily. It may range from zero to 100 percent efficiency as a water barometer, if you had a confined -- I mean this is the extreme as you can get.

Q. What about temperature changes in the weather?

A. Temperature changes basically produce barometric changes. The barometer certainly, of course, as the air warms up, I mean, it becomes lighter, and as it becomes colder, it becomes heavier, so you get a barometric effect as a result of changes in temperature.

Q. What about seasonal fluctuations in this aquifer

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

out there, from year to year, in the water table?

Is there any reason to think this doesn't occur and hasn't occurred every year?

A. Well, certainly water levels are going up and down in the aquifer over a long period of time; however, Mr. Hensley, we're dealing with a relatively short period of time. Here we're dealing with a period of about a month and here we're dealing with a period of from, say, four to six months.

Q. Now, insofar as the water tables are concerned I believe you've indicated, sir, that you made a correction for the density of chloride in the observation well, which is immediately adjacent to the wellbore of the subject disposal well.

A. Well, that well, sir, is not -- that well is not included in these maps.

Q. It's not?

A. No.

Q. What about the water level map?

A. The water level is just plotted on there but it was merely added -- it is corrected for density where it's shown on this map.

Q. There's an abbreviation next to that correction indicating that that was corrected to fresh water equivalent.

A. Yeah.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Isn't it a fact, Mr. Galloway, that every other water measurement on the entire contour is on formation water?

A. We have a unique difference, sir. This water is in a -- this water level is being measured in a cased well, whereas the others are being measured in uncased wells.

Q. I understand that, but in the uncased wells you're measuring the water level at formation level, are you not, and yet you corrected for fresh water density in the observation well?

A. Well, I don't believe I quite follow you, Mr. Hensley.

Q. Can you make a correction mathematically so that the water level in the observation well is based on the same parameters, that is formation water, as all the rest of the test holes observation points?

A. Yes, sir, and this correction has been made.

Q. What do the initials I think it's EFW?

A. Equivalent fresh water.

Q. Is equivalent fresh water the same as formation water?

A. This correction, sir, was made to make this water level compatible with the other water levels inasmuch as we were dealing with a casing filled with brine, or with highly saline water.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Yes, sir, I understand, Mr. Galloway, but my question is, isn't it necessary that you correct all of the other observation wells, cased or not, to an equivalent fresh water factor? Otherwise, you're comparing apples to oranges.

A. No, sir.

Q. Is that right?

A. In an uncased hole, sir, the water column, once it's settled down, the water column inside that bore hole and immediately adjacent to that bore hole, since it's not separated by any kind of a tubing, should be identical.

You've got the same layering in both sides of the monometer.

Q. Do you take into consideration the layering when you make a fresh water equivalent change by calculation?

A. We contoured, sir, the water level as measured in the well on all these uncased holes. These are the water levels where they stand. No attempt was made -- I mean these are merely measurements to the top of the water of where they stand in uncased holes.

Q. Are all those wells uncased?

A. Yes, sir.

Q. None of them have any casing in them?

A. Well, we've got to stay with -- well, we've got some irrigation wells, and so forth, way down here, and

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

they're not in -- they're not in this area.

Q. What about some of these test holes? Don't they have plastic tubing in them?

A. No, sir.

Q. None of them do?

A. No, sir. The only cased well out there, sir, is this new observation well that's been equipped with a recorder.

Q. I think we covered this a little earlier in the testimony, but isn't it a fact, from a hydrological standpoint, that if this well were leaking, based on these volumes that are being injected, that that ground water in fact would increase immediately around the wellbore radially?

A. I would expect it to, yes, sir.

Q. And when it in fact decreases, isn't that conclusive proof to a hydrologist that there is no communication?

A. No, sir.

Q. Why?

A. I think, if you'll permit me to, Mr. Hensley, there are indications that at the time this study was initated, we had a mounding of the water level, of the water table, in the vicinity of this well. Now that mounding is now -- the mound is now dissipating.

We had a mound build up. Now I think that the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

evidence, as I see it, indicates that some point in time we had an addition of water to the Ogallala in the vicinity of this injection well; however, I think the evidence points out that we are now dealing with either a cessation of leakage or a reduction of leakage. Either one, if you build up -- if you add water and you build up the mound, and you start adding less water or quit adding water from that source, then that mound is going to decrease.

Q. So that the only way that this can be tied in to any type of communication with that salt water disposal is to make the assumption that this salt water disposal well was leaking and has now cured itself. And by leaking, we're talking about tremendous volumes of water, aren't we?

A. Well, I mean, based on your injection rate, I believe the testimony was about 11,500 barrels, and I believe it's 330-some gallons per minute. Certainly this would have mounded the water table up some three and a third times what these curves show, and if it -- now, if you reduce the rate of leaking, or if the leakage had ceased, then this mound is going to go down.

Certainly it would have mounded the water level up.

Q. And the volume of water required under these radial exhibits, which are Exhibits Four, would cause that

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

water to go over that mounding area, would take one-third of the total volume injected, approximately.

A. Not necessarily, because assuming that --- okay, let's take the five year curve, or whichever one you prefer, sir.

For example, let's take the five year curve on Exhibit Number Four. Based on the condition that we have in the area, at the end of five years at the distance of 1000 feet, we could have a two foot rise in water table with a leakage of 100 gallons per minute.

Q. And that's almost a third of the volume, right?

A. That would be --

Q. You said 350 gallons.

A. 350, 330.

Q. Okay, so this well, in order to even rise two feet would have had to have been leaking approximately one-third of the total injected volume into the Ogallala.

A. Basically, sir, yes, in round numbers.

Q. And you had that size leak -- that size leak would have had to cure itself in order for this anomaly in the water tables to be explained as connected with any type of communication in this well and the Ogallala formation.

A. I mean you have the possibility of it being cured by itself or you have the possibility of somebody helping it get cured. I don't know.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Well, do you know of any evidence, Mr. Galloway, that anybody helped this well --

A. The testimony is that nobody has bothered the well, sir.

Q. All right. Now on these radial studies that you've made, which I believe is Exhibits One through Four, what is the vertical line in each of the four different segments of that exhibit?

A. This is -- this would be basically -- okay, let's say that we have -- well, for purpose of illustration, let's say that this is a hole; make it a well. This would be merely the vertical extension, just a -- just a line extending right up the center of that bore hole.

Q. It's a vertical source, then, rather than a point source, as you explain it?

A. Well, it's a point source at the bottom. I mean you have a -- okay, it would be like this vertical line, sir, if you assume that this is -- this is a flat surface, then that vertical line on there represents the same thing as this point.

Q. All right, sir.

A. It's just a vertical line. This thing -- these things are really circles.

Q. Okay, and --

A. I'm just showing the cross section of a circle.

825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. I understand, sir, and that implies, does it not, sir, the exhibit itself implies, that because this is, in fact, a cross section, that the flow from this vertical source is necessarily radial?

In other words, it's equalized on both sides.

A. Well, it -- yes, sir, it also comes this way and goes back -- it's a complete -- this is the center of the circle. This is the center of the cone and it's generated around that.

Q. And yet utilizing these concepts of hydrology and the explanation of radial flow from an injected point source, we see no evidence of this same anomaly radially around the wellbore. You've got it centered in only one direction.

How do you explain that?

A. I don't understand, sir, what you're getting at.

Q. Okay. Why isn't this same -- same effect under this hypothetical example of water table increase mounding, reflected to the north and to the east at the same amount radially as is shown on your map to be present south and west?

A. Well, it would be the same in all directions, sir.

Q. But it's not, is it? Your contamination, as a

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

matter of fact, would be much more likely to occur north and east, because you've got a valley going straight to the north and east from the well downhill.

A. I would expect, sir, that the -- that a significant part of the saline water would move to the north and east; however, inasmuch as if you were mounding up the water table and you had water coming up from a point source, I think that these calculations would show that it was within the realm of reason to expect that some of that water would have spilled across this little Red Bed high to the south.

Q. Well, even if some of it did, most of it would have gone north and east, and it looks to me like from your chloride samples, some of those wells north and east indicated normal chloride content.

A. I believe, though, sir, now my experience has been in dealing with saline water, that they normally, because of their density, move to the bottom of the aquifer.

Now, I realize that -- I believe that right there was a test hole.

Q. Yes, sir. You've looking at Exhibit Two?

A. Exhibit Two.

Q. In the northwest quarter?

A. Of Section 24.

Q. Section 24.

A. As I recall the water analyses, that was -- water

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

wasn't too bad; however --

Q. I believe it was 130 parts per million chloride?

A. Something like that, yes, sir. But if water had spilled at all, this basically, in my opinion, would be to the north and -- well, basically to the north and northwest of the principal direction of the movement of the saline water because now we've got another little trough coming in here. We've got that well sitting here and we've got the possibility that part of this water -- as a matter of fact, in my opinion water could move right over here, like this.

Q. Now, for purposes of the record, Mr. Galloway, will you indicate the direction which you're indicating on Exhibit Two?

A. I am moving from the site of the disposal well generally northeastward along the trough in the Red Beds up to the vicinity of a point that's labeled 4207.

Q. Uh-huh.

A. Now that's a low in the Red Beds there.

Q. Well, on Mr. Runyan's water quality map, or chloride map, which was introduced in the prior hearing, there actually were three test holes immediately north and immediately west of the subject disposal well, all of which were very low chloride content.

A. I believe that's correct, sir.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. If there any way to explain why that's not the high if this theory of radial disperseion from this communication in fact occurred?

A. This -- these calculations basically would be based -- let's just say this is a perfectly flat, level water table, my base line at the bottom. This is a flat water table. This is on Exhibit Number Four. But the line labeled distance from point source, let's assume that that is the water table. Well, then these mounds would raise up from that level, flat surface. The water table is not flat. The water table has a slope, and you have water in this area moving from basically northwest to southeast.

When you superimpose this mound on top of the sloping water table, and with the natural movement of water, the brines would tend to move more readily towards the southeast than they would to the northwest.

Q. Why is that?

A. It's merely the water sweeping them in the direction of water movement in the ground water reservoir.

Q. I thought that there was a mixing of this brine when it came in contact with your fresh water aquifer.

A. All the data I have, sir, indicates that you get -- in some of these drill holes you have to get down pretty close to the top of the Red Beds before you get saline water. The saline water tends to be concentrated at the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

bottom of the aquifer.

Q. Is the water movement on Exhibit Two to the east? On Three, I'm sorry?

A. Locally, yes, sir, it ranges from basically east to southeast. As a matter of fact, the direction of movement seems to turn. In the north -- looking now at Exhibit Four, in the northwest part of Section 24 our movement is basically east, but as we come down across the section to the east, we tend to get a movement of water that seems to turn and go southwards. And I point out, in my opinion, this is a reflection of this Red Bed topography in this big trough that we intersect here. I believe that the turning of this water table reflects the Red Beds, right there.

Q. Okay. You indicate that on Exhibit Two there's a big trough which extends north of Section 24 and then cuts through the east half of Section 24, is that it?

A. That is correct.

Q. Actually, there's a direct valley in communication with that from the disposal well, is there not, in a north and east direction?

A. Yes, sir, and you really have -- well, you have the valley extending from the disposal well basically northeast to the vicinity of the point labeled elevation 4207, and then it wouldn't take much to spill it off into another parallel valley a little bit to the north of that, which is

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

in the vicinity of the two points labeled elevation 4218 and 4213. There's another little trough, both of which are tributary troughs to the main trough.

Q. In connection with your comment that this water would have intersected that valley in the Red Beds, is that correct terminology?

A. Correct, yes, sir.

Q. In the east half, there also was a chloride sample taken from a well in the same area you pointed to, which would be in the northeast quarter of that section, showing only 8500 -- only 85 parts per million chloride.

COMMISSIONER RAMEY: The northeast quarter, Mr. Hensley?

MR. HENSLEY: Yes, sir. It's actually, yeah, in the northeast quarter.

A. Is that this point right here?

Q. Yes, sir.

A. One of these points.

Q. Yes.

A. Okay, sir. Inasmuch as we tend to have the water, the saline water, moving to the base of the aquifer because of the density, I would expect the more highly saline water to have been farther out here in this trough. Since these are up on the hillside, they may be above the mainstream of saline water that's moving down this trough.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. I see.

A. They're up on the side slopes. This is the same situation we have up here, Mr. Hensley, right near the northeast quarter, you're up on the side slope and the salt water would probably sweep down through the lower part of the Red Bed trough and it's up on the side slope out of the saline water.

Q. And on this same chloride map, which was introduced by Mr. Runyon, and I don't recall the number that he gave to it, dated May 1, 1978, it also shows a water well along the extreme northeast boundary of the northeast quarter, showing a chloride content of only 70 parts per million chloride.

A. I might point out, Mr. Hensley, that that, too, is on a Red Bed high up above. It's on a Red Bed high that has troughs both to the northeast of it and to the southwest of it.

Q. But there are no water samples in between those two --

A. There are no water samples to my knowledge, sir, between those.

Q. Let me ask you about the Exhibit Number Six, Mr. Galloway. I believe that in the course of your direct testimony you indicated that the largest change, or most noticeable change, was nine-hundredths of a foot?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Yes, sir.

Q. Where is that reference point?

A. This is an exploratory hole that was drilled just a few feet from the injection well.

Q. Did you indicate earlier that a margin of error within one-tenth of a foot is possible on these water level measurements?

A. I think that's the maximum. Ordinarily, I think, sir, as far as the actual measurements, I don't think the error is probably as great.

Q. Okay. Actually a tenth of a foot, that could occur as a consequence of placement of the two-by-four or the angleiron, couldn't it? When you're trying to measure the table?

A. With -- with sloppy work, yes, sir, but I mean care was taken. I mean, recognizing this problem, care was taken to try to get the most reasonable measurement that could be made. I feel that the measurements were made -- I believe, sir, they're as accurate as we could expect to reasonably get.

Q. Well, realizing that I'm sure you did take them as carefully as could be done. My question is, could you not expect an error of nine-hundredths of a foot in water level measurement at any point on those contours?

A. I can expect errors, sir, but I can expect the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

same -- I can expect error on any point on that map.

Q. Were you present when these water levels were taken?

A. No, sir. These were measured by personnel with the Water Rights Division in Roswell. Mr. Jack Adkins, one of the engineers there measured these water levels.

Q. Was Mr. Wright present?

A. Mr. Wright, I'm not sure, sir.

Q. Now, you indicate, if I understand Exhibit Six, correctly, that there has been, what, a decrease in the water level up to -- that would be in Section 23?

A. Right here.

Q. That would be in the southeast quarter of Section 23?

A. Yes, sir.

Q. Is that a decrease in the level?

A. That is a plus. The water level there came up four-hundredths of a foot at that control point.

Q. And --

A. That is a plus.

Q. I see, you indicate, then, an increase in the water level, which would be in the northwest -- northeast quarter of Section 23, as well, right?

A. Well, we have a -- we have a plus here in the extreme southeast corner of Section 14. I have another

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

plus here just barely down over the line in Section 24, here to the north, and I have pluses completely around the east and south sides of several points in there. Then I also have a plus to the southwest, over in Section 23.

Q. Is it not possible, sir, if you contoured these water levels in the entire section, that this increase in these isolated points which surrounds the disposal well could be explained simply by virtue of the fact that the cone of depression which originally existed when Mr. Hamilton was pumping his wells no longer exists because of the cessation of pumping? Wouldn't the direction of flow, in other words, explain those anomalies?

A. Not this -- in my opinion, sir, the fact that we have an isolated area. Now, I admit my control does not go completely around this. I mean it's not completely surrounded by pluses. Basically it is almost completely surrounded by pluses, or by zeros that were actually zero changes. I cannot conceive why we should have a high, if you'll pardon the expression, in the map in a very local area in which water levels declined, in just a -- in just a local spot, and yet have water levels coming up all around it, particularly when there's no pumpage in that area.

Q. Is that even more difficult from a hydrological standpoint to explain when you're injecting 10,000 plus barrels of salt water a day in a disposal well which is in

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

the very center of the area around which these increases have occurred?

A. If we had a mounding of the water table, sir, and I believe I understand you, if we have a mounding of the water table, which I believe we had, and I think the data indicate that, and we build up a mounding, then I would expect that mound to decline if the discharge of -- from the point source was either decreased or ceased. Then water levels should decline within the area in which that mound existed, due to the dissipation of the mound.

Q. Would the decrease in the water level, assuming that hypothetical analysis can be traced to the well, would the areas where the decrease in the water table served to be in communication with each other?

If there's any relationship at all to this disposal well?

A. Well, certainly the water in this entire area in the Ogallala formation, it's all the same aquifer. It's all in communication.

Q. And yet the three areas you've indicated experiencing a slight decrease in water level over that month or so time of measurement, are not in communication. They're separated by areas of no change.

A. They are all in communication, sir. This entire area is in communication. But this decline -- okay, let

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

me liken this to having a hill. We have a nice round hill out here and we take a bulldozer and we scrap the top off the hill. The hill is lowered but when you scrap the dirt out on the side slopes, the elevation of the side slopes get higher, and I think that would be a reasonable analogy, sir, of what I believe has happened.

Q. Okay, let me ask you this, Mr. Galloway. Since the date of the last hearing has there been any evidence at all introduced through the State Engineer's Office which in your opinion as an expert indicates that this well is leaking at the present time?

A. I have seen no evidence, sir, to --

Q. Thank you.

A. -- indicate it.

Q. Thank you.

MR. HENSLEY: No further questions.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Galloway, I'm a little unclear as to why you make a correction for a cased versus a noncased hole.

A. Okay. It goes back to the old problem of monometers. Whenever you get -- whenever you get fluids of unlike -- of different densities, they have to balance each other. A heavier fluid, for instance, if I took a U-

shaped monometer and I filled it half full of salt water and half full of fresh water, it would take -- say, we have a specific gravity of 1.04, whereas fresh water would have 1.00. That means that it would take 104 feet of fresh water to offset the same weight of 100 feet of salt water with a density of 1.04.

COMMISSIONER RAMEY: I understand that.

A. Consequently, when you confine the water inside the pipe you are creating a monometer in which the density of the water inside the pipe -- now they had this, by the way, this well, I think Mr. Wright will testify to the construction of it since he sat on it -- my understanding is that it's perforated only at the base of the aquifer down in the salt water section. Well, in developing the well and in pumping it, you of necessity have filled the wellbore with salt water, that is pumped up off the bottom.

Now, you have a column, therefore, of saline water standing inside this casing that has a different density from the water outside the casing; consequently, a correction has to be made to bring that up to what the water level -- the water level in the well, sir, is lower than the water level outside the well, outside the casing. If you measured immediately inside the casing and outside the casing with two different entities, you'd get a different water level.

and Recorded Reporting Service
Phone (505) 982-9212

Q. Did you take a water level reading before you cased the hole?

A. You would have to ask Mr. Wright about that, sir. He sat on it.

Q. Now, you're talking about the salt water is at the bottom of the aquifer in this area.

A. Yes, sir.

Q. How do we know this? Outside of the theory did -- were any samples taken at the top of the aquifer when it was first penetrated in the drilling of these wells?

A. On some of this well, now, on some of the wells there were some tests made before they got all the way to the bottom, and you had -- and then when you get to the bottom the water gets a whole lot worse. Now we've also observed this in some other areas, that basically, the -- the brine is on the bottom, because of the -- which I believe is because of density.

Q. But you did in this area take and analyze some water samples from the top of the aquifer and --

A. Well, that is my understanding, sir.

Q. That is your understanding. Now, you talked about the permeability in the Ogallala in this area, that you thought it was fairly uniform because of the water levels and such as that. Did you examine any of the gravels or --

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Well, of course, I've worked with all the well logs. I've worked for years on the Ogallala formation.

Q. What kind of well logs are you talking about?

A. Well, in -- I was actually there present and sat on one well back before the last hearing. I've examined all the logs.

Q. Are these electric logs?

A. No, sir, these --

Q. Or drillers logs?

A. Drillers logs or sample logs.

Q. And these indicate the permeability and porosity?

A. You can look at the samples, sir.

Q. You looked at the samples?

A. I haven't actually looked at the samples per se.

Q. You looked at the logs where it said coarse gravel or fine gravel?

A. Yes, sir, gravel or sand or whatever it might be.

Q. And this would be an indication of permeability?

A. All the data I have, all the subsurface data, indicates that the Ogallala is permeable.

Q. How were the wells drilled, with air?

A. They were drilled with water.

Q. They were drilled with water with a bit?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Yes.

Q. The bit would grind up the samples somewhat?

A. Well, basically the Ogallala is such that it doesn't take much to disintegrate it. I mean you can break it up real easy; It's rather friable formation.

Q. If it some cementing in sand grades or gravel grades --

A. Yes, well then you'd get chips --

Q. -- why it might --

A. Yes, you would still -- well, basically, you can get typical, typical drill samples. I mean that's what you get.

Q. And this might give you a better -- looking at samples, a better indication of permeability than what really existed?

A. Well, not -- not necessarily. I mean --

Q. The action of the bit, the grinding through the formation would not destroy signs of non-permeability?

A. Well, you have the problem, sir, of contamination due to the rotary drilling system. I mean you have the problem of contamination of samples all the way, but of course, when you're looking at samples you learn -- you learn to watch for the continued appearance of stuff you'd already looked at. You're looking for new stuff all the time. I mean it's a standard technique in examining drill samples.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Well, you've made some pretty definite statements, it seems to me, on permeability, Mr. Galloway, which I'm, you know, curious about.

A. Well, Mr. Ramey, down here, right down here, we have enough permeability that Mr. Hamilton was able to produce irrigation water.

Q. Yes.

A. We have enough permeability over here that's able to produce irrigation water, so I mean, when you have a formation that is capable of producing irrigation water, we know it produces up here, when you can produce irrigation water, you have pretty good permeability.

Q. Do you know any part of the Ogallala where you are not able to produce irrigation water?

A. Yes, sir, there are places where --

Q. Perhaps nearby there is irrigation water? Do you know of any instances like that?

A. The principal ones I know of, sir, are due to difference of saturated thickness, but you can get irrigation water down in a Red Bed low and can't get it up on a Red Bed high. These are different; you don't have enough saturated material to give you enough production to make it economically good to produce water for irrigation.

Q. That's the only --

A. Also, as you get -- let me point out, sir, when

you get on a Red Bed high, you seem to have finer sediment, some -- particularly in the basal part of the Ogallala than you do in the draws because the coarser sediments tend to wash to the lower points. That's why a lot of times you'll notice the gravels, when you get into a Red Bed trough, very typical, you'll find gravels down the center of these troughs. When you get up onto the Red Bed highs the gravels are absent because they wash down the slope. They're down in the bottoms.

Q. But you have no control to the north and west of your areas on Exhibits Five and Six beyond what is, say, plotted on Two.

A. No control, sir? We have control --

Q. To the north and west in the unmapped area.

A. In the unmapped area?

Q. Yes.

A. Yes, sir, we have control in that area.

Q. There's a control there? You just didn't extend your Red Bed map?

A. No, sir, we just didn't extend it. I mean this is the control we have. As a matter of fact, when you get to the north and west, Mr. Ramey, we have thousands of control points. We have them clear off the edge of the Caprock.

Q. Well, then I --

Stewart morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Well, yes, it continues on up, sir.

Q. There couldn't be anything like a permeability barrier there in the southeast quarter of -- or in the northwest of the southeast of Section, what is that, 14?

A. I don't think so, sir. I haven't -- I see no indication of it.

I think this permeability would extend right back up here. Now, admittedly, when you -- in the northern part of Lea County when you get back up to the north and west you begin to get into where you have cretaceous rocks immediately below the Ogallala instead of Red Beds, and in some cases you get a little finer sediments up there due to the source of the sediments. I mean, the source material was a finer material, consequently, the deposit material was necessarily finer.

Q. But in general this whole area, the Ogallala is composed of gravels, coarse gravels?

A. Basically -- basically, sir, the Ogallala normally consists of fine to medium grained sand, very -- rather poorly cemented. It has carbonate cement that's rather open. Most of it is generally -- well, once in awhile you'll get some hard stuff in it, but basically, you can crumble it in your hands. Matter of fact, I know some people consider the Ogallala what they call a sandstone; I wouldn't, because the sands, they dis-aggregate very readily,

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

except for --

Q. It's more of an unconsolidated sand than a sandstone.

A. It's more of an unconsolidated sand. Basically, the Ogallala is nothing but a big alluvial sand that extended all the way from mountains to the west of Roswell clear across clear over into Texas. It's a bunch of coalescing alluvial sands typical of the type of material you get deposited on the front slope of the mountains.

Q. Mr. Galloway, have you -- have you ever made any calculations on the amount of salt water that would have to be injected into the Ogallala to cause a certain degree of contamination?

A. No, sir.

Q. That's not possible to do?

A. Well, I suppose, Mr. Ramey, it would be possible to do if you had enough detailed data, but in order to do that I would have to have an awful lot of quality data, both laterally and with respect to various vertical intervals. I mean I'd have to know what the lateral extent and vertical extent was both, and it would take an awful lot of control. If you had enough control I suppose it could be done.

Q. Well, you've got a pretty good series of wells that have been drilled in here to the Ogallala.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Through.

Q. To or through the Ogallala.

A. Okay.

Q. All right, you have your tops of your Red Beds. You have the contours of the Red Beds. You have, I assume, thickness of the Ogallala.

A. Well, certainly, I could take a few thicknesses.

Q. Why couldn't you make such a calculation?

A. If I had the kind of -- if you had -- if you give me an analysis, let's say, every, well, I may be going to extremes.

If I had an analysis on every one of these holes from grassroots at intervals of five feet down to the Red Beds, then from that, I think, you could make some kind of a determination of the volume, but you'd have to know what the vertical changes were in that quality.

Q. Well, doesn't the sample that, you know, has been mixed from the Ogallala -- I think that taking these samples -- correct me if I'm wrong -- you drilled through the Ogallala to the Red Beds and then they either blow the -- blow the well until it cleans up somewhat and then take a sample of the water, and this is mixed water, so if there is -- if there's salt water on the bottom, it should mix with fresh water on top to give you relative sample of a mixed sample of the water at that point.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. These samples, Mr. Ramey, I don't believe are mixed samples, because the way the blow -- these were blown with air. The way -- the way the sampling technique was handled, I'm of the opinion that the water sample collected is a reasonable representation of the water at the base of the aquifer.

Q. At the base of the aquifer.

A. At the base of the aquifer.

Q. The top of the aquifer didn't contribute anything to the samples?

A. Well, I mean there was a temporary casing run. Then they ran their airline and so forth, and it was blown up through a pipe. So basically the water -- the water that was being blown out of the hole was coming in -- was coming in at the bottom of the hole.

Q. Every well was -- had casing run in it?

A. There was a temporary piece of pipe run in, sir. I think Mr. Wright, he sat on dozens of them, so I think that -- I think he would be glad to tell you, sir, exactly their techniques. As a matter of fact, they did some innovating. They started out and they had some problems and they gradually improved their technique with time. I think Mr. Runyan's well aware of some of this, too.

But I believe, sir, that the samples that were taken that the chloride maps are based on, are -- are basi-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

cally -- they're representative samples of the water that is present -- that was present at the base of the Ogallala as of the date of the sample.

Q Thank you.

COMMISSIONER RAMEY: Any other questions of the witness?

Mr. Stamets?

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Galloway, in your Exhibit Number Six you've shown an area around this salt water disposal well and you've colored it up to show areas where water has moved away from or water's moved into or decreased or increased.

Without more data points in this area, how can we know that this isn't common, that if you had data points for all of these sections we might not see five or six areas that looked exactly like what you've shown?

A If we had pumpage, sir, distributed at various points, this would not be an uncommon thing, to see something like this in the vicinity of an area of pumping. But our problem is, sir, there's no pumping in this area of decline.

Q Now, that's not what I asked you. I asked you if we had all the data points out there, how can you assure

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

us that we wouldn't see five or six more of these? Are you firmly convinced that this is the only one of these you've got in the whole water basin out there? Is this an absolutely unique situation? Is this one of a kind because of this salt water disposal well?

A. No, I don't say this is unique, one of a kind, because I can't give you a specific instance that you'd have another one; however, it's entirely possible. We have other situations. But in the light of the fact --- now, if I contoured the whole Lea County basin, I would normally --- I would find places in which I had declines in middle of rises. I mean the water level comes up and goes down and it depends, and it fluctuates basically in response to pumping and cessation of pumpage.

Q. Okay. Now you show increases of water levels in the northwest and the southwest and both of these areas are uphill from the disposal well. How do you account for those increases?

A. Well, now, these are -- these are vertical changes in the water table. These are not lateral changes, sir. These are vertical differences.

Q. Okay.

A. This is a plan view, but here we have a zero line. Outside this zero line water levels came up. Inside the zero line water levels went down. Along the zero line

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

there's no change.

Q. Where did the water come from in the blue area in the northwest and southwest of the disposal well that caused that increase?

A. Okay, we had irrigation pumping over here. We had irrigation pumping here by Mr. Hamilton, and it seems as though, based on this area, that in this region in general the water level is coming up; that normally it would have come up all over here and this blue, this should have all been blue. If you cease pumping down here, then you would expect water levels to rise. The closer to the well they rise more because the cone of depression is deeper.

Now, as you proceed out away from the well, the rises would be less, and basically, this is the pattern we had. Our greatest rises to the southeast towards the pumping, and the rises we have the other way are somewhat less, indicating the normal way water levels recover.

But I've got a problem here. I've got an area in which they declined right in the middle of all these rises, and there is no -- there is no -- if I had pumping in there, this would tell me -- I could explain this by pumping, but inasmuch as no water is being discharged in this area, and water levels are coming up all around it, then this is an unusual condition.

Q. Well, could the increase in water levels be due

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

also to higher water level areas to the northwest and southwest of the two blue areas on the west side?

A. Now, I have not mapped -- I have not mapped up in this area, but we have rises of water levels completely surrounding this local area of study.

Q. Now I asked you if that could be the result of high areas in the northwest, southwest, to the west of those, is that a possibility?

A. A high area?

Q. Right.

A. In which water levels are coming up?

Q. No, in which water levels were higher and are going down.

COMMISSIONER RAMEY: Could you have a mound of water to the northwest?

A. I suppose there could be a mound of water to the west, but the indications are --

Q. Okay, that's all I asked.

A. I mean -- I can't say, because I don't know.

Q. Are there any sinks at the surface in this area which could contribute to inflow to the aquifer and mounds of water in the aquifer in the area?

A. Well, of course there are sink holes all over the high plains; I'm certain they're related, because when they collect water, certainly the water seeps out of the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

bottom. HOwever, in general, the seepage out of most sink holes is probably at a minimum because of the fine sediments and you have very little permeability at the bottom and probably most of the water that accumulates in sink holes in the high plains is lost through evaporation.

Q. Well, was your answer yes or no?

A. Well there are sink holes, yes, sir, all over the high plains.

Q. Well, but my question was could these contribute to mounds of water in reservoirs?

A. Normally I would not expect it. I mean, well, certainly they're going to cause little bobbles in the water table. Any time, any time you get additions to the water table you're going to cause a mounding. Any time you take water out of a reservoir you're going to cause a decline.

Q. Okay, then your answer is yes?

A. I suppose so.

Q. Okay. Now, why was there no increase in the water level immediately east of the injection well?

A. No increase? I have an increase there, sir, of plus .03 feet; to the southeast I have a zero-zero; and right to the south I have a zero-zero.

Anywhere outside this zero line water levels -- the yellow on this side of the line, water levels came up. The yellow on the inside of that zero-zero, water levels

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

went down.

Q. It seems to me, though, that there is a long interval there between the injection well and the blue area to the southeast where you finally encounter what you define as an increased water level. It would seem as though if the water were moving away from the injection well you would encounter that increase at a closer to the injection well.

A. I think, sir, you're going to have to look at the time. You're going to have to know how long this has been happening. I mean these things do not occur instantaneously by any means; they take time.

I think I could solve your problem, sir, if I could have a piece of paper and I'd be glad to draw you a picture.

As I pointed out, the indications are within this area we had a decline in a very localized area in the middle of an area of rising water tables. We have a decline in which there is no pumping within this area of decline, and it's hard for me to conceive how you can decline water levels in a local area by some decent means of communication under these conditions. I can't see it. That's not normal in nature. You have to have a pipe. But if we took a map -- let me have my colored pencils over here.

Now, let's put us a mound on the water table.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Here's the water table, it normally would be along here. Now, let's put us a mound on the water table.

So we draw the mound up. It mounds up in the vicinity of a point of natural recharge to the aquifer; a point from a point source. So this mounds up.

Now, let's say that we quit injecting water or we ceased -- or else we reduced our -- we quit adding water to this aquifer or else we continue adding it at a reduced rate.

We have higher gradients up on the side of this mound, so this mound, the water is going to have a natural tendency to flow off the sides and down into these areas, until they eventually, you're going to get something -- it would eventually stabilize. Now, my vertical scale is exaggerated, but I would end up with something like this, in which up here my water level went down into the dissipation of that mound and down on either side my water levels came up.

So here I'm adding water on either side as this moves down. Now, I've also got the added effect of cessation of pumping over here and the general rise of the water table due to that. Now, normally, if there hadn't have been a mound in there, you would have had a situation that looked something like this. You had pumping down here and toward the east you had decline. They ceased

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

pumping over here to the east. Where your greatest water recovery would be, it looks something like this. It would be greatest over here and gradually decrease outward with distance from that well, and this would have been the normal picture of what you would normally get radially from the center of pumping.

And you would not have had -- this would have occurred all the way out and this decline would not have occurred. You should have rises all over the area under normal conditions.

I don't know whether this is responsive to your question or not.

Q. I think it is.

Is there any reason for the center of the decrease being located north and west of the injection well?

A. The center?

Q. Right, you have a broad red area -- on Exhibit Six you have three red areas. The northern one is the biggest one and the majority of that lies northwest of the injection well.

A. Okay, sir, I merely took my contour out because I have minus 0.05 there. I had a minus .0 -- minus 0.03 there, and right down next to the well I had a minus 0.09. I mean it's standard contouring technique to merely contour in lines of equal value.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Is there any significance to the fact that it looks like most of the water has moved out of an area north and west of the injection well?

A. Well, I think that, sir, we do have -- referring to Exhibit Two, we have our injection well there. Now, we do have -- we do have a trough to the north and west of us. We have water -- I would expect water to spill off in that direction and you also expect water to spill off in this direction and in that direction.

Now, we tend to seem to have more rises right in here and then down -- down in here in this other trough. That seems to be -- and it may be related to the -- what I would expect is an increase of permeability in the bottom of these troughs, and it could be related to permeability.

Now, with the declines we've had, I think that mound is probably pretty much dissipated, looking at the changes we've had and how high the mound was.

Q. On Exhibit Number Six the two southern red areas seem to lie below and east of the old Amerada pit, is that correct?

A. That is basically correct.

Q. Okay, would this indicate that water is moving out of this area below and east of the old pit?

A. I don't believe I quite -- I quite follow you, sir.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Okay, you've got decreases which seem to be centered below and east of the old pit.

A. Yes, sir.

Q. Is that indicative of water moving out of those areas?

A. Well, the indications are that the water level is declining in the vicinity of this trough that comes generally eastward from that -- where that Amerada pit is. That's correct.

Q. So that means they're moving out there.

A. Well, water levels -- I think that the configuration we get here is related to some of the troubles and perhaps the increase in permeability of the bottoms of those troughs.

Q. Is this movement in relationship to the pit, does this indicate that there could be another source and/or an additional source besides the salt water disposal well? And I'm not talking about contamination. I'm talking about water.

A. With respect to the pit, sir, and I believe someone said awhile ago that the OCC records indicate that pit has been abandoned something like twenty years, I would expect that any additions of water, the effects of any additions of water from that pit to the Ogallala, the amount of that --

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Now, that's not my question.

A. Okay.

Q. The question is does this movement indicate to you that there could be or is likely to be another source besides or instead of the disposal well?

A. Now, I don't believe I'm still with you. Another source for where, in this area?

Q. Well, you've got three areas there where your water levels have declined, indicating water is moving from those areas to some place else.

A. No, sir.

Q. No?

A. No, that's not what I said.

Let me point out again, the water levels declined everywhere inside the zero-zero contour. That water is moving out. If you have a mound as I postulate, that water would move out from that mound basically in all directions.

Now, I don't think that all this blue is due to the dissipation of that mound. This blue is due, perhaps, in part -- well, I'll say it's due in part to the dissipation of the mound and it's also due to the cessation of irrigation pumping from Mr. Hamilton and also the irrigation pumping to the east.

Q. I don't know whether you have a mound there,

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

but isn't that mound --- doesn't that mound have three centers?

A. This, sir, is not a mound per se. This is merely a change. This map shows change in feet.

Q. Okay, but now when you drew your little cross section up there you showed the water moving away from the center of that mound to the sides.

A. Yes, sir.

Q. Now, isn't that what you're showing -- the effects that you're showing on Exhibit Six, the movement of the water away from the center to the edge?

A. Well, this is my -- this is my -- okay, I have certain facts of -- I have certain data in front of me. It gives me this picture, and I used this illustration to explain why you can get a decline here with no pumping in an area -- you have an area of no pumpage in which the water levels declined, and that area is basically completely surrounded by an area of rising water levels.

Q. Okay.

A. And that's not normal.

Q. Now, but your exhibit still shows three centers of water movement. Is that indicative of more than one source?

A. Inside the red the only -- the only thing these show, sir, is that the change has been more than five hundredths of a foot; every one of those if five hundredths

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

of a foot.

Our greatest change has occurred in the red areas.

Q. Okay, and how many red areas do you have?

A. I have three.

Q. Okay, does that indicate there's more than one source?

A. Well, if I had a mound, I could have a mound here develop from a single source, but we're getting down -- we're getting down in time --

Q. Would you just answer the question yes or no?

A. Yes, sir. Well, I don't understand your question, sir, because I don't know what you're getting at.

Q. I just asked a question, and I'm not getting at anything except the truth, whatever the truth might be.

A. Well, that, sir, is my interest, too.

Q. All right. You've got three red areas. Does that indicate you have three high areas?

A. No, sir.

Q. It doesn't?

A. No, sir.

Q. In other words, one mound can break into three?

A. One mound can decline at different rates due to the differences in permeability.

Q. In one month?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. In one month.

Q. So in other words for us to really evaluate this exhibit we'd have to know what the shape of that mound was to begin with.

A. I don't think so, sir, not in my opinion.

The only thing I can say, sir, we have an abnormal condition here. We have an area, a localized area, in which water levels are declining in the middle of an area in which water levels are rising. Inasmuch as there is no pumping in that area, why are the water levels declining?

Q. Let me just ask the question one more time and see if I can get it right.

Could what you show on Exhibit Six indicate that there are -- that there is more than one source?

I'm not saying does it. I'm asking could it.

A. Well, certainly.

Q. Okay, thank you. That's all.

COMMISSIONER RAMEY: Recess till 1:30.

(Thereupon the noon recess was taken.)

COMMISSIONER RAMEY: Any other questions of Mr. Galloway?

MR. HENSLEY: I have two or three, if I might, Mr. Ramey.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

COMMISSIONER RAMEY: Okay.

RECROSS EXAMINATION

BY MR. HENSLEY:

Q. Mr. Galloway, these water measurements that you've taken on water levels, do they all assume that the saline content is constant in every sample and everywhere else?

A. Well, Mr. Hensley, those water levels, it's merely a matter of measuring the depth to the water level in the well. As far as making the actual measure -- the measured depth of water, quality doesn't come into this.

Q. Quality has an effect on depth of water, though, does it not? Saline content does?

A. Where we're measuring in op n holes it really doesn't make any difference, unless, as I pointed out, when you're measuring in a cased hole, in which that cased hole is full of -- has a water that is substantially higher, more mineralized than what the water is outside the casing, well then, then this needs to be corrected. But in the case of the measurement, the actual measured depth of water, even in that cased well it would be accomplished in the same way. It's merely a matter of taking a steel tape and measuring the depth down to the water. Then any correction would have -- is calculated and added onto that.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. As I understand it, the only well where you made a correction was the observation well immediately adjacent to the wellbore of the disposal well.

A. This is the only one, sir, that a correction has been applied to. And I might point out, sir, that that well is not used in either exhibits Five or Six.

Q. I understand, but on all the rest of the wells, some of these wells had high chloride content in the water; some have low. You made no adjustment for salinity at all on any water level measurement?

A. I did not, sir, because I did not feel it was necessary.

Q. My question, then, Mr. Galloway, isn't it a fact that it is necessary that you make those adjustments because otherwise you are not comparing the same quantum of water content?

A. Inasmuch as we are dealing with an open hole in which the column of water inside the borehole can be reasonably assumed to be the same as the column of water outside the borehole, I can see no reason for making such a correction.

Q. But if the salinity in that formation and in any one observation well is high, then the effect is going to be to lower; unless you correct for the density of the chloride, you're going to lower the water level.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

And what you're doing in effect, then, is comparing a hole with high salinity, no adjustment, no correction for density, with holes where you have a low chloride content and no effect on water level.

A. Well, if there's no casing, sir, in the hole and you have the same water quality both inside and immediate adjacent to the bare walls of the borehole, I see no reason for making such a correction.

Q. Well, is it your belief as an expert hydrologist that the water quality is the same in every one of these boreholes regardless of saline content in the reservoir?

A. Well, the -- I mean the analyses indicate that the quality varies.

Q. So then the effect on water level would vary, if the quality varies.

A. I do not see, sir, unless you -- unless you have -- unless you actually have a column of water, actually separated from the water outside by a casing or something like that, I can see no reason for making a correction.

Q. So as far as you're concerned, it's just as accurate to measure the water level in an observation well where the saline content is 24,000 parts per million chloride and compare that with one where you've got sixty parts per million chloride without any adjustment for density of chloride.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. If it's an open uncased hole.

Q. At the close of the testimony this morning, Mr. Galloway, you prepared an exhibit, handwritten exhibit, which Mr. Brown has marked Exhibit A - Seven.

I'll hold this out here, if I may, because I want to ask you a couple of questions about it. As I understand it, the example on the bottom of this exhibit, where you got the slow gradient indicated, is what you say the effect on the water table is going to be where you have an area where you have an irrigation well, and that irrigation ceases. The gradient of the increase in the water level is going to be gradual back up through the water table, is that correct?

A. Well, it will gradually diminish out to zero at some distance.

Q. Okay. Now, what I want to ask you about is this zero line. Let's take -- I'm going to write on this exhibit. You've got these lines almost joined and I'm going to extend them on the bottom to a point which I'll mark zero.

A. Okay, sir.

Q. Now, isn't it a fact that from a standpoint of hydrologic equalization of the reservoir when you have a recharge due to the cessation of pumping, that beyond the zero point this water level has got to decrease? To equalize

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

the increase which you show on the other side of the zero point?

A. To fill the cone of depression, sir, requires that water outside flow into that cone, so it would take outside that to equalize it and level it up again.

Q. And the only way that cone is going to be filled is for that water to be taken from the point beyond the zero line.

A. That is correct, sir.

Q. Let me first ask you, have you made calculations to determine where the zero line is from this irrigation well?

A. No, sir, I have not.

Q. Isn't it reasonable to assume, Mr. Galloway, that on your exhibit Five, that the decline in the water table in the area which you show marked in red could easily explain the point beyond the zero line where the water has decreased to equalize with the increase caused by the cessation of pumping?

A. If I did not have pluses beyond the red, this could be reasonably assumed, but inasmuch as I have pluses I have pluses and then minuses and then pluses again, this casts a different light on the problem.

Q. That just could be a function of permeability, could it not?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Well, I fail to see how a water level could decline, could rise in part, decline in part, and then rise again, and just suddenly have a hole out there in which it declined that's more or less isolated in the middle of a rise. This is not normal.

Q. But it is a fact, is it not, that beyond that zero point you would expect under normal conditions to find a decrease in the water table to equalize with the increase caused by the cessation of the pumping?

A. That is correct, sir.

MR. HENSLEY: I have no further questions.

COMMISSIONER RAMEY: Any other questions of the witness?

He may be excused.

MR. JONES: We would ask that Exhibits One through Seven be admitted and made a part of the record.

COMMISSIONER RAMEY: They will be admitted.

MR. JONES: Jim Wright.

JIM WRIGHT

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. JONES:

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Would you state your name, please?

A. Jim Wright..

Q. Have you testified at an earlier hearing before the Commission on this matter?

A. Yes, sir, I have.

Q. You're with the Water Resources Division, is that right?

A. That's correct.

Q. And what section of that division are you with?

A. I'm with the Water Resources Division.

Q. Is there a section within that division that you work with, water rights? Or whatever?

A. I work for the water rights section, yes.

Q. Now, were you involved in picking the site for some of the four wells that have been drilled since -- since the earlier Commission hearing?

A. I helped with the selection of sites, yes, sir.

Q. Has the data that's been collected and furnished to Mr. Galloway for preparation or presentation by way of these charts and exhibits, was that collected under your supervision?

A. Yes, sir, it was.

Q. Were you personally present when any of these water right levels were -- or water levels, pardon me, were obtained? Measured?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. I'm not positive whether I was present in the measurement of some of them or not. I know I wasn't present in the -- for the water levels on Exhibit Six. Either time they were measured I was not present there.

Q. Have you personally measured water levels in this part of the determination of some of the water levels on other wells?

A. Yes, sir, in the overall study I have measured some water levels.

A. Is it your opinion that these measurements are accurate to a hundredth of an inch?

A. I would say that probably they're accurate within two or three hundredths. The measurements were made and recorded to the nearest hundredth of a foot.

COMMISSIONER RAMEY: And they're accurate within two or three hundredths of a foot?

A. I would say so.

Q. Were you involved in the decision to locate and complete the observation well that's located near the salt water disposal well, "BO" 3?

A. I was consulted regarding the location of it. I don't remember -- I don't think that I actually selected the spot.

Q. Did you prescribe a manner -- prescribe it's completion of the casing and perforations, and so forth?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Are you familiar with that?

A. Yes, sir, I did that part of the well.

Q. Can you describe it for the Commission?

A. The well was drilled, as I recall, to about 109 feet and we run five joints of PVC, 20-foot joints, and we had a 10-foot joint of steel casing at the top. The perforations, the only perforations are in the lower about six or seven feet of the casing -- of the PVC casing.

Q. Are you familiar with the water quality in the well?

A. Yes, sir, we collected water samples from the well.

Q. Do you recall the chlorine content of the water at the bottom and at the top of the well?

A. Well, the quality at the base of the aquifer and at the top of the aquifer is substantially the same. At least it was within analytical error.

Q. Do you recall whether or not there was much difference between that quality and the quality of the produced water in that area?

A. Oh, as I recall, the quality would run about 26,000 parts per million chloride, and I think it was comparable probably to the water that was being injected.

Q. And this is fairly uniform throughout the column of water in the observation well, is that right?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Yes, sir, in that particular well.

Q. So that would require, in your opinion, before any comparison of that level with any other level in the area, of an adjustment for density, is that right?

A. That's correct.

Q. Have you had a recording device placed that monitors the water level in the observation well?

A. Yes, sir, we have a Stevens recorder on it with a continuing water level chart. This operates on a float mechanism and a time clock.

Q. What -- what's the purpose of installing this device on the observation well?

A. Well, the purpose of installing it is to see whetheror not we got any fluctuations in the water table flowed through the Texaco salt water disposal well.

Q. The idea being that when the well was injected there would be some change in the fluid level in the observation well, is that right?

A. The idea being that there might be.

Q. Has any such change been detected up to this point?

A. No, sir, I looked at the chart and the fluctuations in the chart are really, in my opinion, insignificant.

Q. Well, in your opinion does that indicate that there is no communication between the disposal well and the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

aquifer?

A. Well, I wouldn't say that it guarantees that there's no connection at all, but at least the recorder doesn't show any connection.

Q. Is there any value, in your opinion, to continuing with this experiment to see if there will be any significant changes noted on the recorder?

A. Well, I'm sure since we've installed it we'll leave it out there for awhile, just to see what happens. You never know when you're collecting data whether it's going to do you any good or not.

Q. You think it then is somewhat premature to decide one way or the other, is that right?

A. Well, I think the record really on this particular well is too short to be of a whole lot of value right at the present time.

Q. Now, you have worked with Mr. Galloway in the preparation of some of -- or perhaps most of these exhibits that have been discussed here this morning, haven't you?

A. Yes, sir.

Q. Now, have these been prepared and has this survey of water levels been conducted, in your opinion, in conformity with the good practice and hydrological measurements?

A. Yes, sir.

Q. Do you have any different opinion than his re-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

garding the existance of this mound at the location of the disposal well that he testified to earlier, at the earlier hearing, and I believe reiterated today, or with the findings that has been a decline in the water table in the vicinity of the disposal well?

A. No, sir, in general I agree with Mr. Galloway's testimony.

Q. I believe you stated at the earlier hearing that it was your opinion that the disposal well had leaked, is that correct?

A. Well, based on the evidence that I've seen, that is my opinion.

Q. Have you changed your opinion in that regard since that time?

A. No, sir.

Q. Can you give us a very concise and succinct statement of the basis for your opinion?

A. Well, the anomalous effect around the well due to the quality, the water table high, and more recently, the decline of the water levels in the vicinity of the disposal well, all indicate to me that the well has leaked at one time and either is not leaking now or has -- is leaking at a lesser rate than it once leaked.

Q. Now, I asked Mr. Galloway if there was any

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

knowledge of any native salt deposits in the Ogallala. Are you aware of any such thing?

A. I've never heard of any salt in the Ogallala.

Q. It would be your opinion that any salt in the Ogallala was placed there through the intervention of some human activity, is that right?

A. That would be my opinion, yes, sir.

Q. Now I believe you testified at the earlier hearing that you had calculated a rate of water movement for this area, is that right, Mr. Wright?

A. Yes, sir, I calculated the range, I think, of the velocities that you might expect.

Q. Now are you aware of any anomalous condition in the permeability in this area that for some reason would just happen to occur in the vicinity of this disposal well that would in and of itself account for this condition that has occurred in which the water levels are declining near the well as opposed to rises elsewhere?

A. No, I haven't seen anything to make me believe that there's any sudden changes in permeability.

Q. Have you personally collected samples of the Ogallala from the test hole driller? In this area?

A. Yes, sir, we've collected samples from some of the wells and we have looked at samples during the drilling operation on essentially all the wells that we were at.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Now you weren't on the wells that Texaco drilled, is that right?

A. I believe I was out there a time or two during the drilling but I really had nothing to do with their wells.

Q. Have you seen any evidence in the wells you were on of any such discontinuity in the permeability of the Ogallala in this area to account for this anomalous condition with regard to water levels?

A. No, sir.

Q. I believe you heard the testimony at the earlier hearing, didn't you, Mr. Wright, regarding casing tests and tubing tests, and so forth, in this well?

A. Yes, sir.

Q. Now, is there, in your opinion, a conceivable -- or mechanism whereby this well could have leaked, could have put salt water into the Ogallala in this vicinity without having a casing leak or tubing leak?

A. Yes, sir, as I testified before, it's possible to move water behind the pipe by channeling through a cement job or possibly you could have water moving laterally from another disposal well along some bedding plain, such as the Rustler anhydrite, for instance, move over to this well, and migrate to the surface through channeling behind the intermediate casing.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. What level is this Rustler formation at, Mr. Wright, if you know?

MR. HENSLEY: I'm going to interject an objection to this question and to all further inquiries concerning the possible communication through the Rustler formation on the ground that it's entirely speculative and hypothetical and there's no foundation in fact, no foundation in geology, no engineering foundation, to support any type of speculation. This is rank speculation.

COMMISSIONER RAMEY: I'm going to sustain the objection, Mr. JOnes. I think we could set here and suppose all day.

MR. JONES: Well, I'm not going to quarrel with the Commission's ruling but I think that the overall tendency of this is, of course, the Commission's records indicate the collapse of "BO" 4 at some unspecified level, and we've been subjected, I think, so far in our presentation, to a great deal of speculation and so forth, and unfounded --

COMMISSIONER RAMEY: The Commission cannot make any kind of a finding based on --

MR. JONES: I understand. I understand. I haven't got anything else. Nothing further.

COMMISSIONER RAMEY: Any questions of the witness?

MR. HENSLEY: Yes, sir.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

CROSS EXAMINATION

BY MR. HENSLEY:

Q. You indicate that you personally supervised the drilling of the observation well, Mr. Wright, is that correct?

A. That's correct.

Q. And that the water in this well was tested at approximately 26,000 parts per million chloride, is that right?

A. As I recall, it was around that.

Q. And I believe you indicated that by virtue of the fact that it was cased, that you recommended that an adjustment be made for the density of chloride in order to determine the water level, is that correct?

A. Yes, sir, you have to make corrections due to the weight of the water.

Q. Did you yourself make any of those calculations for adjustment of the density?

A. I made the calculation that was made on this observation well, yes, sir.

Q. Did you make an adjustment to correct the fresh water equivalent or to the formation water equivalent?

A. I made an adjustment to fresh water equivalent because I wasn't -- didn't know what the formation water equivalent was.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Are you familiar with a publication by the State Engineer by Mr. W. L. Hiss, shown as Technical Report Thirty-eight, which contains specifications for the calculation of these water equivalents, both formation water equivalent and fresh water equivalent?

A. I know such a report exists, yes, sir.

Q. There is --

A. I've seen the report.

Q. And there is a difference, isn't there, Mr. Wright, between trying to calculate an equivalent between formation water and fresh water?

A. Yes, sir, there would be a difference.

Q. And when you start making an adjustment for density in this observation well and comparing it to all these other observation wells where you tested water levels based on formation, then the only way that you can make that density adjustment in the observation well and make it comparable to the water level measurements in the observation wells is to adjust it to formation level, isn't that correct?

A. I'm not positive if that is a necessary adjustment or not; however, assuming that it is, we do not know the thickness of the brine in the well. We don't know whether the adjustment should be made for five feet of water, two feet of water, or ten feet of water, and with

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

the densities that we're dealing with here, that adjustment would be so small that I doubt that it would even be significant to make it.

Q. Well, do you understand that some of these adjustments for water levels are two hundredths of a foot, three hundredths of a foot?

A. Well, the changes, yes, sir.

Q. And that could easily be accounted for by simply an error in the adjustment of the density.

A. No, sir, because the changes that we're dealing with there are the same water at two different periods in time.

Q. But you're comparing one, which has been adjusted on a fresh water equivalent to water which is formation water equivalent, and they're not the same.

A. No, but if you take two hundredths and multiply it by 1.03 you're not changing the answer much.

Q. Right, but it can make a difference on whether or not you have a mounding of the water level.

A. Well, assuming that a correction is necessary to be made, and you apply where Mr. Galloway has his water table map, the only thing that it would do would make the mound higher.

Q. Talking about this mound of water and also the fact that in the area immediately adjacent to the salt

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

water disposal well the recent water level measurements have indicated they declined in that well, have you considered that that decline can be accounted for in full part as a consequence the cessation of the irrigation pumping from Mr. Hamilton's property?

A. There's no way that this decline could be attributed to, in my opinion, at least, the cessation of irrigation pumping, due to the pattern. NOw, if -- if you got out there and had the decline after you passed the zero line and then didn't have any positive -- any rise in the water table, then I would say yes, this was a possibility. But the pattern that appears on Exhibits Five and Six indicates to me that this is not related to the cessation of pumpage.

Q. Well, Exhibit Five you have a generalized area of the water level diminishment, don't you?

A. Yes, sir.

Q. And isn't that necessarily true if your zero line curves immediately to the east of that point if you have a cessation of production from Hamilton properties, cessation of pumping?

A. As I said before, you could have this if you didn't have pluses up dip or up gradient, but since you have that, this is -- just doesn't make sense to call it due to ceasing pumping.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. Can those water level changes be traced to different -- differences in chloride content of the waters?

A. Chloride content wouldn't have any effect at all on the water level changes.

Q. What about the permeability in the Ogallala? Would that have any effect on the change in the water level?

A. It could if -- if you had a sudden abrupt change in permeability at some point out there.

Q. Well, are there areas in this general vicinity where you have a pinching out of the permeability in the Ogallala reservoir?

A. Not that I'm aware of.

Q. Are there areas in Lea County where you have pinchouts?

A. Oh, there's areas where you have no Ogallala section at all.

Q. Permeability is a function of the rate of flow, is it not, and the displacement characteristics of the water?

A. Well, the rate of flow would be a function of the permeability and the water table break.

Q. And I believe you were present during the testimony of Mr. Galloway where he explained that in all probability the permeability in these -- in these valley areas, which are designated by the topography of the Red Beds, would be greater.

alderman reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. I'm not sure I understood that question there.

Q. Do you agree with Mr. Galloway that in the area of the -- of the troughs in the Red Bed topography, that in all probability you have a higher permeability in the Ogallala?

A. Generally speaking this is true.

Q. And is that true for all of the troughs which are located throughout this northwest quarter of Section 24?

A. Well, I couldn't swear to what's in all the troughs that he had mapped there, but in general your lows have coarser material and your highs have finer material, and that's what I'd expect to find.

Q. Now, you've indicated that one of the reasons that you still have the opinion that this well leaked at one time is the fact that you now have this reduction in the water levels in the immediate vicinity of the wellbore, is that correct?

A. That is one of the considerations, yes, sir.

Q. Isn't it a fact, Mr. Wright, that just the reverse would have -- would be the only evidence of any communication between the disposal reservoir and the Ogallala?

In other words, if there was any communication at all between the Devonian and the Ogallala, the only logical consequence of that communication would be an increase in the water table and certainly not a diminishing?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. If the -- if the leak at the present time was the same as it was initially, then this is true.

Q. And so the only way your theory can be explained is that this -- this leak that you have hypothesized, would have had to cure itself some way, some how, without remedial action.

A. It wouldn't have had to exactly cure itself. It would have had to decrease for some reason unknown to me.

Q. Do you have any evidence of this?

A. No, sir. The only -- the only evidence that we have of any leak at all is what I testified to already.

Q. Actually, isn't it a fact, sir, that because of the fact that there has been a cessation of pumping from Mr. Hamilton's property, so that you no longer have that cone of depression immediately to the east of this disposal well, that in all probability you would expect a rather pronounced rise in the water level if there was any communication?

A. If the, like I said before, if the communication is a constant, assuming the well's discharging a constant rate and all other things being equal, then the water level would rise at the disposal well, obviously.

Q. And yet we have measurements of a decline in that water level measurement.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. This is correct.

Q. So is it fair to say that the evidence which has been adduced at the hearing today is -- is supportive of the view that there is not any communication between the Devonian, where this water has been disposed of, and the Ogallala?

A. I can't swear that there is no leak. All I can say is that the evidence presented in Exhibits Five and Six indicate that there's less leakage than there was once.

Q. So the only hydrological conclusion that can be reached from this to draw any conclusion of any communication is the hypothesis that a leak occurred and it no longer exists, is that correct?

A. Like I said before, I cannot say that it's not -- that the leakage is zero. It has to be less to have the conditions that we have.

Q. Well, now talking about what evidence exists to support any leak in this disposal well, and any communication in the disposal well, let's talk about the reporting device which has been installed on the observation well, if we may, sir.

A. All right, sir.

Q. Now, at my request you have furnished a copy of the chart off a drum which was connected to this recorder,

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

is that correct?

A. That's correct.

Q. Let me hand you what's been marked for identification, Mr. Wright, as Texaco Exhibit One, and ask you, sir, if you can identify this exhibit?

A. Yes, sir, this is an Ozlaid print of a water stage recorder chart, which was taken from an observation well located in Section 24, Township 11 South, Range 32 East, and identified as hole number 20, Hamilton hole number 20.

Q. Approximately how far is that from the wellbore of the Texaco "BO" No. 3 Salt Water Disposal Well?

A. Oh, as I recall, it's something like 60, 75 feet.

Q. Does the graph on this chart, does it reflect that there has been no indicated change in the water level during the period of injection while this recorder has been on the observation well?

A. In general the changes are in the neighborhood of two hundredths of a foot and are probably due to barometric fluctuation.

Q. In effect, then, what we have is a straight line curve?

A. Essentially, except for one spot where we had a change of about, oh, four hundredths of a foot, which occurred sometime after midnight on August the 18th, 1978.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. How long was this recorder on the well?

A. The recorder was installed on August the 7th and the chart was pulled August the 21st, so that would be approximately two weeks.

Q. If I understood your testimony on direct, it was your conclusion that based on the results of this graph, that there can be no indication, or there is no indication, of any change in the water level during periods of injection into the salt water disposal well.

A. Well, there's no significant change. It didn't stay exactly the same, but the changes are small.

Q. If there had been any communication at all, considering the proximity of this observation well, to the wellbore of the disposal well, isn't it true, sir, that the changes would be substantial and immediately detected?

A. I would expect them to be, yes.

Q. So this -- this would indicate then no communication at least during the period that the graph was on the well.

A. That would be my interpretation at this time. A longer period might indicate something else, but I doubt it.

Q. The chances are, I believe you've already indicated, if there was going to be any effect at all with this proximity, that it would be fairly quick, with this

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

volume of water that's being injected.

A. It would, certainly would, if we had a leak in the neighborhood of the quantities that you've injected; no question about it at all.

Q. Well, if you had a leak in the neighborhood of the quantities that Mr. Galloway was assuming in the explanation of his Exhibit Number Four, 100 gallons a minute, you'd detect that immediately, wouldn't you?

A. I feel sure it would show up.

Q. Now, regarding the -- I withdraw that question in view of the ruling of the Commission.

MR. HENSLEY: I have no further questions of the witness.

MR. JONES: I have a few more, if I might.

COMMISSIONER RAMEY: Does anybody else have any questions of the witness?

MR. JONES: I want to ask some.

COMMISSIONER RAMEY: Okay, Mr. JOnes.

REDIRECT EXAMINATION

BY MR. JONES:

Q. Mr. Wright, have you been consulted concerning the possibility of some sort of tracing fluid being placed in the injection water, or some other marking so that it could chemically be determined whether or not there is any

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

water showing up in the observation well from the disposal well?

A. Yes, sir, you contacted me regarding this and I discussed it with Kim Ong, a chemist for the USGS in Albuquerque, and he suggested that rather than using a vegetable dye, flourescene (sic) dye or something of this order, that we spike the water with potassium chloride and test for an increase in potassium. This would be reasonably cheap and the analytical records would not be expensive.

Q. Could -- pardon me, go ahead.

A. And in all probability potassium chloride in with the present brine water that's being injected wouldn't change it enough to bother any chemistry balance, or anything like that in the injection fluid.

Q. Do you feel that a rigorous sound test could be constructed on that basis to cause enough potassium chloride to be added to the water to allow a test to be made?

A. Well, I'm no expert on this. I'm basing my opinion, really, on what he told me, and he said that he thought it could be done.

MR. JONES: That's all.

MR. HENSLEY: I have just a couple.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

RECROSS EXAMINATION

BY MR. HENSLEY:

Q. Mr. Wright, you attended the first hearing in this cause, did you not, sir?

A. Yes, sir.

Q. And you are aware that an injectivity profile with a radioactive tracer was conducted on the disposal well.

A. Yes, sir.

Q. And this was done by an independent contractor and the results witnessed as well as the log furnished to the Commission.

A. Yes, sir, I'm familiar with that.

Q. And are you also familiar from your attendance at the first hearing that the results of this injectivity profile showed that there was no channeling and that all of the disposal water was deposited into the disposal reservoir?

A. As I recall, that was the interpretation of the log.

Q. Based on those findings and the other casing surveys that were made, all of which showed the casing to be without leak or without any problem, isn't the only thing that could be accomplished by this potassium chloride injection the monitoring of the Ogallala? Otherwise, you have no other effect?

adi murrah reporting service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

A. Well, if you put the potassium chloride into the water that you're injecting and there was communication between the Devonian and the Ogallala, by monitoring a test hole out there you could prove beyond a shadow of a doubt that you had communication.

Q. But that's the only difference. I mean as far as trying to show by the injectivity of this potassium chloride into the disposal well, that you've got any channeling or any other type of defect in the mechanical design of the string, you're not going to get any different results. We've already done all those tests.

A. This is true.

Q. And as a matter of fact, isn't it true that the reason that the recording device was put on the observation well was for the very reason of trying to detect conclusively if there was any communication between the injected water and the Ogallala reservoir?

A. I'm not positive this was the only reason. This was the main reason that we put it on there, because we felt that if we had leakage there in the quantity that we felt had leaked from this well, that it would show up when the injection pressures varied, when they were down for some reason or another, and stuff like that. You would get indication on the water level state.

Q. Well, is it not a fact, sir, based on your ex-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

perience as a professional engineer that a change in water table would be the most conclusive evidence of that communication, if it existed?

A. I couldn't say it's the most conclusive, but as far as I'm concerned it would be conclusive unless I could figure out some other way that it happened.

Q. And as of this time this recording device has been on there over two weeks, or so, and the results are negative?

A. That's right, there's no -- no sharp breaks on the chart in this two-week period.

Q. Thank you very much.

MR. HENSLEY: Nothing further.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Wright, back to this potassium chloride tracer, how much would have to be used?

A. We calculated somewhere around seven hundred pounds. But potassium chloride is cheap, so --

Q. It would have to be over what period? Would you dump in seven hundred pounds?

A. Yeah, we just dump seven hundred pounds into the -- into their storage tank and let it dissolve and maybe go in with that batch of water.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Q. And then how long -- how long would you have to monitor the well? I assume that you would monitor the well. you have the level recorder in.

A. Well, we could monitor that one or we've got others out there we could probably get water samples out of, but probably that one would be the one.

Q. I assume this was drilled at what you figured would be the most advantageous spot to detect any influx into the Ogallala.

A. Well, I tried to get it out of the way, for one thing. You could put it maybe where it would be doing a better job, but the location, I think, is adequate to do monitoring; either this type that we're doing here of the water level stage or even -- or quality.

Probably we'd need to look at analytical stuff for at least thirty days.

Q. You would put it in their storage tank, inject it in, probably within a day, I would assume.

A. I would assume so.

Q. So you would think it would take thirty days to absolutely detect if it were coming into the Ogallala?

A. Well, I'm not sure. I don't know how long it would take for sure, but I think it should show us within thirty days. It may get there in ten. It all depends on the velocity. Of course if the well isn't leaking and it's

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

going some devious route around and coming back to the area, I don't know how long it would take.

Q. And you -- I guess you haven't checked to see if this potassium chloride would be compatible with the injected water.

A. No, sir, I've only made inquiries of the chemist in Albuquerque as to whether or not we could do analytical work on the potassium, if it would stay in solution, for one thing. They do have a problem, he says, with some of it coming out in the formation sometime, but he thinks with this big a dose that it would show up.

Q. It could also come out in the Devonian formation.

A. It could stay in the Devonian formation.

Q. Could it plug the Devonian formation?

A. I certainly wouldn't think so.

Q. Have you investigated any other possibilities of tracer fluid?

A. I just -- the only thing I really discussed with him was increasing the sodium content, which he felt would be prohibitive because it would take a ton of salt. Using potassium or using some type of vegetable dye, or flourescent dye, and --

Q. Please continue.

A. And then he felt like potassium was the best thing to use due to the -- it being inexpensive and the

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

cost of running the analyses was inexpensive.

Q. What about the potassium content of the Ogallala water?

A. It's essentially zero.

Q. Essentially zero. What about in the neighborhood, have you analyzed any of these samples from this area for potassium?

A. No, sir, and normally you won't get -- potassium won't be given on an analytical standard, but it will usually group potassium and sodium together. So before such a test could be run and mean anything, you would have to collect some water samples and have them run for potassium.

Q. So you couldn't make a conclusion now that if you injected potassium and there was potassium in the water that you could find out whether the potassium came from the injection water or was there.

A. No, sir, because we do not know the exact level of the potassium. We know ordinarily in the Ogallala there isn't any potassium salts to amount to anything. Now, in the Devonian I don't know. There probably is some potassium but it's probably a low level.

But we would have to know that before we could run this type of test where it would mean anything. If the potassium level is real high already, then this would not work.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

COMMISSIONER RAMEY: Any other questions of the witness?

He may be excused.

MR. HENSLEY: I'll ask just one question, Mr. Ramey.

COMMISSIONER RAMEY: Sure.

RECROSS EXAMINATION

BY MR. HENSLEY:

Q. Mr. Wright, is there any reason why if any further testing is necessary, why a radioactive tracer material with a short half-life couldn't be utilized?

A. It probably could but it would be quite a bit more expensive, I think.

Q. Would it be more conclusive in view of the fact that you're not trying to determine the differences in potassium measurement from the water as it now exists and the water after the test is run?

A. I doubt that it would be any more conclusive. I would think that if the potassium level is what we think it is, this would be fairly conclusive.

Q. Let me ask you this question. If this potassium test were ordered by this Commission and the results were negative, just like the results on the recorder test have been, would it then be your recommendation that some other

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

type of test be utilized and then another one after that?

A. No, sir, it probably wouldn't be my recommendation

Q. Is there really any necessity, practical necessity, whatsoever in running any additional tests on this hole, in view of the fact that the recorder test and the injectivity profile test are all negative?

MR. BROWN: If the Commission please, I'm going to object to that. I think that is a matter within the sole discretion of this Commission and not that of the witness.

MR. HENSLEY: This witness is proposing as an expert on the necessity for further testing, and --

MR. BROWN: He's testifying to an accepted procedure to determine this question. It's up to the Commission to say whether this is done or not.

MR. HENSLEY: I think we're entitled to ask whether or not any additional testing as a practical -- from a practical standpoint would prove anything more than what we already know.

COMMISSIONER RAMEY: Objection overruled.

A. Well, I really don't know whether additional testing would be warranted or not.

Q. Thank you.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

RECROSS EXAMINATION

BY MR. RAMEY:

Q. Now, Mr. Wright, you and Mr. Galloway both have stated you thought the well was leaking.

A. Yes, sir.

Q. Is that correct? And you stated that it's either now not leaking or the leak is diminished.

A. That is correct.

Q. If the Commission did require, say, a potassium chloride test, or some other material, and this did not show up in your recommended thirty day period, could you then say that the well was not leaking at this time?

A. You mean beyond a shadow of a doubt? I could have an opinion, probably, that it wasn't leaking. I don't think that I could ever make a positive statement that I know for sure that this well is not leaking.

Q. Well, how could you ever in talking with Mr. Hamilton say a well was not leaking?

How many exhaustive tests would have to be run on the well before you would be satisfied?

A. Would I personally be satisfied?

Q. Yes. I'm sure Mr. Hamilton is coming to you for advice. I would if I was in his position.

A. Well, I really don't know. There's evidence

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

that the well may not be leaking at all. There's, in my opinion, there's overwhelming evidence that it leaked at one time, and to ever be able to say definitely one way or the other, I just don't know.

Q. So if you -- if you ran a potassium chloride tracer in this water and it didn't show up in the thirty days that you've recommended, and Mr. Hamilton came to you and said do you think it's still leaking, you'd say it's possible?

A. I'd probably say not in my opinion.

Q. Do you think Mr. Hamilton would be satisfied with that?

A. I don't know, sir.

Q. Nobody objected to that question.

COMMISSIONER RAMEY: Any other questions of the witness?

MR. HENSLEY: No, sir.

COMMISSIONER RAMEY: He may be excused.

Mr. Jones, anything further?

MR. JONES: We have no further testimony.

MR. HENSLEY: We have nothing further at this time.

COMMISSIONER RAMEY: Do you want to argue the merits of your motion now, Mr. Jones, or --

MR. JONES: Well, I believe that you have a

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

pretty good feel for the problem. We, of course, would like to see this step taken. I can't help but feel that there's got to be some little touch of mystery surrounding this situation as far as the Commission is concerned. We have all sorts of explanations set forth by what Mr. Wright characterizes as overwhelming circumstantial evidence that this well has leaked and leaked extensively.

This Commission is left with nothing but, I guess, well, the feeling that everyone presumably has, that it's been fixed. The Commission knows nothing about the circumstances of this repair or anything else, but if it hasn't been fixed, then certainly there's a mechanism at work in this -- in this Devonian pool that no one understands, or certainly no explanation has been put before the Commission that I'm aware of that accounts for what's going on out there. I think any -- any step that seeks to remove some of this mystery would perhaps give the Commission some insight to what's going on in that field ought to be taken.

COMMISSIONER RAMEY: Thank you, Mr. Jones.

Mr. Hensley, would you like to respond?

MR. HENSLEY: Well, to the contrary, if the Commission please, I feel that the evidence is conclusive. I think that Texaco and this property, this well in question, has been subjected to a multitude of tests. I don't know how many casing surveys have been run. An extensive radio-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

active tracer injectivity profile was run on the well, one of the most sophisticated methods of determining whether or not any communication existed.

The results of all tests have been conclusively negative. At the last hearing and at the instance of the applicant in this case allegations were made and the motion for rehearing, that new evidence had been discovered.

I believe that the evidence, while there's been some new evidence, which has been introduced, that evidence in and of itself confirms the fact that in our opinion, and I would respectfully submit the proof shows that there is not any leak. I think the evidence today shows that if there had been any communication, that hydrologically the water level in the vicinity of the wellbore would have necessarily had to increase.

The evidence, through the testimony of Mr. Galloway, who made mention of this in detail, is that the water level has reacted just the opposite from what they expected to find when they took this recording device on the observation well.

Again, I would say, conclusively shown, at least for the period of time that it has been in place, that there is no communication between the Devonian and the Ogallala in this disposal well.

I don't think that there is any evidence in this

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

record which can be used to show that any casing leak existed at the time the initial application in this case was made, because I think that this Commission can take judicial notice of the fact, plus -- or administrative notice of the fact, that a casing leak of the magnitude which Mr. Galloway has been talking about through the course of two hearings, cannot physically cure itself.

The evidence is that there has been no remedial work done and the tests show there is no communication, and consequently, on behalf of the Respondent, Texaco, I would like to suggest to the Commission that -- and I think the record of this last examination indicates it, that if this Commission orders a potassium chloride test, injection test, that immediately concluding the results of that test, which I would anticipate, and I would think most people would anticipate, would confirm every other test that's been conducted on this well, then there's nothing to say that additional testing procedures will be suggested, and that Mr. Wright or Mr. Galloway, or somebody, will come in here and say it doesn't matter what tests you do, we still think through this anomaly of there being a mound in the water level, that some leak had to have been from this well sometime in the past.

There's no evidence as to the amount of water that leaked into the reservoir. There is absolutely no

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

evidence as to the amount of water that had to have leaked into the water well to -- into the reservoir to cause the contamination that exists now. There is no indication as to when the leak, if any, occurred. There is no evidence of any remedial work that was done to repair a leak, which necessarily had to have occurred in the absence of channeling which the injectivity profile says did not and does not exist.

So in conclusion, I believe that the Respondent has come forth and met the challenge of the application for an injunction to shut down the Moore-Devonian Pool, and I feel that any further expense in connection with this matter ought to be solely on the Applicant. I think Texaco has done more than its share to come forth and demonstrate to the Commission that the integrity of this casing string is intact and always has been.

And consequently, we would suggest that the rehearing be denied and that there not be any further order of any testing procedure in connection with the subject well.

COMMISSIONER RAMEY: Mr. Hensley, in your response you indicate or you would suggest that a radioactive tracer test be run by a third party.

Do you have any idea of what is the half-life of this radioactive material that's used?

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

MR. HENSLEY: I understand thirty to sixty days.

COMMISSIONER RAMEY: Thirty to sixty days, so it would be detectable in the Ogallala as would be the potassium chloride.

MR. HENSLEY: I'm sorry, I was just corrected, eight and a half days.

COMMISSIONER RAMEY: Eight and a half days.

What would be the cost of a radioactive tracer survey? Mr. Hensley, do you have those figures?

MR. HENSLEY: $7,000.

COMMISSIONER RAMEY: $7,000. Mr. Wright, what would be the cost of what did you suggest, seven hundred pounds of potassium chloride?

MR. WRIGHT: Well, it couldn't be very much. It would probably be in the neighborhood of $200 or $300.

COMMISSIONER RAMEY: You don't know for sure?

MR. WRIGHT: No, sir, I don't know what potassium chloride sells for.

COMMISSIONER RAMEY: Let's take about a fifteen minute recess.

(Thereupon a recess was taken.)

COMMISSIONER RAMEY: The hearing will come to order.

Mr. Arnold had to leave to attend another meeting, but not before we made a ruling on the motion.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

As Mr. Jones pointed out, there is something suspicious surrounding the circumstances of the contamination of this water, and we feel the Commission would be negligent in its duty not to require everything possible.

In view of this, we are going to request some kind of a tracer survey be run on this well.

Mr. Jones, in his motion, said that Applicant would -- said such an experiment could be conducted at a nominal expense, which Applicant would bear, and would not in any way disrupt the activities of the Respondent.

So we're going to rule that -- that the Applicant pay for the material, whatever it be, and if it's potassium chloride, why, of course, we would expect the State Engineer Office to obtain water samples of the contaminated water and have them tested for a potassium level.

I think what we'll do in this case is request Mr. Hamilton to come up with a scheme of a tracer to inject into the well and then they can get together with Mr. Sexton and in turn Mr. Sexton should get together with Texaco and work out some mutually agreeable -- which I hope is inexpensive -- material to put into the well.

I think that if some material is put into the well, I would certainly expect Texaco to run some compatibility tests on the well or on the water at their expense, with the material, potassium chloride and also in the dis-

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

posal water, and see if you get any precipitants (sic).

MR. HENSLEY: Mr. Ramey, if I may respond to the ruling.

In view of the fact that the Commission is going to require a tracer survey, Texaco feels any such survey should be run by a third party under controlled circumstances and they feel, as I've indicated in my response, that a radioactive tracer survey, even though it costs so much money, is the most reliable form of testing.

And I'm authorized to represent to the Commission that in view of your ruling, we would be happy to underwrite the cost of that -- that radioactive tracer survey.

COMMISSIONER RAMEY: I assume, Mr. Hensley, you would inject the radioactive material into the well and then run a monitoring device in the monitor well?

MR. HENSLEY: In the observation well and that, of course, would require that Mr. Hamilton consent for the use of that well, and it would be done by a third party. I don't even know who, but Texaco would not run the test.

COMMISSIONER RAMEY: Mr. Jones, would this be agreeable?

MR. JONES: I don't believe there's any problem. We'd like to have some idea before it's done what's physically contemplated.

Since I sense from the -- from your comments

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

during the hearing that there won't be any more tests, we would like an opportunity perhaps to have some input initially. I'm sure we don't know any more about it than the experts, but we'd like to know what roughly is proposed before it's done, but as far as the use of the well and all that, there is no problem.

COMMISSIONER RAMEY: All right, I'll put it this way. I'll appoint Mr. Sexton as kind of a monitor, or the arbitrator in this case, and request that the Hamilton people and Texaco people get together and work out the details of the tracer survey, or whatever, and have you any suggestions as to an agreeable time that would be necessary to keep the tool in the monitor hole?

AN OBSERVER: The material we propose to use has a measurable life of eighty days -- eight weeks, pardon me, eight weeks.

(There followed a discussion off the record.)

MR. HENSLEY: Mr. Ramey, may we have the Commission set up a meeting date at this point so that we can meet with Mr. Sexton and Mr. Hamilton's representatives and outline the details of this survey?

COMMISSIONER RAMEY: Yes. Mr. Sexton, when would be a convenient day in the very near future to meet with the Hamilton and Texaco people to set up the ground

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

rules for running this tracer survey?

MR. SEXTON: Whenever they can be ready I'm sure we can have the meeting. I'm not sure how much pre-work each side wants to do on this.

MR. BROWN: We'd like not to have to make a commitment on this today. I think we can probably let the Commission know very shortly.

COMMISSIONER RAMEY: I'm very interested in getting this over with.

MR. BROWN: We are too.

COMMISSIONER RAMEY: As rapidly as possible and I would encourage you to have that meeting Tuesday. Would you folks be ready by Tuesday?

(There followed a discussion off the record.)

MR. JONES: We can assure the Commission that as far as Hamilton's end of this thing is concerned, it will be handled as expeditiously as possible.

COMMISSIONER RAMEY: All right, then I'm going to continue this hearing until we get the results of the tracer survey.

So the hearing is adjourned.

(Hearing concluded.)

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Court Reporter, DO HEREBY CERTIFY that the foregoing and attached transcript of hearing before the Oil Conservation Division was reported by me; that said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill from my notes taken at the time of the hearing.

Sally Walton Boyd CSR

Sally Walton Boyd, C.S.R.

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

Texaco BO State #3
D-24 11S-32E
Lea Co.

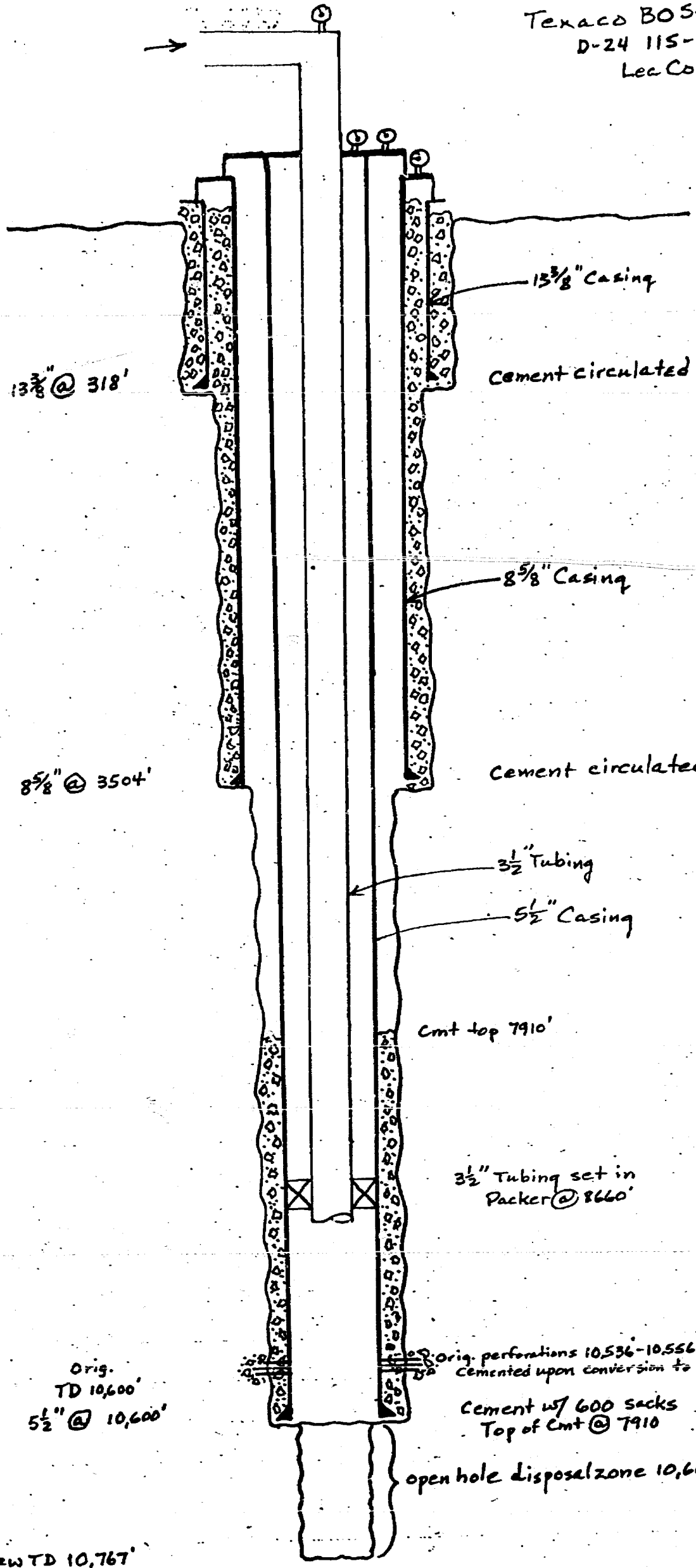


EXHIBIT 1

STATE OF NEW MEXICO COUNTY OF LEA

IN THE DISTRICT COURT

PAUL HAMILTON, Petitioner,	)	
vs.	)	No. CV-79-312
OIL CONSERVATION COMMISSION OF NEW MEXICO, Respondents.	)	

CIVIL APPEAL FROM THE
NEW MEXICO OIL CONSERVATION COMMISSION

RESPONDENT'S BRIEF
NEW MEXICO OIL CONSERVATION COMMISSION

ERNEST L. PADILLA
Assistant Attorney General for the
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

STATEMENT OF THE CASE

This case is a statutory petition brought pursuant to Section 70-2-25B NMSA, 1978 Compilation, for judicial review of an action of the Oil Conservation Commission (Commission). The action in question concerns the Commission's denial of Petitioner's application for an order shutting down salt water disposal operations in the Texaco, Inc. New Mexico State "BO" SWD Well No. 3, located in the NW/4 NW/4 of Section 24, Township 11 South, Range 32 East, Moore Devonian Pool, Lea County, New Mexico. Petitioner's allegations were that the above mentioned salt water disposal well had and was leaking salt water into the Ogallala formation, a shallow fresh water aquifer, underlying Petitioner's farm.

STATEMENT OF THE PROCEEDINGS

On October 16, 1972, the Commission, by its Order No. R-4422, authorized Texaco, Inc. to utilize its New Mexico "BO" State Well No. 3 ("BO" Well No. 3) located in the NW/4 NW/4 of Section 24, Township 11 South, Range 32 East, N.M.P.M., Moore-Devonian Pool, Lea County, New Mexico, to dispose of salt water produced in connection with its oil and gas operations into the Devonian formation at a depth interval from approximately 10,600 feet to 10,780 feet.

Pursuant to Petitioner's application for an order to shut in the "BO" Well No. 3 a hearing was held before the Commission on May 31, 1978. As a result of this hearing, by Order No. R-5753, the Commission denied Petitioner's application.

Upon Petitioner's timely application, the Commission through Order No. R-5753-A granted a rehearing with the scope of the hearing limited to evidence relating to data regarding water quality and water levels obtained from an observation well completed next to the "BO" Well No. 3 and

to other new evidence unavailable at the time of original hearing on May 31, 1978.

On August 23, 1978, the Commission held a rehearing and after taking additional evidence the Commission, after agreement by the parties and coordination with the Commission staff, recessed the hearing until March 15, 1979, to enable the parties to conduct a radioactive tracer survey test on the "BO" Well No. 3. As a result of the August 23, 1978, and March 15, 1979, rehearing, the Commission, by Order No. R-5753-B, affirmed its earlier decision and in doing so made the following findings, among others:

> "(6) That the evidence presented at the aforesaid May 31 hearing of this case established that there is an area in the general vicinity of the subject salt water disposal well in which there is an apparent anomalous 'nose' in the water levels in the Ogallala formation, and also an unnatural concentration of chloride in the ground waters in the basal Ogallala.
>
> "(7) That there was no definitive evidence presented at said May 31 hearing that the subject well had leaked or was leaking injected fluids (salt water) into the Ogallala formation in the area, or that said well was or had been a contributory factor to the aforesaid 'nose' and chloride concentration in the Ogallala water, but there was evidence which indicated that the well is mechanically sound.
>
> . . . .
>
> "(11) That although water levels in wells drilled to the contaminated ground water in the 'nose' described in Finding No. (6) above had declined subsequent to the May 31, 1978, hearing and prior to the August 31, 1978, hearing, such decline cannot be accepted as evidence that the subject well had previously leaked and was no longer leaking, inasmuch as said decline could very well be the result of the stabilization of the ground water gradient in the Ogallala formation due to cessation of pumping 'downstream' from said 'nose.'
>
> . . . .
>
> "(15) That a wide variety of tests have been conducted on the subject well, and all tests to date show that the casing, cement, and tubing in the well are sound, and that there is no channeling of salt water from the disposal zone into the Ogallala formation.

"(16) That although the specific cause of the 'nose' in the Ogallala water table, as described in Finding No. (6) above, and the source of the choride (sic) concentration, also as described in Finding No. (6), cannot be determined, there is no reason to believe that the continued disposal of produced salt water into the subject well is having or will have any detrimental effect on the ground waters in the Ogallala formation, and the denial of the application in this case, as decreed by Order No. R-5753, should be affirmed.

"(17) That the affirmation of said Order No. R-5753 will not cause waste nor impair correlative rights, nor unreasonably endanger fresh water supplies."

. . . .

Thereafter, Petitioner filed his petition for judicial review with this Court claiming that the foregoing findings were unsupported by substantial evidence.

SCOPE OF REVIEW

The scope of review in this case is limited by the fact that this is an appeal from an administrative order issued pursuant to hearings before the Commission. The Court, therefore, may only look at the record made in the administrative hearing. (Continental Oil Company vs. Oil Conservation Commission, 70 N.M. 310, 325, 326, 373 P.2d 809 (1962). It should determine if the Commission acted arbitrarily, capriciously or unreasonably by issuing an order not supported by substantial evidence. Otero vs. New Mexico State Police Board, 495 P.2d 374, 83 N.M. 594 (1972). In the absence of a determination that the Commission acted in one of the above ways, the decision of the Commission should be affirmed. Furthermore, the Court is not to weigh the evidence but its inquiry is limited to whether the Commission could reasonably make its findings based on the record before it. Grace vs. Oil Conservation Commission, 87 N.M. 205, 531 P.2d 939 (1975). Also, the Court is to give "...special weight and credence to the experience, technical competence and specialized knowledge of the Commission." Grace, supra, at 208.

There is a conflict in the technical evidence in this case, but in this proceeding, the real question is whether there is substantial evidence which supports the orders of the Commission. "Substantial evidence" is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." Fort Sumner Municipal School Board vs. Parsons, 82 N.M. 610, 485 P.2d 366 (1971); Wickersham vs. New Mexico State Board of Education, 81 N.M. 188, 464 P.2d 918, Ct. of App. (1970). In deciding whether a finding has substantial support, the Court must review the evidence in the most favorable light to support the finding and reverse only if convinced that the evidence thus viewed together with all reasonable inferences to be drawn therefrom, cannot sustain the finding. Any evidence unfavorable to the finding will not be considered. Martinez vs. Sears Roebuck & Company, 81 N.M. 371, 467 P.2d 37, Ct. of App. (1970); United Veterans Organization vs. New Mexico Property Appraisal Department, 84 N.M. 114, 500 P.2d 199, Ct. of App. (1972).

Since this case must be decided by the Court solely on the basis of the record made before the Commission without the aid of additional evidence, a review of the evidence on each point raised by the petitioner in its Application for Rehearing is essential.

THE COMMISSION FINDINGS ARE SUPPORTED BY SUBSTANTIAL EVIDENCE

Three separate hearing transcripts of significance in this case were prepared at the administrative level. These three transcripts are dated May 31, 1978; August 23, 1978; and March 15, 1979, respectively. References to these transcripts will identify each by date (eg. Tr. 100; 5-31-79).

Various tests to determine whether the "BO" Well No. 3 was leaking and thereby contaminating the fresh water aquifer were made. A discussion of these tests follows:

Radioactive Tracer Survey

This test resulted from a motion filed by Petitioner prior to the August 23, 1978, hearing, asking for a Commission order directing that an experiment, consisting of placing a fluorescent dye in the "BO" Well No. 3, be conducted. The purpose of the experiment was to determine whether or not the fluorescent dye would appear in an observation well which would be completed near the salt water disposal well.

Texaco opposed the Motion on the grounds that the fluorescent dye test would be duplicative and that such testing could result in permanent contamination of ground water. However, Texaco suggested that should the Commission be inclined to require further testing, then a radioactive tracer test should be run by a competent third party qualified in such testing procedures.

The Commission rules on the motion by granting Petitioner's motion. Tr. 134-139; 8-23-78. Thereupon Texaco, of the opinion that a radioactive tracer survey would be a more reliable form of testing, agreed to underwrite the cost of a radioactive tracer survey. Tr. 141; 8-23-78. Details of

the survey were then left up to the parties to coordinate with the Oil Conservation Division's staff. Tr. 142; 8-23-78.

A further hearing to take evidence on the results of the radioactive survey was held on March 15, 1979. In short, the results of the survey indicated that the well was not leaking thereby affirming the results of every test taken of the "BO" Well No. 3 in connection with the proceedings at the administrative level.

In view of the clear and concise testimony given at the March 15, 1979, hearing, by Texaco's witnesses, it appears unnecessary to repeat that testimony herein. See Tr. 4-8, 13-22; 3-15-79. It suffices to say that Petitioner did not present any evidence to rebut the fact that there was no trace of the radioactive material injected into the salt water reservoir and the samples taken from the observation well by either the third party running the testing procedure or by Petitioner, who himself had his own samples independently analyzed. Tr. 8, 20-21; 3-15-79.

Stevens Water Level Recorder

The testimony of Jim Wright, a field engineer for the Water Resources Division of the Natural Resources Department of the State of New Mexico, lays the foundation for a very significant point in this appeal. Tr. 103-104; 8-23-78.

The testimony of Mr. Wright, insofar as water level testing is concerned, reveals to us that the water level in the immediate vicinity of the "BO" Well No. 3 did not vary or coincide with varying salt water injection levels.

Petitioner, with the consultation of the Water Resources Division, drilled an observation well located near the "BO" Well No. 3 salt water disposal well. Tr. 105; 8-23-78.

A recording device called a Stevens Recorder was then placed by personnel of the Water Resources Division in the observation well for the purpose of determining whether or not there were changes in the fluid level in the fresh water aquifer which could be attributed to salt water injections in the disposal well.

The following verbatim testimony sums the results of this experiment:

. . . .

"Q. Have you had a recording device placed that monitors the water level in the observation well?

A. Yes, sir, we have a Stevens recorder on it with a continuing water level chart. This operates on a float mechanism and a time clock

Q. What -- what's the purpose of installing this device on the observation well?

A. Well, the purpose of installing it is to see whetheror (sic) not we got any fluctuations in the water table flowed through the Texaco salt water disposal well.

Q. The idea being that when the well was injected there would be some change in the fluid level in the observation well, is that right?

A. The idea being that there might be.

Q. Has any such change been detected up to this point?

A. No, sir, I looked at the chart and the fluctuations in the chart are really, in my opinion, insignificant.

Q. Well, in your opinion does that indicate that there is no communication between the disposal well and the aquifer?

A. Well, I wouldn't say that it guarantees that there's no connection at all, but at least the recorder doesn't show any connection.

. . . .

On cross-examinatin, Mr. Wright again reiterated the results of the Stevens recorder testing at pages 120-123 of the August 23, 1978, hearing transcript. The following dialogue is found at pages 121-122 of that transcript:

. . . .

"Q. Let me hand you what's been marked for identification, Mr. Wright, as Texaco Exhibit One, and ask you, sir, if you can identify this exhibit?

A. Yes, sir, this is an Ozlaid print of a water stage recorder chart, which was taken from an observation well located in Section 24, Township 11 South, Range 32 East, and identified as hole number 20, Hamilton hole number 20.

Q. Approximately how far is that from the wellbore of the Texaco "BO" No. 3 Salt Water Disposal Well?

A. Oh, as I recall, it's something like 60, 75 feet.

Q. Does the graph on this chart, does it reflect that there has been no indicated change in the water level during the period of injection while this recorder has been on the observation well?

A. In general the changes are in the neighborhood of two hundredths of a foot and are probably due to barometric fluctuation.

Q. In effect, then, what we have is a straight line curve?

A. Essentially, except for one spot where we had a change of about, oh, four hundredths of a foot, which occurred sometime after midnight on August the 18th, 1978.

Q. How long was this recorder on the well?

A. The recorder was installed on August the 7th and the chart was pulled August the 21st, so that would be approximately two weeks.

Q. If I understood your testimony on direct, it was your conclusion that based on the results of this graph, that there can be no indication, or there is no indication, of any change in the water level during periods of injection into the salt water disposal well.

A. Well, there's no significant change. It didn't stay exactly the same, but the changes are small.

Q. If there had been any communication at all, considering the proximity of this observation well, to the wellbore of the disposal well, isn't it true, sir, that the changes would be substantial and immediately detected?

A. I would expect them to be, yes.

Q. So this -- this would indicate then no communication at least during the period that the graph was on the well.

A. That would be my interpreation at this time. A longer period might indicate something else, but I doubt it.

. . . .

Injectivity Profile Survey

This test on the "BO" Well No. 3, like the radioactive tracer survey, was conducted by an independent third party. This survey consisted of radioactive tracing of the flow of injected salt water through the 3 1/2-inch tubing string to ultimate point of disposal. Tr. 28-29; 5-31-78.

The conclusions reached as a result of this test were that there had been no fluid loss within the 3 1/2-inch tubing and no loss in fluid at any point in the wellbore until after the open hole section in the Devonian formation, the disposal zone, had been reached. Tr. 29; 5-31-78. See also Paul Hamilton Exhibit 2 introduced at the May 31, 1978, hearing which details the test results.

At pages 100-101 of the May 31, 1978, hearing transcript, on cross-examination of Mr. Wright, a witness for Petitioner, we gather additional information dealing with the integrity of the casing in the "BO" Well No. 3. The following exchange took place there:

. . . .

"Q. Have you looked at the tracer log that was made?

A. Yes, I've looked at the tracer log.

Q. And every ounce of fluid that was pumped into this well bore went into the Devonian formation, did it not?

A. Yes.

Q. And if it hadn't gone in there would be some possibility of a casing leak, is that correct?

A. That would be correct.

Q. That's why it was run and it showed that every bit of it went into the injection formation?

A. I think I stated that there is no casing leak in this well.

Q. I'm talking about channeling behind the casing. The conclusion of the service that ran this test was also that there were no indications of any channeling.

A. Yes, sir. I agree with that statement, there's no indication."

. . . .

Mr. Wright's last response above leads to another point relevant to the issue of whether or not the salt water once having been injected into the disposal interval then channeled behind the casing back up to the fresh water aquifer. In this instance again the injectivity profile survey is very helpful in that its second function showed that the injected water was not channeling back up behind the casing. Tr. 29; 5-31-78.

Regarding this channeling issue, Charles Joy, a witness for Petitioner, attempted to discredit the validity of this test (beginning at Tr. 105; 5-31-78). However, on cross-examination Mr. Joy finally admitted that he had no evidence that channeling was occurring. Tr. 118; 5-31-78. Similarly, Mr. Wright also testified of having no evidence of channeling. Tr. 95; 5-31-78.

A close scrutiny of Mr. Joy's testimony indicates that his testimony is really couched in terms of probabilities and speculation, and his testimony is of little value in aiding the Commission insofar as giving something positive which would directly relate to the test itself and the well site.

Nevertheless, a point worth noting is illustrated by a schematic of the well which is attached hereto as Exhibit 1.

This exhibit has been prepared from well records which were admitted into evidence at the hearings. The point is that, if the channeling hypothesis is correct, the injected salt water would have had to channel back up a height of two miles!

A final note on this issue relative to Mr. Joy's testimony is that he was not aware of any other situation where channeling had occurred from a depth of 10,000 or 12,000 feet. Tr. 123; 5-31-78.

The testimony of Sherman E. Galloway sums the essence of this test. If there was communication between the "BO" Well No. 3 and the Ogallala formation, Mr. Galloway expected the water table to fluctuate with injection through the disposal well. Tr. 42-43; 8-23-78. We already know, however, that there were no fluctuations.

Casing and Tubing Pressure Tests

At pages 29-31 of the May 31, 1978, hearing transcript, Mr. John V. Gannon acquainted the Commission with a series of pressure tests that were carried out on the "BO" Well No. 3. See also Exhibit 3, a memorandum dated March 28, 1978, outlining one of these tests.

The obvious purpose of this experiment was to determine whether there were any leaks in any of the casing strings or the tubing.

This test was designed to show pressure equalization between the tubing string and the 5 1/2-inch casing, between the 5 1/2-inch casing and the 8 5/8-inch casing, or between the 8 5/8-inch casing and the 13 3/8-inch casing, respectively. For example, a rise in pressure in the 5 1/2-inch casing which had a lower pressure than the tubing string would have been evidence of communication between the tubing string and the 5 1/2-inch casing. Similarly, a tendency toward

equalization in the pressures between the 5 1/2-inch casing which had a higher pressure than the 8 5/8-inch casing would have indicated a leak between those two casing strings.

Simply summarized, under no circumstances did the pressure equalize between any of the sets of casing strings. Moreover, Mr. Gannon testified that between 1974 and 1976 Texaco had replaced several joints of tubing string whenever the tubing annulus went on a vacuum or depressurized. Tr. 10-14; 5-31-78. In other words in those instances where something extraordinary was discovered in the 3 1/2-inch tubing or injection string, the problem was investigated and corrected, followed by testing for further leakage.

At this juncture we move from specific testing to a water level study which consumed considerable attention at the May 31 and August 23, 1978, hearings. It seems that Petitioner's witnesses attributed a bulging or mounding in the water table in the immediate vicinity of the "BO" Well No. 3 to leakage from the disposal well. See Tr. 61, 65; 5-31-78 and Tr. 10, 26, 58, 8-23-78.

A careful analysis of Petitioner's theories points to an illogical set of facts.

First, Mr. Galloway's studies of the water table show that the water table has declined in the vicinity of the disposal well. Tr. 23; 8-23-78.

Secondly, Mr. Galloway appears to rely heavily on a theoretical assumption that the disposal well would have had to leak about 100 gallons per minute or about one-third of the total injected volume (Tr. 11, 15, 60; 8-23-78) to raise the water level in the Ogallala high enough to push the water across topographical difficulties imposed by a geologic structure or ridge called the Red Bed high. Tr. 15; 8-23-78.

Thereafter the salt water would migrate southeasterly to Petitioner's water wells.

Third, Mr. Galloway attributed the decline in water levels to a stoppage or reduction in leakage, but is unable to explain how such a large leak could have cured itself. Tr. 58-61; 8-23-78. Further, he has problems sustaining his water level decline theory in the absence of pumping in the vicinity of the disposal well. Tr. 86; 8-23-78.

Finally, Mr. Galloway, in explaining Exhibit 5, prepared by him for the August 23, 1978, hearing, admits that under normal circumstances, water from outside a cone of depression would flow into the cone to equalize the water level. Tr. 101-103; 8-23-78. While Mr. Galloway would not attribute the decline in water level in the vicinity of the "BO" Well No. 3 to an equalization with the increase in water level causes by Petitioner's cessation of pumping from his water wells southeast of the "BO" Well No. 3, it is submitted that such an occurrence would not be an unreasonable assumption.

In the final analysis, it seems inconceivable, considering the magnitude of the assumed leak, that a better explanation for the decline in the water level in the vicinity of the disposal well cannot be given.

CONCLUSION

In summary, the results of all tests administered on the "BO" Well No. 3 were negative. Essentially, there was absolutely no concrete evidence which would prove that there was communication between the disposal well and the fresh water acquifer.

As a consequence, in reaching its decision not to shut in the disposal well, the Commission based its decision on substantial evidence. Therefore its decision should be affirmed.

Respectfully submitted,

ERNEST L. PADILLA
Assistant Attorney General for the
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

TELEDYNE ISOTOPES

TEXACO
Mines Field

SHIPPING/RECEIVING SURVEY RECORD

A. Shipment Data

Date Shipped 9/13/78 Date Received 9/27/28

From New England Nuclear

To Petroleum Towers, Lubbock Texas

Via Airborne

Owner of Transport

Type of Package Cardboard Box

Approximate Size 6"x5"x8"

B. DOT Label Information

Class I, II, III (circle)

Radioactive Contents Sodium Iodine - 1125 - 5MC

Activity of Contents

Transport Index (Radiation dose rate @ 3 ft from package) Maximum 10 mr/hr.

C. Health Physics Office Survey Data

Reading at Contact 1200 cpm - Ludlum Model 11

Reading at 3 ft 1200 cpm - Ludlum Model 11

Instrument Ludlum Model 11

Smear Survey cpm

DOT Label Attached ____ Yes ____ No

Background @ 10' away 1200 cpm - Ludlum

Surveyed by Bobby Flatt Date 9-28-78

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. HP Form 5 Exhibit No. 1
Submitted by TEXACO INC
Hearing Date

OVER

Reading of head stock - Model 11 headstock 10,000
Head spacer " " " " 980,000

Reading at workhead - Model 11 headstock
10,000 } Same as
12,000 } background

Model 44 zeroed for
all readings

Registered tracer @ 10:45 AM
9-28-78
Removed tool @ 11:15 AM

Dosimeted 3@ chest
3@ Finish

PETROLEUM TRACERS INC./511 NORTH AKARD BLDG./Dallas, Texas 75201
phone: 214 747-9387

Check List For Injection Of Radioactive Isotopes

1) Make up tools to the correct measurement complete with plunger.

2) Install tool in the wellhead and test at injection pressure.

3) Apply detergent.

4) Take vial of radioactive material out of shipping container and place in injection tool.

5) Make up injection tool thereby crushing vial.

6) Flush material into well by opening injection and well master valves.

7) Flow for a time sufficient to clean up tool.

8) Shut in well, remove injection tool.

9) Take smears to send to Westwood Lab.

Field Moore County, State Lea, New Mexico

Lease & Well No. BO. State #3 Isotope Injected Sodium Iodide Date 9-24-74

New England Nuclear
575 Albany Street, Boston, Mass. 02118
Customer Service - 617-482-9595 - Telex 94-0998

B 023

NENC SHIPMENT AND ORDER NO.
044909

CUSTOMER
41000 99

SOLD TO
TELEDYNE-ISOTOPES INC.
50 VAN BUREN AVE.
WESTWOOD, N.J. 07675

PLEASE REFER TO SHIPMENT NUMBER ON INQUIRIES CONCERNING THIS ORDER

* INDICATES SUBSIDIARY PROCESSING THIS ORDER IF APPLICABLE

If not deliverable, return to:
New England Nuclear
575 Albany St., Boston, Mass. 02118
Tel: (617) 426-7311 Telex: 94-0996

11.9A

SHIP TO
PETROLEUM TRACERS INC.
C/O AIRBORNE AIRFREIGHT
TERMINAL
LUBBOCK, TEXAS 79408

MARK FOR
HOLD FOR PICKUP AT AIRPORT
CALL T CALHOUN 214-747-9386

PACKAGE NO.	CUSTOMER P.O. NO.
044909	38029

WE HAVE ENTERED YOUR ORDER AS FOLLOWS:

CUSTOMER P.O. NO.	REQUISITION	CONTRACT OR FUND NO.	ROUTE F.O.B.	
38029		78C01166M	ORIG PPD	AIRBORN ONLY

SALESMAN	CUSTOMER RECEIVED	TODAY'S DATE	ORDER STATUS AND TERMS	SHIPPED	RADIATION AT SURFACE	INSPECTED	PAGE
37	3/31/78	9/11/78	NET 30 DAYS	4-22-78	1/h		1

LINE NO	CATALOG NO.	COMPOUND OR SERVICE	LOT NO.	NO. OF PACKAGES	PACKAGE SIZE	ESTIMATED SHIP DATE	UNIT PRICE	UNIT TYPE	QTY. SHIP
010	NEZ 033	SODIUM IODIDE-I125 (CARRIER FREE 17C/MC) SHIP IN 5.0ML VOLUME IN SPECIAL MULTIDOSE VIAL SUPPLIED BY CUSTOMER ~~SELLING ONLY~~ RADIOACTIVE MATERIALS LICENSE 29-00055-02 WHEN PLACING ORDERS, CUSTOMERS MAY NOW DIAL OUR TOLL-FREE NUMBER. 800-225-1572 NOTE-IMMUNOREACTIVE IODINE LABELED HORMONES NOW AVAILABLE.WRITE OR CALL FOR DETAILED SPECS.	784	1	5MC	09137			1

16.9A

THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL UNLESS CHECKED HERE ☐

MATERIAL WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR PRIOR PERMISSION.

New England Nuclear

Customer Service
(617) 482-9595

NEN Order # 044909-169A | Amt. 5mCi

CATALOG NO.
NEZ-033

TECHNICAL DATA

NUCLIDE: IODINE-125

CHEMICAL FORM: $Na^{125}I$ in 0.1 M NaOH

SPECIFIC ACTIVITY: Carrier Free

CONCENTRATION: / mCi/ml VOLUME: 5 ml

RADIOMETRIC PURITY: 99% By γ-ray Spectrometry

PRINCIPAL RADIOACTIVE CONTAMINANTS: ^{124}I

TOTAL SOLIDS: 4 mg/ml NaOH

METHOD OF PREPARATION: $^{124}Xe\ (n,\gamma)\ ^{125}Xe \xrightarrow{EC} {}^{125}I$

ASSAY DATE: 9/25/78 LOT: 9784

RADIATION UNSHIELDED: 100 mr/hr 0

...ION. NOT FOR USE IN HUMANS OR CLINICAL DIAGNOSIS: This product ... for research or manufacturing use only. It is pharmaceutically ... for research or manufacturing use only. It is pharmaceutically ... d for research or manufacturing use only. It is pharmaceutically ... verification of its suitability for use in humans or as a clinical ... and the compliance with all Federal and State laws ... irations is the sole responsibility of the purchaser.

WARRANTY:

New England Nuclear warrants the materials sold by it to be of merchantable quality at the time of shipment. There is no warranty, express or implied, as to the fitness of these materials for any particular purpose. The customer must notify the company, by registered mail, of any breach of warranty. Because of the inherent susceptibility to deterioration of those products containing short half-lived radionuclides, or which show a radiation decomposition rate of greater than one per cent (1%) per month, notification must be made within 15 days of receipt. For all other products a 50-day period will be allowed. All claims shall be deemed waived in the event the customer fails to notify the company within the guarantee period. The maximum liability for breach of warranty shall be the invoice price for said materials and this liability shall be exclusive. **New England Nuclear shall not be liable for any consequential, compensatory, incidental, or special damages.**

S-436

it is operated on a purely numerical basis which makes it possible to use small computers. The principle and advantages of the new method are discussed.

356 Harzer, D., Pilot, J., Roesler, H.J. ANALYSES OF OXYGEN ISOTOPES IN SURFACE AND RAINWATERS OF THE HARZ MOUNTAINS. Bergakademie 20 (1968) 329-32. (In German)

Rain, surface waters and groundwaters of the Harz Mountains were analysed for oxygen isotopes. The seasonal range of variation in ^{18}O content of rain was a maximum of 10‰ (-5.5 to -15.9‰). The range for river water was 5‰, and for water from a lake formed by a dam, 4‰. The labelling of the surface water was, in comparison to the groundwater, most pronounced during October and was at the maximum 2.0 to 2.5‰ or ~1‰ on a monthly average. Differences in the $\delta^{18}O$ values of the reservoir water corresponded to the temperature layering of the water, which was most strongly developed during the summer months. The δD and $\delta^{18}O$ values were measured on a few samples. They obey the Craig equation, $\delta D = 8\delta^{18}O + 10$.

357 Havlik, B. RADIOACTIVE POLLUTION OF RIVERS IN CZECHOSLOVAKIA. Hlth Phys. 19 (1970) 617-24.

One of the oldest uranium-mining areas in the world is the spa Jáchymov in Bohemia. A study of environmental contamination began there when uranium mining was at a maximum, and continued until mining ceased six years later. The content of ^{226}Ra and total beta activity of water, river sediments and water plants were estimated in the streams of this area and of the other uranium ore area, where mining reached its maximum during the study period. Radioactive pollution of the major Czechoslovak rivers during 1964 to 1967 is described.

358 Hazzaa, I.B. A MODIFIED METHOD FOR DETERMINATION OF AQUIFER PARAMETERS USING RADIOACTIVE ISOTOPES. Int. J. appl. Radiat. Isotopes 17 (1966) 583-5.

The method for measuring the lowering of water levels in wells during pumping, previously developed in the Middle Eastern Regional Radioisotope Centre, was modified to overcome some difficulties. The method has been applied on deep wells with good results.

→ 359 Hazzaa, I.B., Girgis, R.K., Saad, K.F., Swailem, F.M., Bakr, A.A. INVESTIGATION OF GROUND WATER RADIAL FLOW USING RADIOACTIVE TRACERS. Bull. int. Ass. scient. Hydrol. 12 (1967) 55-9.

A study of the effectiveness of various radioisotopes in investigating the porosity of water-bearing formations, with ^{131}I, ^{51}Cr-EDTA, and ^{82}Br, in comparison with $^{3}H_2O$, showed that ^{131}I was most useful for this purpose. Field experiments were conducted to study the effective porosity of the groundwater aquifer, by injecting ^{131}I simultaneously with $^{3}H_2O$ as a reference, at different depths, to examine the influence of the depth of injection of the radioisotopes on the values obtained for the effective porosity of the aquifer under pumping conditions. A pumped well, fully penetrating a homogeneous sandy aquifer, was chosen. Three runs were undertaken injecting the radioisotopes in a 10 m distant observation well at three different levels. An additional run was made by injecting ^{131}I at the three depths simultaneously. In each run, the activity of the outflowing water was followed until it reached the background level. The results indicated that the values obtained for the effective porosity of a groundwater aquifer using tracers are not dependent on the depth of injection of the tracer. This conclusion holds for radial flow, in homogeneous aquifers, between the observation well and the pumped well. The percentage recovery of the injected activity was calculated.

360 Hazzaa, I.B. DETERMINATION OF THE VELOCITY OF GROUNDWATER FLOW WITH RADIOISOTOPES. Int. J. appl. Radiat. Isotopes 20 (1969) 127-9.

The velocity of groundwater flow can be calculated if the displacement r during a period t is known ($v = r/t$), and it is possible to measure r by introducing a radioisotope into a well, allowing the radioactivity to be carried away by the groundwater stream over a known time and then pumping from the well at a known rate, the radioactivity in the pumped water being continuously monitored. Several ways of applying this method are described, including tests of the method using a model basin.

361 Hazzaa, I.B. SINGLE-WEL
DIRECTION AND VELOCITY
Hydrology 1970', Proceedi
held by the IAEA in co-opera
International Atomic Energy

A radiographic method for d
groundwater flow has been d
or a thin-column source, at
The injection is performed a
radioisotope is left to follow
adsorbed onto the walls of tw
few centimetres and fitted in
radiographed; the darkest pa
another film give the value o
measured. Velocities are de
calibration curve of the veloc

362 Hazzaa, I.B., Sharhan, A.M
AVERAGE VELOCITY OF GF
OF THE QUANTITY OF GRO
RADIOISOTOPES. Isotop. R

The velocity of groundwater
ten localities. This velocity
period y. The velocity is the
by injecting a few millicuries
radioactivity be carried away
pumping from the well at a kn
was continuously monitored,
determined using the velocity
0.7 m/d and 0.3 m/d; the ave
estimation of the quantity of g
existing conditions was obtain

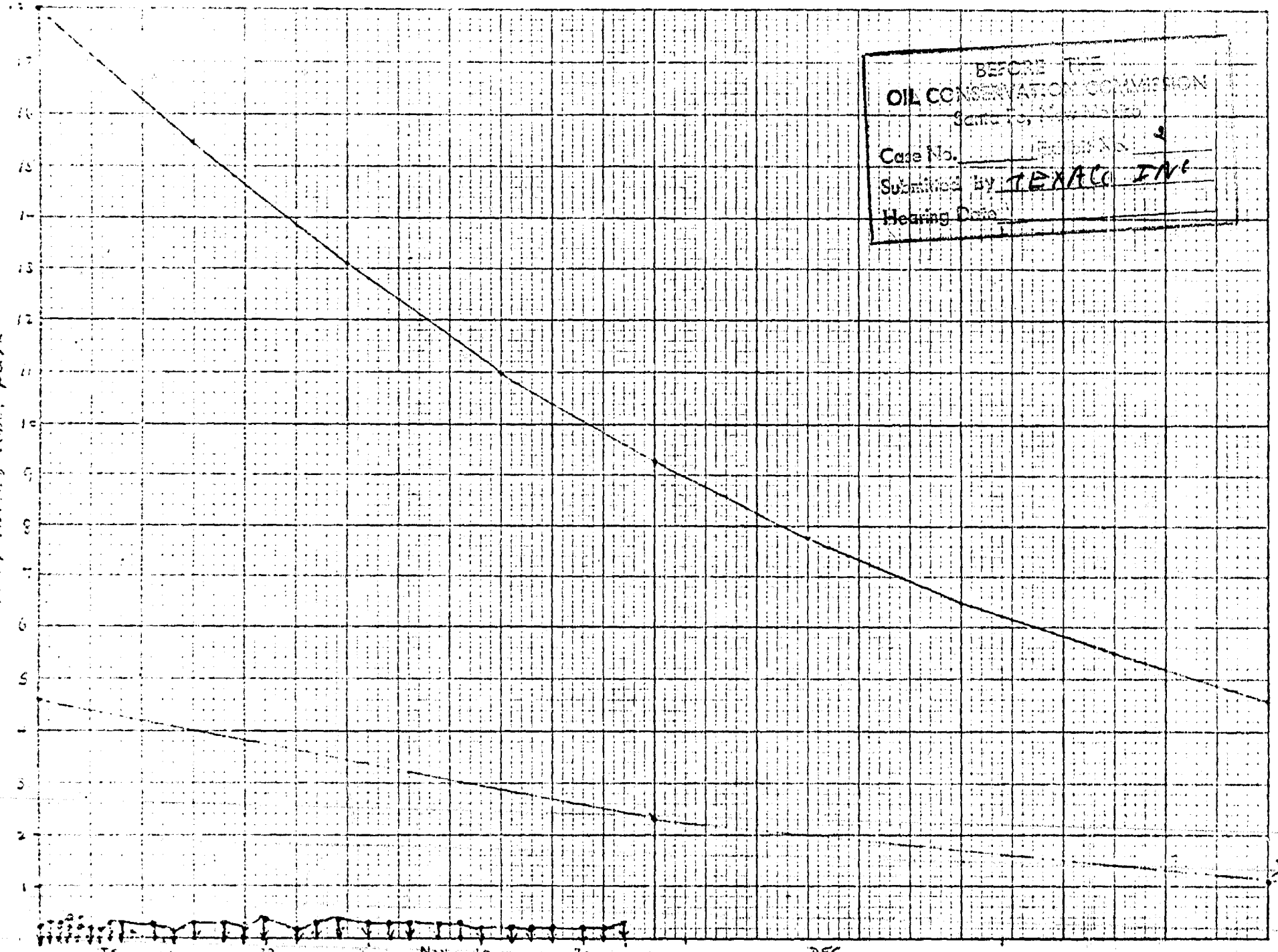
363 Deleted

364 Helf, S. ENVIRONMENTAL
ARSENAL AREA, 1963-1966.
N.J. Feltman Research Labs

An environmental radioactivit
from Picatinny Arsenal and s
spring 1963 to fall 1966. San
precipitation were assayed du
done on soil from wooded are
1963 to October 1966. Radios
concentration of individual ga
Resolution of the complex spe
by electronic computer metho
was observed in almost all sa
nuclide per gram of sample.
are cerium-144 (285 d), antim
(30 yr), and manganese-54 (31
environment is principally fro
atmospheric tests conducted b
1962. Zirconium-95 (65 d) wa
at barely detectable levels in
short-lived radionuclide is pr
Naturally occurring potassium
radioactivity was detectable w
to Picatinny Arsenal operation

365 Hem, J.D. STUDY AND INT
OF NATURAL WATER. Geol
D.C., U.S. Government Print

TEXACO INC


BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No.
Submitted by TEXACO INC
Hearing Date
Formation Pressure, psig
28 MAY
20
30
NOV
10
20
24 NOV
LAST SAMPLE
DEC

TELE-TRACER DATA SUMMARY - TEXACO, INC. - MOORE FIELD - ^{125}I in 60' OBS - WELL

COLLECTION DATE		TI #	^{125}I	pCi/l	W.O. No.
Fri.	29 Sept. 1978	S7570	less than 0.2	3-	2229
Sat.	30 " "	S7656	"	0.3	3- 2238
Sun.	1 Oct. 1978	S7632	"	0.2	3- 2236
Mon.	2 " "	S7633	"	0.4	3- 2238
Tues.	3 " "	S7634	"	0.2	3- 2238
Wednes.	4 " "	S7943	"	0.2	3- 2258
Thurs.	5 " "	S7906	"	0.2	3- 2252
Fri.	6 " "	S8004	"	0.3	3- 2281
Mon.	9 " "	S8225	"	0.3	3- 2337
Wednes.	11 " "	S8226	"	0.1	3- 2337
Fri.	13 " "	S8062	"	0.3	3- 2240
Mon.	16 " "	S8130	"	0.3	3- 2311
Wednes.	18 " "	S8227	"	0.2	3- 2357
Fri.	20 " "	S8263	"	0.4	3- 2342
Mon.	23 " " [1]	S8331	"	0.2	3- 2346
Wednes.	25 " "	S8510	"	0.3	3- 2379
Fri.	27 " "	S8511	"	0.4	3- 2379
Mon.	30 " "	S8664	"	0.3	3- 2408
Wednes.	1 Nov. 1978 [1]	S8848	"	0.3	3- 2450
Fri.	3 " "	S8849	"	0.3	3- 2430
Mon.	6 " " [2]	S8998	"	0.3	3- 2455
Wednes.	8 " "	S9280	"	0.3	3- 2493
Fri.	10 " "	S9171	"	0.2	3- 2474
Mon.	13 " "	S9281	"	0.2	3- 2493
Wednes.	15 " "	S9423	"	0.2	3- 2505
Fri.	17 " "	S9458	"	0.3	3- 2511
Mon.	20 " " [3]	S9529	"	0.2	3- 2534
Wednes.	22 " " [4]	S9620	"	0.2	3- 2543
Fri.	24 " "	S9621	"	0.3	3- 2543

Note:

/ - Analysis in Progress

1 - No Collection Date on Bottles - Inferred Date

2 - Labeled 6 October - Assumed 6 November

3- " 20 " - " 20 "

4- " 22 " - " 22 "

FORM NO. 1137 GOLDSMITH BROS., N. Y. 10038 (212) 267-7900

3

TEXACO INC

SUMMARY OF TESTIMONY--JIM WRIGHT
OCD Hearing August 23, 1978

Page

104 Helped with selection of sites for four wells drilled since May OCD Hearing; data collected from wells was collected under his supervision

105 He measured some water levels in the study himself; believes the measurements are accurate within .02 or .03 of a foot

106 [redacted] quality of water in observation well is very similar to quarity of water being injected.

107 [redacted] but the fluctuations noted were insignificant

108 [redacted] for longer time to "see what happens"

109 Agrees with Galloway's testimony concerning decline in mound, also still believes disposal well had leaked at one time, cites anomaly around well, decline of water levels, former water table high

110 Hasn't seen anything to cause him to believe any sudden differences in permeability in the vicinity of the disposal well

111 He testifies that this well could have leaked without there being a casing leak or tubing leak if:

1. Water moved behind the pipe by channeling through a cement job, or
2. lateral movement of water from another disposal well which could move to BO3 and migrate to the surface by channeling behind intermediate casing

113 On cross, Wright says he adjusted for density on the cased observation well, made adjustment to the fresh water equivalent

114 Reference to publication (Tech. Report 38) by W. L. Hiss in State Engineer's office which contains specifications for calculation of water equivalents; Wright doesn't know if it is necessary to adjust to formation level to make density adjustment in observation well comparable to water levels in uncased wells are not; he says he doesn't know the thickness of the brine in the well

115 He agrees that the comparison of levels in a well which has been adjusted on fresh water equivalent to formation water are not the same, but says the difference is insignificant; would only make the mound higher

116 Disagrees that the decline of the water level can be attributed to a cessation of irrigation pumping by Hamilton, due to the pattern

Page

118 Agrees with Galloway that in the area of the troughs of the Red Beds the ogallala has higher permeability

119 Says leak in well would have had to decrease for some reason unknown to him for the mound to have declined; he has no evidence of any decrease in the leak

120 He says the evidence now is that there is less leakage than there once was

121 [redacted] when Texaco was injecting into BO3

122 [redacted] indicates no communication during the period the graph was on the well

124 Suggests injection of flourescent dye or potassium chloride as tracer test

126 [redacted] potassium chloride injected would prove [redacted] "beyond [redacted]

127 He agrees that a change in the water table during periods of injection would be conclusive evidence of communication

Has he seen tracer test results -- Conclusive proof of communication

SUMMARY OF TESTIMONY--SHERMAN GALLOWAY
OCD August 23, 1978 Hearing

Page	
6-7	Ex. 1 showed location of four test wells drilled between first and second hearing; they were numbered 17-20; Well 20 was closest to disposal well, was completed as observation well.
8	Well 19 was drilled to check on water quality in vicinity of abandoned Amerada well; wells 17 and 18 drilled to check on actual presence of red bed high; well 20 drilled as observation well, equipped with automatic water level recorder. Found that red beds were lower than he testified earlier.
9	Prior believed red bed elevation was 4240, now he testifies it is 4236
10	Testifies that he did not believe it necessary to revise the water table map submitted at the previous hearing after receiving data from the 4 new wells; he states that he still believes the chloride map indicates a point of recharge in the vicinity of the salt water disposal well.
11	Another exhibit introduced showing a theoretical rise in water levels assuming a recharge, based on his opinion of conditions in the area; his curves were plotted assuming a discharge of 100 gpm
12	Transmissivity (permeability times thickness of aquifer) figured to be from 30,000 to 60,000 gals per day per foot; storage coefficient of .10 used
15	States it is possible, "within the realm of reason", that if BO3 was leaking, at a rate of 100 gpm, there would have been enough water to push it across the red bed high
16	11,500 to 12,000 barrels disposed of per day, equals approximately 350 gpm
17-18	Not entirely clear, but appears that Galloway testified that the well would have to leak 100 gallons per minute for 5 years to rise 4 feet and get over the red bed high about 3 of Ludwig, Kellahin, Kellahin
19	Testifies that abnormality in water table is present for approx. 500 feet on either side of the disposal well
20	Exhibit showing change in ground water levels from approximately March 1978 (Spring) to August 11, 1978, shows change from initial static water level measurement up to August 11.
21	Measurements were made with steel tape by employees of State Engineer's office, taken to the hundreth of a foot
23	From this exhibit, he concludes that water levels are declining in the vicinity of the disposal well, but increasing in the surrounding area outside; maximum decline was .38 feet from March until August

Page

24 No correction made in water level measurements for density of salt water because measurements were made in open, uncased holes

25 He would not expect decline in vicinity of BO3 because declines usually relate to pumping, and there is no pumping in this particular area for ½ mile or more; his opinion is that well has leaked, and has either quit leaking or is leaking at reduced rate.

26 Says mound is lower than it was a previous hearing but is still present

27 Measurements are made from the top of the hole

29 Next map shows water level changes from July 14 to August 11, 1978; These measurements taken to check on possible pattern of change in one month period

30 Maximum decline in water level again was adjacent to disposal well between July 14 and August 11

32 Galloway explains decline in water level with increases in outlying areas as being due to a cessation of the leak from BO3, causing the water mound to dissipate

33 Says he is not aware of any native salt deposits in the ogallala in this area

35 Says his office has experienced "lots of problems" from disposal pits and he believes most pits have contributed salt water to the ogallala

37 He would expect water from the pit to move northeast, which is the direction of the well from the pit, but doesn't think the pit would cause a rise in water levels around the well

38 If pit leaked water sufficient to cause a mound, he believes the mound would be at the pit, not at the disposal well

39 Galloway never expressed an opinion on whether water from the pit could still be lingering in the vicinity of the well, says he doesn't know rates of movement in the area because he wasn't concerned with it

40 Expresses 3 reasons why he thinks the well has leaked:
1. Salt water anomaly in vicinity of well
2. Water table mound coinciding with salt water anomaly in location of well
3. Anomalous water level change coinciding with location of well, salt water anomaly, and mound on water table

43 On cross, Galloway says he would expect water table to fluctuate with injection [illegible] if there was communication between well [illegible]

Page

45 Says red bed high itself would explain mounding anomaly if mounding coincided exactly with highest point, but mound is a little north of the high of the red beds, on the north slope

46 [redacted] water running through well in the red beds could possibly explain anomaly in water table, but Galloway doesn't believe it does, because even greater differences in elevation of the red beds don't seem to show the sharp breaks

47 From [redacted] from disposal well north and east is downhill

48 He believes mound would have extended in all directions from the well, based on the water level changes

50 Galloway doesn't think the non-pumping of Hamilton's well explains the increase in water level in the vicinity of the well, because increase in water level did not decrease uniformly outwardly from the point of the pumping

53 He ac[redacted] in permeability and barometric p[redacted] factors in changes in water levels

54 But he says the water here is basically unconfined and therefore barometric pressure is not a major factor

60 At the end of [redacted] with leakage of 100 gpm it would be possible to have a 100' rise in the water table at a distance of 1,000 [redacted] from the well; well would have had to have leaked approximately 1/3 the total injected volume for 5 years for even that to result

62-63 Galloway repeats that approximately the same mounding should occur in all directions from the well, thinks a significent portion of the salt water should move north and east because of valley going downhill from the well north and east

65 Doesn't explain too well why low chloride numbers appear to the north, seems to think that the brines are just naturally swept along with the natural flow of the water to the southeast

66 Ex. 2 indicates that a big trough extends north of Section 24 and then cuts through the east half of Section 24; also have valley extending from disposal well northeast to vicinity of point labeled elevation 4207

69 Admits errors could occur in measurement simply by placing 2 x 4 or angleiron incorrectly; doesn't really respond to questions whether error of as much as .09 feet could occur

70-71 Water level map showed increase in water level in northeast corner of Section 24 and southeast corner of Section 14, also to the southwest in Section 23; does not agree that cessation of Hamilton's pumping could explain isolated points of increase surrounding the well

Page

74 Galloway explains that correction has to be made for water level in cased well as opposed to water level outside the casing, to correct for heavier density of water in the cased well

76 Galloway had not looked at samples from drilling

77 Seems to admit that the very action of drilling the well might do some destruction to signs of non-permeability

78 Says he knows of some places in the ogallala where irrigation water can't be produced because of differences in saturated thickness

80 Doesn't think there could be a permeability barrier in the northwest of southeast of Section 14; says ogallala generally consists of fine to medium grained sand

82 Didn't calculate amount of salt water that would have to be injected into the ogallala to cause contamination because he didn't have enought data

83 His water samples are a "reasonable representation" of the water at the base of the aquifer

85 Says he would find areas throughout the Lea County Basin where declines in water level would be present in the middle of rises; water level goes up and down basically in response to pumping and cessation of pumping; he accounts for increases NW and SW Cuphill from disposal well) by saying they are vertical, not lateral, changes

86 His problem [illegible] the areas of the disposal well is based primarily on the absence of pumping in that area

87 Says there could be a mound of water to the west, but he doesn't know

88 Says sink holes which exist throughout the ogallala could contribute to mounds of water

92 Explains fact of largest decline in area north and west of well by citing trough to north and west that water would spill off through

94 Says increase in water levels was due to two sources: dissipation of the mound, and cessation of irrigation pumping

96 Galloway's 3 red areas (indicating decrease in water level) did not, in his opinion, indicate the existence of more than one high area; he says the mound can decline at different rates in one month due to differences in permeability

97 [illegible] red area on his map could indicate more than one source of contamination

Page

98-100 Galloway sees no reason to correct for density in his water level measurements if the measurements are made in open uncased holes

102-103 Admits he would expect beyond his "zero point" to find a decrease in the water table to equalize the increase caused by a cessation of pumping, but refuses to [redacted] decrease around [redacted] is merely the equalization of the increase caused by cessation of pump[redacted]

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

July 10, 1978

Re: CASE NO. 6222
ORDER NO. R-5753

Mr. Alvin Jones
and Donald Brown
Attorneys at Law
Post Office Box 776
Roswell, New Mexico 88201

Applicant:

Paul Hamilton

Dear Sir:

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

Yours very truly,

Joe D. Ramey

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other Harold Hensley

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

June 14, 1979

Re: CASE NO. 6222
ORDER NO. R-5753-B

Mr. Alvin Jones
Attorney at Law
Post Office Box 776
Roswell, New Mexico 88201

Applicant:

Paul Hamilton

Dear Sir:

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

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other Harold Hensley, Robert Thebeaux

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

July 21, 1978

Mr. Alvin Jones
Attorney at Law
Post Office Box 776
Roswell, New Mexico 88201

Re: CASE NO. 6222
ORDER NO. R-5753-A

Applicant:

Paul Hamilton

Dear Sir:

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

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other Harold Hensley

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6222 REHEARING
Order No. R-5753-B

APPLICATION OF PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT-IN,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 23, 1978, and was continued to March 15, 1979, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 12th day of June, 1979, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 Texaco, Inc., New Mexico "BO" State Well No. 3 located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, is an active salt water disposal well authorized by Division Order No. R-4422.

(3) That ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source.

(4) That the applicant in this case, Paul Hamilton, is the surface owner in the vicinity of the aforesaid Texaco New Mexico "BO" State SWD Well No. 3, and seeks an order from the Commission shutting in said well, alleging that said well has been and still is the source of said contaminants in the ground water.

(5) That upon receipt of the application of Paul Hamilton in this matter, the same was set for hearing on May 31, 1978, before the Commission.

(6) That the evidence presented at the aforesaid May 31 hearing of this case established that there is an area in the general vicinity of the subject salt water disposal well in which there is an apparent anomalous "nose" in the water levels in the Ogallala formation, and also an unnatural concentration of chloride in the ground waters in the basal Ogallala.

(7) That there was no definitive evidence presented at said May 31 hearing that the subject well had leaked or was leaking injected fluids (salt water) into the Ogallala formation in the area, or that said well was or had been a contributory factor to the aforesaid "nose" and chloride concentration in the Ogallala water, but there was evidence which indicated that the well is mechanically sound.

(8) That subsequent to said hearing the Commission entered Order No. R-5753 denying said application.

(9) That subsequent to the entry of said Order No. R-5753, Paul Hamilton filed timely application for Rehearing of Case No. 6222.

(10) That the matter came on for Rehearing on August 23, 1978.

(11) That although water levels in wells drilled to the contaminated ground water in the "nose" described in Finding No. (6) above had declined subsequent to the May 31, 1978, hearing and prior to the August 31, 1978, hearing, such decline cannot be accepted as evidence that the subject well had previously leaked and was no longer leaking, inasmuch as said decline could very well be the result of the stabilization of the ground water gradient in the Ogallala formation due to cessation of pumping "downstream" from said "nose."

(12) That in order to further evaluate the subject well and to further examine its integrity and to more definitely ascertain whether it is in communication with and leaking into the Ogallala formation, the Commission, at the August 31, 1978, hearing, ordered the injection of a traceable substance into the well and careful monitoring of a nearby observation well, and continued the case to March 15, 1979.

(13) That a radioactive material (Iodine 125) was injected into the subject well and the Ogallala ground water from the nearby observation well was monitored for approximately two months.

(14) That no radioactivity from the Iodine 125 was detected in the Ogallala ground water at any time during the two-month monitoring period.

(15) That a wide variety of tests have been conducted on the subject well, and all tests to date show that the casing, cement, and tubing in the well are sound, and that there is no channeling of salt water from the disposal zone into the Ogallala formation.

(16) That although the specific cause of the "nose" in the Ogallala water table, as described in Finding No. (6) above, and the source of the choride concentration, also as described in Finding No. (6), cannot be determined, there is no reason to believe that the continued disposal of produced salt water into the subject well is having or will have any detrimental effect on the ground waters in the Ogallala formation, and the denial of the application in this case, as decreed by Order No. R-5753, should be affirmed.

(17) That the affirmation of said Order No. R-5753 will not cause waste nor impair correlative rights, nor unreasonably endanger fresh water supplies.

(18) That in order to ensure the continued integrity of the subject well as a salt water disposal well, the Hamilton observation well located immediately southeast of the subject well should be monitored monthly for water levels and chloride content.

IT IS THEREFORE ORDERED:

(1) That Order No. R-5753, entered July 7, 1978, in Case No. 6222, denying the application of Paul Hamilton for an order shutting in the Texaco, Inc., New Mexico State "BO" State SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, be and the same is hereby affirmed.

(2) That the applicant, Paul Hamilton, and the operator of the aforesaid salt water disposal well, Texaco, Inc., in conjunction with the supervisor of the Hobbs District Office of the Division, shall arrange to have unauthorized access into the Hamilton observation well located some 30 to 50 feet southeast of the disposal well precluded by a mutually agreeable sealing and locking mechanism.

(3) That the Ogallala water level in said observation well shall be determined within the first ten days of each month, and a water sample also taken, and the water level and chloride content of the water reported to the Division Director within ten days.

(4) That Hamilton, Texaco, and the Division's District Supervisor shall agree upon a mutually satisfactory procedure for obtaining such water levels and water samples, and the chloride analysis shall be performed in the Hobbs District Office of the Division.

(5) That jurisdiction of this cause is hereby 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

ALEX J. ARMIJO, Member

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

fd/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6222
Order No. R-5753-A

APPLICATION OF PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT-IN,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for reconsideration for a rehearing upon the petition of Paul Hamilton.

NOW, on this 20th day of July, 1978, the Commission, a quorum being present, having considered the petition for rehearing,

FINDS:

(1) That Order No. R-5753 was entered in Case No. 6222 on July 7, 1978.

(2) That the petition for rehearing in Case No. 6222 was received by the Oil Conservation Division from the above-named party within the period prescribed by law.

(3) That the petitioner alleges "...that recent data regarding water quality and water level obtained from an observation well completed next to the [Texaco New Mexico "BO" State No. 3] disposal well indicate the disposal well has leaked and is still leaking."

(4) That a rehearing should be held on Case No. 6222, Order No. R-5753, at 9 o'clock a.m. on August 9, 1978, in the Oil Conservation Commission Conference Room, State Land Office Building, Santa Fe, New Mexico, to permit all interested parties to appear and present evidence relating to this matter.

PROVIDED HOWEVER, That the evidence presented at said rehearing should be limited to evidence concerning the observation well referred to in Finding No. (3) above and to matters relating directly to said observation well, and to other new

evidence unavailable at the time of the original hearing of this case on May 31, 1978.

IT IS THEREFORE ORDERED:

(1) That Case No. 6222 be reopened and a rehearing of same be held at 9 o'clock a.m. on August 9, 1978, in the Oil Conservation Commission Conference Room, State Land Office Building, Santa Fe, New Mexico, at which time and place all interested parties may appear.

IT IS FURTHER ORDERED:

(2) That the evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the Texaco New Mexico "BO" State No. 3 salt water disposal well located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, and to other new evidence unavailable on May 31, 1978.

IT IS FURTHER ORDERED:

(3) That Commission Order No. R-5753 shall remain in full force and effect until further Order of the Commission.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

fd/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6222
Order No. R-5753

APPLICATION OF PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT-IN,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on May 31, 1978, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 7th day of July, 1978, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 Texaco, Inc., New Mexico "BO" State Well No. 3 located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, is an active salt water disposal well authorized by Division Order No. R-4422.

(3) That ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source.

(4) That the applicant in this case, Paul Hamilton, is the surface owner in the vicinity of the aforesaid Texaco New Mexico "BO" State SWD Well No. 3, and seeks an order from the Commission shutting in said well, alleging that said well has been and still is the source of said contaminants in the ground water.

(5) That the evidence presented is inconclusive as to whether the subject well has ever leaked injected fluids (salt water) to the ground water in the area.

(6) That recent tests conducted on said well indicate the well to be mechanically sound.

(7) That the evidence presented in this case fails to establish that the subject well is now leaking injected fluids to the ground water in the area.

(8) That the application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Paul Hamilton for an order shutting in the Texaco, Inc., New Mexico State "BO" State SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, be and the same is hereby denied.

(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

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Division Director

fd/

TELEDYNE ISOTOPES

TEXACO
Mose Field

SHIPPING/RECEIVING SURVEY RECORD

A. Shipment Data

Date Shipped 9/13/78 Date Received 9/27/78

From New England Nuclear

To Petroleum Towers, Lubbock Texas

Via Airborne

Owner of Transport

Type of Package Cardboard Box

Approximate Size 6"X 5"X 8"

B. DOT Label Information

Class I, II, III (circle)

Radioactive Contents Sodium Iodine-1125 - 5mc

Activity of Contents

Transport Index (Radiation dose rate @ 3 ft from package) Maximum 10 mr/hr.

C. Health Physics Office Survey Data

Reading at Contact 12 counts/min - Ludlum Model II
2 mR/hr - Ludlum model II

Reading at 3 ft 12 cpm - Ludlum model II
0 mR/hr - Ludlum model II

Instrument Ludlum Model #II

Smear Survey cpm

DOT Label Attached ____ Yes ____ No

Background @ 10' away 12 counts/min - Ludlum

Surveyed by Bobby Fluitt Date 9-28-78

CIL CO... ...ION

Case No. 1

Sc... HP Form 5 TEXACO Inc

Receipt Date

--- Over ---

Reading of ~~Leak~~ block - Model II bedplate 10,000
Leak open " " " 400,000

Reading at weldment - Model II bedplate
10,000) Same as
12,000) background

Model II zero for
all readings

Injected tracer @ 10:45 AM
9-28-78
Removed tool @ 11:15 AM

Dosimeted 3 @ start
3 @ Finish

PETROLEUM TRACERS INC./511 NORTH AKARD BLDG./Dallas, Texas 75201
phone: 214 747-9387

Check List For Injection Of Radioactive Isotopes

1) Make up tools to the correct measurement complete with plunger.

2) Install tool in the wellhead and test at injection pressure.

3) Apply detergent.

4) Take vial of radioactive material out of shipping container and place in injection tool.

5) Make up injection tool thereby crushing vial.

6) Flush material into well by opening injection and well master valves.

7) Flow for a time sufficient to clean up tool.

8) Shut in well, remove injection tool.

9) Take smears to send to Westwood Lab.

Field Moore County, State Lea, New Mexico

Lease & Well No. BO. State #3 Isotope Injected Sodium Iodide Date 9-28-74

New England Nuclear

575 Albany Street, Boston, Mass. 02118
Customer Service - 617-482-9595 - Telex 94-0996

B 023

NENC SHIPMENT AND ORDER NO.
044909

CUSTOMER
41000 99

SOLD TO
TELEDYNE-ISOTOPES INC.
50 VAN BUREN AVE.
WESTWOOD, N.J. 07675

PLEASE REFER TO SHIPMENT NUMBER ON INQUIRIES CONCERNING THIS ORDER

* INDICATES SUBSIDIARY PROCESSING THIS ORDER IF APPLICABLE

If not deliverable, return to:
New England Nuclear
575 Albany St., Boston, Mass. 02118
Tel: (617) 426-7311 Telex: 94-0996

16 9A

SHIP TO
PETROLEUM TRACERS INC.
C/O AIRBORNE AIRFREIGHT TERMINAL
LUBBOCK, TEXAS 79408

MARK FOR
HOLD FOR PICKUP AT AIRPORT
CALL T CALHOUN 214-747-9386

PACKAGE NO.	CUSTOMER PURCHASE ORDER NO.
044909	38029

WE HAVE ENTERED YOUR ORDER AS FOLLOWS:

CUSTOMER ORDER NO.	REQUISITION	CONTRACT OR FUND NO.	ROUTE / F.O.B.	
38029		78C01166M	ORIG PPD	AIRBORN ONLY

SALESMAN	CUSTOMER REF. NO.	TODAY'S DATE	ORDER STATUS AND TERMS	SHIPPED	RADIATION AT SURFACE	INSPECTED	PAGE
37	3/31/78	9/11/78	NET 30 DAYS	9-22-78			1

LINE NO	CATALOG NO.	COMPOUND OR SERVICE	LOT NO.	NO. OF PACKAGES	PACKAGE SIZE	ESTIMATED SHIP DATE	UNIT PRICE	INVTY TYPE	QTY. SHIP
010	NEZ 033	SODIUM IODIDE-I125 (CARRIER FREE 17C/MG) SHIP IN 5.0ML VOLUME IN SPECIAL MULTIDOSE VIAL SUPPLIED BY CUSTOMER ~~SELLING ONLY~~ RADIOACTIVE MATERIALS LICENSE 29-00055-02 WHEN PLACING ORDERS, CUSTOMERS MAY NOW DIAL OUR TOLL-FREE NUMBER. 800-225-1572 NOTE-IMMUNOREACTIVE IODINE LABELED HORMONES NOW AVAILABLE. WRITE OR CALL FOR DETAILED SPECS.	9784	1	5MC	09137			1

16 9A

THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL UNLESS CHECKED HERE ☐

MATERIAL WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR PRIOR PERMISSION.

New England Nuclear

Customer Service
(617) 482-9595

NEN Order #	Amt.
044909-169A	5mCi

CATALOG NO.
NEZ-033

TECHNICAL DATA

NUCLIDE: IODINE-125

CHEMICAL FORM: $Na^{125}I$ in 0.1 M NaOH

SPECIFIC ACTIVITY: Carrier Free

CONCENTRATION: / mCi/ml VOLUME: 5 ml

RADIOMETRIC PURITY: 99% By γ-ray Spectrometry

PRINCIPAL RADIOACTIVE CONTAMINANTS: ^{124}I

TOTAL SOLIDS: 4 mg/ml NaOH

METHOD OF PREPARATION: $^{124}Xe\ (n,\gamma)\ ^{125}Xe \xrightarrow{EC} {}^{125}I$

ASSAY DATE: 9/25/78 LOT: 9784

RADIATION UNSHIELDED: 100 mr/hr @

...ION, NOT FOR USE IN HUMANS OR CLINICAL DIAGNOSIS: This product ...d for research or manufacturing use only. It is pharmaceutically ...verification of its suitability for use in humans or as a clinical ...e and the compliance with all Federal and State laws ...rations is the sole responsibility of the purchaser.

WARRANTY:

New England Nuclear warrants the materials sold by it to be of merchantable quality at the time of shipment. There is no warranty, express or implied, as to the fitness of these materials for any particular purpose. The customer must notify the company, by registered mail, of any breach of warranty. Because of the inherent susceptibility to deterioration of those products containing short half-lived radionuclides, or which show a radiation decomposition rate of greater than one per cent (1%) per month, notification must be made within 15 days of receipt. For all other products a 60-day period will be allowed. All claims shall be deemed waived in the event the customer fails to notify the company within the guarantee period. The maximum liability for breach of warranty shall be the invoice price for said materials and this liability shall be exclusive. **New England Nuclear shall not be liable for any consequential, compensatory, incidental, or special damages.**

S-424

it is operated on a purely numerical basis which makes it possible to use small computers. The principle and advantages of the new method are discussed.

356 Harzer, D., Pilot, J., Roesler, H.J. ANALYSES OF OXYGEN ISOTOPES IN SURFACE AND RAINWATERS OF THE HARZ MOUNTAINS. Bergakademie 20 (1968) 329-32. (In German)

Rain, surface waters and groundwaters of the Harz Mountains were analysed for oxygen isotopes. The seasonal range of variation in ^{18}O content of rain was a maximum of 10‰ (-5.5 to -15.9‰). The range for river water was 5‰, and for water from a lake formed by a dam, 4‰. The labelling of the surface water was, in comparison to the groundwater, most pronounced during October and was at the maximum 2.0 to 2.5‰ or ~1‰ on a monthly average. Differences in the $\delta^{18}O$ values of the reservoir water corresponded to the temperature layering of the water, which was most strongly developed during the summer months. The δD and $\delta^{18}O$ values were measured on a few samples. They obey the Craig equation, $\delta D = 8\delta^{18}O + 10$.

357 Havlik, B. RADIOACTIVE POLLUTION OF RIVERS IN CZECHOSLOVAKIA. Hlth Phys. 19 (1970) 617-24.

One of the oldest uranium-mining areas in the world is the spa Jáchymov in Bohemia. A study of environmental contamination began there when uranium mining was at a maximum, and continued until mining ceased six years later. The content of ^{226}Ra and total beta activity of water, river sediments and water plants were estimated in the streams of this area and of the other uranium ore area, where mining reached its maximum during the study period. Radioactive pollution of the major Czechoslovak rivers during 1964 to 1967 is described.

358 Hazzaa, I.B. A MODIFIED METHOD FOR DETERMINATION OF AQUIFER PARAMETERS USING RADIOACTIVE ISOTOPES. Int. J. appl. Radiat. Isotopes 17 (1966) 583-5.

The method for measuring the lowering of water levels in wells during pumping, previously developed in the Middle Eastern Regional Radioisotope Centre, was modified to overcome some difficulties. The method has been applied on deep wells with good results.

→ 359 Hazzaa, I.B., Girgis, R.K., Saad, K.F., Swailem, F.M., Bakr, A.A. INVESTIGATION OF GROUND WATER RADIAL FLOW USING RADIOACTIVE TRACERS. Bull. int. Ass. scient. Hydrol. 12 (1967) 55-9.

A study of the effectiveness of various radioisotopes in investigating the porosity of water-bearing formations, with ^{131}I, ^{51}Cr-EDTA, and ^{82}Br, in comparison with $^{3}H_2O$, showed that ^{131}I was most useful for this purpose. Field experiments were conducted to study the effective porosity of the groundwater aquifer, by injecting ^{131}I simultaneously with $^{3}H_2O$ as a reference, at different depths, to examine the influence of the depth of injection of the radioisotopes on the values obtained for the effective porosity of the aquifer under pumping conditions. A pumped well, fully penetrating a homogeneous sandy aquifer, was chosen. Three runs were undertaken injecting the radioisotopes in a 10 m distant observation well at three different levels. An additional run was made by injecting ^{131}I at the three depths simultaneously. In each run, the activity of the outflowing water was followed until it reached the background level. The results indicated that the values obtained for the effective porosity of a groundwater aquifer using tracers are not dependent on the depth of injection of the tracer. This conclusion holds for radial flow, in homogeneous aquifers, between the observation well and the pumped well. The percentage recovery of the injected activity was calculated.

360 Hazzaa, I.B. DETERMINATION OF THE VELOCITY OF GROUNDWATER FLOW WITH RADIOISOTOPES. Int. J. appl. Radiat. Isotopes 20 (1969) 127-9.

The velocity of groundwater flow can be calculated if the displacement r during a period t is known ($v = r/t$), and it is possible to measure r by introducing a radioisotope into a well, allowing the radioactivity to be carried away by the groundwater stream over a known time and then pumping from the well at a known rate, the radioactivity in the pumped water being continuously monitored. Several ways of applying this method are described, including tests of the method using a model basin.

COMMISSION
IA
TEXACO INC.

361 Hazzaa, I.B. SINGLE-WEL
DIRECTION AND VELOCITY
Hydrology 1970". Proceedir
held by the IAEA in co-opera
International Atomic Energy

A radiographic method for de
groundwater flow has been de
or a thin-column source, at t
The injection is performed at
radioisotope is left to follow
adsorbed onto the walls of tu
few centimetres and fitted ins
radiographed; the darkest par
another film give the value of
measured. Velocities are de
calibration curve of the veloc

→ 362 Hazzaa, I.B., Sharhan, A.M.
AVERAGE VELOCITY OF GR
OF THE QUANTITY OF GRO
RADIOISOTOPES. Isotop. R

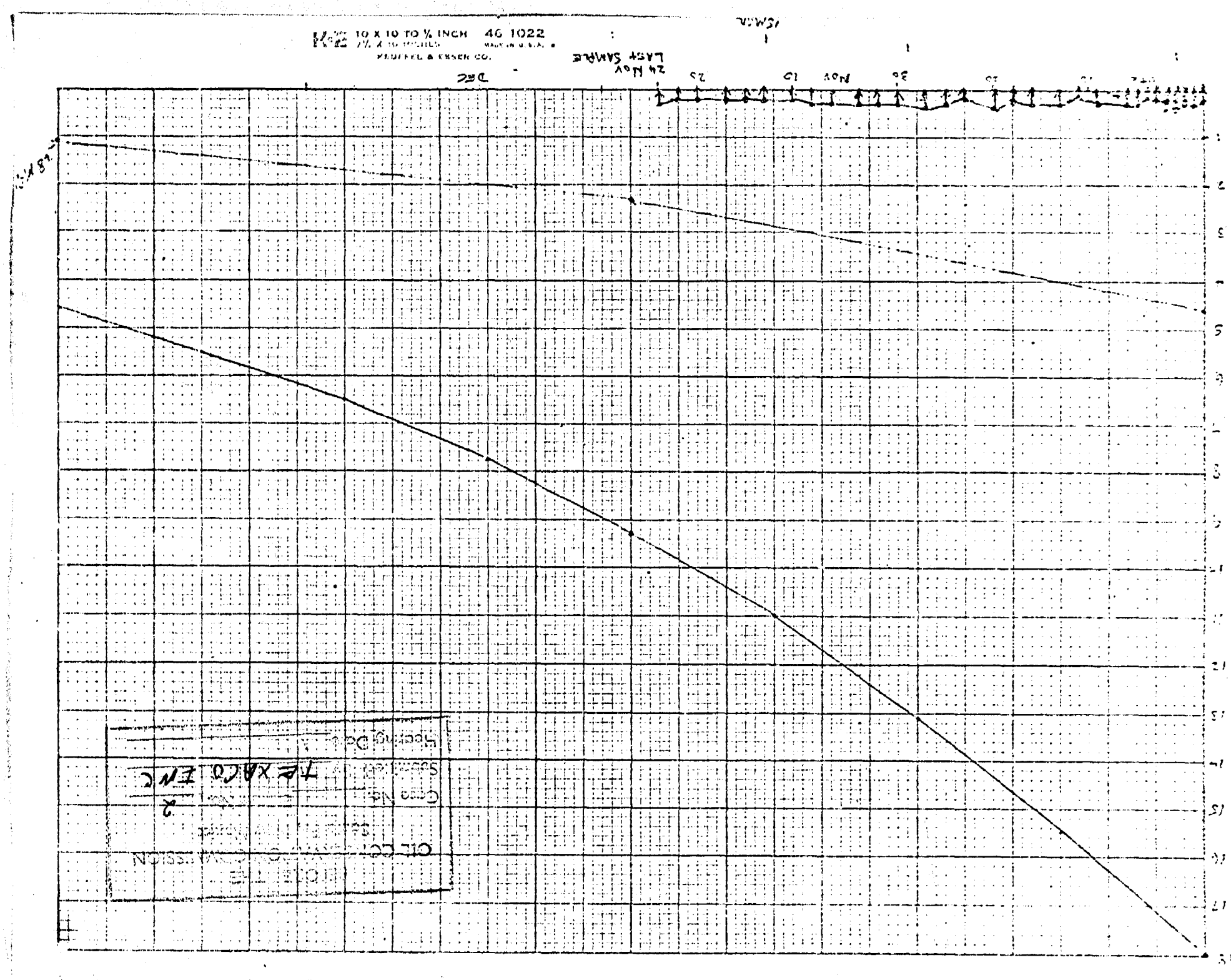
The velocity of groundwater f
ten localities. This velocity
period γ. The velocity is the
by injecting a few millicuries
radioactivity be carried away
pumping from the well at a kn
was continuously monitored.
determined using the velocity
0.7 m/d and 0.3 m/d; the ave
estimation of the quantity of g
existing conditions was obtain

363 Deleted

364 Helf, S. ENVIRONMENTAL
ARSENAL AREA, 1963-1966.
N.J. Feltman Research Labs

An environmental radioactivit
from Picatinny Arsenal and st
spring 1963 to fall 1966. Sam
precipitation were assayed dur
done on soil from wooded area
1963 to October 1966. Radion
concentration of individual gar
Resolution of the complex spec
by electronic computer metho
was observed in almost all sa
nuclide per gram of sample.
are cerium-144 (285 d), antim
(30 yr), and manganese-54 (31
environment is principally fro
atmospheric tests conducted b
1962. Zirconium-95 (65 d) wa
at barely detectable levels in t
short-lived radionuclide is pro
Naturally occurring potassium
radioactivity was detectable wi
to Picatinny Arsenal operation

365 Hem, J.D. STUDY AND INTE
OF NATURAL WATER. Geol
D.C., U.S. Government Print


10 X 10 TO ½ INCH 46 1022
KEUFFEL & ESSER CO.
MADE IN U.S.A.
24 Nov
LAST SAMPLE
Nov
THE XEROX CORP.

TELE-TRACER DATA SUMMARY - TEXACO, INC. - MOORE FIELD - ^{125}I in 60' OBS - WELL

COLLECTION DATE				TI	^{125}I	pCi/ℓ	W.O.	No.
Fri.	29	Sept.	1978	57570	less than	0.2	3-	2229
Sat.	30	"	"	57656	"	0.3	3-	2238
Sun.	1	Oct.	1978	57632	"	0.2	3-	2236
Mon.	2	"	"	57633	"	0.4	3-	2238
Tues.	3	"	"	57634	"	0.2	3-	2238
Wednes.	4	"	"	57943	"	0.2	3-	2258
Thurs.	5	"	"	57906	"	0.2	3-	2252
Fri.	6	"	"	58004	"	0.3	3-	2281
Mon.	9	"	"	58225	"	0.3	3-	2337
Wednes.	11	"	"	58226	"	0.1	3-	2337
Fri.	13	"	"	58062	"	0.3	3-	2240
Mon.	16	"	"	58130	"	0.3	3-	2311
Wednes.	18	"	"	58227	"	0.2	3-	2337
Fri.	20	"	"	58263	"	0.4	3-	2342
Mon.	23	"	" [1]	58331	"	0.2	3-	2346
Wednes.	25	"	"	58510	"	0.3	3-	2379
Fri.	27	"	"	58511	"	0.4	3-	2379
Mon.	30	"	"	58664	"	0.3	3-	2408
Wednes.	1	Nov.	1978 [1]	58848	"	0.3	3-	2450
Fri.	3	"	"	58849	"	0.3	3-	2430
Mon.	6	"	" [2]	56998	"	0.3	3-	2455
Wednes.	8	"	"	59250	"	0.3	3-	2493
Fri.	10	"	"	59171	"	0.2	3-	2474
Mon.	13	"	"	59281	"	0.2	3-	2493
Wednes.	15	"	"	59423	"	0.2	3-	2505
Fri.	17	"	"	59458	"	0.3	3-	2511
Mon.	20	"	" [3]	59529	"	0.2	3-	2534
Wednes.	22	"	" [4]	59620	"	0.2	3-	2543
Fri.	24	"	"	59621	"	0.3	3-	2543

Note:

/ - Analysis in Progress

1 - No Collection Date on Bottles - Inferred Date

2 - Labeled 6 October - Assumed 6 November

3- " 20 " - " 20 "

4- " 22 " - " 22 "

6222 3

TEXACO INC.
3/15/79

FORM NO. 1127 GOLDSMITH BROS., N. Y. 10030 (212) 267-7880

SUMMARY OF TESTIMONY--CHARLES JOY
OCD Hearing May 31, 1978

Page

104 He is consulting engineer, particularly in reservoir engineering, well completions, evaluation of properties

105 Says he has been running tracer surveys since 1964; thinks he was one of the first to ever run tracer surveys; checked tracer log from prior run by Western Wireline around the log of little value; says Mr. Wright in Artesia agreed with him 100%

106 Cites three reasons the log is of little validity:

1. Time
2. Loss of radioactive material
3. Rate of investigation

Says it can't be proved from this log whether there was channeling behind the casing or not

107 Says he has been on 100 of "these wells" or more; tool was only run at optimum condition at 18 inches, while he normally feels he can't get over "10 inches investigation"; the tool itself, gamma ray and radioactive material all limit the range of the tool

108 Says tool was only left at 10,490½ feet for 5 minutes, 6 seconds, would take fluid 1 minute 13 seconds to move from tool down to first displacement point, then the fluid had only 3 minutes 53 seconds to channel up; slow leak or large volume might result in not enough time to monitor the radioactive material; says he has had to wait up to 3-4 hours before fluid came back up; also says the formation is highly fractured, which slows up fluid (?)

110 Says initial field pressure here (from Roswell Geological Society symposium) is 4,099 pounds; he calculates fluid gradient of .446 lbs per foot, and conclude that the reservoir pressure would hold a column a column a foot of 9,191 feet from the reservoir back, which means the fluid would stand with in 1,589 feet of surface; he also surmises cement never hardened or set up on this well

111 * He believes well would definitely have a channel in it if it went on vacuum, because with the reservoir pressure as high as it is the water will not go into the formation, but will take the path of least resistance

112 He recommends temperature survey along with noise tool to check for channeling; says that as of date of hearing he couldn't say whether well was channeling or not; he also believes 500 pounds pressure used in tests to be inadequate, thinks 1500-2000 pounds pressure should be used as this is normal checking packers and for casing leaks

117 Suggest possibility of void in the cement in the well

118 Admits he has no evidence that there is or is not channeling in the well

119 Says running bond log after cement sets up is not normal procedure

120 Says channeling would occur near the well bore, probably right next to it, says temperature survey and noise log would probably pick it up if channeling was present

121 [redacted]

123 hasn't seen channeling from 10,000 or 12,000 feet subsurface

124-125 [redacted] because he believes the friction loss given is incorrect

SUMMARY OF TESTIMONY OF SHERMAN GALLOWAY
BEFORE OCD ON MAY 31, 1978

p. 60 "Altitude and Configurated Water Table" map--general movement of water is toward east/southeast.

p. 61 Galloway's map showed bulge of water table contours indicating point of recharge to shallow water aquifer in vicinity of Texaco well.

p. 62 "Altitude and Configuration of Post Mesozoic Sediments"

p. 63 Disposal well is located on northeastward trending nose on south side of northeastward trending valley; slope of red beds from well is northward to northeastward.

p. 64 Galloway says it is possible that salt water from well could go south or southwesterly through sands underlying weathered zone of surface.

p. 65 Believes water mounds up around well to get over the ridge because the water level builds around the well faster than the formation allows it to move away.

p. 66 From Runyan's chloride map, Galloway finds a "general correspondence" between the configuration of the top of the red beds and the distribution of chlorides in the aquifer.

p. 67 He finds an anomalous condition with chloride content of water in vicinity of well, and outward extension of chlorides basically following lows in red beds in the vicinity of the well.

p. 68 Most pronounced displacement of chlorides is west of well, upslope from well.

p. 69 Elevation of water at disposal well; 4274.5 feet.

**p. 71 Mound produced by discharge of salt water will dissipate with time if discharge is not continuous.

p. 73 Galloway finds 2 factors pointing to the disposal well as the culprit. (1) Anomalous condition on quality of water in vicinity of well; and (2) anomalous condition in the water table.

p. 73-74 Water could go west by running though the sand under the weathered surfaceor mounding sufficiently to spill over the red bed high.

p. 79 Galloway's anomaly is based on water level measurements with a steel tape

p. 75 Galloway is not sure why there is water south of the well.

p. 82-83 He would expect salt water to drain in same direction as fresh water.

p. 84 But he says salt water generally goes to lows on top of red beds and follows them down, not necessarily in direction of general movement.

SUMMARY OF TESTIMONY OF SHERMAN GALLOWAY
BEFORE OCD ON MAY 31, 1978

p. 86 He believes a discharge of salt water into the Ogallala has to be occurring in the vicinity of the area with high chloride numbers because the normal chloride content of uncontaminated Ogallala water is around 50 parts per million.

p. 87 [redacted]

p. 88 [redacted]

Oral Argument

Explain nature of appeal:
nature of problem
* substantial evidence
reasonable mind - inference
review evidence
injectivity profile —— tests - all negative
mounding - bulging - conc of depression
4 pert Commissioners - 30 yrs +
Ramey + Arnold

"30" well natural thing to point finger
But failure to prove case
How could the Commission ignore tests?!
Unfortunate circumstances
Commission tried hard

LAW OFFICES
HINKLE, COX, EATON, COFFIELD & HENSLEY
600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201
(505) 622-6510

LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.
JAMES H. BOZARTH

DOUGLAS L. LUNSFORD
PAUL M. BOHANNON
J. DOUGLAS FOSTER
K. DOUGLAS PERRIN
C. RAY ALLEN‡
JACQUELINE W. ALLEN‡
T. CALDER EZZELL, JR.
WILLIAM B. BURFORD‡
JOHN S. NELSON
RICHARD E. OLSON

OF COUNSEL
CLARENCE E. HINKLE

W. E. BONDURANT, JR. (1914-1973)

MIDLAND, TEXAS OFFICE
1000 FIRST NATIONAL BANK TOWER
(915) 683-4691

‡LICENSED IN
TEXAS ONLY

January 31, 1980

Mr. Ernest Padilla
New Mexico State Land Office
P. O. Box 5674
Santa Fe, New Mexico 87501

Re: Texaco--OCD

Dear Mr. Padilla:

Enclosed please find various testimonies in regard to the above captioned matter.

Very truly yours,

HINKLE, COX, EATON, COFFIELD & HENSLEY

Doug Perrin

K. Douglas Perrin

KDP:lab
encl.

SUMMARY OF TESTIMONY OF JAMES WRIGHT
BEFORE OCD ON MAY 31, 1978

p. 89 Has worked for State Engineer for 24 years, is licensed Professional Engineer in New Mexico, is field engineer for State Engineer's office.

p. 90 His basic role in the Hamilton investigation was to assist the OCD in drilling of test holes, including location of holes, and in collecting water samples; he also collected certain cutting samples on the underground formations.

p. 91 He made calculations on the rate of water movement in the area; computed it to be between 700 gals per day per square foot and 1300 gallons per day per square foot, or between 2--3½ feet per day.

How Computed

p. 92 The above rate was computed from the chlorides shown on the map, takes into account the "residual draw down" from Hamilton's irrigation well, but not any additional pumping from the well.

Avg in Lea Co .8 foot per day

p. 94 Wright says oil well could lead from casing, or channeling through the current behind the casing, or from fracturing of the formation when the well sand fracked, with a fracturing of the cement job at the same time.

p. 95 He thinks there are "possibilities" of channelling behind the casing or actual fracturing of the formation, but admits he has no evidence of channelling.

p. 97 Says he "can't see" another explanation for the salt water anomaly except the salt water disposal well; also says water would not have to pass through the "salt section" if it were channelling

p. 98 Believes fact well is on vacuum if no pressure is on it would not eliminate the possibility of channelling; but admits to only a "very general" familiarity with the Devonian formation.

p. 99 On cross, admits he has no evidence that any of the possibilities he discussed have occurred on the Texaco well.

p. 101 He agrees with conclusion of December 1978 tracer survey that there was no indication of channelling.

p. 102 Says Runyan's figure of a rate of flow of .8 feet per day is the general rate in Lea County, but is incorrect for this area because the gradient is different.

SUMMARY OF HERSCHEL MOORE TESTIMONY
May 31, 1978

Page	
125	Moore Devonian Pool named for his father.
126	He is a contractor for Samedan, has been around the Pool since February 1953; in February 1976 he witnessed a Texaco crew having trouble getting their packer and tubing on B03 back into the hole; problems present for 2 or 3 days, he was not back on the site until it was finished.
127	He saw some material circulate out of the hole, looked like grindings from some formation in the well; this material was circulated out of the well into a steel pit, but some of the formation was dropped on the ground, and made a stack 2 feet high and 2 feet round; this stack was removed between 6 months and a year prior to date of hearing.
128	Around August of 1977, Texaco pumper told Moore that although well had 1,000 lbs. pressure, it had dropped to 600 lbs; this conversation took place in Caprock at the Caprock store. He has also noted a crew around the well cleaning up around it and raking it.
129	Says in the last 3 or 4 months Texaco had regularly raked around the well location, cleaned it up and levelled the location; on cross, Moore admits cleaning up around the location is good from an operational standpoint.
130	Testifies that the cuttings from the operation in February 1976 stayed on the ground for approx a year.
131	Says he had never seen pressure on well at less than 1,000 lbs, but then it dropped to 600 and has been at that level ever since; acknowledges that less volume would explain that; is speaking of the injection pressure at the top of the well.

SUMMARY OF TESTIMONY OF JOHN RUNYAN
BEFORE OCD ON MAY 31, 1978

p. 39 January 1978 report identified substantial area of chloride contamination in vicinity of salt water disposal well; concluded that Texaco disposal well had leaked in the past.

p. 40 Runyan map--do we have it? Identifies water movement mainly as moving east and southeast.

p. 44 Runyan's second map indicates the well has leaked extensively sometime because of chloride anomaly right around the well (26,178 chlorides, which is 500 parts per million off of the produced water).

p. 55 On cross, Runyan says only way salt water would get southward would be for the water to flow over a ridge, because the directional flow of the red beds is west to east.

His Report - Amerada Pit Mark

- By his own report - Even assuming BO #3 were leaking and had leaked from the first day it was used for SWD purposes - contaminated chlorides would not have reached Mr Hamiltons well
- Calculations

TEXACO

Hobbs, New Mexico, March 28, 1978

S-2 MOORE DEVONIAN SWD SYSTEM
N. M. "BO" State Well No. 3
Casing Pressure Test

Casing test of March 23-25 1978.

Mr. D. T. McCreary (LAH)
Midland, Texas

From March 23 through 25, Texaco completed a series of bradenhead well tests on the Moore SWD System's injection well N. M. "BO" State No. 3. The procedure was as follows:

1. Pressure recordings began with the system shut in. Pressure recorders were on all casing strings (5½", 8-5/8", 13-3/8") and the 3½" tubing string.

2. A pressure of 500 psi was applied to the 5½" casing string alone at 12:30 P.M. on 3-23-78. This pressure showed a slight reduction to 400 psi in 75 minutes. There was no pressure reaction on either the 8-5/8" or 13-3/8" casing strings which remained at zero pressure during this period.

3. The 5½" casing pressure was released at 1:45 P.M. and allowed to drop to zero. Then injection was started down the 3½" tubing and continued until 4:30 P.M. (3-23-78) at which time the system was again shut in.

4. At 4:30 P.M. (3-23-78) a pressure of 500 psi was again applied to the 5½" casing. All other strings showed zero pressure. The system was left shut in until 9:00 A.M., 3-24-78. The 3½" tubing, 8-5/8" casing and 13-3/8" casing did not vary from a zero pressure reading during this period. The 5½" casing showed a gradual bleed off to 340 psi by 2:00 A.M. (3-24-78). The 5½" casing pressure then remained steady at 340 psi until the end of the test at 9:00 A.M.

5. The injection system was restarted at 9:00 A.M. on 3-24-78, and pressures were recorded on all strings until 9:00 A.M. on 3-25-78. The 8-5/8" and 13-3/8" strings remained at zero pressure throughout this period.
The 3½" tubing pressure fluctuated according to normal operations, depending upon how many pumps were operating and the water level in the water tanks. A maximum pressure of 780 psi was recorded on the 3½" tubing during most of the period 9:00 A.M. to 8:15 P.M. on 3-24-78.
The 5½" casing pressure remained at zero from 9:00 A.M. until 8:15 P.M. (3-24-78). Fluctuations occurred from that time until the end of the test at 9:00 A.M. (3-25-78) because of changes in the rate of water injection caused by one of the pumps shutting down periodically due to low water level in the tank.
The injection water has a temperature of approximately 180°F and causes expansion of the tubing string during injection operations. The maximum pressure on the 5½" casing string was 430 psi.

We conclude from this test that there is no communication between the tubing and casing strings.

J. V. GANNON

J. V. GANNON

SES:las

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 6222 Exhibit No. 3
Submitted by PH
Hearing Date 5-31-78

NO. OF COPIES RECEIVED		
DISTRIBUTION		
SANTA FE		
F.B.G.		
U.S.G.S.		
LAND OFFICE		
OPERATOR		

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-103
Supersedes Old
C-102 and C-103
Effective 1-1-65

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.

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 —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [ ] GAS WELL [ ] OTHER- Salt Water Disposal

7. Unit Agreement Name

2. Name of Operator: TEXACO INC.

8. Farm or Lease Name: New Mexico "BO" State

3. Address of Operator: P. O. Box 728 - Hobbs, New Mexico 88240

9. Well No.: 3

4. Location of Well: UNIT LETTER D, 660 FEET FROM THE North LINE AND 660 FEET FROM THE West LINE, SECTION 24 TOWNSHIP 11-S RANGE 22-E NMPM.

10. Field and Pool, or Wildcat: Moore Devonian

15. Elevation (Show whether DF, RT, GR, etc.): 4348' (DF)

12. County: Lea

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

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [ ]	
OTHER [ ]		OTHER Casing string identification	[X]

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

1. Well shut in 24 hrs.
2. Risers installed on all casing strings with valves above ground and labeled for future identification. 9/22/77
3. Inspected by Melvin Crossland - O.C.C.
4. Casing Strings:

SIZE	SET AT	SX. CEMENT USED
13-3/8"	318	350
8-5/8"	3,504	2,300
5-1/2"	10,600	600

5. 100# on annulus. 525# on 8-5/8". Bled down completely.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 6222 Exhibit No. 1
Submitted by PH
Hearing Date 5-31-78

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED [signature] TITLE Asst. District Superintendent DATE October 13, 1977

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

WESTERN WIRELINE SERVICES
WL.-103 (10/77)

Injectivity Profile

FILING NO. 1277103 H

JOB NO. 704769

COMPANY TEXACO, INC.

WELL N.M. State B.O. #3

FIELD Moore Devonian

COUNTY Lea STATE New Mexico

LOCATION 660' FNL & 660' FWL

SEC 24 TWP. 11-S RGE 32-E

OTHER SERVICES:

PERMANENT DATUM: , ELEV

LOG MEASURED FROM KB 12 FT. ABOVE PERM. DATUM

DRILLING MEASURED FROM

ELEV.: K.B.

D.F. 4348

G.L.

DATE	12-8-77		
RUN NO	One		
TYPE LOG	Profile		
DEPTH-DRILLER	11,767		
DEPTH-LOGGER	10,659		
BOTTOM LOGGED INTERVAL	10,656		
TOP LOGGED INTERVAL	100		
TYPE FLUID IN HOLE	Water		
SALINITY, PPM Cl.			
DENSITY			
LEVEL	Full		
MAX. REC. TEMP., DEG. F.			
OPERATING RIG TIME	Portable Mast		
RECORDED BY	Blackwood		
WITNESSED BY	Mr. Olson		

RUN NO.	BORE-HOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
	4 5/8	10,613	11,659	13 3/8		0	318
				8 5/8		0	3504
				5½		0	10613

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 6222 Exhibit No. 2
Submitted by PH
Hearing Date 5-31-78

WL-49

BURST SHEET

Burst Number	Depth (Feet)	Time Units	Time Sec.	Diameter Hole (Inches)	Dia. Small Hole (In.)	Dist. From Chg. (Feet)	Western Flow Rate (BPD)	Percent Fluid In Hole	Remarks
39	10,500		No time dumped remaining R/A Waited for a channel up check						
			before after survey log						
38	10,530		2.30	5½"-20#			12380	100	
37	10,530		2.27	5½"-20#			12380	100	
36	10,540		2.42	5½"-20#			11864	100	
35	10,540		2.38	5½"-20#			11864	100	
34	10,550		2.39	5½"-20#			11864	100	
33	10,550		2.43	5½"-20#			11864	100	
32	10,560		2.38	5½"-20#			11864	100	
31	10,560		2.38	5½"-20#			11864	100	
30	10,570		2.43	5½"-20#			11864	100	
29	10,570		2.39	5½"-20#			11864	100	
28	10,580		2.40	5½"-20#			11864	100	
27	10,580		2.39	5½"-20#			11864	100	
26	10,590		2.38	5½"-20#			11864	100	
25	10,590		2.40	5½"-20#			11864	100	
24	10,600		2.33	5½"-20#			12380	100	
23	10,600		2.32	5½"-20#			12380	100	
22	10,610		2.33	5½"-20#			12380	100	
21	10,610		2.31	5½"-20#			12380	100	
20	10,635		2.57	4 3/4 Open hole			10812	91	
19	10,635		2.60	4 3/4 open hole			10812	91	
18	10.645		2.62	4 3/4 open hole			10812	91	
17	10,645		2.65	4 3/4 open hole			10412	88	
16	10,652		2.65	4 3/4 open hole			10412	88	
15	10,652		2.66	4 3/4 open hole			10412	88	
14	10,450		2.31	5½"-20#			12380	100	channel up check
13	10,450		2.45	5½"-20#			11380	96	
12	8,700		2.36	5½"-20#			11864	100	100% check
11	8,700		2.36	5½"-20#			11864	100	
10	8,450		.86	3.00			11240	95	
9	8,450		.82	3.00			11788	100	check for tbg leak
8	7,000		.85	3.00			11372	100	
7	7,000		.85	3.00			11372	100	
6	5,000		.84	3.00			11504	100	
5	5,000		.83	3.00			11648	100	
4	1,000		.84	3.00			11508	100	
3	1,000		.83	3.00			11648	100	
2	115		.84	3.00			11508	100	
1	115		.87	3.00			11112	100	

WL-79 Western

Date Injection Started_____

Cumulative Injection_____ BW to_____

Date Injection Started _____

Cumulative Injection _____ BW to _____

Time Drive .48 seconds per Log Division

Customer pressure 700 Western pressure 700

Customer Flow Rate 11,700 BPD Western Rate 11,864 BPD

Perforations 10,536 to 10,556 (Squeezed w/cmt. in 1972)

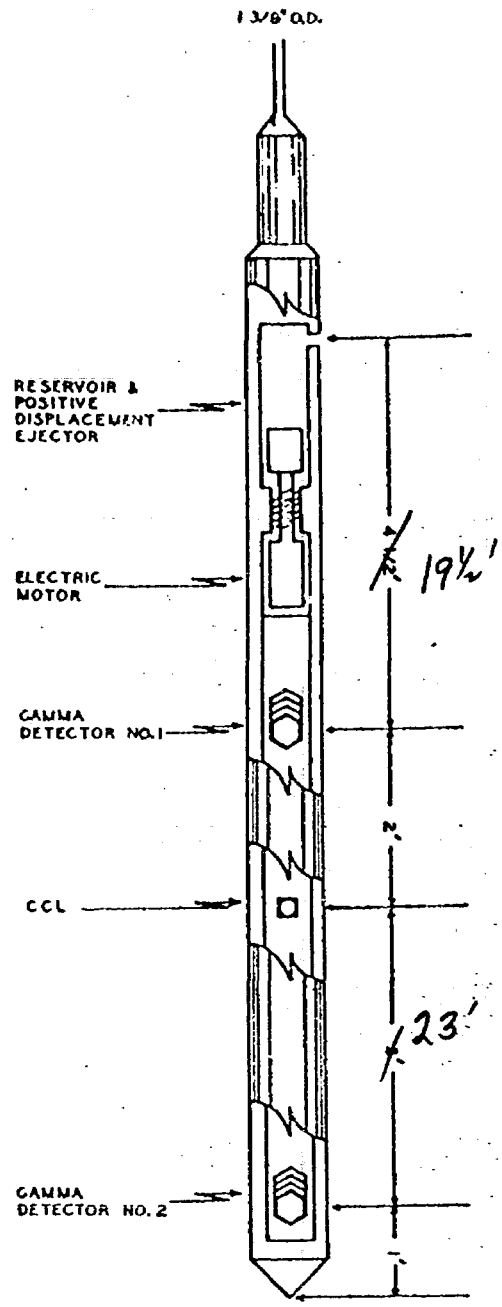
10,565 - 10,600, Open hole 10,613 - 10,659

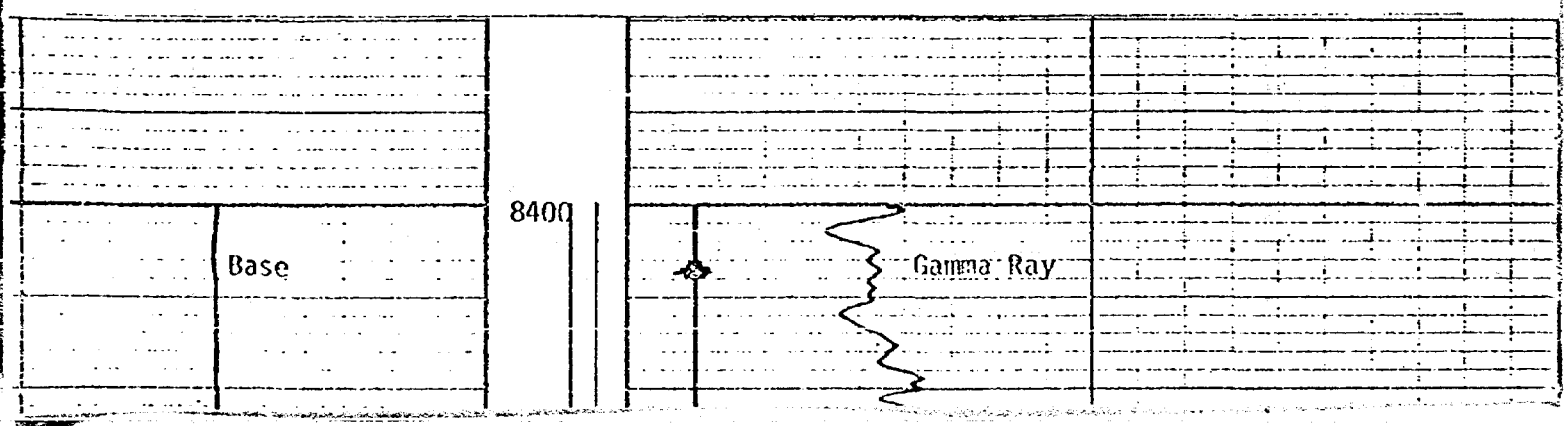
Channeling Indications No XXX From _____ to _____

_____ to _____

_____ to _____

Remarks: Velocity shots indicate no leak in tubing. No leak at packer and no leak in casing. Velocity shots indicate small loss below casing shoe-this may be due to the fact that open hole could not be properly calculated. Rest of fluid going below R.D.. Some rate Fluctuating. No indication of upward channel.





FORM C-6 (7-72) 3MM

TEXACO

April 20, 1978

JOHN H. MOORE SWD (NM 'BO' STATE, WELL #3)
5½" OIL STRING CASING PRESSURE TEST

(OCC REQUEST)

9:10 ARRIVED ON LOCATION ; ATTACHED 1000 PSI RECORDER
9:50 PRESSURED UP THE ANNULUS TO 600 PSI ; 30 MIN TEST
10:20 BLED OFF PRESSURE, RESET CHART, END OF FIRST TEST
10:25 PRESSURED UP ANNULUS TO 560 PSI ; 40 MIN TEST
10:32 PAPER NOT TURNING ON RECORDER, MOVED PEN
11:05 END OF SECOND TEST ; END PRESSURE 530 PSI

PRESENT AT WELLSITE DURING TEST:

LESLIE CLEMENTS, FIELD REP., OIL CONS. DIVISION
PAUL HAMILTON, FARMER
A.G. (JAY) GERNANDT, FIELD FOREMAN
JUNE (RG) JENKINS, RELIEF PROD. FOREMAN, CAPROCK AREA
JOHN CALDWELL, FIELD ENGINEER, LOVINGTON
RICHARD DYE, ROLAND MCCLEAN TRUCKING
KARL (TINY) SCHLITTLER ROLAND MCCLEAN TRUCKING

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 6222 Exhibit No. 4
Submitted by PLT
Hearing Date 5-31-78

JWC

TEXACO

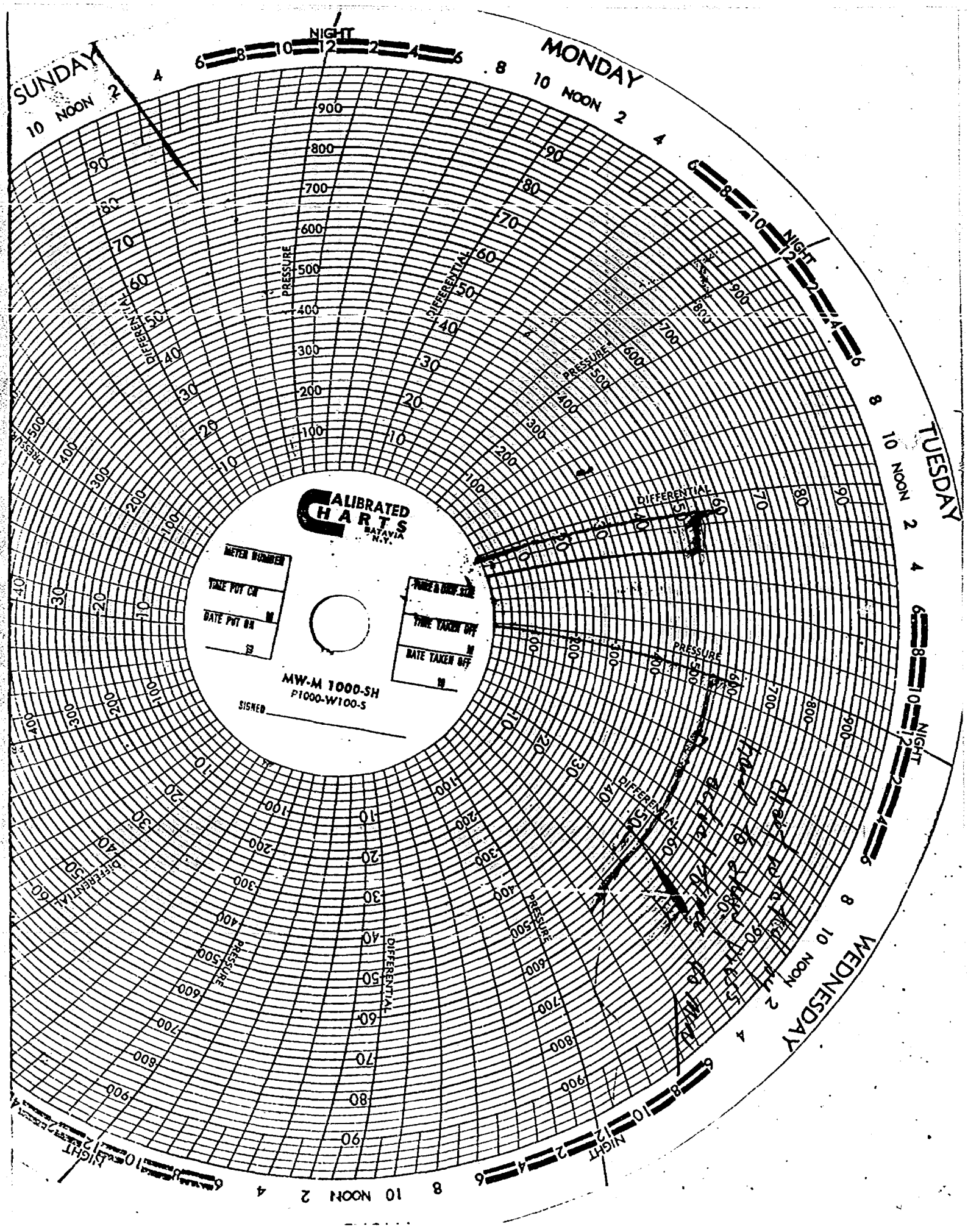
April 20, 1978

COMMENTS (CONT'D):

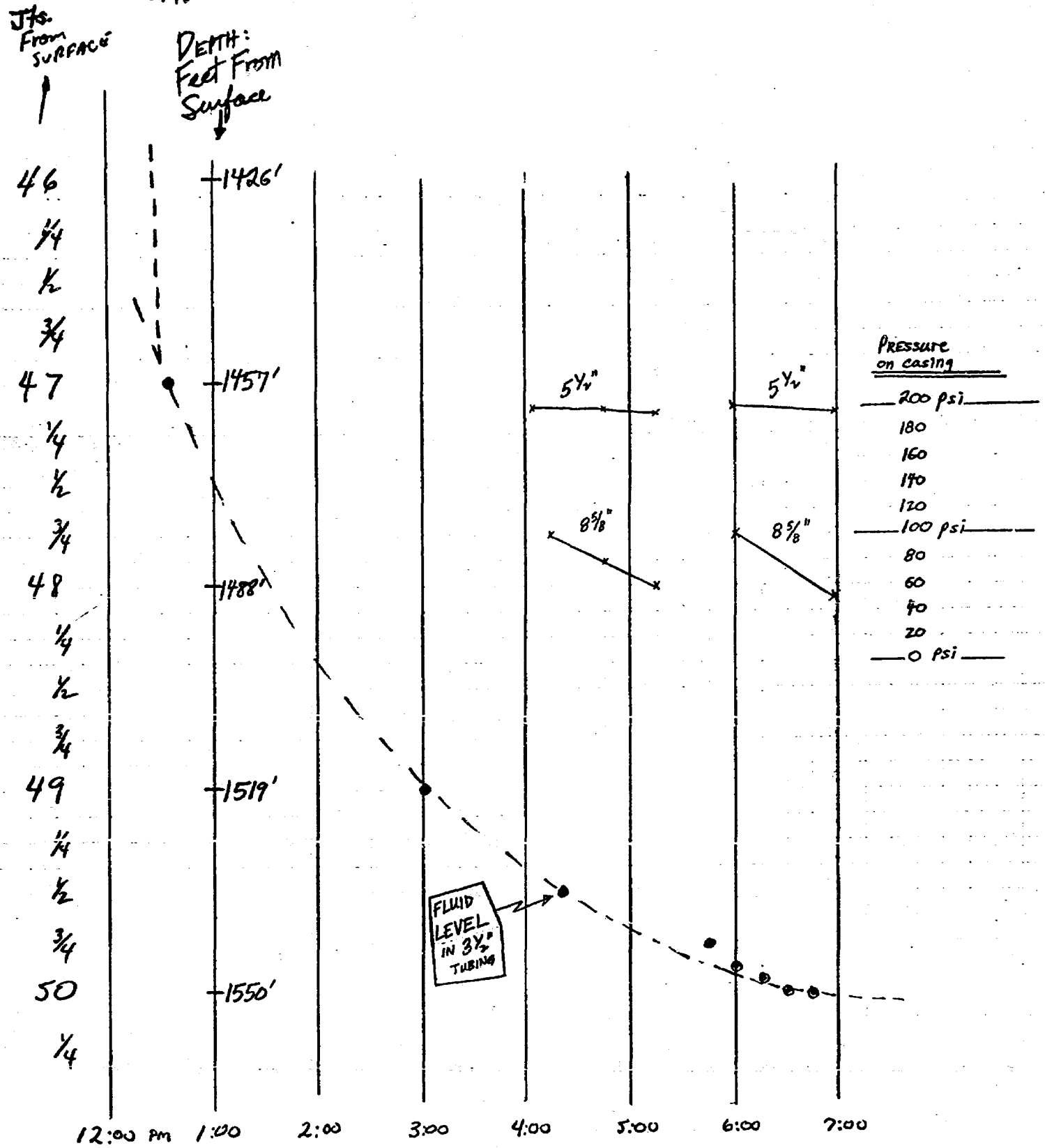
PRESSURE RECORDER USED WAS A BRISTOL 1000 PSI RECORDER, USING A 24 HOUR CLOCK AND 7-DAY CHART. BRADENHEAD PRESSURES TAKEN BEFORE TESTS WERE RUN (9:15 - 9:30 AM, APRIL 20, 1978) WERE AS FOLLOWS:

SURFACE PIPE (13 5/8")	0 PSI
INTERMEDIATE (8 5/8")	SLIGHT BLOW (15 SEC)
TUBING STRING (3½")	STRONG VACUUM
OIL STRING (5½")	TESTED AS INDICATED

PRESSURE WAS ALSO MONITORED WITH 3000 PSI GAUGE ON PUMP-TRUCK FLOWLINE TO HEAD. READINGS SHOWED VERY SLIGHT CHANGE DURING BOTH TESTS, AND CORRELATED WITH PRESSURE RECORDER RESULTS. BOTH THE PRESSURE RECORDER AND BRADENHEAD PRESSURE READINGS WERE REQUESTED BY L. CLEMENTS OF THE OCC.


SUNDAY
MONDAY
TUESDAY
WEDNESDAY
NIGHT
NOON
PRESSURE
DIFFERENTIAL
CALIBRATED CHARTS
BATAVIA N.Y.
METER NUMBER
TAKE PUT ON
DATE PUT ON
PIPE & ORIF. SIZE
TIME TAKEN OFF
DATE TAKEN OFF
MW-M 1000-SH
P1000-W100-S
SIGNED

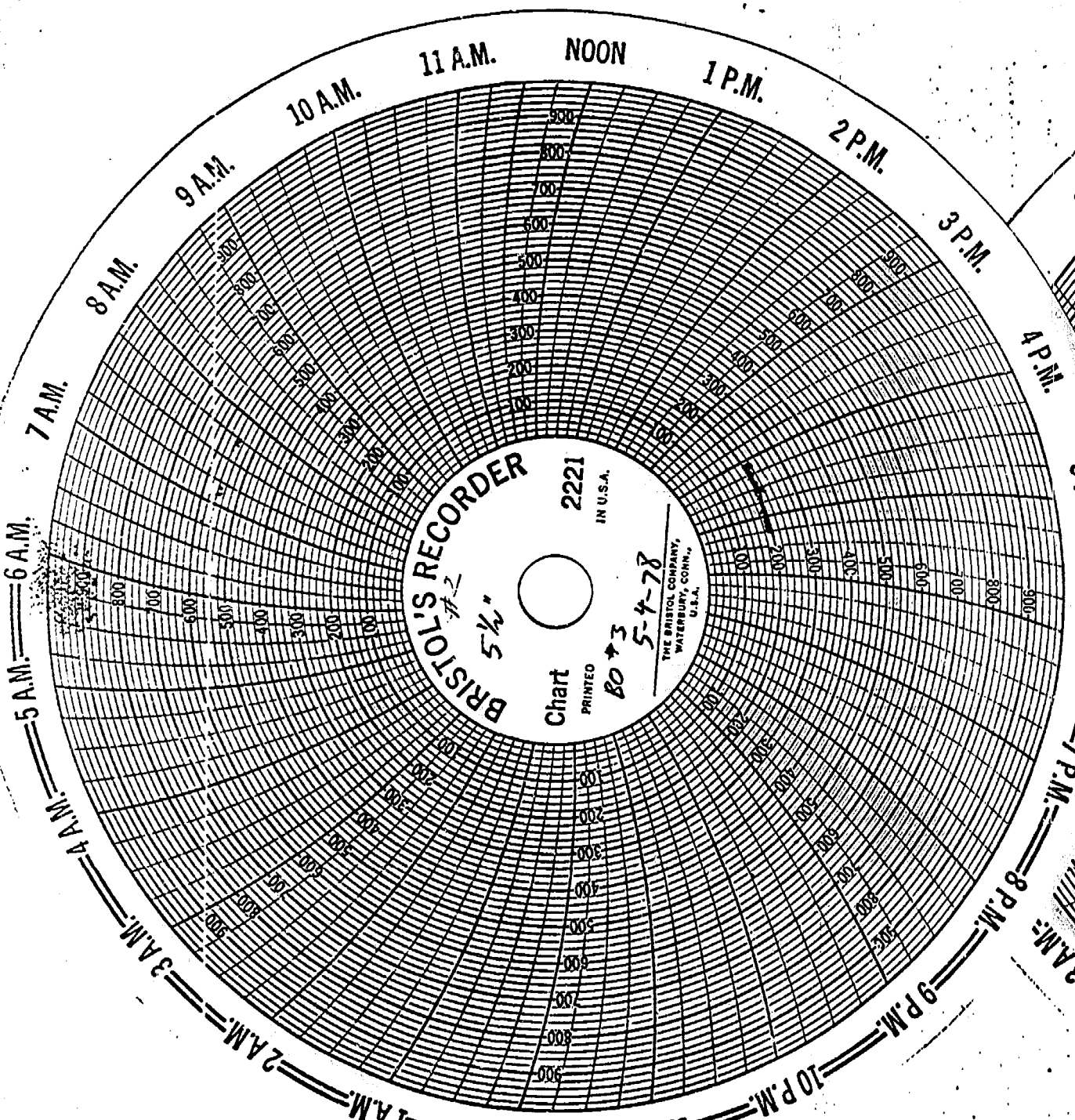
12:30	PUMPS S.D.		
12:35	FIRST S/SHOT	- 47	JTS TO FLUID IN 3½" TUBING.
3:00		49	
4:20		49½	
5:45		49¾	
6:00		49⅞	
6:15		49⅞+	
6:30		50	
6:45		50	

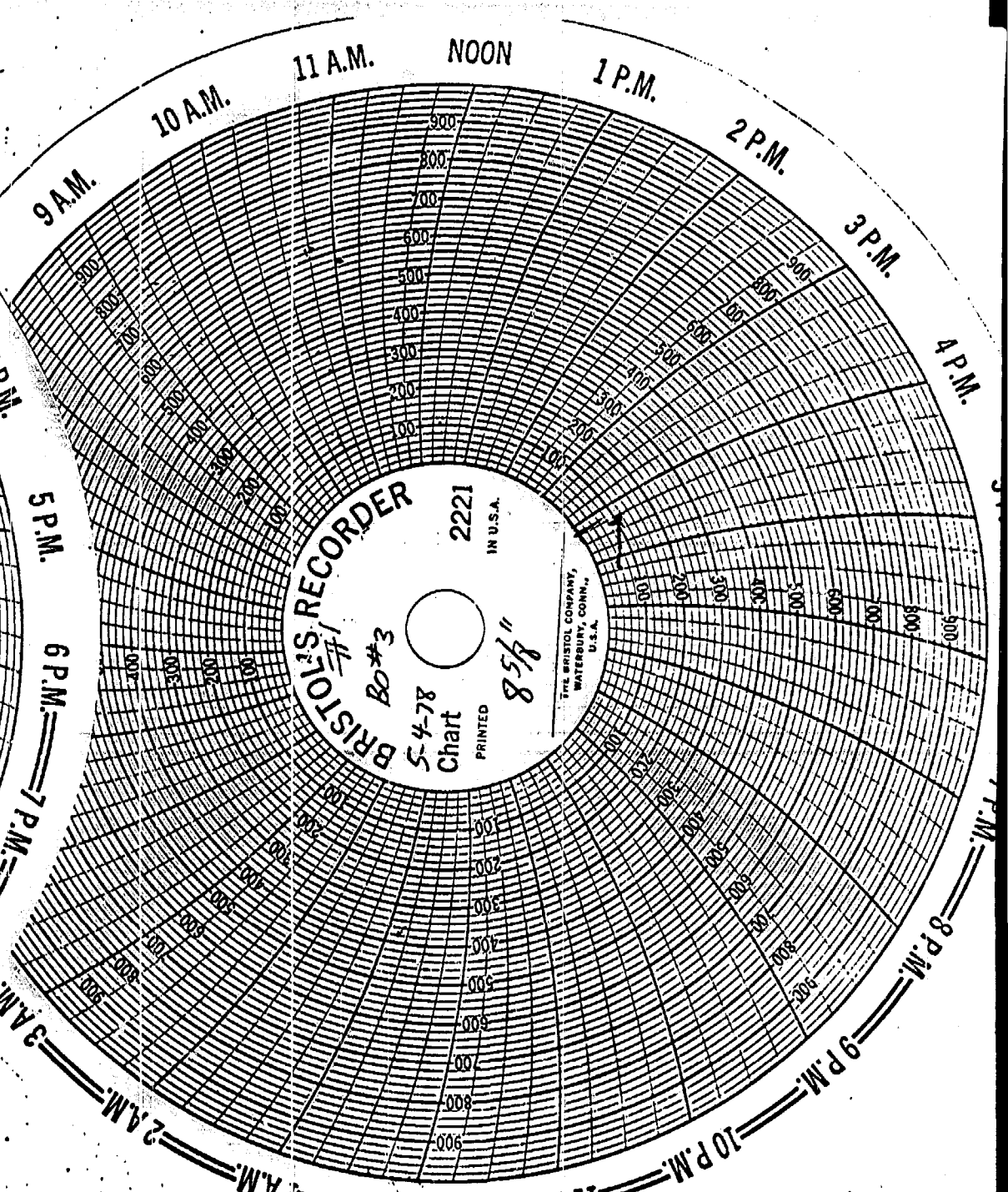


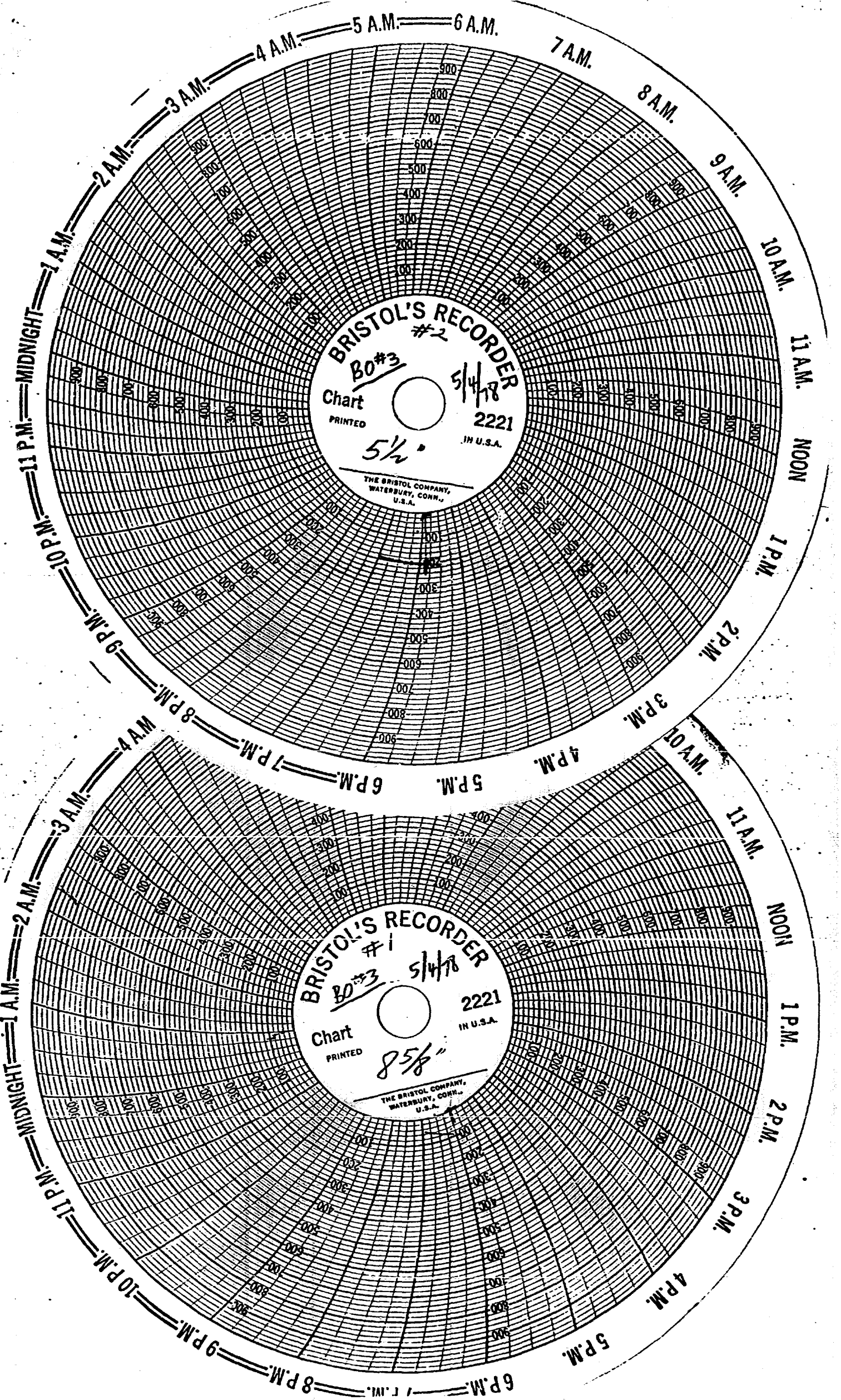
N.M. "BO" State # 3

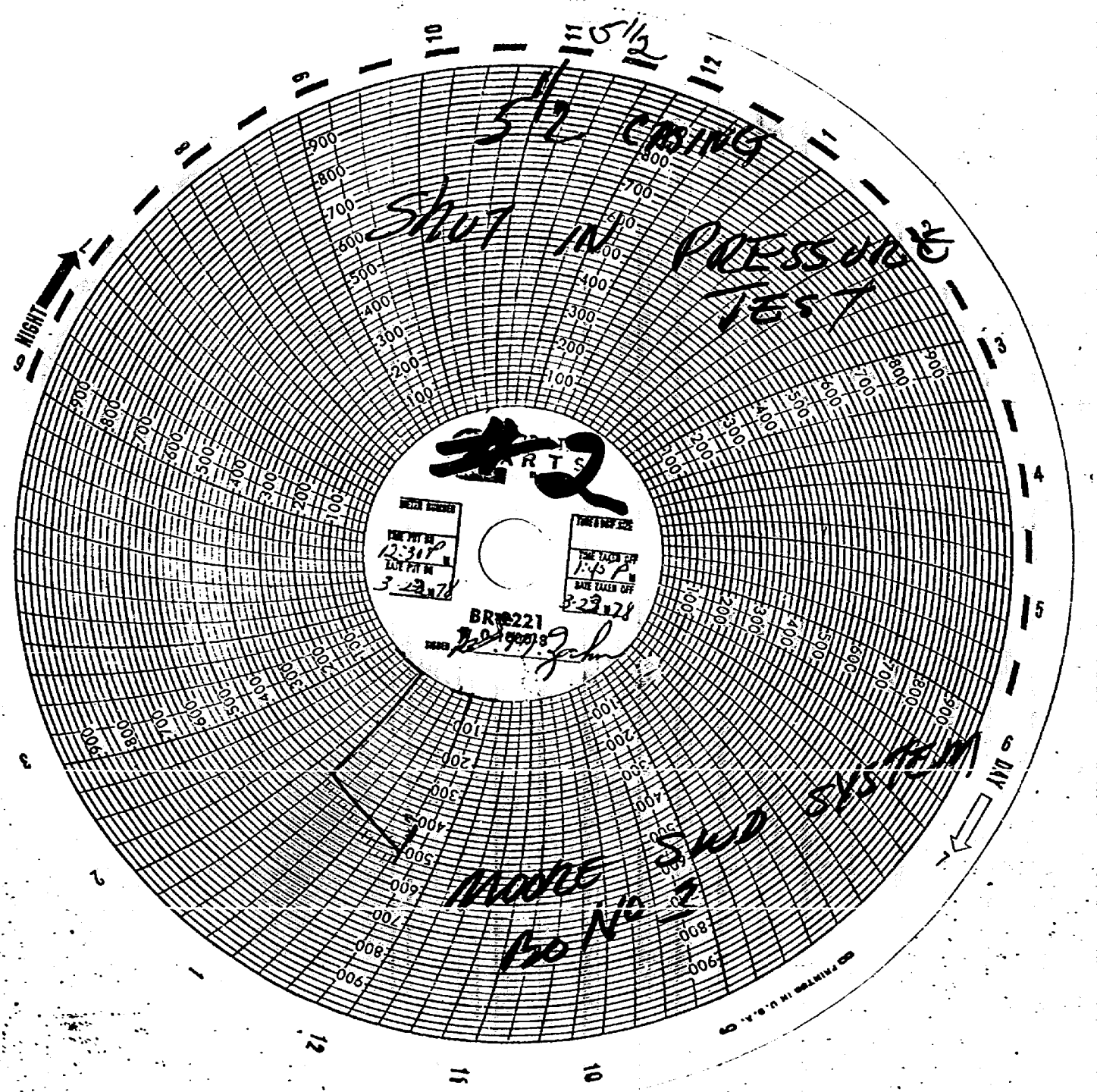
4 May 1978

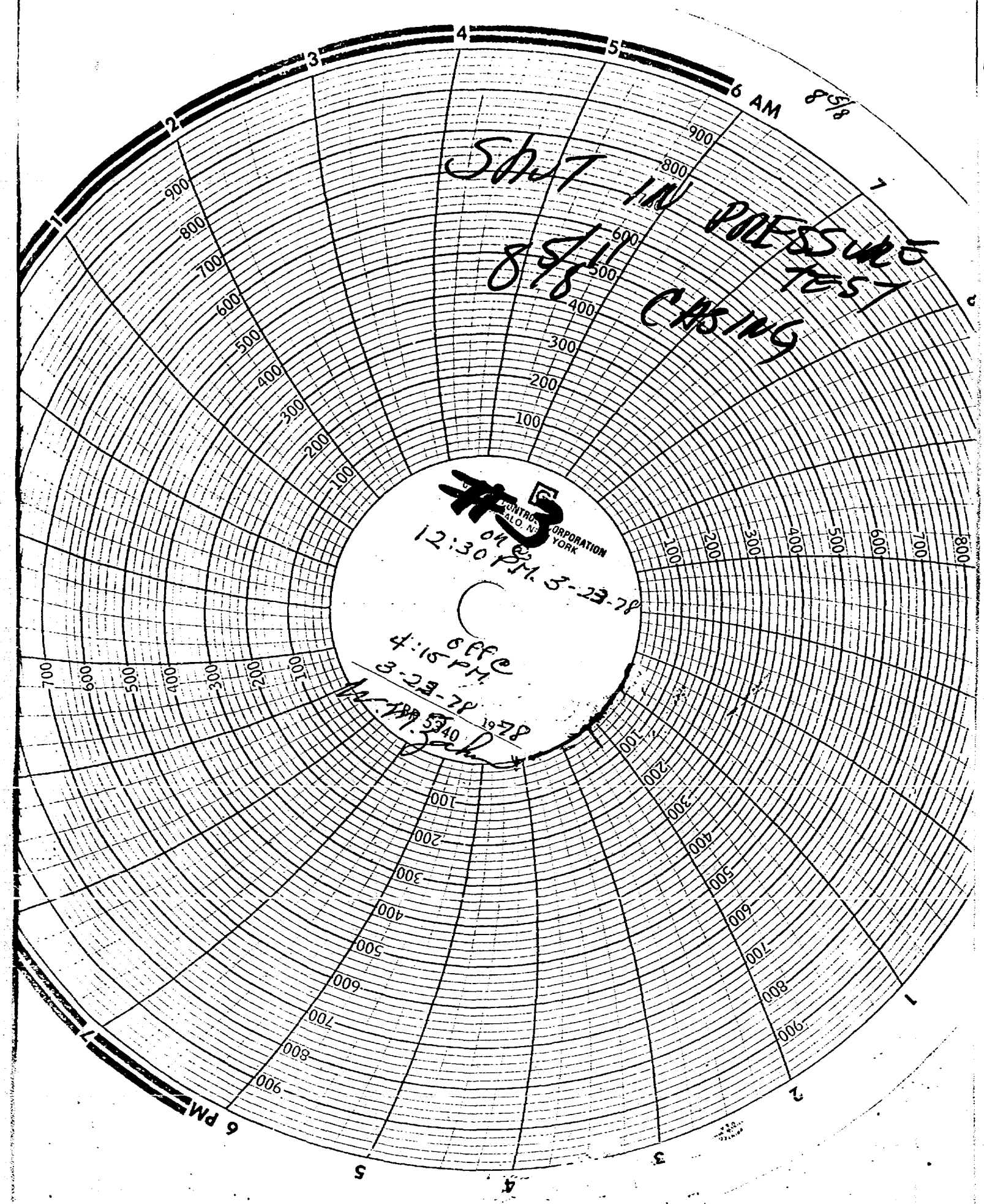
BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 6222 Exhibit No. 5
Submitted by PH
Hearing Date 5-31-78

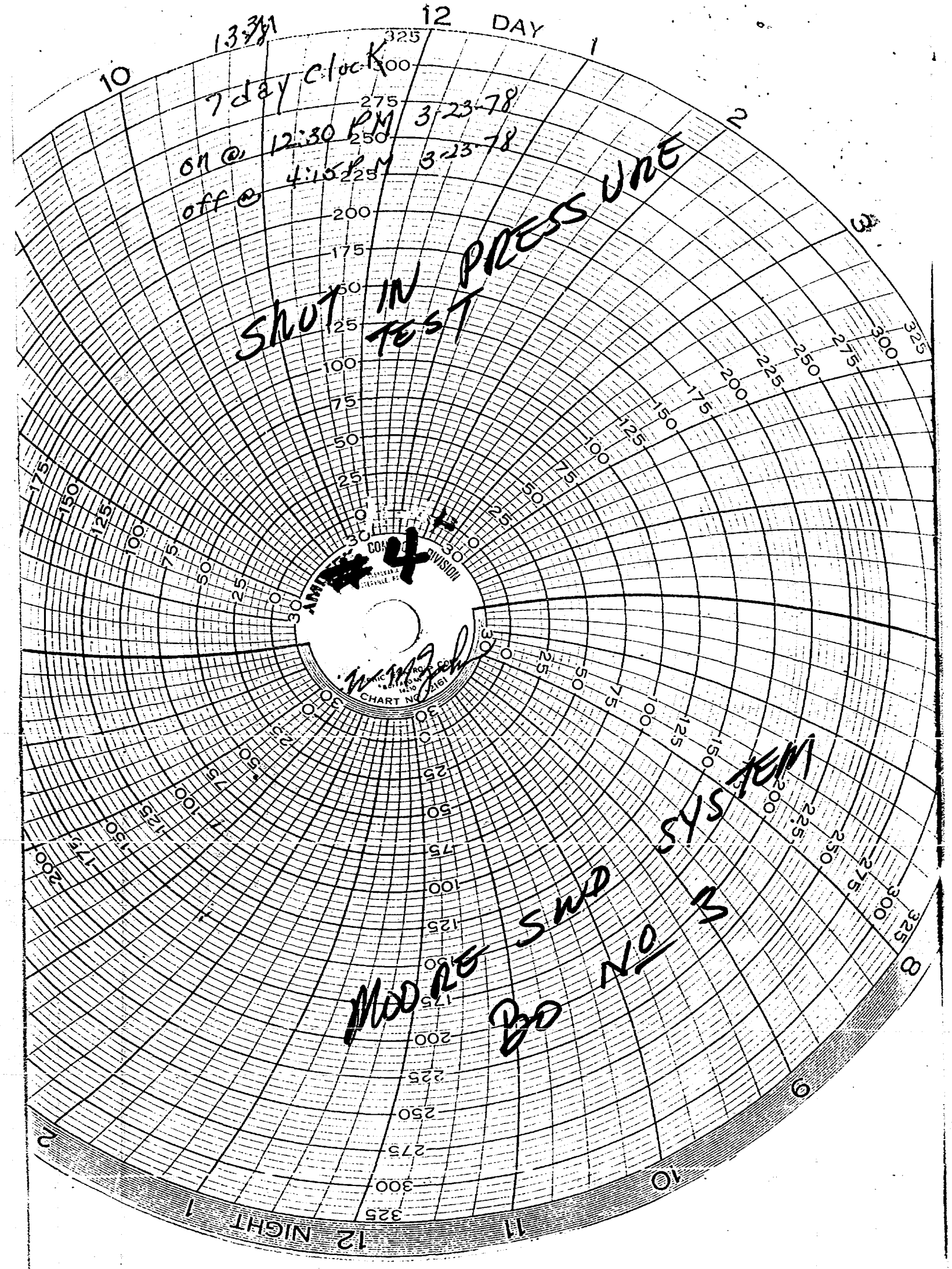

7 A.M.
8 A.M.
9 A.M.
10 A.M.
11 A.M.
NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
5 P.M.
6 P.M.
7 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
MIDNIGHT
1 A.M.
2 A.M.
3 A.M.
4 A.M.
5 A.M.
6 A.M.
BRISTOL'S RECORDER
2221
IN U.S.A.
Chart
PRINTED
Bo #3
5-4-78
THE BRISTOL COMPANY, WATERBURY, CONN., U.S.A.

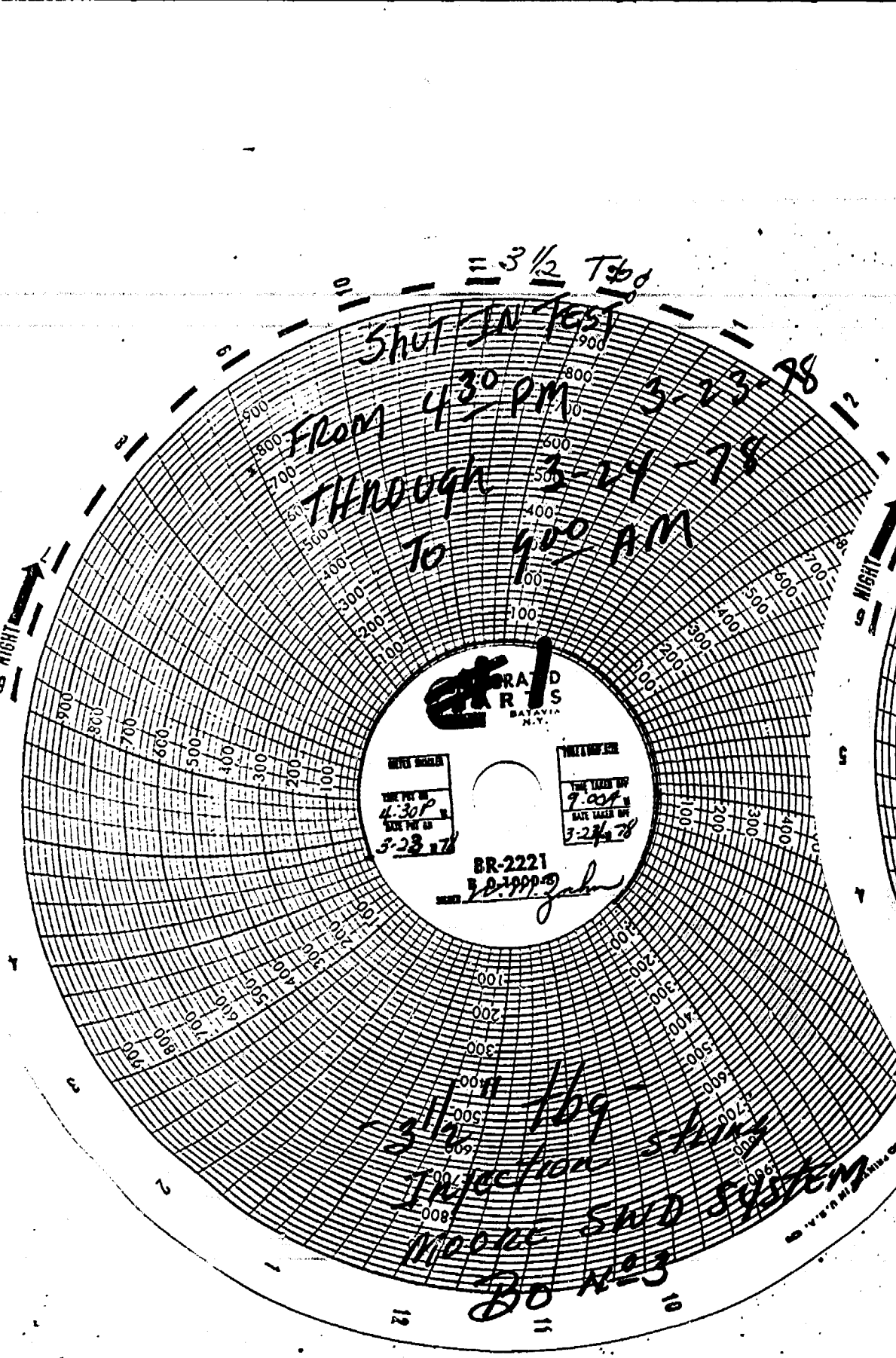

9 A.M.
10 A.M.
11 A.M.
NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
7 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
MIDNIGHT
1 A.M.
2 A.M.
3 A.M.
BRISTOL'S RECORDER
2221
IN U.S.A.
Chart
PRINTED
Bo #3
5-4-78
THE BRISTOL COMPANY, WATERBURY, CONN., U.S.A.

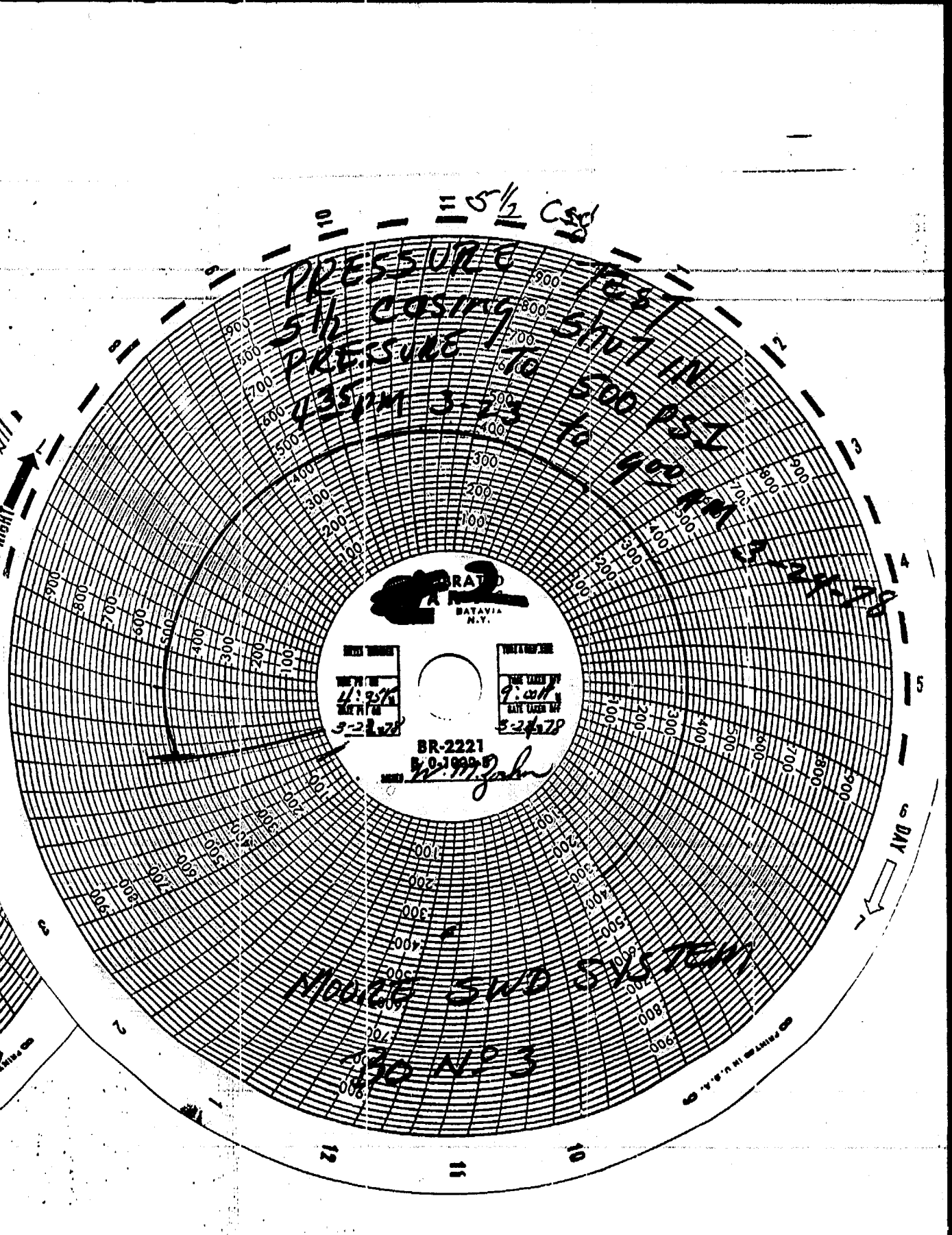

BRISTOL'S RECORDER
#2
BO#3
5/4/78
Chart
PRINTED
2221
IN U.S.A.
5½"
THE BRISTOL COMPANY,
WATERBURY, CONN.,
U.S.A.
BRISTOL'S RECORDER
#1
BO#3
5/4/78
Chart
PRINTED
2221
IN U.S.A.
8 5/8"
THE BRISTOL COMPANY,
WATERBURY, CONN.,
U.S.A.

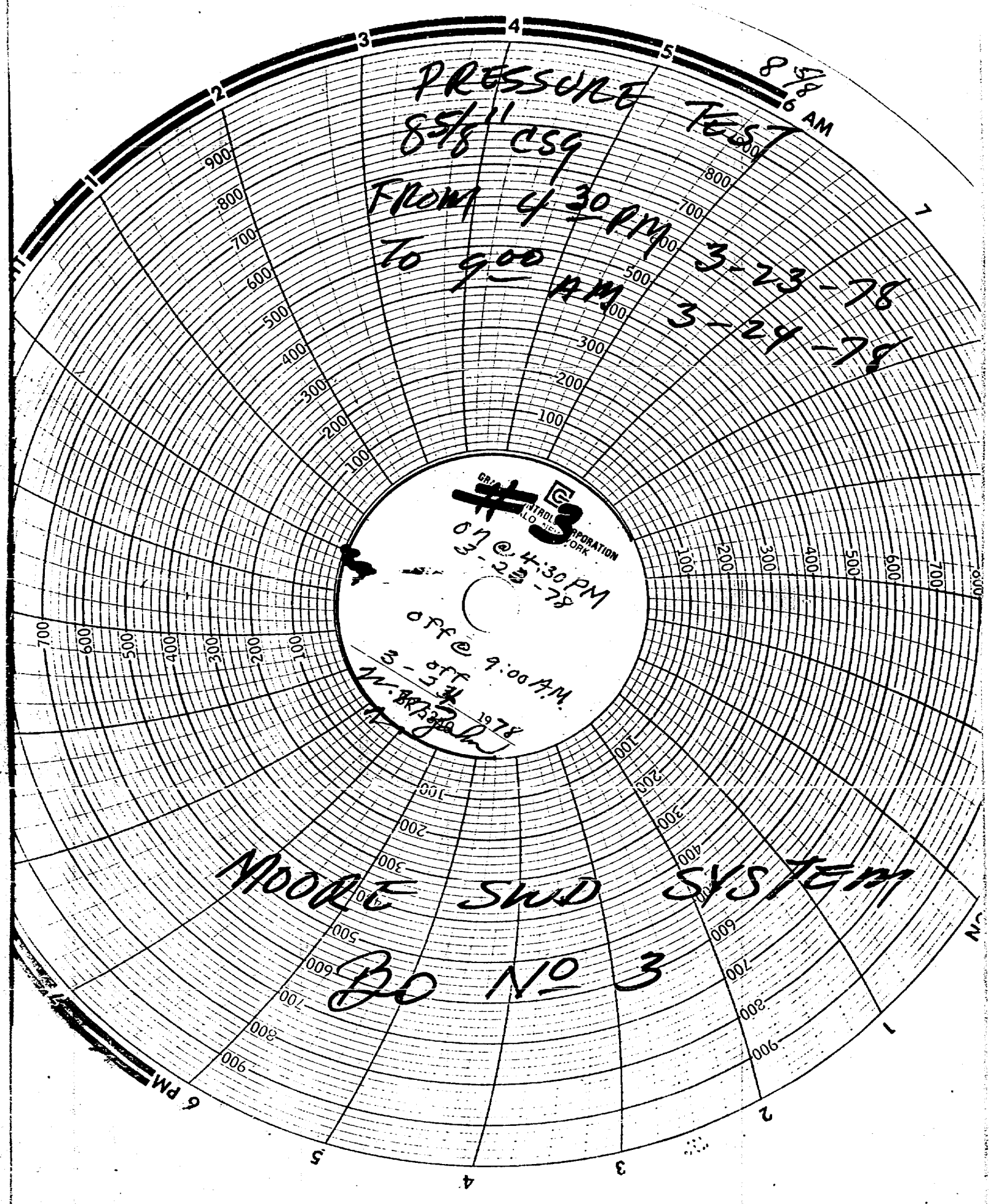

5½ CSG
Shut IN PRESSURE TEST
#2
MOORE CO No 2 SWD SYSTEM
NIGHT
DAY
PRINTED IN U.S.A.

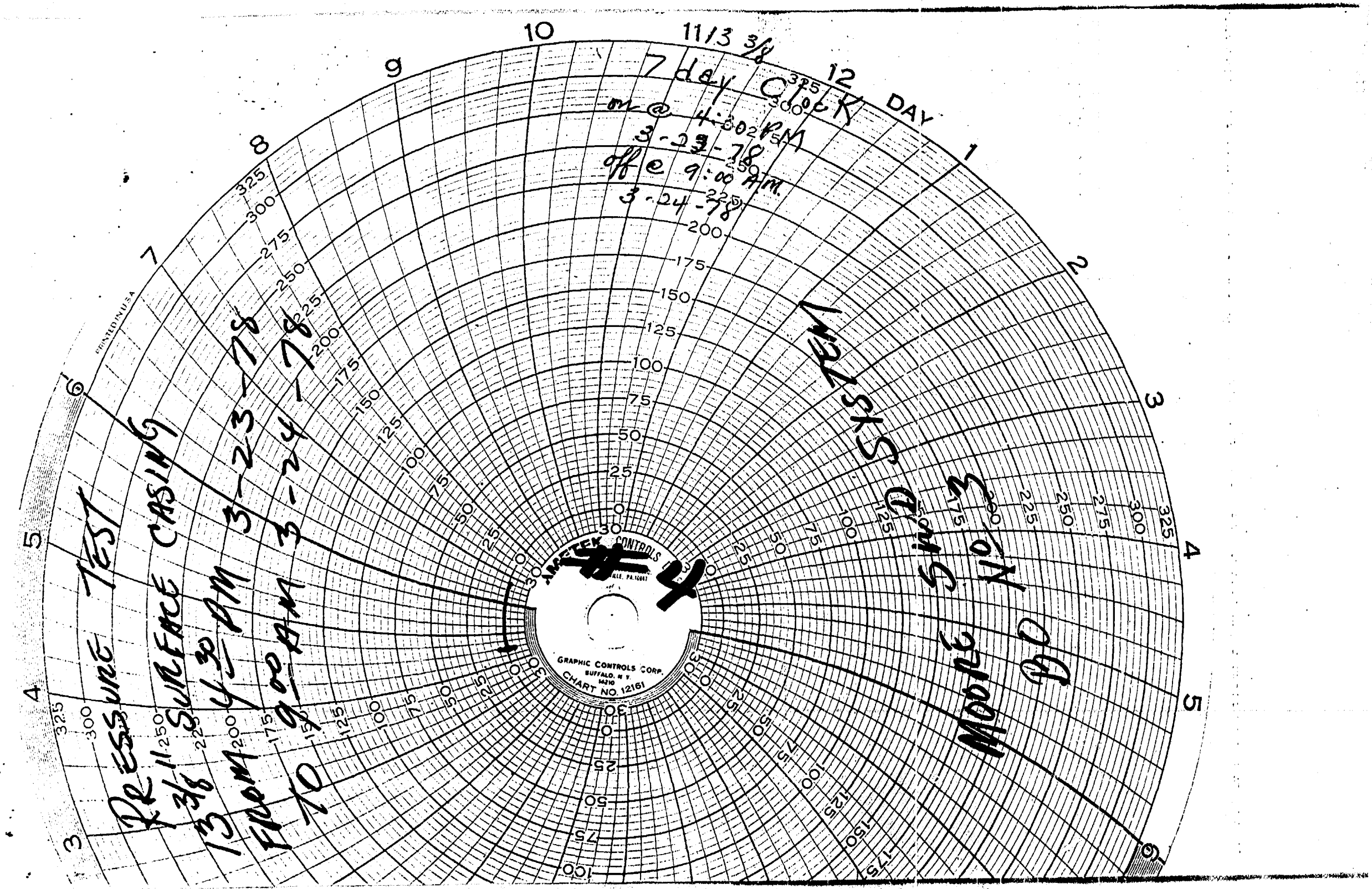

6 AM
7
8 5/8
SHUT IN PRESSURE TEST
8 5/8" CASING
#3
CONTROL CORPORATION
BUFFALO, NEW YORK
on @
12:30 PM. 3-23-78
off @
4:15 PM.
3-23-78
1978
6 PM
1
2
3
4
5
6
7
100
200
300
400
500
600
700
800
900

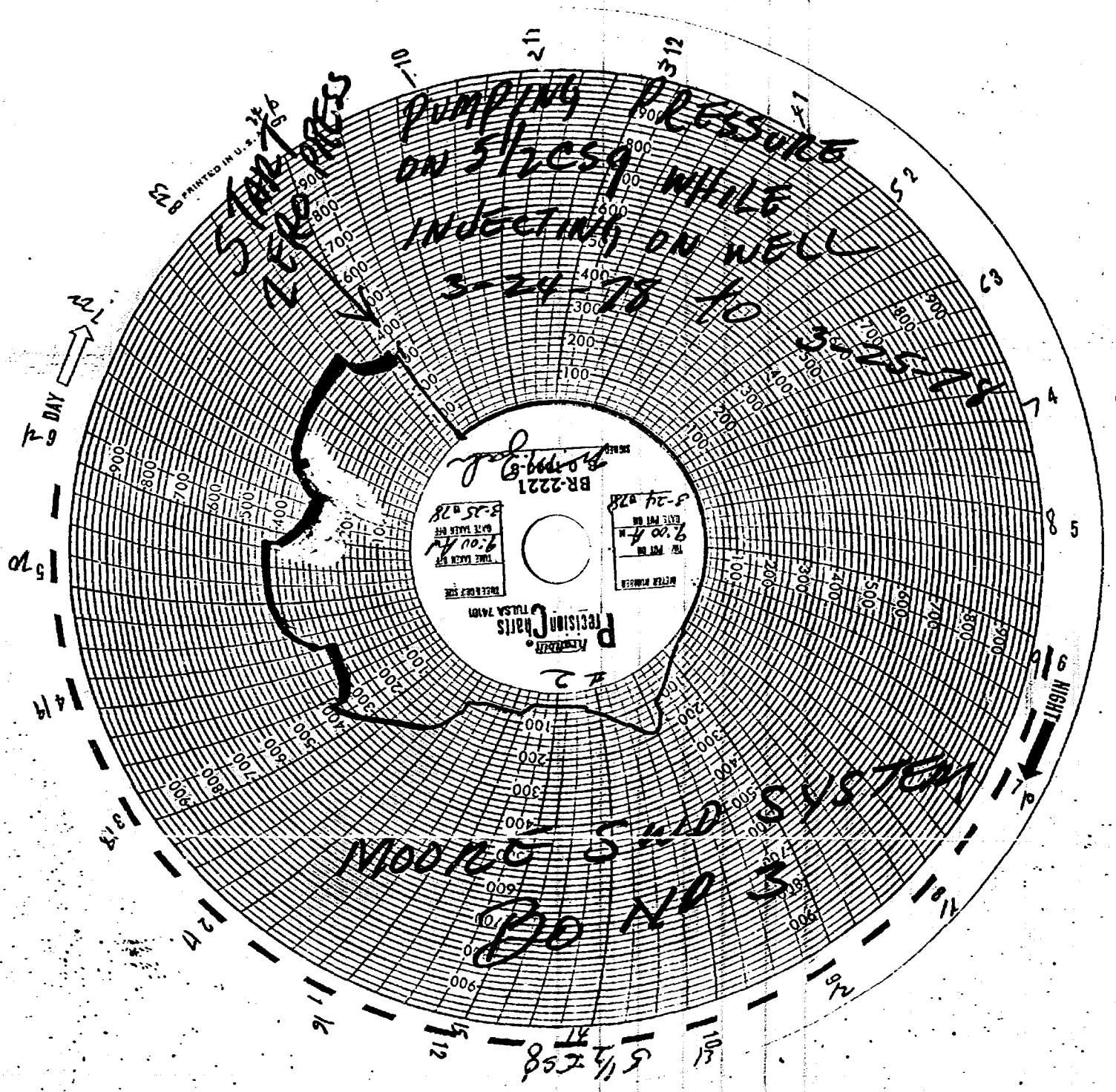

12 DAY
1
2
3
4
5
6
7
8
9
10
11
12 NIGHT
1
2
10
7 day clock
on @ 12:30 PM 3-23-78
off @ 4:15 PM 3-23-78
SHUT IN TEST PRESSURE
MOORE SWD
BD NO 3
SYSTEM
#4
CHART NO 2161

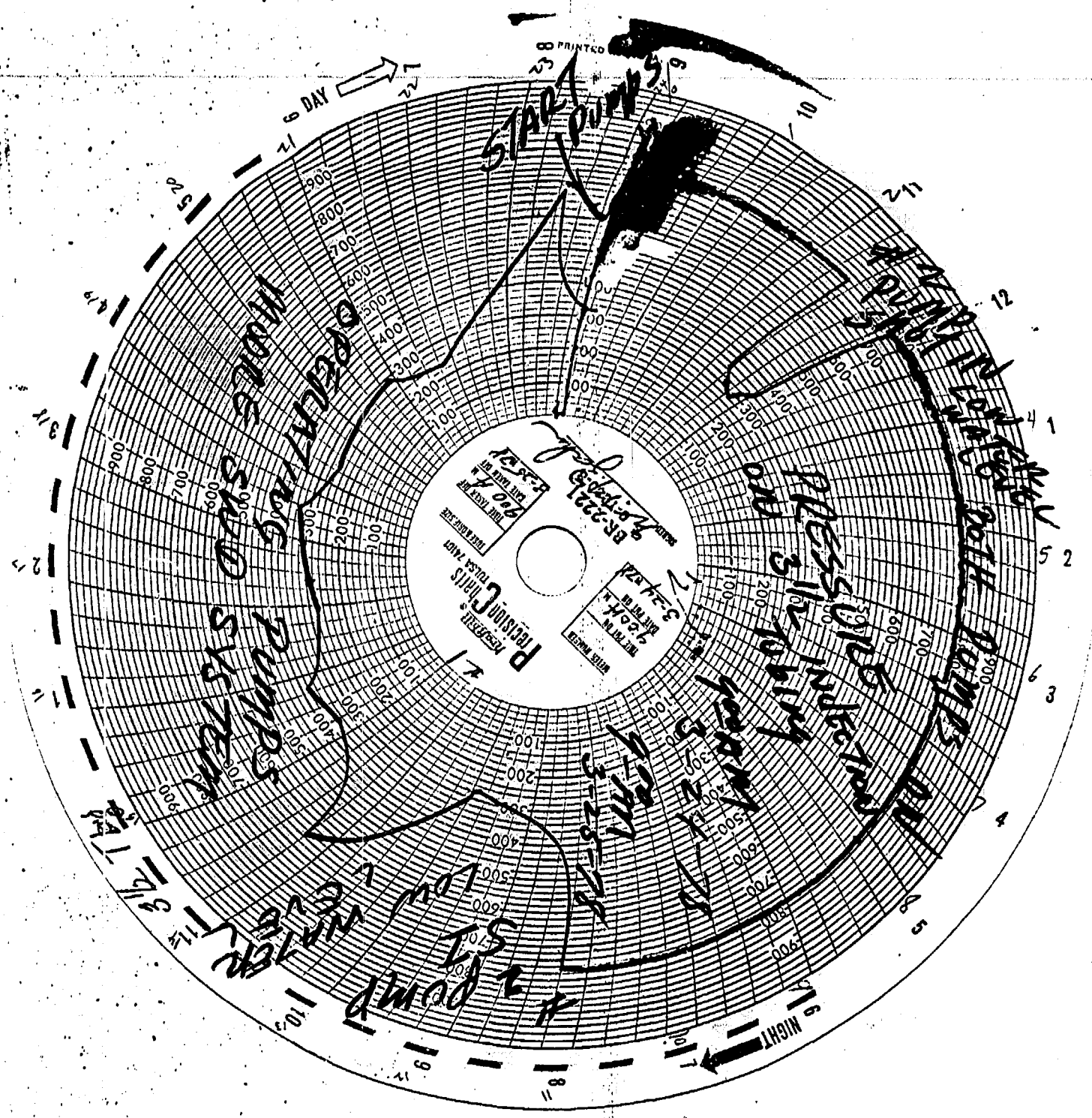

3½ Tbg
Shut In Test
From 4:30 PM 3-23-78
Through 3-24-78
To 9:00 AM
BR-2221
4:30P
3-23-78
9:00A
3-24-78
3½ Tbg - Injection - S-Line
Moore SWD System
Bo #3


5½ Csg
Pressure Test
5½ Csg Pressure
Shut In
To 500 PSI
From 4:35 PM 3-23
To 9:00 AM 3-24-78
BR-2221
9:00A
3-24-78
Moore SWD System
Bo #3


PRESSURE TEST
8-5/8" CSG
FROM 4:30 PM 3-23-78
TO 9:00 AM 3-24-78
#3
ON @ 4:30 PM
3-23-78
OFF @ 9:00 A.M.
3-24-78
MOORE SWD SYSTEM
MOORE NO 3
6 AM
6 PM


7 day Clock
m @ 4:00 PM
3-23-78
off @ 9:00 AM
3-24-78
11/3 3/8
DAY
1
2
3
4
5
6
7
8
9
10
12
Pressure Test
1336 11 Surface Casing
1300 4:30 PM 3-23
TO 9:00 AM 3-24
Model 10X
Sinaled Sky
GRAPHIC CONTROLS CORP.
BUFFALO, N.Y.
14210
CHART NO. 12161
ARMTEK CONTROLS
PRINTED IN U.S.A.


PRESSURE
TIME
DAY
NIGHT
PRECISION CHARTS
TULSA 74101
BR-2221
PRINTED IN U.S.A.
Pumping Pressure on 5½ csg while injecting on well 3-24-78
5½ csg
3-24-78
3-25-78
Monday
3-27-78
3-28-78
3-29-78
3-30-78
3-31-78
4-1-78
4-2-78
4-3-78
4-4-78
4-5-78
4-6-78
4-7-78
4-8-78
4-9-78
4-10-78
4-11-78
4-12-78
4-13-78
4-14-78
4-15-78
4-16-78
4-17-78
4-18-78
4-19-78
4-20-78
4-21-78
4-22-78
4-23-78
4-24-78
4-25-78
4-26-78
4-27-78
4-28-78
4-29-78
4-30-78
5-1-78
5-2-78
5-3-78
5-4-78
5-5-78
5-6-78
5-7-78
5-8-78
5-9-78
5-10-78


DAY
NIGHT
PRINTED
START PUMPS
PRESS 3 PUMPS
PUMPS
PUMPS

8 5/8

8 5/8 - INTERMEDIATE

PRESSURE WHILE INJECTING

3-24-78

3-25-78

GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK

W. M. Zahn

9:00 AM ON @ 1:00 PM 3-24-78
@ 9:00 AM OFF 3-25-78
BR 5340

78

ANNEX SWD SYSTEM

ON NO 3

AM

NOON

PM

7 day clock

13 3/8 Surface Casing

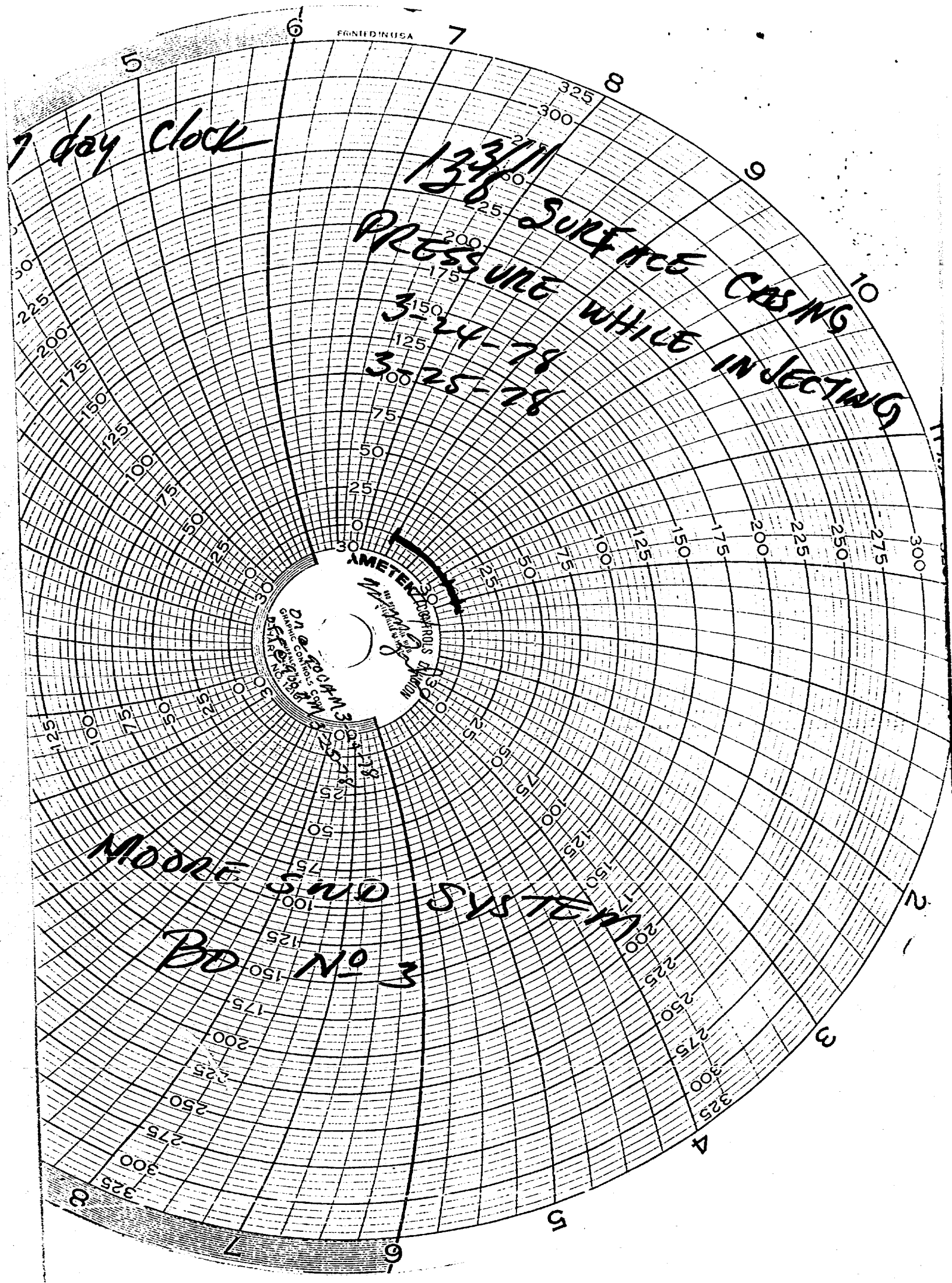
Pressure while injecting

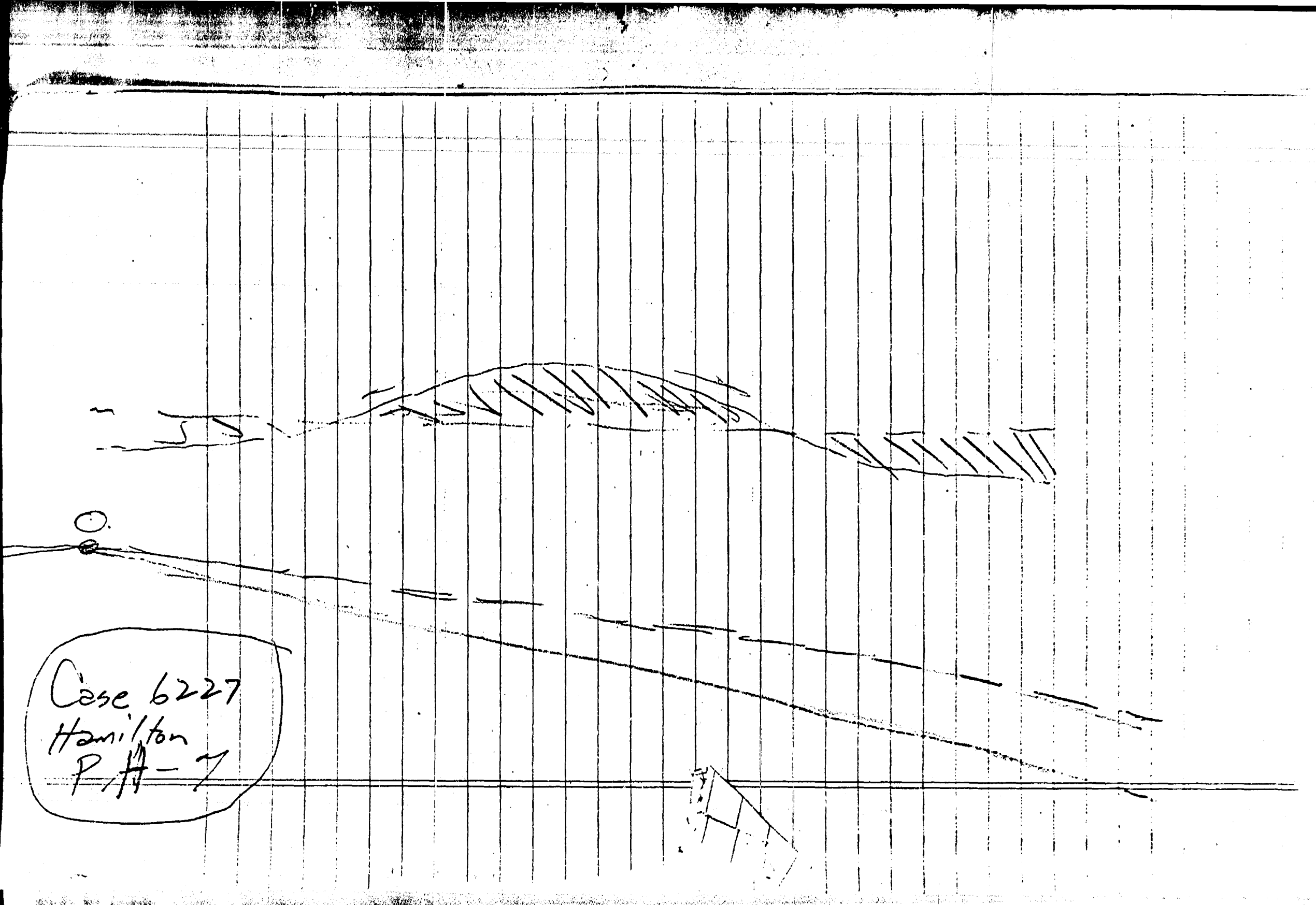
3-24-78

3-25-78

Moore One System

BD No 3


FRIEDINUSA
5
6
7
8
9
10
1
2
3
4
5
6
7
8
0
25
50
75
100
125
150
175
200
225
250
275
300
325
30
225
200
175
150
125
100
75
50
25
0
30
225
200
175
150
125
100
75
50
25
0
30
225
200
175
150
125
100
75
50
25
0



Case 6227
Hamilton
P/H-7

State water rights a sensitive issue



Inside The Capitol

By Carrol Cagle

A little-noticed hearing before a state government agency which is rarely in the public eye illustrates that New Mexico's precious and scarce resource, water, has the capacity of provoking fights between interest groups that often agree.

In this case, the dispute is between agricultural interests and the petroleum industry.

Specifically, it's between a Lea County farmer, Paul Hamilton, and Texaco, Inc. But leaders of the farming and oil communities usually like to keep up with regulatory issues and changes that may affect them.

Whether there'll be any policy changes concerning protections against oil contamination of fresh water acquifers remains to be seen. This may be only another in a series of occasional skirmishes by the two groups, which normally agree on a conservative outlook toward New Mexico political issues.

Since water is a valuable commodity, it's natural that the two would get involved in tactical maneuverings once in a while. The director of the petroleum regulatory agency says he can remember only "a half dozen complaints" by farmers and ranchers against petroleum-related activities in 19 years.

He and the water resources director, however, don't hesitate to make their cases with regard to the jurisdictional issues involved in regulating the two industries. That may indicate the Hamilton case would signal a shift in regulatory policies.

Another measure of the potential importance of the regulatory case is the number of attorneys and other experts summoned by Texaco to attend the hearings before the Oil Conservation Division (OCD).

Hamilton brought the action before the division, seeking a ruling which would shut down a "salt water disposal well" located near his Lea County farm. Texaco runs the well, which pumps salt water back into underground formations after it comes to the surface in oil pumping operations. Hamilton's attorneys claim the salt water got into his farm's fresh water irrigation supplies.

The farmer also has reportedly filed a multi-million dollar damage suit against Texaco in U.S. District Court. The outcome of his Oil Conservation Division case could have a bearing on court deliberations.

Joe Ramey, director of the division, steered clear of saying he's involved in a jurisdictional dispute with the State Water Resources Division and its director, Steve Reynolds. Two Reynolds staffers testified at the OCD hearing, stopping short of saying Texaco had caused the Hamilton farm water contamination but claiming that the disposal well had leaked in the past. But Ramey did say "there was always a question about who should be the lead agency" in handling oil industry water issues.

Ramey said: "You can quote me on this. I'm going to talk to Steve Reynolds and say, 'Hey, you've turned this over to us.'" OCD got the authority from the State Water Quality Control Commission, made up of representatives from various state agencies, Ramey told this column.

Reynolds, when contacted, said he wasn't even aware of whether he had had his agency's staffers at the hearing.

But he said state law requires his division to advise Ramey's OCD "what waters need protection." This involves keeping up "with possible contamination caused by brine, leaky wells, things of that nature."

"Joe is in no way impeded by our operation," Reynolds said. "We have to tell him those fresh water areas needing protection—that's the statute."

Roswell Daily Record
Roswell, N.M.
JUL 23 1978
New Mexico Press Clipping Bureau
Albuquerque, N. M.

State order denies request by farmer

22

[redacted] Staff Writer

The state Oil Conservation Division [redacted] by a Caprock farmer, [redacted] saltwater injection well operated by Texaco on the farmer's land contaminated his water supply.

An official order of denial was mailed from the commission's Santa Fe office on Monday.

The order, signed by commission members Emery C. Arnold and Joe D. Ramey, says that evidence presented in this case fails to establish that the subject well is now leaking injected fluids to the ground water [redacted]."

It further states that evidence is "inconclusive" as to whether the subject well has ever leaked injected fluids (salt water) to the ground [redacted] saltwater contamination [redacted] Texaco Inc., U.S. Highway 380 by Paul and Betty Hamilton of Caprock.

The suit, filed in Albuquerque on April 5, originally was scheduled for trial on July 31 before U.S. District Judge Edwin Mechem in Roswell, a court spokesman said.

Roswell attorney Alvin F. Jones, representing Hamilton in both the court case and the hearings held before the OCD, said Hamilton is "strongly considering" appealing the ruling to state District Court in Santa Fe.

Hamilton, reached by the Daily Record today, said he would reserve comment on the ruling.

[redacted] declined comment was Hamilton attorney Harold E. Hensley, [redacted] in both cases.

Hensley said he felt it would be [redacted] on the case [redacted] pending before federal [redacted]

[redacted] court clerk for U.S. District Judge E. Vearl Payne, said the case has been transferred to Payne's docket and no trial date has been set.

In its ruling, the commission also found that the "ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source."

It also found that "recent tests conducted on said well indicate the well is [redacted]."

Hamilton applied to the commission to close the injection well, which reinjects salt water back into the ground that is produced out of the ground with oil, located northwest of his farm in Caprock.

Hamilton alleged in his application that the injection well had leaked "substantial quantities of salt water" into the Ogallala aquifer underlying his farm, and that it is "still leaking."

A copy of Texaco's answer to the allegations was not available today.

A hearing was held May 31 by the commission and the decision announced today was issued on that hearing, the commission order shows.

The commission is composed of OCD Director Joe D. Ramey, Emery

well and that the contamination was done in "wanton and reckless disregard of the rights of the plaintiff."

Texaco denied Hamilton's allegations in an answer filed to the court on [redacted] and raised two affirmative defenses, the document shows.

The first affirmative defense states that Hamilton's claims are barred by statute of limitations or laches, which are defined in Webster's dictionary as a "failure to do the required thing at the proper time."

The second defense listed states that the Hamiltons "were negligent in failing to investigate the nature and extent of the alleged water contamination prior to planting the 1977 crop" which bars them from collecting for the crops lost.

water supply.

An official order of denial was mailed from the commission's Santa Fe office on Monday.

The order, signed by commission members Emery C. Arnold and Joe D. Ramey, says that evidence presented in this case fails to establish that the subject well is now leaking injected fluids to the ground water in the area."

It further states that evidence is "inconclusive" as to whether the subject well has ever leaked injected fluids (salt water) to the ground

[redacted] saltwater con-

[redacted] Paul

[redacted] on April 5, originally was scheduled for trial on July 31 before U.S. District [redacted] Mechem in Roswell, a [redacted] said.

[redacted] attorney Alan F. Jones, representing Hamilton in both the court case and the hearings held before the OCD, said Hamilton is "strongly considering" appealing the ruling to state District Court in Santa Fe.

Hamilton, reached by the Daily Record today, said he would reserve comment on the ruling.

Also declining comment was [redacted] attorney Hartill L. Hensley, who represents Texaco in both cases.

Hensley said he felt it would be "highly unethical" to comment on the case since it is pending before federal court.

Chris Longwell, court clerk for U.S. District Judge B. Vead Payne said [redacted] was transferred to Payne's docket and no trial date has been set.

In its ruling, the commission also found that the "ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source."

It also found that "recent tests conducted on said well indicate the well to be mechanically sound."

Hamilton applied to the commission to close the injection well, which reinjects salt water back into the ground that is pumped out of the ground with oil, located northwest of his farm [redacted].

Hamilton alleged in the application that the injection well had leaked "substantial quantities of salt water" into the [redacted] underlying his farm [redacted] leaking."

A [redacted] Texaco's [redacted] the [redacted] the [redacted] an- [redacted] that [redacted] lows.

[redacted] is composed of OCD Director Joe D. Ramey, Emery C. Arnold, director of the Mining and Minerals Division of the Department of Energy, and state Land Commissioner [redacted] Cravens. The OCD is a division of the Energy and Minerals Department.

Hamilton is seeking damages of $[redacted]0 for what he claims is the destruction of his farm and crops and the damage to the underlying water basin, the complaint filed last April in Federal District Court said.

Hamilton is asking another $1 million in punitive damages on the grounds that Texaco was "willful and malicious" in causing the contamination allegedly coming from

firmative defenses, the document shows.

The first affirmative defense states that Hamilton's claims are barred by [redacted] failing to investigate the nature and extent of the alleged water contamination prior to planting the 1977 crop" which bars them from collecting for the crops lost.

Case 6252

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

APPLICATION OF PAUL HAMILTON FOR AN ORDER REQUIRING SHUT IN AND PLUGGING OF TEXACO INC. SALT WATER DISPOSAL WELL LOCATED IN THE MOORE DEVONIAN POOL, LEA COUNTY, NEW MEXICO.

A P P L I C A T I O N

COMES NOW, Paul Hamilton, and applies to the Oil Conservation Commission of the State of New Mexico for an Order directing the shut in of Texaco salt water disposal well number three (3) located in unit D of Section 24, Township 11 South, Range 32 East Lea County, New Mexico and in support of such application would show the Commission:

1. Texaco Inc. is the owner and operator of salt water disposal well number three (3) located in unit D of Section 24, Township 11 South, Range 32 East and is presently operating such well for the disposal of salt water in the Moore Devonian Pool in Lea County, New Mexico. Salt water from said well is presently entering the ground water underlying the farm of applicant, Paul Hamilton, said farm being located in Sections 24 and 25 of Township 11 South, Range 32 East N.M.P.M.

2. Pursuant to complaint of applicant, the investigation of the Oil Conservation Commission, Hobbs, New Mexico office of salt water contamination of applicant's irrigation wells, clearly discloses that Texaco Inc. salt water disposal well has leaked substantial quantities of salt water into the ogallala acquifer underlying applicant's farm and further said investigation shows that said salt water disposal well is still leaking and contaminating the ground water supplies, underlying applicant's farm and the farms of others in the area. Applicant draws his irrigation water from the Lea County ground water basin as declared and established by the State Engineer of New Mexico.

3. This commission is required by law to direct the disposal of salt water in such a manner as to protect from contamination fresh ground water supplies designated by the State Engineer and the operation by Texaco Inc. of such salt water disposal well under its present condition is in violation of the pertinent rules and regulations of the Commission governing salt water disposal.

WHEREFORE, Applicant requests that this application be set down for hearing at the earliest next hearing date and that the Commission enter an Order granting the relief applied for.

Respectfully submitted,

DONALD BROWN, P. A.

By _____
Alvin F. Jones
P.O. Box 776
Roswell, New Mexico 88201

RECEIVED
AUG 16 1978
Oil Conservation Commission

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION OF PAUL HAMILTON FOR SALT WATER DISPOSAL SHUT-IN, LEA COUNTY, NEW MEXICO.

Case No. 6222

RESPONSE TO MOTION

The Respondent Texaco Inc. in reply to the Motion of the Applicant Paul Hamilton for an Order directing that a florescent dye test be conducted on the Texaco New Mexico "BO" State No. 3 Disposal Well states that it is opposed to such testing procedures upon the following grounds:

1. Such a test is unnecessary in view of the fact that the State Engineers Office has been monitoring water levels immediately adjacent to the well bore of the "BO" No. 3 Well by recording devices in an effort to determine whether or not injection of salt water in the subject well has any effect on the water level in the Ogallala Formation immediately surrounding the well bore. To conduct a florescent dye test would be to essentially duplicate testing procedures already underway.

2. Florescent dye testing results in permanent contamination of the ground water by reason of the fact that the florescent dye adheres to the clay particles in the Ogallala Formation. In addition, the permanent contamination caused by florescent dye injection prevents future tests utilizing dye injection. In addition, it is possible that florescent dye may have been used for testing in the watershed previously which would invalidate this and any future test results.

3. If for any reason the Commission feels that testing, other than that presently being conducted under the jurisdiction of the State Engineer, is required or necessary,

then Respondent would suggest that a radio-active tracer test be run by competent third-parties who are qualified in such testing procedures upon the condition that such testing be paid for at the sole expense of the Applicant Paul Hamilton. Radio-active tracer tests do not result in permanent contamination when the radio-active materials have a short half-life.

4. If the Commission is inclined to favorably consider the Motion, Respondent would request permission to be heard on the matter at the re-hearing scheduled for August 23, 1978.

RESPECTFULLY SUBMITTED,

HINKLE, COX, EATON, COFFIELD & HENSLEY

By _____
Attorneys for Respondent Texaco Inc.

WE HEREBY CERTIFY THAT WE HAVE MAILED A COPY OF THE FOREGOING PLEADING TO ALL OPPOSING COUNSEL OF RECORD THIS
8/15/78
HINKLE, COX, EATON
COFFIELD & HENSLEY
P.O. BOX 10 Attorneys Roswell, N.M. 88201

RECEIVED
AUG 16 1978
Oil Conservation Commission

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION
OF PAUL HAMILTON FOR
SALT WATER DISPOSAL SHUT-IN,
LEA COUNTY, NEW MEXICO.

Case No. 6222

MOTION

The Applicant in this Cause hereby moves the Commission for its Order directing that an experiment be conducted on the salt water disposal well in question, being the Texaco Well "BO" No. 3, located in the Moore Devonian Pool, Lea County, New Mexico; said experiment to consist of the placing of a florescent dye in the salt water disposed of in said well; the purpose of said experiment being to determine whether or not such florescent dye appears in the observation well completed near the disposal well.

As grounds for this Motion, the Applicant would show the Commission that evidence from the observation well, so far, indicates that the water quality in such observation well is at or near production water quality, that the State Engineers Office in Roswell, New Mexico, recommends that such an experiment be conducted.

The Applicant would further show the Commission that such an experiment could be conducted at nominal expense, which Applicant would bear and would not in any way disrupt the activities of the Respondent insofar as its salt water disposal operations are concerned.

Finally, Applicant would show the Commission that the results of such a test would be highly beneficial in a resolution of this matter on an accurate, factual basis.

I certify that a true copy of the foregoing pleading was mailed to opposing counsel of record on

August 14, 1978

s/

RESPECTFULLY SUBMITTED,

DONALD BROWN, P.A.

By: _____
Attorney for Applicant

JUL 19 1978
CONSERVATION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6222
Order No. R-5753

APPLICATION OF PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT-IN,
LEA COUNTY, NEW MEXICO.

APPLICATION FOR REHEARING

The Applicant, Paul Hamilton, hereby respectfully requests a rehearing in the above case and for his grounds states:

That the Commission finding No. 5 is unsupported by the evidence in the record in this cause. In their testimony, the geologists of the New Mexico State Engineer Roswell Office stated their opinion, that the salt water disposal well in question, Texaco, Inc., New Mexico "BO" State Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, N.M.P.M., Lea County, New Mexico, was and perhaps still is, the source of the ground water contamination by the intrusion of brine water. Applicant would point out that no testimony appears so far as Applicant is aware in the record of the transcript before the Commission on the hearing regarding the source of the contamination of the ground water, other than the testimony outlined above. The subject well was pinpointed by the geologist of the Commission from Hobbs, New Mexico as at least in part being the source of the ground water contamination.

Applicant challenges Finding of Fact No. 6 of the Commission as being incomplete in that, tests indicating the mechanical integrity of such well, do not, by any means, exclude leakage from such well by other processes than mechanical processes.

Applicant challenges Finding of Fact No. 7, that the evidence in the case fails to establish that the subject well is now leaking injected fluids into the ground water. Applicant's challenge is based on the overwhelming evidence before the Commission that the subject well has leaked, and further that no remedial measures have ever been taken to restore the integrity of such well and prevent it from leaking any further.

Finally, Applicant would show the Commission that recent data regarding water quality and water level obtained from an observation well completed next to the disposal well indicate the disposal well has leaked and is still leaking.

Based upon the foregoing, Applicant respectfully requests that a rehearing be granted in this matter, and that the Order heretofore entered herein, be withdrawn; and that upon such rehearing the Commission enter its Order directing a shut-in of the subject well.

RESPECTFULLY SUBMITTED,

DONALD BROWN, P.A.

By _____
Attorneys for Applicant
P. O. Box 776
Roswell, New Mexico 88201

I hereby certify that a true and correct copy of the foregoing was mailed to opposing counsel this 17 day of July, 1978.

_____

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date AUGUST 23, 1978 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
R. E. Richards	Attorney-at-Law (Observer)	~~Hobbs~~
A. Joseph Reed	Ed L. Reed & Associates	Midland
Tidwell & Hendrix	Texaco	Roswell
Donald Brown and Alvin James	Paul Hamilton	Roswell
Thomas E. Galloway	State Engineer	Roswell
James E. Nelson	Atty at Law (Observer)	Hobbs
R. S. Breen	Texaco	Midland
John W. Runyan	OCD	Hobbs
Leo Clements	OCD	Hobbs
Jerry Sexton	OCD	"
Stephen Schlarb	Texaco	Hobbs
John Gannon	Texaco	Hobbs
J. L. Pickerill	Amerada Hess	Tulsa
Jerry Wright	State Engineer	Roswell
J. L. Johnson	Amerada Hess	Seminole, Tex.
Johnston Rowe	Texaco	Midland
Mike Walker	OCD	Artesia

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date AUGUST 23, 1978 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
MARK NAMI HOW	OBSERVAR	ROSWELL
Bill Grassett	OCD	artesia

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date MARCH 15, 1979 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
Stephen Schlarb	Texoco	Hobbs, NM
Donald F. Schutz	Teledyne Isotopes	Westwood NJ
R. G. Brown	Texaco	Midland, TX
J. V. Gannon	"	Hobbs NM
Harold Romero	Paul Hamilton	Roswell. NM
Chris Bosecker	Getty Oil	Midland, TX.
Ah Klaar	Llano, Inc.	Hobbs, N.M.
Steve Collins	Llano, Inc.	Hobbs
[illegible]	~	~
Donald C. Cox	Maddox, Medlock & Cox, Attys	Hobbs

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date May 31, 1978 TIME: 9:00 A.M.

NAME	REPRESENTING	LOCATION
Lee Clements	O.C.D.	Hobbs, N M 88240
Harold Hendley	Humble Pipe Line	Roswell, N.M.
Bill Gressett	OCD	Artesia N. M.

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date May 31, 1978 TIME: 9:00 A.M.

NAME	REPRESENTING	LOCATION

Dockets Nos. 18-78 and 19-78 are tentatively set for hearing on May 17 and June 7, 1978. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - WEDNESDAY - MAY 10, 1978

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6144: DE NOVO

Application of Southland Royalty Company for two unorthodox locations and two non-standard gas proration units, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for two 120-acre non-standard gas proration units comprising the S/2 SE/4 of Section 10 and the SW/4 SW/4 of Section 11, and comprising the SE/4 SW/4 and the S/2 SE/4 of Section 11, all in Township 29 North, Range 11 West, Fulcher Kutz-Pictured Cliffs Pool, San Juan County, New Mexico, each of said units to be dedicated to a well drilled at an unorthodox location thereon.

Upon application of William M. Gallaway this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 6222: Application of Paul Hamilton for salt water disposal well shut in, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order from the Division shutting down salt water disposal operations in the Texaco Inc. New Mexico State BO SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore Devonian Pool, Lea County, New Mexico. Applicant alleges said well has leaked and is leaking salt water into the shallow fresh water aquifer underlying applicant's farm.

CASE 6223: Application of Texas West Oil & Gas Corp. for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling the interests of Continental Oil Co. et al in connection with remedial and rework operations per proposed AFE on applicant's Madera Well No. 1 located in Unit G of Section 5, Township 24 South, Range 34 East, South Bell Lake-Morrow Gas Pool, Lea County, New Mexico. Also to be considered will be the costs of said workover operations and the allocation of said costs as well as a charge for risk involved in the workover operations.

CASE 6224: Application of Texas West Oil & Gas Corp. for a gas well shut-in order, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order shutting in the Continental Oil Co. Bell Lake Unit Well No. 14, located in Unit F of Section 5, Township 24 South, Range 34 East, South Bell Lake-Morrow Gas Pool, Lea County, New Mexico, pending completion of workover operations on applicant's Madera Well No. 1, located in Unit G of said Section 5.

Dockets Nos. 28-78 and 29-78 are tentatively set for hearing on August 30 and September 13, 1978. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 16, 1978

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

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for September, 1978, from fifteen prorated pools in Lea, Eddy, and Chaves Counties, New Mexico.

(2) Consideration of the allowable production of gas for September, 1978, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 6290: In the matter of the hearing called by the Oil Conservation Division on its own motion to permit R. A. Crane, Jr., Great American Insurance Co., and all other interested parties to appear and show cause why the Donella Well No. 1 located in Unit P of Section 3, Township 29 North, Range 15 West, San Juan County, New Mexico, should not be plugged and abandoned in accordance with a Division-approved plugging program.

CASE 6291: Application of Mesa Petroleum Co. for a triple completion, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for the triple completion (conventional) of its State Com S Well No. 15A located in Unit D of Section 36, Township 32 North, Range 12 West, San Juan County, New Mexico, to produce gas from an undesignated Fruitland pool, the Blanco-Pictured Cliffs Pool, and the Blanco Mesaverde Pool thru two strings of tubing and the casing-tubing annulus.

CASE 6292: Application of Amoco Production Company for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its Teledyne Federal Gas Com. Well No. 1 to be drilled 660 feet from the South line and 330 feet from the East line of Section 4, Township 23 South, Range 29 East, Eddy County, New Mexico, the E/2 of said Section 4 to be dedicated to the well.

CASE 6293: Application of Cities Service Company for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Polk "A" Well No. 1 located in Unit B of Section 17, Township 23 South, Range 28 East, Eddy County, New Mexico, to produce gas from the Strawn and Morrow formations thru parallel strings of tubing.

CASE 6279: (Continued from August 2, 1978, Examiner Hearing)

Application of Hanagan Petroleum Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Morrow formation underlying the N/2 of Section 28, Township 21 South, Range 26 East, Avalon Hills-Morrow Pool, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6288: (Continued from August 2, 1978, Examiner Hearing)

Application of Dorchester Exploration, Inc., for pool creation and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order creating a new oil pool in the Strawn formation for its Wilson State Com Well No. 1 located in Unit I of Section 13, Township 21 South, Range 34 East, Lea County, New Mexico, and for promulgation of special pool rules, including provision for 160-acre spacing;

in the alternative, applicant seeks approval of 80-acre spacing for said pool. (This case will be dismissed.)

CASE 6294: Application of El Paso Natural Gas Company for an exception to Rule 2(A) of Order No. R-1670, as amended, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 2(A) of Order No. R-1670, as amended, for the Blanco Mesaverde Pool to approve the unorthodox location of its EPNG "B" Well No. 1, located in Unit O of Section 28, Township 32 North, Range 6 West, San Juan County, New Mexico, as an off-pattern well in said pool.

CASE 6286: (Continued from August 2, 1978, Examiner Hearing)

Application of El Paso Natural Gas Company for downhole commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Blanco Mesaverde and Basin-Dakota gas production in the wellbore of its EPNG "B" Well No. 1 located in Unit O of Section 28, Township 32 North, Range 6 West, San Juan County, New Mexico.

CASE 6287: (Continued from August 2, 1978, Examiner Hearing)

Application of Jack A. Cole for an unorthodox gas well location, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of his Apache Flats Well No. 11, located 1712 feet from the South line and 1223 feet from the East line of Section 28, Township 23 North, Range 4 West, Ballard-Pictured Cliffs Pool, Sandoval County, New Mexico.

CASE 6295: Application of Yates Petroleum Corporation for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Austin-Mississippian Gas Pool, Lea County, New Mexico, to provide for 320-acre spacing rather than 160 acres. In the absence of objection, this pool will be placed on the standard 320-acre spacing for deep gas pools.

In the alternative, the applicant seeks to limit the 160-acre spacing rules of said Austin-Mississippian Gas Pool to the present horizontal limits of the pool.

CASE 6296: Application of Texaco Inc. for an unorthodox location and simultaneous dedication, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its A. H. Blinebry Fed. (NCT-4) Well No. 3 located 700 feet from the South line and 2100 feet from the East line of Section 31, Township 22 South, Range 38 East, Tubb Gas Pool, Lea County, New Mexico, the S/2 S/2 of said Section 31 to be simultaneously dedicated to the aforesaid well and to applicant's A. H. Blinebry Fed. (NCT-4) Well No. 1 located in Unit P of said Section 31.

CASE 6297: In the matter of the hearing called by the Oil Conservation Division on its own motion for an order creating, contracting, and extending certain pools in Chaves, Eddy, and Lea Counties, New Mexico:

(a) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the Indian Flats-Atoka Gas Pool. The discovery well is Perry R. Bass Big Eddy Unit Well No. 41 located in Unit J of Section 35, Township 21 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 21 SOUTH, RANGE 28 EAST, NMPM
Section 35: E/2

(b) CREATE a new pool in Chaves County, New Mexico, classified as an oil pool for San Andres production and designated as the South Lonesome-San Andres Pool. The discovery well is Flag-Redfern Oil Company Wilson Well No. 1 located in Unit A of Section 31, Township 8 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 8 SOUTH, RANGE 32 EAST, NMPM
Section 31: NE/4

(c) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Morrow production and designated as the Many Gates-Morrow Gas Pool. The discovery well is Amoco Production Company State DQ Well No. 1 located in Unit C of Section 32, Township 9 South, Range 30 East, NMPM. Said pool would comprise:

TOWNSHIP 9 SOUTH, RANGE 30 EAST, NMPM
Section 32: N/2

(d) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Wolfcamp production and designated as the Millman-Wolfcamp Gas Pool. The discovery well is Depco, Inc. DHY State B Well No. 1 located in Unit L of Section 11, Township 19 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM
Section 11: W/2

(e) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Morrow production and designated as the South Shoe Bar-Morrow Gas Pool. The discovery well is INC Oil Company Shoe Bar Ranch "3" Well No. 1 located in Unit C of Section 3, Township 17 South, Range 35 East, NMPM. Said pool would comprise:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 3: N/2

(f) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for Strawn production and designated as the Wilson-Strawn Pool. The discovery well is Dorchester Exploration, Inc. Wilson State Com Well No. 1 located in Unit I of Section 13, Township 21 South, Range 34 East, NMPM. Said pool would comprise:

TOWNSHIP 21 SOUTH, RANGE 34 EAST, NMPM
Section 13: SE/4

(g) CONTRACT the vertical limits of the Wilson-Pennsylvanian Gas Pool in Township 21 South, Range 34 East, Lea County, New Mexico, to the Morrow formation only, and redesignate said pool as the Wilson-Morrow Gas Pool. This contraction is necessary because of the completion of a Strawn oil well in same pool acreage.

(h) EXTEND the Austin-Mississippian Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 36 EAST, NMPM
Section 16: SW/4
Section 17: SE/4

(i) EXTEND the Avalon-Upper Pennsylvanian Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 26 EAST, NMPM
Section 10: W/2

(j) EXTEND the Avalon-Strawn Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 26 EAST, NMPM
Section 3: S/2
Section 10: W/2

(k) EXTEND the South Bell Lake-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 24 SOUTH, RANGE 34 EAST, NMPM
Section 7: S/2
Section 18: N/2

(l) EXTEND the Blinebry Oil and Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
Section 29: NE/4

(m) EXTEND the Buffalo-Pennsylvanian Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 33 EAST, NMPM
Section 5: SW/4
Section 6: SE/4

(n) EXTEND the Burton Flat-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 27 EAST, NMPM
Section 14: E/2

(o) EXTEND the East Burton Flat-Atoka Gas Pool in Eddy County, New Mexico to include therein:

TOWNSHIP 20 SOUTH, RANGE 29 EAST, NMPM
Section 16: E/2
Section 20: N/2
Section 21: N/2

(p) EXTEND the South Carlsbad-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 27 EAST, NMPM
Section 29: E/2

TOWNSHIP 23 SOUTH, RANGE 27 EAST, NMPM
Section 21: N/2

(q) EXTEND the Cato-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 30 EAST, NMPM
Section 32: SW/4

(r) EXTEND the Cemetery-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 25 EAST, NMPM
Section 20: S/2
Section 21: S/2
Section 28: N/2

TOWNSHIP 20 SOUTH, RANGE 24 EAST, NMPM
Section 36: N/2

(s) EXTEND the Comanche Stateline-Yates Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 26 SOUTH, RANGE 36 EAST, NMPM
Section 28: N/2

(t) EXTEND the Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 7: E/2 and SW/4

(u) EXTEND the Eagle Creek-Strawn Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM
Section 5: W/2
Section 6: E/2

(v) EXTEND the E K-Bone Springs Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 32: NE/4
Section 33: W/2

(w) EXTEND the Grayburg Jackson Seven Rivers-Queen-Grayburg-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 31: N/2

(x) EXTEND the Hoag Tank-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 24 EAST, NMPM
Section 15: S/2

(y) EXTEND the Justis-Blinebry Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 3: E/2 SE/4

(z) EXTEND the West King-Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM
Section 8: NW/4

(aa) EXTEND the South Leonard-Queen Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM
Section 13: NW/4
Section 14: W/2

(bb) EXTEND the Maljamar-Grayburg-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 33 EAST, NMPM
Section 11: SE/4

(cc) EXTEND the South Millman-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM
Section 20: S/2
Section 29: N/2

(dd) EXTEND the Red Lake Queen-Grayburg-San Andres Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 27 EAST, NMPM
Section 13: W/2 SE/4 and NE/4 SE/4

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 18: SW/4

(ee) EXTEND the Revelation-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 25 EAST, NMPM
Section 10: E/2

(ff) EXTEND the Sand Springs-Devonian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 11 SOUTH, RANGE 34 EAST, NMPM
Section 2: SE/4

(gg) EXTEND the North Teague-Devonian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM
Section 27: NE/4

(hh) EXTEND Tom-Tom San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 7 SOUTH, RANGE 31 EAST, NMPM
Section 33: W/2

(ii) EXTEND the Wantz-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 3: NE/4

(jj) EXTEND the Wantz-Granite Wash Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 35: NE/4

(kk) EXTEND the Warren-Tubb Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
Section 28: NW/4
Section 29: NE/4

(ll) EXTEND the White City-Pennsylvanian Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Section 8: All

TOWNSHIP 25 SOUTH, RANGE 26 EAST, NMPM
Section 4: All
Section 10: All

****

Docket No. 25-78

DOCKET: COMMISSION HEARING - WEDNESDAY - AUGUST 9, 1978

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6222: (Rehearing)

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting down salt water disposal operations in the Texaco, Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978. (This case will be continued to August 23.)

CASE 6289: Application of Bill Taylor for enforcement and amendment of Order No. R-5332, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks a determination of well costs, an accounting of expenditures and costs withheld from production, and the amendment of Order No. R-5332 to remove the present operator of the pooled proration unit comprising the N/2 of Section 13, Township 22 South, Range 26 East, South Carlsbad Field, Eddy County, New Mexico, and designate another operator for said unit.

****

Docket No. 27-78

DOCKET: COMMISSION HEARING - WEDNESDAY - AUGUST 23, 1978

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6222: (Rehearing) (Continued from August 9, 1978, Commission Hearing)

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting down salt water disposal operations in the Texaco, Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

(m) EXTEND the Rusty-Chacra Pool in Sandoval County, New Mexico, to include therein:

TOWNSHIP 22 NORTH, RANGE 7 WEST, NMPM
Section 24: SE/4
Section 27: NE/4

(n) EXTEND the Tapacito-Pictured Cliffs Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 25 NORTH, RANGE 3 WEST, NMPM
Section 2: NW/4

(o) EXTEND the Tocito Dome-Pennsylvanian D Oil Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 18 WEST, NMPM
Section 14: SW/4
Section 23: W/2

(p) EXTEND the WAW-Fruitland-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 25 NORTH, RANGE 12 WEST, NMPM
Section 2: NE/4
Section 4: All
Section 5: SE/4

TOWNSHIP 27 NORTH, RANGE 13 WEST, NMPM
Section 27: SW/4

****

Docket No. 27-78

DOCKET: COMMISSION HEARING - WEDNESDAY - AUGUST 23, 1978

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6289: (Continued from August 9, 1978, Commission Hearing)

Application of Bill Taylor for enforcement and amendment of Order No. R-5332, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks a determination of well costs, an accounting of expenditures and costs withheld from production, and the amendment of Order No. R-5332 to remove the present operator of the pooled proration unit comprising the N/2 of Section 13, Township 22 South, Range 26 East, South Carlsbad Field, Eddy County, New Mexico, and designate another operator for said unit.

CASE 6222: (Rehearing) (Continued from August 9, 1978, Commission Hearing)

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting down salt water disposal operations in the Texaco, Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

TOWNSHIP 24 NORTH, RANGE 5 WEST, NMPM
Section 2: SE/4
Section 11: NE/4

(e) EXTEND the Cha Cha-Gallup Oil Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 29 NORTH, RANGE 14 WEST, NMPM
Section 25: W/2 NW/4

(f) EXTEND the Chacon-Dakota Associated Pool in Rio Arriba and Sandoval Counties, New Mexico, to include therein:

TOWNSHIP 22 NORTH, RANGE 3 WEST, NMPM
Section 2: W/2

TOWNSHIP 23 NORTH, RANGE 3 WEST, NMPM
Section 4: NE/4
Section 27: W/2
Section 28: E/2
Section 34: NW/4 and SE/4
Section 35: SW/4

TOWNSHIP 24 NORTH, RANGE 3 WEST, NMPM
Section 29: SW/4
Section 30: S/2 (partial)
Section 31: NW/4 (partial)
Section 32: E/2
Section 33: W/2 and SE/4

(g) EXTEND the Choza Mesa-Pictured Cliffs Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 28 NORTH, RANGE 4 WEST, NMPM
Section 15: N/2 and SW/4
Section 22: W/2

(h) EXTEND the Dufers Point Gallup-Dakota Oil Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 25 NORTH, RANGE 9 WEST, NMPM
Section 12: E/2

(i) EXTEND the South Gallegos-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 12 WEST, NMPM
Section 14: NE/4

(j) EXTEND the West Lindrith Gallup-Dakota Oil Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 24 NORTH, RANGE 4 WEST, NMPM
Section 1: N/2

TOWNSHIP 25 NORTH, RANGE 4 WEST, NMPM
Section 30: SE/4
Section 32: SW/4

(k) EXTEND the Mount Nebo-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Section 28: S/2
Section 33: NW/4

(l) EXTEND the Otero-Chacra Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 6 WEST, NMPM
Section 18: N/2

CASE 6307: Application of Exxon Corporation for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Drinkard and Wantz-Abo production in the wellbore of its P. P. Hardison B Well No. 10, located in Unit A of Section 34, Township 21 South, Range 37 East, Lea County, New Mexico.

CASE 6308: Application of Petroleum Corporation of Texas for compulsory pooling, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp and Pennsylvanian formations underlying the N/2 of Section 8, Township 8 South, Range 37 East, Roosevelt County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6309: Application of Southland Royalty Company for an exception to Rule 2(A) of Order No. R-1670, as amended, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 2(A) of Order No. R-1670, as amended, for the Blanco Mesaverde Pool to approve the unorthodox locations of its Jicarilla 468 Well No. 1, located in the NW/4 of Section 32, Township 28 North, Range 3 West and its Jicarilla 446 Well No. 1, located in the SE/4 of Section 8, Township 27 North, Range 3 West, Rio Arriba County, New Mexico, as off-pattern wells in said pool.

CASE 6310: Application of Southland Royalty Company for an exception to Rule 2(A) of Order No. R-1670, as amended, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 2(A) of Order No. R-1670, as amended, for the Blanco Mesaverde Pool to approve the unorthodox location of its Jicarilla 101 Well No. 7, to be located in the SE/4 SE/4 of Section 12, Township 27 North, Range 4 West, Rio Arriba County, New Mexico, as an off-pattern well in said pool.

CASE 6311: In the matter of the hearing called by the Oil Conservation Division on its own motion for an order creating and extending certain pools in Rio Arriba, Sandoval, and San Juan Counties, New Mexico:

(a) CREATE a new pool in San Juan County, New Mexico, classified as a gas pool for Nacimiento production and designated as the Arch-Nacimiento Pool. The discovery well is El Paso Natural Gas Company San Juan 32-9 Unit Well No. 84 located in Unit N of Section 14, Township 31 North, Range 10 West, NMPM. Said pool would comprise:

TOWNSHIP 31 NORTH, RANGE 10 WEST, NMPM
Section 14: SW/4

(b) EXTEND the Blanco Mesaverde Pool in Rio Arriba and San Juan Counties, New Mexico, to include therein:

TOWNSHIP 29 NORTH, RANGE 4 WEST, NMPM
Section 5: SE/4

(c) EXTEND the Blanco-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 29 NORTH, RANGE 8 WEST, NMPM
Section 35: SE/4
Section 36: S/2

TOWNSHIP 31 NORTH, RANGE 9 WEST, NMPM
Section 32: NE/4 and S/2

TOWNSHIP 32 NORTH, RANGE 11 WEST, NMPM
Section 30: N/2

TOWNSHIP 32 NORTH, RANGE 12 WEST, NMPM
Section 24: E/2
Section 25: S/2
Section 26: SE/4
Section 36: N/2

(d) EXTEND the South Blanco-Pictured Cliffs Pool in Rio Arriba, San Juan, and Sandoval Counties, New Mexico, to include therein:

TOWNSHIP 23 NORTH, RANGE 3 WEST, NMPM
Section 3: SW/4
Section 4: S/2
Section 10: N/2
Section 11: NW/4

Dockets Nos. 29-78 and 30-78 are tentatively set for hearing on September 13 and 27, 1978. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 30, 1978

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

The following cases will be heard before Daniel S. Nutter, Examiner, or Richard L. Stamets, Alternate Examiner:

CASE 6298: In the matter of the hearing called by the Oil Conservation Division on its own motion to consider the amendment of Rule 1105 of the Division Rules and Regulations to require the filing of two copies of all well logs instead of one.

CASE 6312: In the matter of the hearing called by the Oil Conservation Division on its own motion to consider the amendment of Order No. R-1670-T, Rule 2(A), Blanco Mesaverde Pool, San Juan and Rio Arriba Counties, New Mexico, to provide that the initial well drilled on a proration unit shall be located not closer than 790 feet to any outer boundary of the quarter section on which the well is located, and not closer than 130 feet to any quarter-quarter section or subdivision inner boundary.

CASE 6299: Application of Wm. G. Ross for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause seeks approval for its South Lea Unit Area comprising 1,753 acres, more or less, of state land in Township 21 South, Range 34 East, Lea County, New Mexico.

CASE 6300: Application of The Petroleum Corporation for downhole commingling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Atoka and Morrow production in the wellbore of its Parkway West Unit Well No. 1, located in Unit C of Section 28, Township 19 South, Range 29 East, Parkway West (Atoka) Field, Eddy County, New Mexico.

CASE 6301: Application of The Petroleum Corporation for downhole commingling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Strawn and Morrow production in the wellbore of its Superior Federal Well No. 4, located in Unit I of Section 5, Township 20 South, Range 29 East, East Burton Flat Field, Eddy County, New Mexico.

CASE 6302: Application of Amoco Production Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the N/2 of Section 25, Township 23 South, Range 28 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6303: Application of Texas Oil & Gas Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its Indian Hills State Com. Well No. 2 to be drilled 660 feet from the South line and 660 feet from the East line of Section 36, Township 20 South, Range 24 East, Eddy County, New Mexico, to test the Morrow formation, the S/2 of said Section 36 to be dedicated to the well.

CASE 6304: Application of Doyle Hartman for compulsory pooling and a non-standard proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Jalmat Gas Pool underlying the S/2 NE/4 of Section 26, Township 24 South, Range 36 East, Lea County, New Mexico, to form an 80-acre non-standard proration unit to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6305: Application of Flag-Redfern Oil Company for two unorthodox locations and two non-standard oil proration units, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 61.14-acre non-standard unit comprising Unit K and Lot 3 of Section 16, Township 8 South, Range 38 East, Bluitt-San Andres Associated Pool, Roosevelt County, New Mexico, to be dedicated to a well to be drilled 2130 feet from the South line and 2873 feet from the West line of said Section 16; also a 60.43-acre unit comprising Unit N and Lot 4 of said Section 16 to be dedicated to a well to be drilled 810 feet from the South line and 2850 feet from the West line of the section.

CASE 6306: Application of Texaco Inc. for an unorthodox location, permission to inject water, and directional drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its Central Vacuum Unit Well No. 139 to be located 85 feet from the South line and 958 feet from the East line of Section 36, Township 17 South, Range 34 East, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, and directionally drilled to a 100' square bottom hole target location with the center of the target being 60 feet from the South line and 1310 feet from the East line of said Section 36, and approval to inject water into the San Andres formation in said well.

Dockets Nos. 10-79 and 11-79 are tentatively set for hearing on March 14 and 28, 1979. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - FRIDAY - MARCH 2, 1979

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6483: (Continued from February 28, 1979, Examiner Hearing)

Application of Harvey E. Yates Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp, Pennsylvanian, and Mississippian formations underlying the S/2 of Section 8, Township 14 South, Range 36 East, Lea County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6488: Application of John H. Hendrix Corporation for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Mississippian formation underlying the E/2 of Section 8, Township 14 South, Range 36 East, Lea County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6222: (Rehearing) (Continued from August 23, 1978, Commission Hearing)

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting down salt water disposal operations in the Texaco Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

DONALD BROWN, P. A.
ATTORNEYS AT LAW
DONALD BROWN
ALVIN F. JONES
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201
AREA CODE 505
622-1041

June 13, 1978

Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87503

In Re: Case No. 6222
Paul Hamilton for Salt Water Disposal Well

Gentlemen:

Please find enclosed subpoena No. 8 and No. 9 for filing in the above referenced cause.

Best regards,

Sincerely yours,

Alvin F. Jones

AFJ:srg

Enclosures

12362

CASE NO. 6222

RECEIVED
Lea Co. Sheriff's Dept.
MAY 22 1978
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

SUBPOENA DUCES TECUM no. 8

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To John Gannon, Texaco, Inc., Broadmoor Building, Hobbs, New Mexico Greeting:

We command you to be and appear May 31, 1978, at 9:00 a.m. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton and also that you bring with you and produce at the time and place aforesaid any and all records pertaining to the New Mexico "BO" State Well No. 3 located in Unit D of Section 24, Township 11 South, Range 32 East.

And this do you under penalty of the law

SEAL

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 19th day of May, 19 78.

Joe D. Ramey

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON
FOR SALT WATER DISPOSAL WELL
SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA DUCES TECUM NO. 8

RETURN OF SERVICE

Served John Broadhurst Building
at 9:55 AM 5-25-88

Dennis Williams
Deputy Sheriff

12362

CASE NO. 6222

SUBPOENA DUCES TECUM NO. 9

RECEIVED
Lea Co. Sheriff's Dept.
MAY 22 1978
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Billy C. Jones, West Bend Addition, Lovington, New Mexico Greeting:

We command you to be and appear May 31, 1978, at 9:00 a.m. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton and also that you bring with you and produce at the time and place aforesaid any and all records pertaining to the New Mexico "BO" State Well No. 3 located in Unit D of Section 24, Township 11 South, Range 32 East.

And this do you under penalty of the law

SEAL

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 19th day of May, 19 78.

Joe D. Ramey

RETURN OF SERVICE

Served Billy C. Jones in Person
on May 22, 1978.

Ernie Lovato
Deputy Sheriff

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON
FOR SALT WATER DISPOSAL WELL
SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA DUCES TECUM NO. 9

Docket No. 10-79

Dockets Nos. 11-79 and 12-79 are tentatively set for hearing on March 14 and 28, 1979. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - WEDNESDAY - MARCH 7, 1979

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6489: Application of J. V. Fritts and Wm. B. Barnhill for review of Order No. R-4831, Eddy County, New Mexico. Applicants, in the above-styled cause, seek the review and interpretation of Order No. R-4831 to permit them the opportunity to join in the drilling of the Federal "B" Well No. 1 located in Unit P of Section 1, Township 18 South, Range 26 East, Atoka-Pennsylvanian Pool, Eddy County, New Mexico, and to determine the applicability of the 200% risk factor.

CASE 6398: (DE NOVO)

Application of Texas Oil & Gas Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location for the Wolfcamp and Pennsylvanian formations of its State Com Well No. 1, to be located 660 feet from the South and West lines of Section 18, Township 21 South, Range 26 East, Catclaw Draw Field, Eddy County, New Mexico, all of said Section 18 to be dedicated to the well in the Morrow formation.

Upon application of Texas Oil & Gas Corporation this case will be heard De Novo pursuant to the provisions of Rule 1220.

****

Docket No. 11-79

DOCKET: EXAMINER HEARING - WEDNESDAY - MARCH 14, 1979

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

The following cases will be heard before Daniel S. Nutter, Examiner, or Richard L. Stamets, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for April, 1979, from fifteen prorated pools in Lea, Eddy, and Chaves Counties, New Mexico.

(2) Consideration of the allowable production of gas for April, 1979, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 6490: Application of L. C. Harris for a unit agreement, Chaves and Eddy Counties, New Mexico. Applicant, in the above-styled cause, seeks approval for his Walnut Draw Unit Area comprising 9,797 acres, more or less, of Federal, state and fee lands in Townships 15 and 16 South, Ranges 23 and 24 East, Chaves and Eddy Counties, New Mexico.

CASE 6491: Application of C & E Operators, Inc. for an unorthodox well location and a non-standard proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval of an 80-acre non-standard gas proration unit comprising the E/2 SW/4 of Section 10, Township 30 North, Range 11 West, Aztec-Pictured Cliffs Pool, San Juan County, New Mexico, to be dedicated to a well to be located 1700 feet from the South line and 1760 feet from the West line of said Section 10.

CASE 6477: (Continued from February 28, 1979, Examiner Hearing)

Application of Sun Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project on its East Millman Pool Unit Area by the injection of water into the Queen and Grayburg formations through eleven wells located in Sections 12 and 13 of Township 19 South, Range 28 East, East Millman Pool, Eddy County, New Mexico.

CASE 6492: Application of Yates Petroleum Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the San Andres formation underlying the NE/4 NW/4 of Section 13, Township 17 South, Range 25 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6072: (Reopened and Readvertised)

In the matter of Case 6072 being reopened pursuant to the provisions of Order No. R-5643 which order created the Travis-Upper Pennsylvanian Pool, Eddy County, New Mexico, with provisions for 80-acre spacing. All interested parties may appear and show cause why the Travis-Upper Pennsylvanian Pool should not be developed on 40-acre spacing units.

CASE 6493: Application of Merrion & Bayless for gas well commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for the surface commingling, prior to measurement, of Pictured Cliffs production from the Hi Roll Wells Nos. 1 and 2 located in Units O and K of Section 35, Township 27 North, Range 13 West, San Juan County, New Mexico.

CASE 6494: Application of Morris R. Antwell for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of his Mesa Macho Well No. 1 located in Unit O of Section 24, Township 20 South, Range 27 East, Morrow formation, Eddy County, New Mexico; the E/2 of said Section 24 to be simultaneously dedicated to the aforesaid well and to applicant's Macho Norte Well No. 1 located in Unit G of Section 24.

CASE 6495: Application of Amax Chemical Corporation for the amendment of Order No. R-111-A, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-111-A to extend the boundaries of the Potash-Oil Area by the inclusion of certain lands in Sections 23 and 24, Township 19 South, Range 29 East, Sections 1, 4, 5, 6, 7, 11, 12, 13, 14, 19, 20, 23, 24, and 29, Township 19 South, Range 30 East, and Sections 7, 8, 17, 18, and 19, Township 19 South, Range 31 East, all in Eddy County, New Mexico.

CASE 6496: Application of Llano, Inc. for rescission of pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the rescission of Order No. R-3006, which promulgated 640-acre spacing for the Grama Ridge-Morrow Gas Pool, Lea County, New Mexico. Applicant proposes that said pool be developed and operated under 320-acre spacing and well location requirements.

CASE 6497: Application of Llano, Inc. for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be located 1650 feet from the South line and 660 feet from the East line of Section 34, Township 21 South, Range 34 East, Grama Ridge-Morrow Gas Pool, Lea County, New Mexico, the E/2 of said Section 34 to be dedicated to the well.

CASE 6498: Application of Pogo Producing Company to limit application of pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks to limit the application of the Grama Ridge-Morrow Gas Pool Rules to the horizontal limits of said pool, being all of Sections 2, 3, 4, and 10, Township 22 South, Range 34 East and Sections 33 and 34, Township 21 South, Range 34 East, Lea County, New Mexico.

CASE 6499: In the matter of the hearing called by the Oil Conservation Division on its own motion for an order creating and extending horizontal limits and contracting vertical limits of certain pools in Chaves, Eddy, Lea, and Roosevelt Counties, New Mexico:

(a) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Antelope Sink-Morrow Gas Pool. The discovery well is Maddox Energy Corporation State 32 Well No. 1 located in Unit I of Section 32, Township 18 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 24 EAST, NMPM
Section 32: E/2

(b) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Baldridge Canyon-Morrow Gas Pool. The discovery well is W. A. Moncrief, Jr., Baldridge Canyon Com Well No. 1 located in Unit G of Section 13, Township 24 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 24 SOUTH, RANGE 24 EAST, NMPM
Section 13: E/2

(c) CREATE a new pool in Eddy County, New Mexico, classified as an oil pool for Delaware production and designated as the Burton Flat-Delaware Pool. The discovery well is Yates Petroleum Corporation Stonewall EP State Well No. 3 located in Unit N of Section 19, Township 20 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 20 SOUTH, RANGE 28 EAST, NMPM
Section 19: SW/4

(d) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for San Andres production and designated as the East Crossroads-San Andres Pool. The discovery well is MCF Oil Corporation Santa Fe Railway Well No. 1 located in Unit A of Section 13, Township 10 South, Range 36 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 36 EAST, NMPM
Section 13: NE/4

(e) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the South Culebra Bluff-Atoka Gas Pool. The discovery well is Delta Drilling Company South Culebra Bluff Unit Well No. 1 located in Unit G of Section 23, Township 23 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 23 SOUTH, RANGE 28 EAST, NMPM
Section 14: E/2
Section 23: All
Section 26: All

(f) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Dublin Ranch-Morrow Gas Pool. The discovery well is J. C. Barnes Oil Company Big Chief Com Well No. 1 located in Unit F of Section 22, Township 22 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 22 SOUTH, RANGE 28 EAST, NMPM
Section 22: All
Section 27: N/2

(g) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Gardner Draw-Morrow Gas Pool. The discovery well is Phoenix Resources Company Gardner Draw Unit Well No. 1 located in Unit C of Section 20, Township 19 South, Range 21 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 21 EAST, NMPM
Section 17: W/2
Section 19: N/2
Section 20: N/2

(h) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Pennsylvanian production and designated as the Jubilee-Pennsylvanian Gas Pool. The discovery well is Tom L. Ingram Jubilee Well No. 1 located in Unit E of Section 28, Township 10 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 29 EAST, NMPM
Section 28: W/2

(i) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Mississippian production and designated as the King-Mississippian Gas Pool. The discovery well is Cabot Corporation J. L. Reed Well No. 1 located in Unit H of Section 35, Township 13 South, Range 37 East, NMPM. Said pool would comprise:

TOWNSHIP 13 SOUTH, RANGE 37 EAST, NMPM
Section 35: NE/4

(j) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Atoka production and designated as the Lone Wolf-Atoka Gas Pool. The discovery well is Depco, Inc. Sundance A Federal Well No. 1 located in Unit J of Section 25, Township 12 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 12 SOUTH, RANGE 29 EAST, NMPM
Section 25: S/2

(k) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Strawn production and designated as the Lost Lake-Strawn Gas Pool. The discovery well is Texas Oil & Gas Corporation O'Brien Well No. 1 located in Unit I of Section 11, Township 9 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 9 SOUTH, RANGE 29 EAST, NMPM
Section 2: S/2
Section 11: All
Section 14: N/2

(l) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Morrow production and designated as the West Mescalero-Morrow Gas Pool. The discovery well is Natomas North America, Inc. New Mexico State Well No. 1 located in Unit M of Section 19, Township 10 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 32 EAST, NMPM
Section 19: W/2

(m) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Permo-Penn production and designated as the Penasco Draw Permo-Penn Gas Pool. The discovery well is Yates Petroleum Corporation La Cama Com Well No. 1 located in Unit F of Section 20, Township 18 South, Range 25 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM
Section 18: S/2
Section 19: All
Section 20: All
Section 21: W/2
Section 30: All
Section 31: All

(n) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Siegrest Draw-Morrow Gas Pool. The discovery well is Yates Petroleum Corporation Siegrest JS State Com Well No. 1 located in Unit C of Section 30, Township 19 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 24 EAST, NMPM
Section 30: N/2

(o) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the North Turkey Track-Atoka Gas Pool. The discovery well is Amoco Production Company State ER Com Well No. 1 located in Unit G of Section 6, Township 19 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM
Section 6: N/2

(p) EXTEND the Angell Ranch-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 27 EAST, NMPM
Section 35: E/2

(q) EXTEND the Buffalo Valley-Pennsylvanian Gas Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 28 EAST, NMPM
Section 17: S/2

(r) EXTEND the Cato-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 31 EAST, NMPM
Section 5: NW/4 SW/4

(s) EXTEND the Cedar Lake-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM
Section 25: W/2
Section 26: E/2
Section 36: NW/4

(t) EXTEND the East Chisum-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 11 SOUTH, RANGE 28 EAST, NMPM
Section 9: E/2 NE/4
Section 10: W/2 NW/4

(u) EXTEND the South Corbin-Wolfcamp Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM
Section 20: SW/4

(JJ) EXTEND the Twin Lakes-San Andres Associated Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 28 EAST, NMPM
Section 36: NE/4

****

Docket No. 12-79

DOCKET: COMMISSION HEARING - THURSDAY - MARCH 15, 1979

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6222: (Rehearing) (Continued from March 2, 1979, Commission Hearing)

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting down salt water disposal operations in the Texaco Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

(v) EXTEND the Double L Queen-Associated Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 29 EAST, NMPM
Section 24: NE/4 and E/2 SW/4
Section 36: NW/4 NW/4, S/2 NW/4 and SW/4

(w) EXTEND the Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 18: SE/4

(x) EXTEND the East Eagle Creek Atoka-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM
Section 7: N/2

(y) EXTEND the Grama Ridge-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 34 EAST, NMPM
Section 35: All

(z) REDEFINE the vertical limits of the Monument Tubb-Drinkard Pool in Lea County, New Mexico, to include only the Tubb formation and redesignate said pool as the Monument-Tubb Pool.

(aa) EXTEND the West Indian Basin-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 22 EAST, NMPM
Section 23: E/2

(bb) EXTEND the Millman-Strawn Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 27 EAST, NMPM
Section 12: E/2

(cc) EXTEND the South Prairie-Wolfcamp Pool in Roosevelt County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 20: N/2

(dd) EXTEND the Querecho Plains-Bone Spring Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 34: NW/4

(ee) EXTEND the Richard Knob Atoka-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM
Section 7: All
Section 18: N/2

(ff) EXTEND the Round Tank-Queen Associated Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM
Section 30: NE/4

(gg) EXTEND the South Salt Lake-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 32 EAST, NMPM
Section 5: Lots 11, 12, 13, 14 and SW/4

(hh) EXTEND the North Teague-Devonian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM
Section 22: NW/4

(ii) EXTEND the Tomahawk-San Andres Pool in Roosevelt County, New Mexico, to include therein:

TOWNSHIP 7 SOUTH, RANGE 32 EAST, NMPM
Section 30: SW/4

Docket No. 10-79

Dockets Nos. 11-79 and 12-79 are tentatively set for hearing on March 14 and 28, 1979. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - WEDNESDAY - MARCH 7, 1979

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6489: Application of J. V. Fritts and Wm. B. Barnhill for review of Order No. R-4831, Eddy County, New Mexico. Applicants, in the above-styled cause, seek the review and interpretation of Order No. R-4831 to permit them the opportunity to join in the drilling of the Federal "B" Well No. 1 located in Unit P of Section 1, Township 18 South, Range 26 East, Atoka-Pennsylvanian Pool, Eddy County, New Mexico, and to determine the applicability of the 200% risk factor.

CASE 6398: (DE NOVO)

Application of Texas Oil & Gas Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location for the Wolfcamp and Pennsylvanian formations of its State Com Well No. 1, to be located 660 feet from the South and West lines of Section 18, Township 21 South, Range 26 East, Catclaw Draw Field, Eddy County, New Mexico, all of said Section 18 to be dedicated to the well in the Morrow formation.

Upon application of Texas Oil & Gas Corporation this case will be heard De Novo pursuant to the provisions of Rule 1220.

****

Docket No. 11-79

DOCKET: EXAMINER HEARING - WEDNESDAY - MARCH 14, 1979

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

The following cases will be heard before Daniel S. Nutter, Examiner, or Richard L. Stamets, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for April, 1979, from fifteen prorated pools in Lea, Eddy, and Chaves Counties, New Mexico.

(2) Consideration of the allowable production of gas for April, 1979, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 6490: Application of L. C. Harris for a unit agreement, Chaves and Eddy Counties, New Mexico. Applicant, in the above-styled cause, seeks approval for his Walnut Draw Unit Area comprising 9,797 acres, more or less, of Federal, state and fee lands in Townships 15 and 16 South, Ranges 23 and 24 East, Chaves and Eddy Counties, New Mexico.

CASE 6491: Application of C & E Operators, Inc. for an unorthodox well location and a non-standard proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval of an 80-acre non-standard gas proration unit comprising the E/2 SW/4 of Section 10, Township 30 North, Range 11 West, Aztec-Pictured Cliffs Pool, San Juan County, New Mexico, to be dedicated to a well to be located 1700 feet from the South line and 1760 feet from the West line of said Section 10.

CASE 6477: (Continued from February 28, 1979, Examiner Hearing)

Application of Sun Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project on its East Millman Pool Unit Area by the injection of water into the Queen and Grayburg formations through eleven wells located in Sections 12 and 13 of Township 19 South, Range 28 East, East Millman Pool, Eddy County, New Mexico.

CASE 6492: Application of Yates Petroleum Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the San Andres formation underlying the NE/4 NW/4 of Section 13, Township 17 South, Range 25 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6072: (Reopened and Readvertised)

In the matter of Case 6072 being reopened pursuant to the provisions of Order No. R-5643 which order created the Travis-Upper Pennsylvanian Pool, Eddy County, New Mexico, with provisions for 80-acre spacing. All interested parties may appear and show cause why the Travis-Upper Pennsylvanian Pool should not be developed on 40-acre spacing units.

CASE 6493: Application of Merrion & Bayless for gas well commingling; San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for the surface commingling, prior to measurement, of Pictured Cliffs production from the Hi Roll Wells Nos. 1 and 2 located in Units O and K of Section 35, Township 27 North, Range 13 West, San Juan County, New Mexico.

CASE 6494: Application of Morris R. Antweil for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of his Mesa Macho Well No. 1 located in Unit O of Section 24, Township 20 South, Range 27 East, Morrow formation, Eddy County, New Mexico, the E/2 of said Section 24 to be simultaneously dedicated to the aforesaid well and to applicant's Macho Norte Well No. 1 located in Unit G of Section 24.

CASE 6495: Application of Amax Chemical Corporation for the amendment of Order No. R-111-A, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-111-A to extend the boundaries of the Potash-Oil Area by the inclusion of certain lands in Sections 23 and 24, Township 19 South, Range 29 East, Sections 1, 4, 5, 6, 7, 11, 12, 13, 14, 19, 20, 23, 24, and 29, Township 19 South, Range 30 East, and Sections 7, 8, 17, 18, and 19, Township 19 South, Range 31 East, all in Eddy County, New Mexico.

CASE 6496: Application of Llano, Inc. for rescission of pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the rescission of Order No. R-3006, which promulgated 640-acre spacing for the Grama Ridge-Morrow Gas Pool, Lea County, New Mexico. Applicant proposes that said pool be developed and operated under 320-acre spacing and well location requirements.

CASE 6497: Application of Llano, Inc. for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be located 1650 feet from the South line and 660 feet from the East line of Section 34, Township 21 South, Range 34 East, Grama Ridge-Morrow Gas Pool, Lea County, New Mexico, the E/2 of said Section 34 to be dedicated to the well.

CASE 6498: Application of Pogo Producing Company to limit application of pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks to limit the application of the Grama Ridge-Morrow Gas Pool Rules to the horizontal limits of said pool, being all of Sections 2, 3, 4, and 10, Township 22 South, Range 34 East and Sections 33 and 34, Township 21 South, Range 34 East, Lea County, New Mexico.

CASE 6499: In the matter of the hearing called by the Oil Conservation Division on its own motion for an order creating and extending horizontal limits and contracting vertical limits of certain pools in Chaves, Eddy, Lea, and Roosevelt Counties, New Mexico:

(a) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Antelope Sink-Morrow Gas Pool. The discovery well is Maddox Energy Corporation State 32 Well No. 1 located in Unit I of Section 32, Township 18 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 24 EAST, NMPM
Section 32: E/2

(b) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Baldridge Canyon-Morrow Gas Pool. The discovery well is W. A. Moncrief, Jr., Baldridge Canyon Com Well No. 1 located in Unit G of Section 13, Township 24 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 24 SOUTH, RANGE 24 EAST, NMPM
Section 13: E/2

(c) CREATE a new pool in Eddy County, New Mexico, classified as an oil pool for Delaware production and designated as the Burton Flat-Delaware Pool. The discovery well is Yates Petroleum Corporation Stonewall EP State Well No. 3 located in Unit N of Section 19, Township 20 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 20 SOUTH, RANGE 28 EAST, NMPM
Section 19: SW/4

(d) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for San Andres production and designated as the East Crossroads-San Andres Pool. The discovery well is MGF Oil Corporation Santa Fe Railway Well No. 1 located in Unit A of Section 13, Township 10 South, Range 36 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 36 EAST, NMPM
Section 13: NE/4

(e) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the South Culebra Bluff-Atoka Gas Pool. The discovery well is Delta Drilling Company South Culebra Bluff Unit Well No. 1 located in Unit C of Section 23, Township 23 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 23 SOUTH, RANGE 28 EAST, NMPM
Section 14: E/2
Section 23: All
Section 26: All

(f) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Dublin Ranch-Morrow Gas Pool. The discovery well is J. C. Barnes Oil Company Big Chief Com Well No. 1 located in Unit F of Section 22, Township 22 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 22 SOUTH, RANGE 28 EAST, NMPM
Section 22: All
Section 27: N/2

(g) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Gardner Draw-Morrow Gas Pool. The discovery well is Phoenix Resources Company Gardner Draw Unit Well No. 1 located in Unit C of Section 20, Township 19 South, Range 21 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 21 EAST, NMPM
Section 17: W/2
Section 19: N/2
Section 20: N/2

(h) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Pennsylvanian production and designated as the Jubilee-Pennsylvanian Gas Pool. The discovery well is Tom L. Ingram Jubilee Well No. 1 located in Unit E of Section 28, Township 10 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 29 EAST, NMPM
Section 28: W/2

(i) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Mississippian production and designated as the King-Mississippian Gas Pool. The discovery well is Cabot Corporation J. L. Reed Well No. 1 located in Unit H of Section 35, Township 13 South, Range 37 East, NMPM. Said pool would comprise:

TOWNSHIP 13 SOUTH, RANGE 37 EAST, NMPM
Section 35: NE/4

(j) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Atoka production and designated as the Lone Wolf-Atoka Gas Pool. The discovery well is Depco, Inc. Sundance A Federal Well No. 1 located in Unit J of Section 25, Township 12 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 12 SOUTH, RANGE 29 EAST, NMPM
Section 25: S/2

(k) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Strawn production and designated as the Lost Lake-Strawn Gas Pool. The discovery well is Texas Oil & Gas Corporation O'Brien Well No. 1 located in Unit I of Section 11, Township 9 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 9 SOUTH, RANGE 29 EAST, NMPM
Section 2: S/2
Section 11: All
Section 14: N/2

(l) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Morrow production and designated as the West Mescalero-Morrow Gas Pool. The discovery well is Natomas North America, Inc. New Mexico State Well No. 1 located in Unit M of Section 19, Township 10 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 32 EAST, NMPM
Section 19: W/2

(m) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Permo-Penn production and designated as the Penasco Draw Permo-Penn Gas Pool. The discovery well is Yates Petroleum Corporation La Cama Com Well No. 1 located in Unit F of Section 20, Township 18 South, Range 25 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM
Section 18: S/2
Section 19: All
Section 20: All
Section 21: W/2
Section 30: All
Section 31: All

(n) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Siegrest Draw-Morrow Gas Pool. The discovery well is Yates Petroleum Corporation Siegrest JS State Com Well No. 1 located in Unit C of Section 30, Township 19 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 24 EAST, NMPM
Section 30: N/2

(o) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the North Turkey Track-Atoka Gas Pool. The discovery well is Amoco Production Company State ER Com Well No. 1 located in Unit G of Section 6, Township 19 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM
Section 6: N/2

(p) EXTEND the Angell Ranch-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 27 EAST, NMPM
Section 35: E/2

(q) EXTEND the Buffalo Valley-Pennsylvanian Gas Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 28 EAST, NMPM
Section 17: S/2

(r) EXTEND the Cato-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 31 EAST, NMPM
Section 5: NW/4 SW/4

(s) EXTEND the Cedar Lake-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM
Section 25: W/2
Section 26: E/2
Section 36: NW/4

(t) EXTEND the East Chisum-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 11 SOUTH, RANGE 28 EAST, NMPM
Section 9: E/2 NE/4
Section 10: W/2 NW/4

(u) EXTEND the South Corbin-Wolfcamp Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM
Section 20: SW/4

(v) EXTEND the Double L Queen Associated Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 29 EAST, NMPM
Section 24: NW/4 and E/2 SW/4
Section 36: NW/4 NW/4, S/2 NW/4 and SW/4

(w) EXTEND the Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 18: SE/4

(x) EXTEND the East Eagle Creek Atoka-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM
Section 7: N/2

(y) EXTEND the Grama Ridge-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 34 EAST, NMPM
Section 35: All

(z) REDEFINE the vertical limits of the Monument Tubb-Drinkard Pool in Lea County, New Mexico, to include only the Tubb formation and redesignate said pool as the Monument-Tubb Pool.

(aa) EXTEND the West Indian Basin-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 22 EAST, NMPM
Section 23: E/2

(bb) EXTEND the Millman-Strawn Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 27 EAST, NMPM
Section 12: E/2

(cc) EXTEND the South Prairie-Wolfcamp Pool in Roosevelt County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 20: N/2

(dd) EXTEND the Querecho Plains-Bone Spring Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 34: NW/4

(ee) EXTEND the Richard Knob Atoka-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM
Section 7: All
Section 18: N/2

(ff) EXTEND the Round Tank-Queen Associated Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM
Section 30: NE/4

(gg) EXTEND the South Salt Lake-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 32 EAST, NMPM
Section 5: Lots 11, 12, 13, 14 and SW/4

(hh) EXTEND the North Teague-Devonian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 37 EAST, NMPM
Section 22: NW/4

(ii) EXTEND the Tomahawk-San Andres Pool in Roosevelt County, New Mexico, to include therein:

TOWNSHIP 7 SOUTH, RANGE 32 EAST, NMPM
Section 30: SW/4

(jj) EXTEND the Twin Lakes-San Andres Associated Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 28 EAST, NMPM
Section 36: NE/4

****

Docket No. 12-79

DOCKET: COMMISSION HEARING - THURSDAY - MARCH 15, 1979

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6222: (Rehearing) (Continued from March 2, 1979, Commission Hearing)

Application of Paul Hamilton for salt water disposal well shut-in, Lea County, New Mexico. Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting down salt water disposal operations in the Texaco Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

JUL 19 1978

July 17, 1978

Mr. Joe D. Ramey, Director
Oil Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

In Re: Case No. 6222

Dear Mr. Ramey:

Please find enclosed the Applicant's request for a re-hearing in the above matter. A copy of this request has been served on opposing counsel by mail.

Best regards.

Sincerely yours,

Alvin F. Jones

AFJ:pme

Enc.

DONALD BROWN
ALVIN F. JONES

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

AREA CODE 505
622-1041

JUL 28 1978

July 26, 1978

Mr. Joe D. Ramey, Director
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

In Re: Case No. 6222
Order No. R-5753

Dear Mr. Ramey:

Please have two Commission subpoenas issued in the above matter to Mr. Sherman Galloway and Mr. Jim Wright of the State Engineers Office here in Roswell, New Mexico. I will see to their service.

Thank you.

Sincerely,

Alvin F. Jones

AFJ:pme

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

August 7, 1978

Mr. Joe D. Ramey
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

In Re: Paul Hamilton - Case No. 6222(rehearing)

Dear Mr. Ramey:

Enclosed please find the return of service on the subpoenas for Sherman E. Galloway and Jim Wright.

As you can see, this service was completed on August 2, 1978.

Best regards.

Sincerely,

Alvin F. Jones

AFJ:pme

Enc.

AUG 9 19

CASE NO. 6222 (Rehearing)

SUBPOENA No. 1

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To SHERMAN E. GALLOWAY Greeting:

We command you to be and appear August 23, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut-In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 1st day of August, 1978.

Joe D. Ramey

RETURN OF SERVICE

I, Patsy M. Edington, over the age of twenty-one, upon my oath state that I have served the within summons by delivering a copy thereof, in the County of Chaves, State of New Mexico, in person to Sherman E. Galloway at the State Engineers Office, Roswell, New Mexico, on August 2, 1978.

Patsy M. Edington

STATE OF NEW MEXICO)
)
COUNTY OF CHAVES)

SUBSCRIBED AND SWORN to before me this 7th day of August, 1978.

Juanita Torres
Notary Public

My Commission Expires:

2-9-79

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico

CASE NO. 6222 (Rehearing

SUBPOENA NO. 1

CASE NO. 6222 (Rehearing)

SUBPOENA No. 2

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To JIM WRIGHT Greeting:

We command you to be and appear August 23, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 1st day of August, 1978.

Joe D. Ramey

RETURN OF SERVICE

I, Patsy M. Edington, over the age of twenty-one, upon my oath state that I have served the within summons by delivering a copy thereof, in the County of Chaves, State of New Mexico, in person to Jim Wright at the State Engineers Office, Roswell, New Mexico, on August 2, 1978.

Patsy M. Edington

STATE OF NEW MEXICO)
) ss
COUNTY OF CHAVES)

SUBSCRIBED AND SWORN to before me this 7th day of August, 1978.

Notary Public

My Commission Expires:

2-9-79

CASE NO. 6222 (Rehearing)

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT IN,
LEA COUNTY, NEW MEXICO

SUBPOENA NO. 2

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

August 14, 1978

Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

In Re: Cause No. 6222

Gentlemen:

Enclosed please find a Motion for filing in the above Cause on behalf of the applicant, Mr. Paul Hamilton.

Best Regards.

Sincerely yours,

Alvin F. Jones

AFJ:pme

Enc.

AUG 16 19

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

August 14, 1978

Mr. Joe D. Ramey
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

RECEIVED
AUG 16 1978
Oil Conservation Commission

Dear Mr. Ramey:

Enclosed is a copy of a Motion we have filed in the presentation pending matter before the Commission on the Application of Paul Hamilton. I have conferred with Mr. Hensley with regard to the suggestion that florescent dye in their salt water disposal well, and he has advised me after conference with his clients, that they are unable to concur in that request.

I believe the position of Texaco, as laid out in a letter to me, is that since water level tests are being conducted by the State Engineers Office in the observation well near salt water disposal well No. 3, the florescent dye test would be superfluous. We,of course, don't agree to that position and wish to go forward with the test. I understand that this test can be administered through the OCC office in Hobbs and the State Engineers Office here in Roswell at the expense of the Applicant and that this can be accomplished with very little, if any, disruption of the disposal activities in the field.

I am concerned that we will be able to ge this done, if it meets with the Commission's approval, in time for the August 23rd hearing. If the Commission feels that the Motion is well taken, perhaps a delay of a week to ten days would be appropriate as to the hearing date in order to allow us an opportunity to run the test and realize the results, if any.

I, for one, would appreciate a ruling on our Motion well in advance of the August 23rd hearing date and would follow any procedure with regard to submission of the Motion to the Commission that the Commission would direct. I am sending a copy of this Motion to Mr. Hensley, as well as a copy of this letter.

Best regards.

Respectfully yours,

Alvin F. Jones

AFJ:pme

Enc.
cc: Harold Hensley

LAW OFFICES
HINKLE, COX, EATON, COFFIELD & HENSLEY
600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201
(505) 622-6510

LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.
JAMES H. BOZARTH

DOUGLAS L. LUNSFORD
PAUL M. BOHANNON
J. DOUGLAS FOSTER
K. DOUGLAS PERRIN
C. RAY ALLEN*
JACQUELINE W. ALLEN*
T. CALDER EZZELL, JR.

OF COUNSEL
CLARENCE E. HINKLE

W. E. BONDURANT, JR. (1914-1973)

MIDLAND, TEXAS OFFICE
1000 FIRST NATIONAL BANK TOWER
(915) 683-4691

*LICENSED IN TEXAS ONLY

August 15, 1978

RECEIVED
AUG 16 1978
Oil Conservation Commission

Mr. Joe D. Ramey, Executive Director
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

RE: Case No. 6222

Dear Mr. Ramey:

We received in the mail this morning a copy of Mr. Alvin F. Jones' letter to you dated August 14 to which was appended a Motion seeking an Order from the Commission for permission to conduct a florescent dye test on the Texaco "Bo" No. 3 Disposal Well which is the subject matter of this pending case set for rehearing August 23.

As evidenced by the attached response to the Applicant's Motion, the Respondent Texaco Inc. opposes the Motion for the reasons therein set forth, and in the alternative suggests that should the Commission feel that additional testing is necessary, that a radio-active tracer test be conducted at the sole expense of the Applicant.

We are serving a copy of this letter and the Response upon Applicant's counsel, Mr. Alvin F. Jones this date.

Respectfully submitted,

HINKLE, COX, EATON, COFFIELD & HENSLEY

Harold L. Hensley, Jr.

HLH:lss
Enclosure
cc: Mr. Alvin F. Jones
Mr. Johnston S. Rowe

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

September 7, 1978

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88240
(505) 393-6161

MEMO TO: Mr. Joe D. Ramey

FROM: Jerry Sexton

SUBJECT: Radioactive Test Procedure on
Texaco Inc. New Mexico "BO" State Well #3 SWD

A meeting between Texaco and Paul Hamilton, to work out details for testing Texaco SWD well in Moore Pool, was held on September 6, 1978. The people in attendance were as follows:

Paul Hamilton	
Alvin Jones	- Hamilton
Don Brown	- Hamilton
John Gannon	- Texaco
Steve Schlarb	- Texaco
Les Clements	- OCD
John Runyan	- OCD
Jerry Sexton	- OCD

It was agreed that each party would have a witness on location when the well was sampled and an OCD Representative would mail the samole.

Due to obtaining a state license to inject a radioactive material, it will be approximately a month before the testing will start.

Hamilton's lawyer proposed that they drill and complete a monitor well approximately 30' south of the disposal well and this well be used as a monitor well. Texaco saw no problems with this.

Attached is the procedure which will be used to place the radioactive material and a short article on the material to be placed in the well.

Both sides appear to be set to go when the license from the state is obtained.

Either we will have to rig a sampler or borrow one from the State Engineers Office.

JS/ed
Attachment

FORM C-8 (10-73) 3MH

TEXACO

Radioactive Test Procedure
N.M. "BO" State Well #3 (SWD)

1. Obtain background water samples of Devonian injection water and Ogallala water in observation well. (All samples are sent to Teledyne Isotopes, Inc., of Westwood, N.J. for analysis.)

2. Radioactive isotope is ejected at the wellhead of well #3 by personnel from Petroleum Tracers, Inc., of Dallas, Texas.

3. Continue injection operations as usual.

4. Obtain Ogallala water samples from the observation well (THREE quart samples required) on the following schedule:

Week No. 1 ..... One sample daily (3 qts.)
Weeks No. 2 thru 8 ..... One sample every Mon-Wed-Fri.

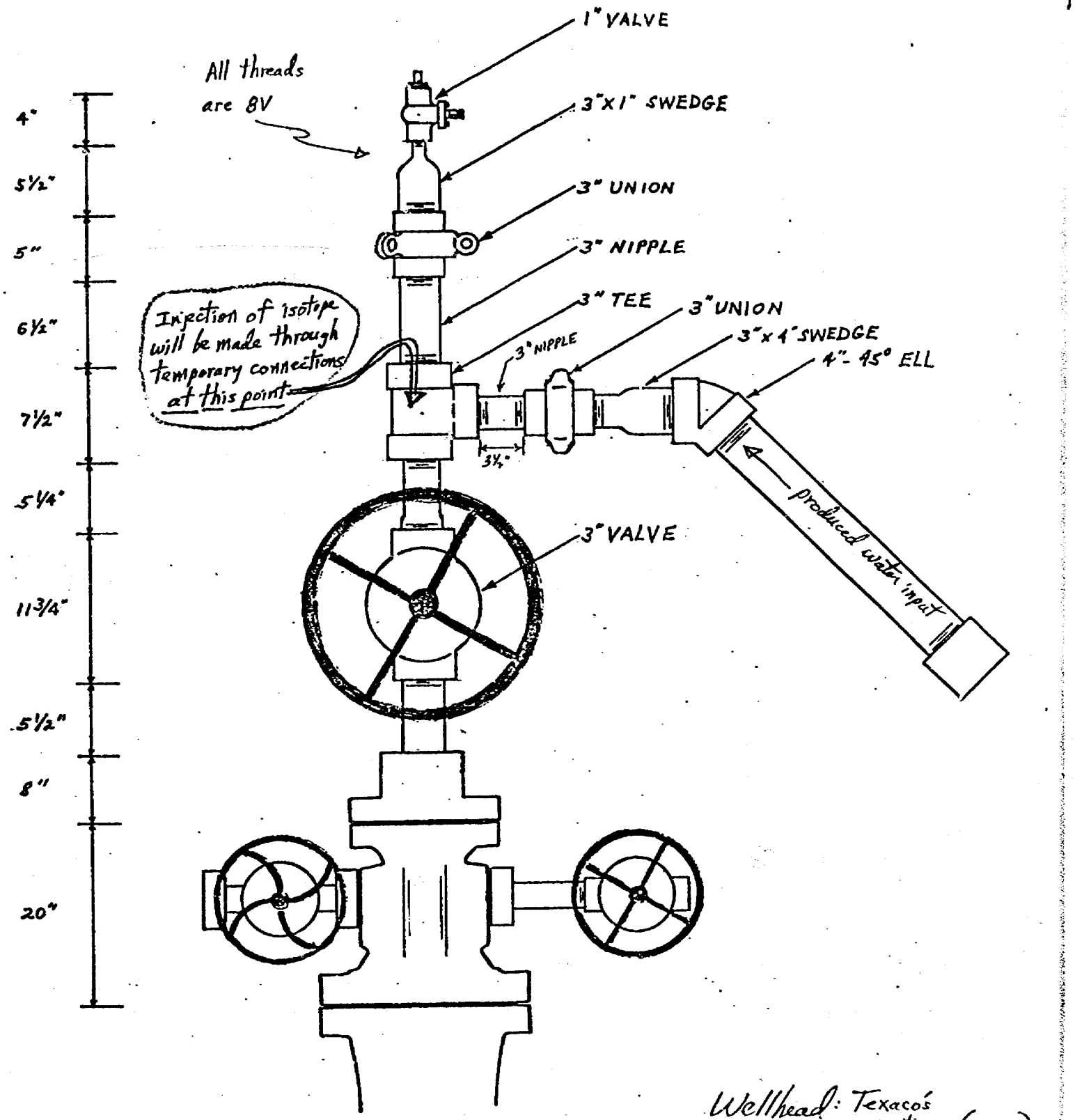
5. Results of water analyses to be presented to O.C.D. for final disposition of Case No. 6222.

DISCUSSION OF RADIOACTIVE MATERIAL

The radioactive material is Iodine isotope 125 (I-125) which has a half-life of 2 months. Approximately ten millicuries (10 mc) of I-125 will be ejected. This radioactivity level has been designed by Teledyne Isotopes, Inc., of Westwood, N.J. to be sufficient for detection at the observation well at least 8 weeks after placement in "BO" Well No. 3 should communication exist between these wells. There is a minimum design factor of 10 times the detection limit of Teledyne Isotopes' equipment--that is, there is at least 10 times as much radioactivity used as is required for Teledyne to detect it.

The design of the necessary radioactivity for detection is based on a maximum dilution volume of 1.7 million barrels. This is the radial volume of pore space in a 60' radius around the disposal well No. 3 (encompassing the observation well) and extending two miles vertically from the surface of the ground to the top of the Devonian injection interval at 10,600'. This volume is considered far in excess of what actual dilution will occur.

There will be no external radiation hazard when obtaining water samples. For internal protection it will be necessary to wear gloves when sampling and to avoid skin contact with the water to prevent absorption through the skin. No one should taste or swallow any of the water. Plastic bottles with lids tightly closed are sufficient for containing the samples. There will be no hazard to drinking or irrigation water in the area.



Wellhead: Texacos
N.M. "BO" St. #3 (SWD)

SAMPLES to be shipped to:

TELEDYNE ISOTOPES, INC.
50 Van Buren Ave.
Westwood, N.J. 07675
Attention: ANDY CARMICHAEL

Design of test + analysis of results:

DR. Don F. Schutz (President of Teledyne Isot.)
112-201-664-7070 (Westwood, N.J.)

Placement of radioactive material:

Tom Calhoun
Petroleum Tracers, Inc.
511 North AKard
Suite 100
Dallas, Texas 75201
112-214-747-9386

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

BATAAN MEMORIAL BUILDING
STATE CAPITOL
SANTA FE, NEW MEXICO 87503

September 8, 1978

Mr. Joe D. Ramey
Director
Oil Conservation Division
Energy and Minerals Department
Post Office Box 2088
Santa Fe, New Mexico 87503

Dear Joe:

Thank you for your September 6, 1978 letter regarding our respective roles in investigation of contamination sources in Lea County. Your letter requests that my office continue to sample existing water wells and advises that you will make available information on red beds and water levels if that information is of value to my office.

We will be pleased to participate in the sampling of existing water wells to determine conductivity and chloride content of the water as you may request; however, I ask that requests for such work be directed to me. As I mentioned in our September 1 telephone conversation we will continue our sampling program to monitor the quality of the fresh water in Lea County. It is requested that you continue to furnish us information on the red beds and water levels as that information would be of value to this office.

Your letter also advises that no further information is needed on the Blocker and Doom studies. Accordingly, we have terminated our work on these studies.

Please let me know if further discussion of this matter would be helpful.

Sincerely,

S. E. Reynolds
State Engineer

SER*hl

DONALD BROWN, P.A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 720
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

September 13, 1978

Mr. Jerry Sexton
District Supervisor
Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

In Re: Hamilton-Texaco Well Test

Dear Mr. Sexton:

I have generally reviewed the proposed procedure for the radio active tracer test to be conducted on Texaco Salt Water Disposal Well BO 3 at the request of Mr. Hamilton. I am concerned that there has been a substantial reduction in injection volumes at this well since the contamination was discovered. A test of the well at the reduced volumes would, in our opinion, be useless, unless the test can in some way be structured to compensate for the change.

We would prefer that the injection volumes be restored to the levels they were at when this contamination evidently occurred during the test interval.

Finally, we are going ahead with the construction of an observation well to be located 30 feet south of the injection well with perforations from the top of the water table to the bottom of the casing. We hope to have this well completed promptly.

I am sending a copy of this letter to Mr. Ramey and to Mr. Hensley to advise them of my concerns regarding the test format.

Best regards.

Sincerely,

Alvin F. Jones

AFJ:pma

cc: Mr. Joe D. Ramey, Director
Oil Conservation Division

Mr. Harold Hensley
Attorney at Law

COPY

DONALD BROWN, P.A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 220
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

September 14, 1978

Mr. Jerry Sexton
District Supervisor
Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

In Re: Hamilton - Texaco Well Test

Dear Mr. Sexton:

I have been advised that the new observation well we would like completed as part of the pending tracer test on Texaco B03 can be completed on the 25th of September. This will interfere somewhat, we understand, with the proposed starting day of the test of the 28th of September. We are reluctant to delay the test even one day, but we do feel that the proposed observation well is of sufficient importance to the overall integrity of the test procedure that we ought to have a chance to have it completed and the water sampled before the tracer is injected in the well. If we are able to get the test hole rig on the site before the 25th of September, we will do so and we will let everyone know of course.

Best regards.

Sincerely yours,

Alvin F. Jones

AFJ:pmc

cc: Mr. Joe D. Ramey

Mr. Harold Hensley

P. S. We suggest that every other water sample be submitted to analysis with the following lab as well as the New Jersey lab: Hazen Research, Inc., 4601 Indiana St., Golden, Colorado 80401, 303-279-4501, at the expense of Texaco. This duplicate testing should further insure the test integrity.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

September 15, 1978

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88240
(505) 393-6161

SEP 18 1978

Mr. John Gannon
Texaco Inc.
P. O. Box 728
Hobbs, New Mexico

Dear Mr. Gannon:

Attached is a letter from Mr. Alvin Jones requesting that the amount of water to be disposed of in your Moore SWD well during the radioactivity test due to start around the 28th of September be approximately the same as it was during 1977.

I am asking for the following data, which I feel will assure Mr. Jones that the volumes to be disposed of during the radioactive tracer test can be set to allow an accurate test to be obtained:

Water disposed of in avg. daily rate	1977---August, 1978
No. of wells producing & normal water production	1977---August, 1978
No. and size of pumps	1977---August, 1978
Pumps plunger size	1977---August, 1978
RPM of pumps	1977---August, 1978
Estimate of number of hours second pump runs	

Yours very truly,

OIL CONSERVATION DIVISION

Jerry Sexton
Supervisor, District 1

JS/mc
Attach.

cc-Mr. Alvin Jones
Roswell, New Mexico

Mr. Joe D. Ramey, Director
OCD, Santa Fe

DONALD BROWN, P. A.
ATTORNEYS AT LAW
DONALD BROWN
ALVIN F. JONES
816 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201
AREA CODE 505
622-1041

SEP 18 1978

September 13, 1978

Mr. Jerry Sexton
District Supervisor
Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

In Re: Hamilton-Texaco Well Test

Dear Mr. Sexton:

I have generally reviewed the proposed procedure for the radio active tracer test to be conducted on Texaco Salt Water Disposal Well BO 3 at the request of Mr. Hamilton. I am concerned that there has been a substantial reduction in injection volumes at this well since the contamination was discovered. A test of the well at the reduced volumes would, in our opinion, be useless, unless the test can in some way be structured to compensate for the change.

We would prefer that the injection volumes be restored to the levels they were at when this contamination evidently occurred, during the test interval.

Finally, we are going ahead with the construction of an observation well to be located 30 feet south of the injection well with perforations from the top of the water table to the bottom of the casing. We hope to have this well completed promptly.

I am sending a copy of this letter to Mr. Ramey and to Mr. Hensley to advise them of my concerns regarding the test format.

Best regards.

Sincerely,

Alvin F. Jones

AFJ:pme

cc: Mr. Joe D. Ramey, Director
Oil Conservation Division

Mr. Harold Hensley
Attorney at Law

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

September 18, 1978

Mr. Alvin F. Jones
P. O. Box 776
Roswell, New Mexico 88201

Dear Mr. Jones:

This is with reference to your letter of September 15, 1978, wherein you request certain things be made a part of the record of Case No. 6222.

I am attaching a copy of a letter to Mr. Steve Reynolds which I feel is self-explanatory. Mr. Reynolds requested this letter to clarify what their participation should be in any future contamination studies. This letter does not request the State Engineer to withdraw from the Hamilton study and Mr. Reynolds and I agree that no such request was made.

All testimony presented at Commission and Division hearings is carefully considered before a ruling is written. This is the practice of the Commission and the Division.

In view of these, no action will be taken on your request of September 15, 1978.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd
enc.

COPY

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

September 15, 1978

Mr. Joe D. Ramey, Director
Oil Conservation Division
Energy and Minerals Department
P. O. Box 2088
Santa Fe, New Mexico 87503

Re: Application of Paul Hamilton for
Texaco salt water disposal shut-in,
Case No. 6222

Dear Mr. Ramey:

It has come to our attention through the absence of any participation of the State Engineer in the tracer test ordered by the Commission upon the adjournment of the rehearing in the above matter, that at your request the State Engineer has been ordered out of the investigation into the salt water contamination of Mr. Hamilton's wells.

It is also my understanding that you have declared on at least one occasion in writing that the evidence of the type presented through the State Engineer's office at the rehearing regarding water levels and red bed configurations is of little or no value; this, even though there was no testimony produced before the Commission at either hearing thus far conducted in the above matter indicating that such is the case.

In light of these developments occurring as they did during the adjournment of the rehearing and pending a final decision by the Commission through you as its Chairman regarding the merits of the application of Mr. Hamilton, we feel that a full and complete record concerning both such occurrences should be made and included in the transcript of the proceedings in this case.

Therefore, we formally request by this letter that a full and complete record be made with regard to (1) the withdrawal of the State Engineer from this matter at your insistence and (2) with regard to your feeling that the evidence concerning water levels and red bed configurations is of little or no value. We must insist that this letter be made a part of the record of this case and we await word from you as to when a hearing can be held pursuant to this request.

Best regards.

Respectfully yours,

Alvin F. Jones

AFJ/jt
cc: Mr. Harold Hensley
Attorney for the Respondent, Texaco

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

September 20, 1978

Mr. Jerry Sexton, Dist. Supervisor
Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

In Re: Application of Paul Hamilton
Case No. 6222

Dear Mr. Sexton:

It is my understanding that with regard to my concern with regard to injection volumes during the proposed tracer test of Texaco well B03 in the Moore Pool we have agreed as follows: That Texaco will make every effort to approach or attain salt water disposal volumes on the order of 12,000 barrels per day during the test interval. In the event that such volumes are unattainable, they will dispose of all salt water available and, in any event, maintain volumes of at least 11,000 barrels per day of salt water disposed of.

It would be our hope that we can conduct the test under conditions which would duplicate in all respects insofar as possible the conditions that must have existed during the period of contamination, that is, disposal at the rate of 12,000 barrels per day and perhaps greater. If, for various reasons, a disposal volume of this magnitude cannot be reached we would like the highest disposal volume reasonably attainable. We would, of course, expect that accurate, reasonably precise records would be maintained regarding the daily disposal volumes during the test interval.

It is my understanding that Texaco has rejected our suggestion that they pay for additional testing to a second laboratory to confirm results obtained by Teledyne Labs in New Jersey. With that understanding, we have made arrangements with Eberline Instrument Corporation for back-up analysis of the water samples. We, therefore, are going to be requiring OCD assistance in gathering the necessary water samples at the time samples are obtained for Teledyne. It is anticipated that we will be collecting 8 liter samples of the water for submission to Eberline. Also, we will need OCD assistance to collect samples of the produced water and water from the observation well.

Finally, I believe we did agree over the phone the other day that we would go ahead with the completion of the new observation

well thirty feet from the salt water disposal well, hopefully on September the 25th, with a water sample to be obtained then or shortly thereafter for submission to Teledyne without any need to delay commencement of the test on the 28th of this month.

I trust that this letter is sufficient to clear up any remaining questions regarding the test or test procedure. If there are any remaining problems that have been overlooked, please call at once, and we will get them out of the way.

Best regards.

Sincerely yours,

Alvin F. Jones

AFJ:pme

cc: Harold L. Hensley

Mr. Joe D. Ramey

LAW OFFICES
HINKLE, COX, EATON, COFFIELD & HENSLEY
600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201
(505) 622-6510

LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.
JAMES H. BOZARTH

DOUGLAS L. LUNSFORD
PAUL M. BOHANNON
J. DOUGLAS FOSTER
K. DOUGLAS PERRIN
C. RAY ALLEN*
JACQUELINE W. ALLEN*
T. CALDER EZZELL, JR.

OF COUNSEL
CLARENCE E. HINKLE

W. E. BONDURANT, JR. (1914-1973)

MIDLAND, TEXAS OFFICE
1000 FIRST NATIONAL BANK TOWER
(915) 683-4691

*LICENSED IN
TEXAS ONLY

September 20, 1978

Mr. Jerry Sexton
District Supervisor
Oil Conservation Division
P.O. Box 1980
Hobbs, New Mexico 88240

Re: Hamilton - Texaco Well Test

Dear Mr. Sexton:

With reference to Mr. Jones letter to you of September 14, please be advised that present arrangements are for the test to begin September 28th and consequently I would hope that Mr. Hamilton will be in a position to complete the new observation well in time for testing to commence as scheduled. In the event the tests are not started by the 28th, I am informed that it will be necessary to delay the beginning of the test until the week of October 9 because of prior commitments by the parties conducting the test. In addition, Texaco will not agree to pay for the testing suggested by Mr. Jones in addition to the test which it has already made arrangements to pay for. It would be my suggestion that if Mr. Hamilton desires that water samples be submitted to some other laboratory for analysis that this be arranged for at his expense and we would hope that you would advise him accordingly.

Finally, Mr. Schlarb of Texaco Hobbs Office advised me by telephone that you had requested certain additional information with regard to the "BO" No. 3 Well which is herewith set forth:

1. The average disposal rate in 1977 was 12,242 barrels per day (Amerando's volumes estimated). In August 1978 the average disposal rate was 11,100 barrels per day (Amerado's volumes estimated).

2. During 1977 and in August 1978 there were seven producing wells connected to the disposal system.

3. During both periods two injections pumps were in use, both being size J-150 and with a plunger size of 3 3/4 inches and a RPM rating of 400.

4. During the time periods in question the second pump ran a maximum of 19 hours per day and a minimum of 16 hours per day when Samedan Moore "B" No. 2 Well was not producing.

I trust that this letter will answer Mr. Jones' letter of September 14, and will also supply you with the information which you requested from the Hobbs District Office.

Very truly yours,

HINKLE, COX, EATON, COFFIELD & HENSLEY

Harold L. Hensley, Jr.

HLH:ems

cc: Mr. Joe D. Ramey, Director
Oil Conservation Division
Energy and Minerals Department
P.O. Box 2088
Santa Fe, New Mexico 87503

Mr. Alvin F. Jones
Attorney at Law
P.O. Box 776
Roswell, New Mexico 88201

Mr. Johnston S. Rowe
P.O. Box 3109
Midland, Texas 79701

Mr. J. V. Gannon
Texaco Inc.
P.O. Box 728
Hobbs, New Mexico 88240

Mr. Bob Brown
P.O. Box 3109
Midland, Texas 79701

LAW OFFICES
HINKLE, COX, EATON, COFFIELD & HENSLEY
600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201
(505) 622-6510

LEWIS C. COX, JR
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.
JAMES H. BOZARTH

DOUGLAS L. LUNSFORD
PAUL M. BOHANNON
J. DOUGLAS FOSTER
K. DOUGLAS PERRIN
C. RAY ALLEN*
JACQUELINE W. ALLEN*
T. CALDER EZZELL, JR.
WILLIAM B. BURFORD*
JOHN S. NELSON
RICHARD E. OLSON

OF COUNSEL
CLARENCE E. HINKLE

W. E. BONDURANT, JR. (1914-1973)

MIDLAND, TEXAS OFFICE
1000 FIRST NATIONAL BANK TOWER
(915) 683-4691

*LICENSED IN TEXAS ONLY

January 26, 1979

JAN 29 1979
OIL CONSERVATION
Santa Fe

Mr. Joe D. Ramey
Secretary-Director
Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

Re: Application of Paul Hamilton for
Texaco Salt Water Disposal Shut-in,
Case No. 6222

Dear Mr. Ramey:

The radio-active tracer tests of the Texaco "BO No. 3" SWD have now been concluded and the analysis of the water samples submitted to your District Office.

In view of the status of this matter, we would now request that a final hearing on the case be scheduled at the convenience of the Commission.

Respectfully submitted,

HINKLE, COX, EATON, COFFIELD & HENSLEY

Harold L. Hensley, Jr.

HLH:ems

xc: Mr. Don Brown
Mr. R. E. Richards

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88240
(505) 393-6161

March 9, 1979

Mr. Joe D. Ramey
Director
Oil Conservation Division
Box 2088
Santa Fe, New Mexico

SUBJECT: Paul Hamilton Water Samples

Dear Mr. Ramey:

All water samples taken from Texaco Inc. New Mexico "BO" State SWD Well #3 located in Unit D of Section 24, Township 11 South, Range 32 East, and sent to Teledyne Isotopes for analysis were witnessed by Oil Conservation Division personnel.

Very truly yours,

OIL CONSERVATION DIVISION

Jerry Sexton
Supervisor, District I

JS/ed

xc: Texaco Inc.
Hobbs, NM

TO Lynn

DATE _____ TIME _____

WHILE YOU WERE OUT

MR. _____

OF _____

PHONE _____ AREA CODE _____

TELEPHONED		PLEASE PHONE	
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RETURNED YOUR CALL	

MESSAGE Howard Hensley called on Case 6222 - March 2 not OK for him. He said Melvin Jones wants case continued, also.

MESSAGE TAKEN BY S

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

AREA CODE 505
622-1041

DONALD BROWN
ALVIN F. JONES

RECEIVED
FEB 23 1979
OIL CONSERVATION DIVISION
SANTA FE

February 22, 1979

Mr. Joe Ramey, Chairman
Oil Conservation Commission
Energy and Minerals Department
P. O. Box 2088
Santa Fe, New Mexico 87503

Dear Mr. Ramey:

We are in receipt of Notice of Hearing in Cause No. 622 on Part Second. Unfortunately, we have a conflicting setting in the District Court of Chaves County on that date and must ask that the matter be continued, if possible, to the next session of the Commission.

I am sending a copy of this letter to Mr. Harold Hensley, attorney for the respondent, in order that he be aware of our conflict and our request for continuance.

Best regards.

Respectfully yours,

Alvin F. Jones

AFJ/plk
cc: Mr. Harold Hensley
Mr. Paul Hamilton

Cont. to March 15th
Same place - same time

COCHRAN AND JONES, LTD.
ATTORNEYS AT LAW
Suite 916 – Security National Bank Building
Roswell, New Mexico 88201

A. TOM COCHRAN
ALVIN F. JONES

(505) 622-7663
P.O. BOX 1194

August 23, 1979

RECEIVED
AUG 27 1979
OIL CONSERVATION DIVISION
SANTA FE

Mr. Joe D. Ramey
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Hamilton vs. OCC
Lea County No. CV-79-312

Dear Mr. Ramy:

Pursuant to the order of the Commission, No. R-5753-B entered in Case No. 6222, particularly sub-paragraph eighteen thereof, water samples have been taken from the observation well adjacent to Texaco, Inc.'s state BO 3 salt water disposal well which is the subject matter of the above action.

I have been advised of the results of the analysis of the samples from the observation well taken on August 7, 1979 and understand those results to be as follows:

Analysis of the sample taken at a depth of 68 feet of the observation well on the above date reveal chlorides in the amount of 26,341 parts per million.

A sample taken at a depth of 100 feet on the same date and the same observation well revealed chlorides in the amount of 25,560 parts per million.

I am further advised by Mr. Runyan of the OCD office in Hobbs that subsequent samples taken within a week of the above revealed that water at a depth of approximately 67 feet in the observation well had a chloride content of 25,884 and that analysis of water taken from the disposal system on the same date at approximately the same time showed the chlorides in the disposal system to be 25,884.

One cannot, we feel, overlook the remarkable coincidence occurring on the date of this last sampling wherein the chloride levels of the produced water and the water from the observation well coincided precisely to five figures. While the five-figure accuracy may be something of a fluke, the message, we feel, is plain for all who care to see.

We must first request that the results of the analysis referred to in this letter be made a part of the record of this cause for filing before the District Court of Lea County and we must further request that the Commission immediately undertake a reconsideration of its Order entered in this cause and move forthwith to a hearing and an Order shutting in the subject well.

It is our opinion that there can no longer by any reasonable doubt regarding the continued integrity of said well in light of these most recent tests.

Sincerely,

Alvin F. Jones

AFJ/plk
cc: Harold Hensley
cc: Ernest Padilla
cc: Paul Hamilton
cc: Senator Bill Lee

TELEDYNE
ISOTOPES

50 VAN BUREN AVENUE

WESTWOOD, NEW JERSEY 07675

(201) 664-7070 TELEX 13-4474

13 December 1978

Mr. Douglas Sprague
Texaco Inc.
Box 728
Hobbs, NM 88240

Re: W.O. Nos. 3-2493, 2534, & 2543

Dear Mr. Sprague:

Enclosed are the Reports of Analysis for the above referenced work orders. Also enclosed is an updated Tele-tracer Data Summary Sheet.

There are two samples which remain to be reported. They are in the process of analysis, and the results will be sent to you shortly.

From all the tracer data analyzed, no Iodine-125 has been detected in the fresh water of the Ogallala formation.

Yours truly,

Andrew Carmichael

Andrew Carmichael
Tele-Trace Project Coordinator

AC:hp
enclosures

cc: Mr. Jerry Sexton, w/encl.
Mr. Donald Brown, w/encl.
Mr. Tom Calhoun, w/encl.
Mr. Harold Hensley, Jr., w/encl.

TELE-TRACER DATA SUMMARY - TEXACO, INC. - MOORE FIELD - ^{125}I in 60' OBS - WELL

COLLECTION DATE		TI #	^{125}I pCi/L		W.O. No.
Fri.	29 Sept. 1978	57570	less than 0.2		3- 2229
Sat.	30 " "	57656	"	0.3	3- 2238
Sun.	1 Oct. 1978	57632	"	0.2	3- 2238
Mon.	2 " "	57633	"	0.4	3- 2238
Tues.	3 " "	57634	"	0.2	3- 2238
Wednes.	4 " "	57943	"	0.2	3- 2258
Thurs.	5 " "	57906	"	0.2	3- 2252
Fri.	6 " "	58004	"	0.3	3- 2281
Mon.	9 " "	58225	"	0.3	3- 2337
Wednes.	11 " "	58226	"	0.1	3- 2337
Fri.	13 " "	58062	"	0.3	3- 2240
Mon.	16 " "	58150	"	0.3	3- 2311
Wednes.	18 " "	58227	"	0.2	3- 2337
Fri.	20 " "	58263	"	0.4	3- 2342
Mon.	23 " " [1]	58331	"	0.2	3- 2346
Wednes.	25 " "	58510	"	0.3	3- 2379
Fri.	27 " "	58511	"	0.4	3- 2372
Mon.	30 " "	58664	"	0.3	3- 2408
Wednes.	1 Nov. 1978 [1]	58648	"	0.3	3- 2450
Fri.	3 " "	58849	"	0.3	3- 2430
Mon.	6 " " [2]	58998	"	0.3	3- 2455
Wednes.	8 " "	59280	"	0.3	3- 2495
Fri.	10 " "	59171	"	0.2	3- 2474
Mon.	13 " "	59281	"	0.2	3- 2493
Wednes.	15 " "	59423			/
Fri.	17 " "	59458			/
Mon.	20 " " [3]	59529	"	0.2	3- 2534
Wednes.	22 " " [4]	59620	"	0.2	3- 2543
Fri.	24 " "	59621	"	0.3	3- 2543

Note:

/ - Analysis in Progress

1 - No Collection Date on Bottles - Inferred Date

2 - Labeled 6 October - Assumed 6 November

3- " 20 " - " 20 "

4- " 22 " - " 22 "

FORM NO. 112 GOLDSMITH BROS., N. Y. (212) 267-7900

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/12/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2536		11/22/78	12/25/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
59529	OBSERVATION WELL GOFT		11/20				I-125	L.T. 2. E-01		11/29			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 12/12/78

K Roach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PZ850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/12/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2543		11/27/78	12/30/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
59620	OBSERVATION WELL 60FT		11/22				I-125	L.T. 2. E-01		12/03			3
59621	N MEX"BOY ST WL NO 3		11/24				I-125	L.T. 3. E-01		11/30			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 12/12/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BB595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/12/7

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2493		11/15/78	12/10/78	

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
59280	OBSERVATION WELL 60FT		11/08				I-125	L.T. 3. E-01		12/05			3
59281	OBSERVATION WELL 60FT		11/13				I-125	L.T. 2. E-01		12/04			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 12/12/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPT
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE
ISOTOPES
50 VAN BUREN AVENUE
WESTWOOD, NEW JERSEY 07675
(201) 664-7070 TELEX 13-4474

2 November 1978

File
Paul Hamilton

Mr. Douglas Sprague
Texaco, Inc.
Box 728
Hobbs, New Mexico 88240

Re: W. O. Nos. 3-2229, 2238, 2252,
3-2258, 2281, 2290, 2311

Dear Mr. Sprague:

Enclosed are the Reports of Analysis for the above referenced work orders. The following table summarizes the analytical results:

W.O. Number	Collection Date	T.I. No.	^{125}I Activity (pCi/ℓ)
3-2229	09/28	57468	"Less than" 0.4
3-2238	09/30	57656	" 0.3
"	10/01	57632	" 0.2
"	10/02	57633	" 0.4
"	10/03	57634	" 0.2
3-2258	10/04	57943	" 0.2
3-2252	10/05	57906	" 0.2
3-2281	10/06	58004	" 0.3
3-2290	10/13	58062	" 0.3
3-2311	10/16	58130	" 0.3

All but the sample collected on 9/28 are from the observation well 60 feet from the disposal well. The 9/28 sample was collected from the 46 foot observation well. The elemental iodine concentration for that sample was 1.0 ± 0.8 mg/ℓ.

Yours truly,

Andrew Carmichael

Andrew Carmichael
Tele-Trace Project Coordinator

AC:mm

cc: Jerry Sexton, Dist. Supv. ✓
Donald Brown
Petroleum Tracers
H. Hensley, Jr.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2290		10/18/78	11/20/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE. SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58062	OBSERVATION WELL 60PT		10/13				I-125	L.T. 3. E-01		10/23			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 10/31/78

K. Roach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE85ON MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2311		10/19/78	11/21/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 729
HOBBS NM 88240

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58130	OBSERVATION WELL 60FT		10/16				I-125	L.T. 3. E-01		10/20			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 10/31/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO DB595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2229		10/10/78	11/12/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
57468	46 FT OBSVTN WELL		09/28				IODIDE	1.0 +-0.8 E 00	mg/liter *	10/13			3
							I-125	L.T. 4. E-01		10/13			3
57470	60 FT OBSVTN WELL		09/29				I-125	L.T. 2. E-01		10/25			3

LAST PAGE OF REPORT

APPROVED BY K. BOACH 10/31/78

K Boach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2281		10/16/78	11/18/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 723
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58004	OBSERVATION WELL 60FT		10/06				I-125	L.T. 3. E-01		10/23			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 10/31/78

K. Roach

SEND 1 COPIES TO TE930S MR DOUGLAS PRAGUE
SEND 1 COPIES TO PE85ON MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO DB595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2252		10/12/78	11/14/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
57906	OBSERVATION WELL 60FT		10/05				I-125	L.T. 2. E-01		10/20			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 10/31/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO DR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2258		10/13/78	11/15/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
57983	OBSERVATION WELL 60FT		10/04				I-125	L.T. 2. E-01		10/22			3

LAST PAGE OF REPORT

APPROVED BY K. BOACH 10/31/78

E.K. Boach

SEND 1 COPIES TO T29305 MR DOUGLAS SPRAGUE
SEND 1 COPIES TO P28505 MR T CALHOUN
SEND 1 COPIES TO T2930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/31/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2238		10/11/78	11/13/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% O/N *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
57632	OBSERVATION WELL 60FT		10/01				I-125	L.T. 2. E-01		10/18			3
57633	OBSERVATION WELL 60FT		10/02				I-125	L.T. 4. E-01		10/19			3
57634	OBSERVATION WELL 60FT		10/03				I-125	L.T. 2. E-01		10/19			3
57656	OBSERVATION WELL 60FT		09/30				I-125	L.T. 3. E-01		10/20			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 10/31/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

PAUL HAMILTON
WATER CONTAMINATION STUDY

From June 26 to June 30, 1978, an additional 4 water test wells were drilled by Paul Hamilton, one in Section 23 and three in Section 24, all in T11S, R32E. These were test wells number 17 through 20.

With only the chloride analysis from these four test wells (no other data available at this time), there is an indication that the chloride content of the contaminated water in the immediate area of Texaco SWD #3 well is declining. This is due to the position and chloride content of test wells nos. 17, 18, and 20. Test well #20, located 10' NE of Texaco TW #4, is 1100 ppm less than TW #4, and Test wells #17 and #18 are both 23,000 plus and are located inside the old 28,000 ppm chloride contour.

WELL DATA

Test Well No.	Location	BY	CHLORIDES	R.B.	T.D.
17	11.32.24.11330	WRD	23,330	98'	106'
17	"	WRD	23,700		
17	"	OCD	24,566		
18	11.32.24.11341334	WRD	21,820	98'	107'
18	"	WRD	23,610		
18	"	OCD	22,067		
18	"	OCD	24,211		
19	11.32.23.2425413	WRD	3,970	108'	109'
19	"	WRD	3,850		
19	"	OCD	4,047		
19	"	OCD	4,047		
20	11.32.24.1141112	WRD	24,970	108'	109'
20	"	WRD	25,030		

Revised chloride map attached.

Note: Test well #20 was cased with 110 feet of 4" PVC pipe, and lower four feet was perforated. This well is to be used as an observation well for water samples and water levels.

Respectfully submitted,

John W. Runyan

John W. Runyan, Geologist
July 24, 1978

Memo

From

Jerry Sexton
Aug. 15, 1979

To Joe,

The water analysis from the Hamilton Observation Well for the month of Aug. are attached.

NEW MEXICO OIL COMSERVATION COMMISSION- HOBBS

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

WATER ANALYSIS

WELL OWNERSHIP: HAMILTON OBSERVATION WELL WELL NO. _____

LAND STATUS: State X Federal _____ Fee _____

WELL LOCATION: Unit Letter D, Section 24, T 11 S, R 32 E

Well is located 30 to 50 feet SE of Texaco State BO SWD #3

Type well: Observation well Depth 101 feet

Well Use: To obtain water samples from fresh water zone (Ogallala)

Sample Number: 1 (taken at 68 feet) Date Taken: 8-7-79

Taken By: Otto W. Wink

Specific Conductance: _____ m/~

Total Dissolved Solids _____ PPM

Chlorides: 26,341 PPM

Sulfates: _____ PPM

Water Level: 66' from surface

Date Analyzed: 8-8-79 By: John W. Runyan
Oil Conservation Division

REMARKS: 5 ml sample = 710.0 factor x 37.1 titration = 26,341 ppm

Supervisor, District I

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

WATER ANALYSIS

WELL OWNERSHIP: HAMILTON OBSERVATION WELL WELL NO. _____

LAND STATUS: State X Federal _____ Fee _____

WELL LOCATION: Unit Letter D, Section 24, T 11 S, R 32 E

Well located 30 to 50 feet SE of Texaco State BO SWD #3

Type well: Observation well Depth 101 feet

Well Use: To obtain water samples from Ogallala

Sample Number: 2 (taken at 100 feet) Date Taken: 8-7-79

Taken By: Otto W. Wink

Specific Conductance: _____ m/~

Total Dissolved Solids _____ PPM

Chlorides: 25,560 PPM

Sulfates: _____ PPM

Water Level: 66 feet from surface

Date Analyzed: 8-8-79 By: John W. Runyan John W. Runyan
Oil Conservation Division

REMARKS: 5 ml sample = 710.0 factor x 36.0 titration = 25,560 ppm

Supervisor, District I

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

WATER ANALYSIS

WELL OWNERSHIP: HAMILTON OBSERVATION WELL WELL NO. _____

LAND STATUS: State X Federal _____ Fee _____

WELL LOCATION: Unit Letter D, Section 24, T 11 S, R 32 E

Sample taken at 67 feet, statis -- water level at 65'

Type well: water observation well Depth 101 feet

Well Use: water levels and water samples

Sample Number: #1 Date Taken: Aug. 16, 1979

Taken By: Eddie Seay

Specific Conductance: _____ m/~

Total Dissolved Solids _____ PPM

Chlorides: 25,844 PPM

Sulfates: _____ PPM

Water Level: 65 feet from surface

Date Analyzed: 8-17-79 By: John W. Runyan
Oil Conservation Division

REMARKS: Test well location 60' SE of Texaco SWD #3 Moore Dev. Pool.
(Identical to injected water at SWD well #3)
5 ml sample = 710.0 factor x 36.4 titration = 25,844 ppm

Supervisor, District I

cc: Paul Hamilton
Texaco Inc.
Joe Ramey
File

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

WATER ANALYSIS

WELL OWNERSHIP: TEXACO Inc. SWD well WELL NO. #3

LAND STATUS: State X Federal _____ Fee _____

WELL LOCATION: Unit Letter D, Section 24, T 11 S, R 32 E

Sample taken from wellhead of SWD #3 - injecting water

Type well: salt water disposal Depth _____ feet

Well Use: disposal

Sample Number: #1 Date Taken: 8-16-79

Taken By: Eddie Seay

Specific Conductance: _____ m/~

Total Dissolved Solids _____ PPM

Chlorides: 25,844 PPM

Sulfates: _____ PPM

Water Level: _____ from surface

Date Analyzed: 8/17/79 By: John W. Runyan
Oil Conservation Division

REMARKS:

5 ml sample = 710.0 factor x 36.4 titration = 25,844 ppm

cc: Paul Hamilton
Texaco, Inc.
Joe D. Ramey
File

Supervisor, District I

Memo

From Jerry

To Joe

NEW MEXICO OIL COMSERVATION COMMISSION- HOBBS

TELEDYNE
ISOTOPES
50 VAN BUREN AVENUE
WESTWOOD, NEW JERSEY 07675
(201) 664-7070 TELEX 13-4474

Nones
622-1041

27 November 1978

Mr. Douglas Sprague
Texaco Inc.
Box 728
Hobbs, NM 88240

Re: W. O. Nos. 3-2379, 2408, 2430 & 2455

Dear Mr. Sprague:

Enclosed, please find the Reports of Analysis for the above referenced work orders. Also enclosed is an updated Tele-tracer Data Summary Sheet for the 60 foot observation well on the Moore field.

No Iodine-125 is present above our detection limit.

Yours truly,

Andrew Carmichael

Andrew Carmichael
Tele-Trace Project Coordinator

AC:hp
enclosures

cc: Mr. Donald Brown, Roswell, NM w/encl.
Mr. Jerry Sexton, Hobbs, NM w/encl.
Mr. Harold Hensley, Jr., Roswell, NM w/encl.
Mr. Tom Calhoun II, Dallas, TX w/encl.

TELE-TRACER DATA SUMMARY - TEXACO, INC. - MOORE FIELD - ^{125}I in 60' OBS - WELL

COLLECTION DATE	TT #	^{125}I	pCi/ℓ	W.O.	No.
Fri. 29 Sept. 1978	57570	less than 0.2		3-	2229
Sat. 30 " "	57656	"	0.3	3-	2238
Sun. 1 Oct. 1978	57632	"	0.2	3-	2238
Mon. 2 " "	57633	"	0.4	3-	2238
Tues. 3 " "	57634	"	0.2	3-	2238
Wednes. 4 " "	57943	"	0.2	3-	2258
Thurs. 5 " "	57806	"	0.2	3-	2252
Fri. 6 " "	58004	"	0.3	3-	2281
Mon. 9 " "	58225	"	0.3	3-	2337
Wednes. 11 " "	58226	"	0.1	3-	2337
Fri. 13 " "	58062	"	0.3	3-	2240
Mon. 16 " "	58130	"	0.3	3-	2311
Wednes. 18 " "	58227	"	0.2	3-	2337
Fri. 20 " "	58263	"	0.4	3-	2342
Mon. 23 " " [1]	58331	"	0.2	3-	2346
Wednes. 25 " "	58510	"	0.3	3-	2379
Fri. 27 " "	58511	"	0.4	3-	2379
Mon. 30 " "	58664	"	0.3	3-	2408
Wednes. 1 Nov. 1978 [1]	58848	"	0.3	3-	2450
Fri. 3 " "	58849	"	0.3	3-	2450
Mon. 6 " " [2]	58998	"	0.3	3-	2455
Wednes. 8 " "					✓
Fri. 10 " "					✓
Mon. 13 " "					✓
Wednes. 15 " "					✓
Fri. 17 " "					✓
Mon. 20 " "					
Wednes. 22 " "					
Fri. 24 " "					

Note:

✓ - Analysis in Progress

1 - No Collection Date on Bottles - Inferred Date

2 - Labeled 6 October - Assumed 6 November

FORM NO. 5137 GOLDSMITH PRINTING, N. Y. (212) 267-7000

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/21/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2379		10/30/78	12/02/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58510	OBSERVATION WELL 60FT		10/25				I-125	L.T. 3. E-01		11/07			3
58511	OBSERVATION WELL 60FT		10/27				I-125	L.T. 4. E-01		11/13			3

LAST PAGE OF REPORT

APPROVED BY K. BOACH 11/21/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PR850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/21/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2408		11/02/78	12/05/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58664	OBSERVATION WELL GOPT		10/30				I-125	L.T. 3. E-01		11/06			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 11/21/78

Roach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE85ON MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/21/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2430		11/06/78	12/09/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/N *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
56648	OBSERVATION WELL 60FT		11/08				I-125	L.T. 3. E-01		11/14			3
56649	OBSERVATION WELL 60FT		11/03				I-125	L.T. 3. E-01		11/15			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 11/21/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850M MR T CALHOUN
SEND 1 COPIES TO TR930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/21/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2455		11/09/78	12/12/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-X U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58598	OBSERVATION WELL 60FT		11/06				I-125	L.T. 3. E-01		11/13			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 11/21/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

Memo

From 1-4-79
Jerry Sexton

To Joe Ramey

For your information.

NEW MEXICO OIL COMSERVATION COMMISSION- HOBBS

DONALD BROWN
ALVIN F. JONES

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

AREA CODE 505
622-1041

January 3, 1979

Mr. Jerry Sexton
Oil Conservation Commission
1000 West Broadway
Hobbs, New Mexico 88240

Re: Paul Hamilton - Texaco

Dear Mr. Sexton:

Enclosed is a copy of the report of results we have received from the Eberline Instrument Corporation with regard to the water samples we collected.

Best regards.

Sincerely yours,

for Alvin F. Jones

AFJ/plk
Enclosure
cc: Harold Hensley w/enc.
Paul Hamilton w/enc.

JAN - 8 1979
OIL CONSERVATION COM...
Santa Fe

eberline

I-125 in Water Samples

Sample No. and Identification	Collection Date	I-125 pCi/l*
# 1 Texaco B. O. 3 Disposal Well	09/29/78	<1
# 2 Hamilton A-1 Monitoring Well	09/29/78	<2
# 3 "	09/29/78	<2
# 4 "	10/01/78	<1
# 5 -	10/03/78	<1
# 6 -	**	<1
# 7 -	**	<1
# 8 -	10/09/78	<1
# 9 -	10/13/78	<1
#10 -	10/18/78	<1
#11	10/23/78	1±1
#12 -	**	<1
#13 -	11/03/78	<1
#14 -	11/10/78	<1
#15 -	**	<1
#16 -	11/20/78	<1
#17 -	11/24/78	<1

* Corrected for decay to date of collection
** Collection date not given

12/29/78

PLEASE REPLY TO: MIDWESTERN FACILITY, 245 ROOSEVELT ROAD, WEST CHICAGO, ILLINOIS 60185 TELEPHONE (312) 231-9400
EBERLINE INSTRUMENT CORPORATION, PO BOX 2108, SANTA FE, NEW MEXICO 87501 TELEPHONE (505) 471-3232, TWX 910-985 0678

CASE NO. 6222 (Rehearing)

SUBPOENA No. 1

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To SHERMAN E. GALLOWAY Greeting:

We command you to be and appear August 23, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 1st day of August, 1978.

(SEAL)

CASE NO. 6222 (Rehearing)

SUBPOENA No. 2

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To JIM WRIGHT Greeting:

We command you to be and appear August 23, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 1st day of August, 1978.

(SEAL)

_____

RETURN OF SERVICE

CASE NO. 6222 (Rehearing)

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA NO. 1

RETURN OF SERVICE

CASE NO. 6222 (Rehearing)

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT IN,
LEA COUNTY, NEW MEXICO

SUBPOENA NO. 2

(6) That recent tests conducted on said well indicate the well to be mechanically sound.

(7) That the evidence presented in this case fails to establish that the subject well is now leaking injected fluids to the ground water in the area.

(8) That the application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Paul Hamilton for an order shutting in the Texaco, Inc., New Mexico State "BO" State SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, be and the same is hereby denied.

(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

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Division Director

S E A L

fd/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6222
Order No. R-5753

APPLICATION OF PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT-IN,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on May 31, 1978, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 7th day of July, 1978, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 Texaco, Inc., New Mexico "BO" State Well No. 3 located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, is an active salt water disposal well authorized by Division Order No. R-4422.

(3) That ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source.

(4) That the applicant in this case, Paul Hamilton, is the surface owner in the vicinity of the aforesaid Texaco New Mexico "BO" State SWD Well No. 3, and seeks an order from the Commission shutting in said well, alleging that said well has been and still is the source of said contaminants in the ground water.

(5) That the evidence presented is inconclusive as to whether the subject well has ever leaked injected fluids (salt water) to the ground water in the area.

Memo

From

11-16-78
Jerry Sexton

To

JOE RAMEY

FOR YOUR INFORMATION.

NEW MEXICO OIL COMSERVATION COMMISSION- HOBBS

TELEDYNE
ISOTOPES

50 VAN BUREN AVENUE

WESTWOOD, NEW JERSEY 07675

(201) 664-7070 TELEX 13-4474

10 November 1978

Mr. Douglas Sprague
Texaco, Inc.
P. O. Box 728
Hobbs, NM 88240

Re: W. O. Nos. 3-2337, 2342 & 2346

Dear Mr. Sprague:

Enclosed are the Reports of Analysis for the above referenced work orders. No Iodine-125 was found above our detection limit.

For your convenience in data presentation and interpretation, I have enclosed a Tele-tracer Data Summary Sheet. As the analyses are completed, I will update the summary sheet and send you copies with completed Reports of Analysis.

Yours truly,

Andrew Carmichael

Andrew Carmichael
Tele-Trace Project Coordinator

AC:hp
enclosures

cc: Mr. Donald Brown, Roswell, NM w/encl.
Mr. Jerry Sexton, Hobbs, NM w/encl.
Mr. Harold Hensley, Jr., Roswell, NM w/encl.
Mr. Tom Calhoun II, Dallas, TX w/encl.

TELE-TRACER DATA SUMMARY - TEXACO, INC. - MOORE FIELD - ^{125}I in 60' OBS - WELL

COLLECTION DATE	TI #	^{125}I pCi/L	W.O. No.
Fri. 29 Sept. 1978	57570	less than 0.2	3- 2229
Sat. 30 " "	57656	" 0.3	3- 2238
Sun. 1 Oct. 1978	57632	" 0.2	3- 2238
Mon. 2 " "	57633	" 0.4	3- 2238
Tues. 3 " "	57634	" 0.2	3- 2238
Wednes. 4 " "	57943	" 0.2	3- 2258
Thurs. 5 " "	57906	" 0.2	3- 2252
Fri. 6 " "	58004	" 0.3	3- 2281
Mon. 9 " "	58225	" 0.3	3- 2337
Wednes. 11 " "	58226	" 0.1	3- 2337
Fri. 13 " "	58062	" 0.3	3- 2240
Mon. 16 " "	58130	" 0.3	3- 2311
Wednes. 18 " "	58227	" 0.2	3- 2337
Fri. 20 " "	58263	" 0.4	3- 2342
Mon. 23 " " [1]	58331	" 0.2	3- 2346
Wednes. 25 " "	58510		✓
Fri. 27 " "	58511		✓
Mon. 30 " "	58664		✓
Wednes. 1 Nov. 1978 [1]	58848		✓
Fri. 3 " "	58849		✓
Mon. 6 " " [2]	58998		✓
Wednes. 8 " "			
Fri. 10 " "			
Mon. 13 " "			
Wednes. 15 " "			
Fri. 17 " "			
Mon. 20 " "			
Wednes. 22 " "			
Fri. 24 " "			

Note:

✓ - Analysis in Progress

1 - No Collection Date on Bottles - Inferred Date

2 - Labeled 6 October - Assumed 6 November

FORM NO. 1127 GOLDSMITH BOOK, N. Y. 10010 (212) 307-7000

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/09/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2337		10/23/78	11/25/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
POX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58225	OBSERVATION WELL 60FT		10/09				I-125	L.T. 3. E-01		11/02			3
58226	OBSERVATION WELL 60FT		10/11				I-125	L.T. 1. E-01		11/03			3
58227	OBSERVATION WELL 60FT		10/18				I-125	L.T. 2. E-01		11/03			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 11/09/78

K Roach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN RA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/09/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2382		10/24/78	11/26/78	1

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58263	OBSERVATION WELL 60FT		10/20				I-125	L.T. 4. E-01		11/02			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 11/09/78

K Roach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PR850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/09/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
3-2346		10/25/78	11/27/78	1

FR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
58331	OBSERVATION WELL 60FT		10/08				I-125	L.T. 2. E-01		11/01			3

LAST PAGE OF REPORT

APPROVED BY K. ROACH 11/09/78

K Roach

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

Memo

From Jerry

To Joe

NEW MEXICO OIL COMSERVATION COMMISSION- HOBBS

TELEDYNE
ISOTOPES

50 VAN BUREN AVENUE

WESTWOOD, NEW JERSEY 07675

(201) 664-7070 TELEX 13-4474

30 November 1978

Mr. Douglas Sprague
Texaco Inc.
P. O. Box 728
Hobbs, NM 88240

Re: W. O. No. 3-2474

Dear Mr. Sprague:

Enclosed is the Report of Analysis for the above referenced work order. Also enclosed is an updated Teletracer Data Summary Sheet.

There was no detectable Iodine-125 in the sample collected 10 November 1978.

Yours truly,

Andrew Carmichael

Andrew Carmichael
Tele-Trace Project Coordinator

AC:hp
enclosures

cc: Mr. Donald Brown, Roswell, NM w/encl.
Mr. Jerry Sexton, Hobbs, NM w/encl.
Mr. Harold Hensley, Jr., Roswell, NM w/encl.
Mr. Tom Calhoun II, Dallas, TX w/encl.

DEC - 8 1978

TELE-TRACER DATA SUMMARY - TEXACO, INC. - MOORE FIELD - ^{125}I in 60' OBS - WELL

COLLECTION DATE		TI #	^{125}I	pCi/l	W.O. No.
Fri.	29 Sept. 1978	57570	less than	0.2	3- 2229
Sat.	30 " "	57656	"	0.3	3- 2238
Sun.	1 Oct. 1978	57632	"	0.2	3- 2238
Mon.	2 " "	57633	"	0.4	3- 2238
Tues.	3 " "	57634	"	0.2	3- 2238
Wednes.	4 " "	57943	"	0.2	3- 2258
Thurs.	5 " "	57906	"	0.2	3- 2252
Fri.	6 " "	58004	"	0.3	3- 2281
Mon.	9 " "	58225	"	0.3	3- 2337
Wednes.	11 " "	58226	"	0.1	3- 2337
Fri.	13 " "	58062	"	0.3	3- 2240
Mon.	16 " "	58130	"	0.3	3- 2311
Wednes.	18 " "	58227	"	0.2	3- 2337
Fri.	20 " "	58263	"	0.4	3- 2342
Mon.	23 " " [1]	58331	"	0.2	3- 2346
Wednes.	25 " "	58510	"	0.3	3- 2379
Fri.	27 " "	58511	"	0.4	3- 2379
Mon.	30 " "	58664	"	0.3	3- 2408
Wednes.	1 Nov. 1978 [1]	58848	"	0.3	3- 2450
Fri.	3 " "	58849	"	0.3	3- 2450
Mon.	6 " " [2]	58998	"	0.3	3- 2455
Wednes.	8 " "	59280			✓
Fri.	10 " "	59171	"	0.2	3- 2474
Mon.	13 " "	59281			✓
Wednes.	15 " "	59423			✓
Fri.	17 " "	59458			✓
Mon.	20 " " [3]	59529			✓
Wednes.	22 " " [4]	59620			✓
Fri.	24 " "	59621			✓

Note:

✓ - Analysis in Progress

1 - No Collection Date on Bottles - Inferred Date

2 - Labeled 6 October - Assumed 6 November

3- " 20 " - " 20 "

4- " 22 " - " 22 "

FORM NO. 1137 GOLDSMITH BROS., N. Y. 10036 (212) 307-7700

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/28/78

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-2474		11/13/78	12/16/78	

MR DOUGLAS SPRAGUE
TEXACO INC
BOX 728
HOBBS NM 88240

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (pCi/liter)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
59171	OBSERVATION WELL 60FT		11/10				I-125	L.T. 2. E-01		11/21			3

LAST PAGE OF REPORT

APPROVED BY R. ROACH 11/28/78

SEND 1 COPIES TO TE930S MR DOUGLAS SPRAGUE
SEND 1 COPIES TO PE850N MR T CALHOUN
SEND 1 COPIES TO TE930T MR JERRY SEXTON - DIST SUPV
SEND 1 COPIES TO BR595S MR DONALD BROWN BA

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - Ge(Li) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB.

eberline

I-125 in Water Samples

Sample No. and Identification	Collection Date	I-125 pCi/l*
# 1 Texaco B. O. 3 Disposal Well	09/29/78	<1
# 2 Hamilton A-1 Monitoring Well	09/29/78	<2
# 3 "	09/29/78	<2
# 4 "	10/01/78	<1
# 5 –	10/03/78	<1
# 6 –	**	<1
# 7 –	**	<1
# 8 –	10/09/78	<1
# 9 –	10/13/78	<1
#10 –	10/18/78	<1
#11	10/23/78	1±1
#12 –	**	<1
#13 –	11/03/78	<1
#14 –	11/10/78	<1
#15 –	**	<1
#16 –	11/20/78	<1
#17 –	11/24/78	<1

Withdrawn

* Corrected for decay to date of collection
** Collection date not given

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. _____ Exhibit No. #4
Submitted by TEXACO INC
Hearing Date 12/28/78

PLEASE REPLY TO: MIDWESTERN FACILITY, 245 ROOSEVELT ROAD, WEST CHICAGO, ILLINOIS 60185 TELEPHONE (312) 231-9400
EBERLINE INSTRUMENT CORPORATION, PO BOX 2108, SANTA FE, NEW MEXICO 87501 TELEPHONE (505) 471-3232, TWX 910-985-0678

eberline

I-125 in Water Samples

Sample No. and Identification	Collection Date	I-125 pCi/l*
# 1 Texaco B. O. 3 Disposal Well	09/29/78	<1
# 2 Hamilton A-1 Monitoring Well	09/29/78	<2
# 3 "	09/29/78	<2
# 4 "	10/01/78	<1
# 5 -	10/03/78	<1
# 6 -	**	<1
# 7 -	**	<1
# 8 -	10/09/78	<1
# 9 -	10/13/78	<1
#10 -	10/18/78	<1
#11	10/23/78	1±1
#12 -	**	<1
#13 -	11/03/78	<1
#14 -	11/10/78	<1
#15 -	**	<1
#16 -	11/20/78	<1
#17 -	11/24/78	<1

* Corrected for decay to date of collection
** Collection date not given

BEFORE THE
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO.
SUBMITTED BY: TEXACO INC
HEARING DATE:

Date 12/21/78 Not submitted

PLEASE REPLY TO: MIDWESTERN FACILITY, 245 ROOSEVELT ROAD, WEST CHICAGO, ILLINOIS 60185 TELEPHONE (312) 231-9400
EBERLINE INSTRUMENT CORPORATION, PO BOX 2108, SANTA FE, NEW MEXICO 87501 TELEPHONE (505) 471-3232, TWX 910-985-0678

eberline

I-125 in Water Samples

Sample No. and Identification	Collection Date	I-125 pCi/l*
# 1 Texaco B. O. 3 Disposal Well	09/29/78	<1
# 2 Hamilton A-1 Monitoring Well	09/29/78	<2
# 3 "	09/29/78	<2
# 4 "	10/01/78	<1
# 5 –	10/03/78	<1
# 6 –	**	<1
# 7 –	**	<1
# 8 –	10/09/78	<1
# 9 –	10/13/78	<1
#10 –	10/18/78	<1
#11	10/23/78	1±1
#12 –	**	<1
#13 –	11/03/78	<1
#14 –	11/10/78	<1
#15 –	**	<1
#16 –	11/20/78	<1
#17 –	11/24/78	<1

* Corrected for decay to date of collection
** Collection date not given

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Case No. [illegible] No. 4
Submitted by: TEXACO INC
Hearing Date:

Not admitted DK NH 12/28/78

PLEASE REPLY TO: MIDWESTERN FACILITY, 245 ROOSEVELT ROAD, WEST CHICAGO, ILLINOIS 60185 TELEPHONE (312) 231-9400
EBERLINE INSTRUMENT CORPORATION, PO BOX 2108, SANTA FE, NEW MEXICO 87501 TELEPHONE (505) 471-3232, TWX 910-985-0678

eberline

I-125 in Water Samples

Sample No. and Identification	Collection Date	I-125 pCi/l*
# 1 Texaco B. O. 3 Disposal Well	09/29/78	<1
# 2 Hamilton A-1 Monitoring Well	09/29/78	<2
# 3 "	09/29/78	<2
# 4 "	10/01/78	<1
# 5 "	10/03/78	<1
# 6 "	**	<1
# 7 "	**	<1
# 8 "	10/09/78	<1
# 9 "	10/13/78	<1
#10 "	10/18/78	<1
#11	10/23/78	1±1
#12 "	**	<1
#13 "	11/03/78	<1
#14 "	11/10/78	<1
#15 "	**	<1
#16 "	11/20/78	<1
#17 "	11/24/78	<1

OIL CO... EXHIBIT
CASE NO. ...
... 4
... TEXACO INC.
...

* Corrected for decay to date of collection
** Collection date not given

Not admitted 12/20/78

PLEASE REPLY TO: MIDWESTERN FACILITY, 245 ROOSEVELT ROAD, WEST CHICAGO, ILLINOIS 60185 TELEPHONE (312) 231-9400
EBERLINE INSTRUMENT CORPORATION, PO BOX 2108, SANTA FE, NEW MEXICO 87501 TELEPHONE (505) 471-3232, TWX 910-985-0678

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

SWD

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

CASE NO. 1053
Order No. R-1224-A

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION, AT
THE REQUEST OF THE STATE ENGINEER,
FOR AN ORDER PRESCRIBING RULES AND
REGULATIONS TO GOVERN THE DISPOSAL
OF SALT WATER IN AREAS OF LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause originally came on for hearing at 9 o'clock a.m. on May 16, 1956, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and was continued from time to time, and was heard again on June 18, 1958, and again on September 17, 1958.

NOW, on this 25th day of October, 1958, the Commission, a quorum being present, having considered the evidence adduced 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 by virtue of its implied powers and the express powers conferred upon the Commission by sub-section (2) and (7) of Section 65-3-11 of the New Mexico Statutes Annotated (1953).

(2) That the surface disposal of oil field brines in unlined pits in the following-described areas constitutes a hazard to the fresh waters in the Lea County Underground Water Basin, as the same is defined by the State Engineer of the State of New Mexico, and that such method of disposal should be prohibited in said areas, to-wit:

Hobbs	East Caprock	Crossroads
Denton	Bagley	Bough
Moore	Saunders	Echol

(3) That only a portion of the Eunice-Monument-Eumont Area (Eunice-Monument, Eumont, Monument-Blinebry, and Monument

Paddock Pools) lies within the boundaries of the said Lea County Underground Water Basin.

(4) That the disposal of oil field brines in unlined pits in that portion of the Eunice-Monument-Eumont Area which lies within the boundaries of the Lea County Underground Water Basin constitutes a hazard to the fresh waters in said basin and that such method of disposal should be prohibited in that portion of said area.

(5) That the testimony presented at the September 17, 1958, hearing of this case has raised a question as to whether the disposal of oil field brines in unlined pits in any area of Lea County other than those areas referred to in Findings No. 2 and 4 above constitutes a hazard to the fresh water supplies of Lea County.

(6) That paragraph (3) of Order No. R-1224 should, therefore, be rescinded.

(7) That a detailed localized study should be made of each area in Lea County, not included in Findings No. 2 and 4, where substantial quantities of oil field brines are produced, to determine whether the surface disposal of said brines in unlined pits constitutes a hazard to the fresh water supplies of Lea County. Further, that the Secretary-Director of the Commission should, from time to time, appoint pool committees to make such studies.

(8) That any well which produces one half ($\frac{1}{2}$) barrel or less of oil field brines per day should be exempt entirely from the provisions of this order, since there is no evidence that the disposal of such insignificant quantities of oil field brines in unlined pits would constitute a hazard to the fresh waters in the area.

(9) That provision should be made to empower the Secretary-Director to grant administrative exceptions to this order in individual cases where it appears that the granting of such exception would cause no danger of contamination, provided the State Engineer's Office has waived objection to the exception.

IT IS THEREFORE ORDERED:

1. That the surface disposal of oil field brines in unlined pits in the following-described areas be and the same is hereby prohibited as of the effective dates shown below:

Hobbs Area Hobbs Pool Hobbs Drinkard Pool Bowers Pool	-	March 15, 1959
Denton Area Denton Pool Denton-Wolfcamp Pool	-	December 1, 1958
Moore Area Moore-Devonian Pool Moore-Pennsylvanian Pool	-	December 1, 1958
Crossroads Area Crossroads Pool Crossroads-Pennsylvanian Pool Crossroads-Slaughter Pool	-	December 1, 1958
East Caprock Area East Caprock-Devonian Pool	-	December 1, 1958
Bagley Area Bagley-Siluro Devonian Pool Bagley-Pennsylvanian Pool	-	December 1, 1958
Saunders Area Saunders-Pennsylvanian Pool	-	December 1, 1958
Bough Area Bough-Pennsylvanian Pool	-	December 1, 1958
Echol Area Echol Pool	-	December 1, 1958
Eunice-Monument-Eumont Area Eunice Monument Pool Monument-Blinebry Pool Monument-Paddock Pool Eumont Gas Pool Cass Pool Weir Pool	-	March 1, 1960

The provisions of this paragraph apply only to that portion of the Eunice-Monument-Eumont Area which lies within the Lea County Underground Water Basin as the same was declared by the State Engineer in his Order No. 3, dated August 21, 1931, and as the same was extended by Order No. 33, dated October 1, 1952.

PROVIDED HOWEVER; that any well which produces one half ($\frac{1}{2}$) barrel, or less, of oil field brines per day shall be entirely exempt from the provisions of this order.

2. The Secretary-Director of the Commission shall have authority to extend the effective dates set forth in paragraph 1. above without notice and hearing where good cause is shown.

3. That nothing contained in this order shall be construed as prohibiting the disposal of oil field brines in impervious lined pits, provided said pits are inspected and approved by a representative of the Commission prior to being used.

4. That the Secretary-Director of the Commission shall have authority to grant exceptions without notice and hearing, to paragraph (1) above where, in his opinion, the granting of such exception would not create a hazard to any fresh water supply, provided the State Engineer has waived objection to the proposed exception.

5. That the Secretary-Director of the Commission shall appoint a committee for each area in Lea County, New Mexico, where substantial quantities of oil field brines are produced, which committees shall make studies as to whether the disposal of oil field brines in unlined pits constitutes a hazard to any fresh water source in said areas. The State Engineer shall be a member of each of said committees.

Such committees will not be required to submit formal reports of their findings to the Commission. If, however, a committee or any member thereof is of the opinion that the surface disposal of oil field brines in unlined pits constitutes a hazard to any fresh water supply, the Commission shall be so notified and the matter shall be set for hearing.

6. That paragraph (3) of Order No. R-1224 be and the same is hereby rescinded.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

S E A L
ir/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION UPON ITS OWN MOTION TO CONSIDER AN ORDER PROHIBITING THE DISPOSAL OF OIL FIELD BRINES IN SURFACE PITS IN LEA, CHAVES, ROOSEVELT, AND EDDY COUNTIES, NEW MEXICO.

CASE No. 3551
Order No. R-3221

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 19, 1967, at Hobbs, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 1st day of May, 1967, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 large amounts of water produced in conjunction with the production of oil or gas, or both, are being disposed of on the surface of the ground by means of unlined disposal pits located in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(3) That said produced water contains high concentrations of chlorides.

(4) That fresh water supplies as designated by the state engineer exist in substantially all areas where there is surface pit disposal and in substantially all the area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(5) That the disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of

the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, constitutes a hazard to existing fresh water supplies, as designated by the state engineer, in the vicinity of such disposal.

(6) That in order to afford reasonable protection against contamination of fresh water supplies as designated by the state engineer, the disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies existing in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico, should be prohibited in said Counties.

(7) That the testimony indicates that the volume of water produced in conjunction with the production of oil or gas, or both, from the North Bagley-Upper Pennsylvanian, North Bagley-Middle Pennsylvanian, North Bagley-Lower Pennsylvanian, North Bagley-Wolfcamp, and Northeast Bagley-Wolfcamp Pools, Lea County, New Mexico, and being disposed of into unlined pits is so great as to constitute an imminent threat to fresh water supplies designated by the state engineer and the surface disposal of said water should, therefore, be prohibited after October 31, 1967, in the area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(8) That large amounts of water are produced in conjunction with the production of oil from active waterflood projects and active water pressure maintenance projects.

(9) That one or more injection wells are present in each waterflood project.

(10) That in order to afford reasonable protection against contamination of fresh water supplies designated by the state engineer, the surface disposal of water produced in conjunction with the production of oil from active waterflood projects and active water pressure maintenance projects should be prohibited after December 31, 1967, in the area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(11) That complete prohibition of surface disposal in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico, of water produced in conjunction with the production of oil or gas, or both, should be accomplished by December 31, 1968, unless specifically exempted.

(12) That the surface disposal in pits of not more than one barrel per day for each developed 40-acre tract served by said pits, but limited to a maximum of 16 barrels per day, is so insignificant as to present little hazard to fresh water supplies and should be allowed in order to prevent waste caused by the premature abandonment of wells.

(13) That in order to prevent waste caused by the drowning out of oil or gas wells or burdensome delay or expenses, the District Supervisor of the appropriate District Office of the Commission should be empowered to authorize temporary disposal in surface pits for a period not to exceed 30 days for such contingencies as injection system failures and evaluation of wildcat wells.

IT IS THEREFORE ORDERED:

(1) That effective November 1, 1967, the disposal of water produced in conjunction with the production of oil or gas, or both, from the North Bagley-Upper Pennsylvanian, North Bagley-Middle Pennsylvanian, North Bagley-Lower Pennsylvanian, North Bagley-Wolfcamp, and Northeast Bagley-Wolfcamp Pools, Lea County, New Mexico, or within one mile thereof, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies, is hereby prohibited in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(2) That effective January 1, 1968, the disposal of water produced in conjunction with the production of oil from any waterflood project or water pressure maintenance projection the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies is hereby prohibited in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(3) That effective January 1, 1969, the disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies and said disposal has not

previously been prohibited by Orders Nos. (1) or (2) above, or by Order No. R-1224-A, or by Order No. R-2526, or by Order No. R-2788, or by Order No. R-3164, is hereby prohibited in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(4) That in those areas subject to the provisions of Orders Nos. (1) and (3) above, surface pits may be utilized for the disposal of a maximum of one barrel of produced water per day for each developed 40-acre tract served by said pits, provided however, that in no event shall said surface pit disposal exceed 16 barrels per day, and provided further, that this authorization shall not apply to those areas affected by Orders Nos. R-1224-A, R-2526, R-2788, or R-3164.

(5) That nothing contained in this order shall be construed as prohibiting the disposal of water produced in conjunction with the production of oil or gas, or both, in impervious lined pits presently in use, provided said pits were inspected and approved by a Commission representative prior to use, and for so long as said pits are properly maintained to ensure their continued imperviousness.

(6) That each unlined pit used for the disposal of water produced in conjunction with the production of oil or gas, or both, and not servicing a well exempt under the provisions of Order No. (4) above shall be filled, leveled, and compacted within six months after its use for the disposal of produced water is prohibited or by November 1, 1967, whichever date is later.

(7) That nothing contained in this order shall be construed as prohibiting the use and maintenance of mud pits or burn pits.

(8) That the District Supervisor of the approporate District Office of the Commission is hereby empowered to authorize temporary disposal in surface pits for a period not to exceed 30 days for such contingencies as injection system failures and evaluation of wildcat wells. Authority for said disposal shall only be granted on an individual case basis and only after the volume and quality of the water produced and the proximity of fresh water supplies have been taken into consideration.

(9) That the provisions of this order are in addition to the provisions of Order No. R-1224-A, Order No. R-2526, Order

No. R-2788, and Order No. R-3164 of the Commission and nothing herein contained shall be construed as abridging or altering in any manner the provisions of said orders.

(10) 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

S E A L

esr/

RECEIVED
MAY 12 1978
Santa Fe

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 778
ROSWELL, NEW MEXICO 88201

AREA CODE 505
622-1041

DONALD BROWN
ALVIN F. JONES

May 10, 1978

Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87503

In Re: Case No. 6222

Gentlemen:

Please find enclosed subpoena No. 2 and subpoena No. 7 for filing in the above referenced case.

Best regards,

Sincerely yours,

Alvin F. Jones

12302

CASE NO. 6222

RECEIVED
Lea Co. Sheriff's Dept.
MAY 16 1978
AM PM

SUBPOENA No. 5

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Les Clements Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

(SEAL)

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

Joe D. Ramey

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 5

RETURN OF SERVICE

County of Lea
State of New Mexico

I Jerry L. Stanley do hereby certify that I served the
State of New Mexico Energy & Minerals Dept. Oil Conservation Div.
within Subpoena No. 5 on the 6th day
August, 19 85 by delivering a copy thereof, in the county
aforesaid, in person to Paul Hamilton

Jerry L. Stanley
Deputy Sheriff

L19

12352

CASE NO. 6222

RECEIVED
Lea Co. Sheriff's Dept.

SUBPOENA No. 1

MAY 16 1978

AM 7|8|9|10|11|12|1|2|3|4|5|6 PM

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To JOHN RUNYAN Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

Joe D. Ramey

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA No. 1

RETURN OF SERVICE

County of Lea
State of New Mexico

I Jerry L. Matthews, Deputy Sheriff of Lea County, State of New Mexico, do hereby certify that I served the within Subpoena by delivering a copy thereof in Lea County, New Mexico to John Runyan.

Jerry L. Matthews
Deputy Sheriff

12352

CASE NO. 6222

SUBPOENA No. 4

RECEIVED
Lea Co. Sheriff's Dept.
MAY 16 1978
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

1-4378
208 W Oxe
400 N 18th

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Vince Balderez Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

(SEAL)

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

Joe D. Ramey

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA No. 4

RETURN OF SERVICE

Came to hand on the 12th day of May, 1978, at 4:00 o'clock P.M. and executed on the 12th day of May, 1978, at 4:30 o'clock P.M. by delivering to Vince Baldonez, Chauffeur of George Teague, Artesia, New Mexico, in person a true copy of this subpoena with the date of delivery endorsed thereon.

George Teague, Artesia, New Mexico

By Deputy Sheriff Eddy County, N.M.

12352

CASE NO. 6222

RECEIVED
Lea Co. Sheriff's Dept.
MAY 16 1978
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

SUBPOENA No. 3

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Herschel Moore Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

Joe D. Ramey

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 3

RETURN OF SERVICE

Received the within Subpoena on the 17 day of May, 88

Served the same on the 17 day of May, 88 by delivering a copy thereof to the within named GEORGE TERRELL - SHERIFF LEA CO. - DEPUTY

CASE NO. 6222

SUBPOENA No. 7

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To SHERMAN E. GALLOWAY Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

Joe D. Ramey

RETURN OF SERVICE

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

Sofia R. Gottlieb being duly sworn, upon her oath, says, I am over the age of eighteen years, I served the subpoena by delivering a copy thereof, in the aforesaid county, in person to Sherman E. Galloway

Sofia R. Gottlieb

SUBSCRIBED AND SWORN to before me this 8 day of May, 1978.

Juanita Terry
Notary Public

My Commission Expires:

2-9-79

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT IN,
LEA COUNTY, NEW MEXICO

CASE NO. 6222

SUBPOENA No. 7

CASE NO. 6222

SUBPOENA No. 2

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To JIM WRIGHT Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

Joe D. Ramey

RETURN OF SERVICE

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

Sofia R. Gottlieb being duly sworn, upon her oath, says, I am over the age of eighteen years, I served the subpoena by delivering a copy thereof, in the aforesaid county, in person to Jim Wright.

Sofia R. Gottlieb

SUBSCRIBED AND SWORN to before me this 8 day of May, 1978.

Notary Public

My Commission Expires:

2-9-79

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

CASE NO. 6222

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 2

(1)

Commission Hearing Aug 9

CASE 6222 (Rehearing)
Application of Paul Hamilton for Salt Water Disposal Well Shut-in, Lea County, New Mexico

Upon application of Paul Hamilton there will be a rehearing of Case No. 6222, Order No. R-5753. This case involves the application of Paul Hamilton for an order shutting ~~in the Texaco, Inc.~~ down salt water disposal operations in the Texaco, Inc., New Mexico State "BO" SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore-Devonian Pool, Lea County, New Mexico. Pursuant to Commission Order No. R-5753-A, evidence at said rehearing shall be limited to evidence relating to data regarding water quality and water level obtained from an observation well completed next to the aforesaid SWD Well No. 3, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6222
Order No. 5753-A

APPLICATION OF PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT-IN, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for reconsideration for a rehearing upon the petition of Paul Hamilton.

NOW, on this ____ day of July, 1978, the Commission, a quorum being present, having considered the petition for rehearing,

FINDS:

(1) That Order No. R-5753 was entered in Case No. 6222 on July 7, 1978.

(2) That the petition for rehearing in Case No. 6222 was received by the Oil Conservation Division ~~within~~ from the above-named party within the period prescribed by law.

(3) That the petitioner alleges "... that recent data regarding water quality and water level obtained from an ~~the~~ observation well completed next to ~~the~~ [Texaco New Mexico "BO" State No. 3] disposal well indicate the disposal well has leaked and is still leaking."

(4) That a rehearing should be held on Case

No. 6222, Order No. R-5753, at 9 o'clock a.m. on August 9, 1978, in the Oil Conservation ~~Commission~~ Conference Room, State Land Office Building, Santa Fe, New Mexico, to permit all interested parties to appear and present evidence ~~in~~ relating to this matter

PROVIDED HOWEVER,

That the evidence presented at said rehearing should be limited to evidence concerning the observation well referred to in Finding No. (3) above and to matters relating directly to said observation well, and to other new evidence unavailable at the time of the original hearing of this case on May 31, 1978.

IT IS THEREFORE ORDERED:

1. That Case No. 6222 be reopened and a rehearing of same be held at 9:00 o'clock a.m. on August 9, 1978, in the Oil Conservation Commission Conference Room, State Land Office Building, Santa Fe, New Mexico, at which time and place all interested parties may appear.

IT IS FURTHER ORDERED:

2. That the evidence at said rehearing shall be limited to evidence relating to ~~recent~~ data regarding water quality and water level obtained from an observation well completed next to the Texaco New Mexico "BO" State No. 3 ~~salt water~~ disposal well located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, and to other new evidence unavailable ~~at the time~~ on May 31, 1978.

IT IS FURTHER ORDERED:

3. That Commission Order No. R-5753 shall remain in full force and effect until further Order of the Commission.

DONE at

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
CUCCIO
ARNOLD
RAMEY

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: January 1974

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	312,051	4,973,878	500
TOTAL						312,051	4,973,878	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: J. W. Stanton
Company: TEXACO Inc.
Title: Assistant District Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: March 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER - BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24 34	11	32	258939	5,485,399	500
TOTAL						258,939	5,485,399	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
5)

Name: [signature]
Company: TEXACO Inc.
Title: Assistant District Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc. Disposal System: Moore Devonian

County: Lea Month: April 19 64

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	159,339	5,744,738	500
TOTAL						159,339	5,744,738	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: J. E. Chenault

Company: TEXACO Inc.

Title: Assistant District Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc. Disposal System: Moore Devonian

County: Lea Month: May 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURE
New Mexico "BO" State	3	D	21 34	11	32	180,031	6,024,769	575
TOTAL						180,031	6,024,769	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: J. B. Elkins Jr.

Company: TEXACO Inc.

Title: Assistant District Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc. — Disposal System: Moore Devonian

County: Lea — Month: June — 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURE
New Mexico "BO" State	3	D	24	11	32	270,592	6,295,361	600
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
(5)

Name: J. [illegible]

Company: TEXACO Inc.

Title: Assistant Disirict Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission

RECEIVED
AUG 16 1974
HOBBS

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: July 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURE
New Mexico "BO" State	3	D	24	11	32	281,731	6,577,092	625
TOTAL						281,731	6,577,092	

RECEIVED
AUG 22 1974
OIL CONSERVATION COMM.
Santa Fe

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
(5)

Name: [signature]
Company: TEXACO Inc.
Title: Assistant District Superintendent

Form C-120-A
3-30-10

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Hoore Devonian

County: Lea

Month: August 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURE
New Mexico "BO" State	3	D	24	11	32	289,466	6,866,558	650
TOTAL						289,466	6,866,558	

RECEIVED
SEP 26 1974
OIL CONSERVATION COMM.
Santa Fe

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: [signature]

Company: TEXACO Inc.

Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
(5)

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc. Disposal System: Moore Devonian

County: Lea Month: September 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	338,182	7,204,740	700
TOTAL						338182	7,204,740	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: J. W. Hoard

Company: TEXACO Inc.

Title: Assistant District Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: October 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	345,099	7,549,839	700
TOTAL						345,099	7,549,839	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
(5)

Name: [signature]

Company: TEXACO Inc.

Title: Assistant District Superintendent

Form C-120-A
3-30-60

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: November 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURE
New Mexico "BO" State	3	D	24	11	32	408,324	7,958,163	700
TOTAL						408,324	7,958,163	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: J. M. Bunch

Company: TEXACO Inc.

Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
(5)

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT
Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Form C-120-A
3-30-60

Disposal System Operator TEXACO Inc. Disposal System Moore Devonian

County Lea Month December 19 74

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	~~24~~ 34	11	32	359,119	8,317,282	700
TOTAL						359,119	8,317,282	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name [signature]

Company TEXACO Inc.

Title Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Memo

From

LYNN
TESCHENDORF

To File

Copies of documents mailed to Alvin Jones re: Paul Hamilton

Case 6222

OIL CONSERVATION COMMISSION-SANTA FE

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: January 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	34 20	11	32	420,999	8,738,281	
TOTAL						420,999	8,738,281	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: [signature]

Company: TEXACO Inc.

Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: February 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	426,600	9,164,881	
TOTAL						426,600	9,164,881	

RECEIVED
MAR 24 1975
OIL CONSERVATION COMM.
Santa Fe

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: [signature]

Company: TEXACO Inc.

Title: Assistant District Superintendent

MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: March 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	465,246	9,630,127	
TOTAL						465,246	9,630,127	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: J. M. Miller
Company: TEXACO Inc.
Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-120-A
3-30-60

MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: April 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	429,736	10,059,863	
TOTAL						429,736	10,059,863	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: J. M. Hendrix

Company: TEXACO Inc.

Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-128-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: May
19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	429,964	10,489,847	
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: V. Hoskins
Company: TEXACO Inc.
Title: Assistant District Superintendent

Form C-120-A
3-30-60

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: June 19

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	400,611	10,890,518	
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: [signature]
Company: TEXACO Inc.
Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-120-A
3-30-60

MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: July 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	403,433	142,93951	
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: J. M. Hollingsworth

Company: TEXACO Inc.

Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: August 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	390,855	11,684,806	
TOTAL						390,855	11,684,806	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name: [signature]

Company: TEXACO Inc.

Title: Assistant District Superintendent

Form C-120-A
3-30-60

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.
Disposal System: Moore Devonian
County: Lea
Month: September
19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	378527	12,063,333	
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: [signature]
Company: TEXACO Inc.
Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION

MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: October 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	383,777	12,442,110	
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

Name

Company: TEXACO Inc.

Title: Assistant District Superintendent

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-120-A
3-30-60

MONTHLY WATER DISPOSAL REPORT

Submit this report in triplicate to the appropriate District Office, Oil Conservation Commission.

Disposal System Operator: TEXACO Inc.

Disposal System: Moore Devonian

County: Lea

Month: November 1975

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	356,671	12,803,781	
TOTAL						356,671	12,803,781	

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Name: [signature]

Company: TEXACO Inc.

Title: Assistant District Superintendent

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File

NEW MEXICO OIL CONSERVATION COMMISSION
MONTHLY WATER DISPOSAL REPORT

Form C-120-A
3-30-60

Submit this report in triplicate to the approriate District Office, Oil Conservation Commission.

Disposal System Operator TEXACO Inc. Disposal System Moore Devonian

County Lea Month December 19 75

LEASE	WELL NO.	LOCATION UL	S	T	R	DISPOSED WATER BARRELS	CUMULATIVE DISPOSED WATER-BARRELS	AVERAGE INJECTION PRESSURES
New Mexico "BO" State	3	D	24	11	32	337,972	1314,753	
TOTAL								

I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks:
(3) NMOCC
(1) Houston
(1) Field
(1) File
(5)

Name [signature]

Company TEXACO Inc.

Title Assistant District Superintendent

Dockets Nos. 20-78 and 21-78 are tentatively set for hearing on June 7 and 21, 1978. Application for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - WEDNESDAY - MAY 31, 1978

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6234: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Corinne Grace, the Travelers Indemnity Co., and all other interested parties to appear and show cause why the following wells should not be plugged and abandoned in accordance with a Division-approved plugging program.

In Lea County:

Punch Well No. 1, Ranger Lake Well No. 1, and Ranger Lake Well No. 3, located in Units J, N, and N, respectively, of Section 11; Texas Pacific AH State Well No. 1 located in Unit F of Section 14; and Ranger SWD Well No. 1 located in Unit H of Section 15, all in Township 12 South, Range 34 East. Also Governor McDonald Well No. 1 located in Unit C of Section 20, Township 14 South, Range 36 East.

In Eddy County:

Sulphate Aunt Well No. 1 located in Unit C of Section 3 and Sulphate Uncle Well No. 1 located in Unit L of Section 23, both in Township 24 South, Range 27 East; and Sulphate Brother Well No. 1 located in Unit L of Section 3 and Sulphate Cousin Well No. 1 located in Unit E of Section 15, both in Township 25 South, Range 27 East.

CASE 6222: (Continued from May 10, 1978, Commission Hearing)

Application of Paul Hamilton for salt water disposal well shut in, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order from the Division shutting down salt water disposal operations in the Texaco Inc. New Mexico State BO SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, Moore Devonian Pool, Lea County, New Mexico. Applicant alleges said well has leaked and is leaking salt water into the shallow fresh water aquifer underlying applicant's farm.

CASE 6223: (Continued from May 10, 1978, Commission Hearing)

Application of Texas West Oil & Gas Corp. for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling the interests of Continental Oil Co. et al in connection with remedial and rework operations per proposed AFE on applicant's Madera Well No. 1 located in Unit G of Section 5, Township 24 South, Range 34 East, South Bell Lake-Morrow Gas Pool, Lea County, New Mexico. Also to be considered will be the costs of said workover operations and the allocation of said costs as well as a charge for risk involved in the workover operations.

CASE 6224: (Continued from May 10, 1978, Commission Hearing)

Application of Texas West Oil & Gas Corp. for a gas well shut-in order, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order shutting in the Continental Oil Co. Bell Lake Unit Well No. 14, located in Unit F of Section 5, Township 24 South, Range 34 East, South Bell Lake-Morrow Gas Pool, Lea County, New Mexico, pending completion of workover operations on applicant's Madera Well No. 1, located in Unit G of said Section 5.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

May 19, 1978

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

Sheriff of Lea County
805 N. Linam
Hobbs, New Mexico 88240

Re: Case No. 6222
Application of Paul Hamilton

Gentlemen:

Please serve the enclosed Subpoena Duces Tecum for John Gannon prior to May 26, 1978. Any bill for services rendered can be sent to Mr. Alvin Jones at P. O. Box 776, Roswell, New Mexico 88201. The original Subpoena should be returned to my office with the Return of Service completed.

Thank you.

Very truly yours,

(Ms.) LYNN TESCHENDORF
General Counsel

LT/dr

cc: Alvin F. Jones
Harold Hensley

CASE NO. 6222

SUBPOENA No. 1

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To JOHN RUNYAN Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

_____

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA No. 1

CASE NO. 6222

SUBPOENA No. 2

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To JIM WRIGHT Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

_____

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 2

CASE NO. 6222

SUBPOENA No. 3

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Herschel Moore Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

_____

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR
SALT WATER DISPOSAL WELL SHUT IN,
LEA COUNTY, NEW MEXICO

SUBPOENA No. 3

CASE NO. 6222

SUBPOENA No. 4

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Vince Balderez Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA No. 4

CASE NO. 6222

SUBPOENA No. 5

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Les Clements Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 1978.

(SEAL)

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 5

CASE NO. 6222

SUBPOENA No. 6

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To _____ Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 1978.

(SEAL)

_____

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 6

CASE NO. 6222

SUBPOENA No. 7

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Sherman Galloway Greeting:

We command you to be and appear May 31, 1978 at 9 A.M. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton

And this do you under penalty of the law.

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 27th day of April, 19 78.

(SEAL)

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT IN, LEA COUNTY, NEW MEXICO

SUBPOENA No. 7

CASE NO. 6222

SUBPOENA DUCES TECUM no. 8

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To John Gannon Greeting:

We command you to be and appear May 31, 1978, at 9:00 a.m. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton and also that you bring with you and produce at the time and place aforesaid any and all records pertaining to the New Mexico "BO" State Well No. 3 located in Unit D of Section 24, Township 11 South, Range 32 East.

And this do you under penalty of the law

SEAL

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 19th day of May, 1978.

Joe D. Ramey

RETURN OF SERVICE

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON
FOR SALT WATER DISPOSAL WELL
SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA DUCES TECUM NO. 8

CASE NO. 6222

SUBPOENA DUCES TECUM NO. 9

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

To Billy C. Jones Greeting:

We command you to be and appear May 31, 1978, at 9:00 a.m. before the Oil Conservation Commission of the State of New Mexico, at The Oil Conservation Commission Conference Room in the State Land Office Building, in the City of Santa Fe, then and there to testify in the Case of Paul Hamilton for Salt Water Disposal Well Shut In, Lea County, New Mexico, on behalf of Paul Hamilton and also that you bring with you and produce at the time and place aforesaid any and all records pertaining to the New Mexico "BO" State Well No. 3 located in Unit D of Section 24, Township 11 South, Range 32 East.

And this do you under penalty of the law

SEAL

WITNESS JOE D. RAMEY, Member of the Oil Conservation Commission of the State of New Mexico, and the seal of said Commission, this 19th day of May, 19 78.

Joe D. Ramey

CASE NO. 6222

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

COUNTY OF SANTA FE

APPLICATION OF: PAUL HAMILTON
FOR SALT WATER DISPOSAL WELL
SHUT IN, LEA COUNTY, NEW MEXICO.

SUBPOENA DUCES TECUM NO. 9

RETURN OF SERVICE

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

May 19, 1978

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

Sheriff of Lea County
Lea County Courthouse
Lovington, New Mexico

Re: Case No. 6222
Application of Paul Hamilton

Gentlemen:

Please serve the enclosed Subpoena Duces Tecum for Bill C. Jones prior to May 26, 1978. Any bill for services rendered can be sent to Mr. Alvin Jones at P. O. Box 776, Roswell, New Mexico 88201. The original Subpoena should be returned to my office with the Return of Service completed.

Thank you.

Very truly yours,

(Ms.) LYNN TESCHENDORF
General Counsel

LT/dr

cc: Alvin F. Jones
Harold Hensley

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

May 15, 1978

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

Mr. Harold Hensley
Hinkle, Cox, Eaton, Coffield
and Hensley
P. O. Box 10
Roswell, New Mexico 88201

Re: Case No. 6222
Application of Paul Hamilton

Dear Mr. Hensley:

Enclosed at your request is a copy of the "application of Paul Hamilton for an order requiring shut in and plugging of Texaco Inc. salt water disposal well located in the Moore Devonian Pool, Lea County, New Mexico."

Please let me know if I can be of further assistance.

Very truly yours,

LYNN TESCHENDORF
General Counsel

LT/dr

cc: Alvin F. Jones

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

AREA CODE 505
622-1041

DONALD BROWN
ALVIN F. JONES

May 4, 1978

Ms. Lynn Teschendorf
General Counsel
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Dear Ms. Teschendorf:

Please be advised that Subpoena No. 7 has been issued to Sherman E. Galloway of the New Mexico State Engineers office.

Best regards,

Sincerely yours,

Alvin F. Jones

AFJ:srg

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

May 2, 1978

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

Mr. Alvin Jones
Donald Brown, P.A.
P. O. Box 776
Roswell, New Mexico 88201

Re: Case No. 6222

Dear Mr. Jones:

I've enclosed seven subpoenas in the above-referenced case. Two are blank and the other five are for John Runyan, Jim Wright, Herschel Moore, Vince Balderez, and Les Clements. Please do not serve the blank subpoenas without prior notice to the Commission.

The subpoenas are to be served in accordance with Rule 45 of the New Mexico Rules of Civil Procedure.

Very truly yours,

LYNN TESCHENDORF
General Counsel

LT/dr

cc: Harold Hensley

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

April 28, 1978

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

Mr. Alvin Jones
Donald Brown, P.A.
P. O. Box 776
Roswell, New Mexico 88201

Re: Case No. 6222

Dear Mr. Jones:

Enclosed are copies of Texaco's C-120-A's for 1974 and 1975 for the New Mexico "BO" State Well No. 3 in Unit D, Section 24, Township 11 South, Range 32 East. As I told you on the phone, all prior forms have been destroyed by the State Records Center.

Please let me know if I can be of further assistance.

Very truly yours,

LYNN TESCHENDORF
General Counsel

LT/dr

cc: Harold Hensley

DONALD BROWN, P. A.
ATTORNEYS AT LAW
916 SECURITY NATIONAL BANK BUILDING
POST OFFICE BOX 776
ROSWELL, NEW MEXICO 88201

DONALD BROWN
ALVIN F. JONES

AREA CODE 505
622-1041

April 24, 1978

Mr. Joe Ramey, Director
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87503

In Re: Case No. 6222

Dear Mr. Ramey:

We would ask that the Commission at this time issue subpeonas for the following named individuals. We will see to their service. Mr. John Runyan of the Hobbs office of the OCD; Mr. Jim Wright of the State Engineers office in Roswell; Mr. Herschel Moore, Tatum, New Mexico; Mr. Vince Balderez of Lovington, New Mexico; and Mr. Leslie Clemens of the OCD office in Hobbs, New Mexico. There may be other witnesses, but for the moment these are the folks that we would like placed under subpeona at the earliest opportunity.

If you would, have your staff send the subpeonas to us and we will get them out from here. If it is permissable, we would like simply to be able to serve the OCD witnesses by mail.

Best regards,

Sincerely yours,

Alvin F. Jones

AFJ:srg

See Rule 45(c)

ROUGH

dr/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

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

CASE NO. 6222

Order No. R-5753

APPLICATION OF PAUL HAMILTON FOR SALT WATER DISPOSAL WELL SHUT-IN, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:00 a.m. on May 31, 1978, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of June, 1978, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 Texaco, Inc., New Mexico "BO" State Well No. 3 located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, is an active salt water disposal well authorized by Division Order No. R-4422.

(3) That ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source.

(4) That the applicant in this case, Paul Hamilton, is the surface owner in the vicinity of the aforesaid Texaco New Mexico "BO" State SWD Well No. 3, and seeks an order from the Commission shutting in said well, alleging that said well has been and still is the source of contaminants in the ground water.

said

(5) That the evidence presented is inconclusive as to whether that the subject well has ever leaked injected fluids (salt water) to the ground water in the area.

(7) That the evidence presented in this case fails to establish that the subject well is now leaking injected fluids to the ground water in the area.

(6) That recent tests conducted on said well indicate the well to be mechanically sound.

~~(6) That the evidence presented in this case fails to establish the source or sources of the contaminants present in the ground water in the area.~~

(8) That the application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Paul Hamilton for an order shutting in the Texaco, Inc., New Mexico State "BO" State SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, be and the same is hereby denied.

(9 Jun.

ROUGH

dr/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

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

CASE NO. 6222 REHEARING

Order No. R-5753-B

APPLICATION OF PAUL HAMILTON
FOR SALT WATER DISPOSAL WELL
SHUT-IN, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. and was continued to March 15, 1979, on August 23, 1978, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of _____, 1979, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 Texaco, Inc., New Mexico "BO" State Well No. 3 located in Unit D, Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, is an active salt water disposal well authorized by Division Order No. R-4422.

(3) That ground water in the vicinity of the subject well has been contaminated by the intrusion of brine water from an outside source.

(4) That the applicant in this case, Paul Hamilton, is the surface owner in the vicinity of the aforesaid Texaco New Mexico "BO" State SWD Well No. 3, and seeks an order from the Commission shutting in said well, alleging that said well has been and still is the source of said contaminants in the ground water.

(5) That upon receipt of the application of Paul Hamilton in this matter, the same was set for hearing on May 31, 1978, before the Commission.

(6) That the evidence presented at the aforesaid May 31 hearing of this case established that there is an area in the general vicinity of the subject salt water disposal well in which there is an apparent anomalous "nose" in the water levels in the Ogallala formation, and also an unnatural concentration of chloride in the ground waters in the basal Ogallala.

(7) That there was no definitive evidence presented at said May 31 hearing that the subject well had leaked or was leaking injected fluids (salt water) into the Ogallala formation in the area, or that said well was or had been a contributory factor to the aforesaid "nose" and chloride concentration in the Ogallala water, but there was evidence which indicated that the well is mechanically sound.

(8) That subsequent to said hearing the Commission entered Order No. R-5753 denying said application.

(9) That subsequent to the entry of said Order No. R-5753, Paul Hamilton filed timely application for Rehearing of Case No. 6222.

(10) That the matter came on for Rehearing on August 23, 1978.

(11) That although water levels in wells drilled to the contaminated ground water in the " nose " described in Finding No. (6) above had declined subsequent to the May 31, 1978, hearing and prior to the August 31, 1978, hearing, such decline cannot be accepted as evidence that the subject well had previously leaked and was no longer leaking, inasmuch as said decline could very well be the result of ~~a build up in water levels "downstream"~~ the stabilization of the ground water gradient in the Ogallala formation due to cessation of pumping ~~from the Ogallala in the~~ "downstream" ~~area~~ from said "nose."

(12) That in order to further evaluate the subject well and to further examine its integrity and to more definitely ascertain whether it is in communication with and leaking into the Ogallala formation, the Commission, at the August 31, 1978, hearing, ordered the injection of a traceable substance into the well and careful monitoring of a nearby observation well, and continued the case to March 15, 1979.

(13) That a radioactive material (Iodine 125) was injected into the subject well and the Ogallala ground water from the nearby observation well was monitored for approximately two months.

(14) That no radioactivity from the Iodine 125 was detected in the Ogallala ground water at any time during the two-month monitoring period.

(15) That a wide variety of tests have been conducted on the subject well, and all tests to date show that the casing, cement, and tubing in the well are sound, and that there is no channeling of saltwater from the disposal zone into the Ogallala formation.

(16) That although the specific cause of the "nose" in the Ogallala water table, as described in Finding No. (6) above, and the source of the chloride concentration, also as described

in Finding No. (6), cannot be determined, there is no reason to believe that the continued disposal of produced salt water into the subject well is having or will have any detrimental effect on the ground waters in the Ogallala formation, and the denial of the application in this case, as decreed by Order No. R-5753, should be affirmed.

(17) That the affirmation of said Order No. R-5753 will not cause waste nor impair correlative rights, nor unreasonably endanger fresh water supplies.

(18) That in order to ensure the continued integrity of the subject well as a salt water disposal well, the Hamilton observation well located immediately southeast of the subject well should be monitored monthly for water levels and chloride content.

IT IS THEREFORE ORDERED:

(1) That Order No. R-5753, entered July 7, 1978, in Case No. 6222, denying the application of Paul Hamilton for an order shutting in the Texaco, Inc., New Mexico State "BO" State SWD Well No. 3, located in Unit D of Section 24, Township 11 South, Range 32 East, NMPM, Lea County, New Mexico, be and the same is hereby affirmed.

(2) That the applicant, Paul Hamilton, and the operator of the aforesaid salt water disposal well, Texaco, Inc., in conjunction with the supervisor of the Hobbs District Office of the Division, shall arrange to have unauthorized access into the Hamilton observation well located some 30 to 50 feet southeast of the disposal well precluded by a mutually agreeable sealing and locking mechanism.

(3) That the Ogallala water level in said observation well shall be determined within the first ten days of each month, and a water sample also taken, and the water level and chloride content of the water reported to the Division Director within ten days.

(4) That Hamilton, Texaco, and the Division's District Supervisor shall agree upon a mutually satisfactory procedure for obtaining such water levels and water samples, and the chloride analysis shall be performed in the Hobbs District Office of the Division.

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

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