BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE No. 4047
Order No. R-3725

APPLICATION OF LARRY C. SQUIRES
FOR AN EXCEPTION TO ORDER NO.
R-3221, AS AMENDED, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 19, 1969, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 16th day of April, 1969, 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 effective January 1, 1969, Order (3) of Commission Order No. R-3221, as amended, prohibits in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico, the disposal, subject to minor exceptions, 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 would constitute a hazard to any fresh water supplies and said disposal has not previously been prohibited.

(3) That the aforesaid Order No. R-3221 was issued in order to afford reasonable protection against contamination of fresh

water supplies designated by the State Engineer through disposal of water produced in conjunction with the production of oil or gas, or both, in unlined surface pits.

(4) That the State Engineer has designated, pursuant to Section 65-3-11 (15), N.M.S.A., 1953 Compilation, all underground water in the State of New Mexico containing 10,000 parts per million or less of dissolved solids as fresh water supplies to be afforded reasonable protection against contamination; except that said designation does not include any water for which there is no present or reasonably foreseeable beneficial use that would be impaired by contamination.

(5) That the applicant, Larry C. Squires, seeks an exception to the provisions of the aforesaid Order (3) to permit the disposal of water produced in conjunction with the production of oil or gas, or both, in three natural salt lakes located in Lea County, New Mexico, as follows:

> Laguna Plata, sometimes referred to as Laguna Grande, located in Sections 2, 3, 9, 10, and 11, Township 20 South, Range 32 East, NMPM;
>
> Laguna Gatuna, sometimes referred to as Salt Lake, located in Sections 7, 17, 18, 19, and 20, Township 20 South, Range 33 East, NMPM;
>
> Laguna Tonto, located in Sections 32 and 33, Township 19 South, Range 33 East, and Section 4, Township 20 South, Range 33 East, NMPM.

(6) That the subject lakes are situated within the confines of a synclinal feature.

(7) That the water in the aforesaid three lakes is not fresh water.

(8) That that portion of the Triassic red beds underlying said three lakes is virtually impermeable and therefore prevents seepage from said lakes into the sand stringers within said red beds which may contain fresh water.

(9) That as to sands that are in communication with said lakes, the evidence indicates that the major flow of surface and subsurface water within the boundaries of said synclinal feature is toward the subject lakes.

(10) That the evidence indicates that there is no leakage of water from said Laguna Plata and Laguna Gatuna into the adjoining formations.

(11) That the evidence indicates that there may be some leakage of water from said Laguna Tonto into the adjoining formations to the southeast, thence southwestward toward Laguna Gatuna.

(12) That the utilization of Laguna Plata and Laguna Gatuna for the disposal of water produced in conjunction with the production of oil or gas, or both, will not constitute a hazard to fresh water supplies that may exist in the vicinity of said lakes.

(13) That the utilization of Laguna Tonto for the disposal of water produced in conjunction with the production of oil or gas, or both, may constitute an additional threat of contamination of fresh water supplies as designated by the State Engineer existing to the southeast of said lake.

(14) That the evidence indicates that commercial deposits of sodium sulphate ($Na_2 SO_4$) may exist in and/or near the three subject lakes.

(15) That disposal of produced salt water into Laguna Plata and Laguna Gatuna will not interfere with the testing required to determine if there are commercial deposits of sodium sulphate in and/or near the said three lakes.

(16) That said disposal prior to actual mining operations will not impair the value of said sodium sulphate nor render its recovery more difficult.

(17) That this case should be reopened upon the motion of the Commission or any other interested party whenever tests have been conducted which indicate to a substantial degree that commercial deposits of sodium sulphate probably exist in and/or near the subject lakes, at which time all interested parties should be prepared to appear and show cause why continued disposal in said lakes should or should not be allowed.

(18) That the applicant should be authorized to utilize Laguna Plata and Laguna Gatuna for the disposal of water produced in conjunction with the production of oil or gas, or both.

(19) That the request of the applicant to utilize Laguna Tonto for the disposal of water produced in conjunction with the production of oil or gas, or both, should be denied.

IT IS THEREFORE ORDERED:

(1) That the applicant, Larry C. Squires, is hereby granted an exception to Order (3) of Commission Order No. R-3221, as amended, to dispose of water produced in conjunction with the production of oil or gas, or both, in two natural salt lakes located in Lea County, New Mexico, as follows:

> Laguna Plata, sometimes referred to as Laguna Grande, located in Sections 2, 3, 9, 10, and 11, Township 20 South, Range 32 East, NMPM;
>
> Laguna Gatuna, sometimes referred to as Salt Lake, located in Sections 7, 17, 18, 19, and 20, Township 20 South, Range 33 East, NMPM.

(2) That the application of Larry C. Squires to utilize Laguna Tonto, located in Sections 32 and 33, Township 19 South, Range 33 East, and Section 4, Township 20 South, Range 33 East, NMPM, Lea County, New Mexico, for the disposal of water produced in conjunction with the production of oil or gas, or both, is hereby denied.

(3) That the Commission may by administrative order rescind such authority whenever it reasonably appears to the Commission that such rescission would serve to protect fresh water supplies from contamination.

(4) That this case shall be reopened upon the motion of the Commission or any other interested party whenever tests have been conducted which indicate to a substantial degree that commercial deposits of sodium sulphate probably exist in and/or near the aforesaid lakes, at which time all interested parties should appear and show cause why continued disposal in said lakes should or should not be allowed.

(5) That the first person to determine to a substantial degree by tests that commercial deposits of sodium sulphate probably exist in and/or near said lakes shall so notify the Commission, setting forth in writing the supporting facts,

whereupon the Commission shall give notification for the reopening of this case.

(6) 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

ALEX J. ARMIJO, Member

S E A L

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

esr/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 8292
Order No. R-3725-A

APPLICATION OF POLLUTION CONTROL INC.
FOR AN AMENDMENT TO DIVISION ORDER
NO. R-3725, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:00 a.m. on August 8, 1984, before Examiner Richard L. Stamets.

NOW, on this 20th day of August, 1984, the Division Director, having considered the testimony, the records, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Pollution Control Inc., has been operating a surface salt water disposal facility at Laguna Gatuna and more specifically at the NE/4 NW/4 of Section 18, Township 20 South, Range 32 East, NMPM, Lea County, New Mexico, as an exception to Division Order No. R-3221, under the terms and conditions of Division Order No. R-3725.

(3) That the applicant now seeks the amendment of said Order No. R-3725 to permit the use of a second salt water disposal site on Laguna Gatuna in the SW/4 SW/4 of Section 17 in said township and for authorization to dispose of solid oil-field waste products including drilling mud and cuttings at either or both sites.

(4) That applicant proposes to utilize the expanded facility at a rate combined with its existing Laguna Gatuna facility so that the total combined discharge from both sites does not exceed 30,000 barrels of salt water per day.

(5) That the geohydrologic evidence presented in this case reaffirms or establishes that:

(a) Laguna Gatuna is sited within the confines of a collapse structure;

(b) naturally occurring highly mineralized springs are located on the periphery of Laguna Gatuna;

(c) the water in Laguna Gatuna is not fresh water;

(d) that portion of the Triassic red beds underlying said Laguna Gatuna is virtually impermeable and therefore prevents seepage from said lake into the sand stringers within said red beds which may contain fresh water;

(e) as to sands that are in communication with said lake, the major flow of surface and subsurface water within the boundaries of said collapse structure is towards Laguna Gatuna;

(f) the evidence indicates that there is no leakage of water from Laguna Gatuna into the adjoining formations containing fresh waters;

(g) the salt springs and brine associated with Laguna Gatuna are more highly mineralized than water collected from oil wells in the immediate area;

(h) Laguna Gatuna is a suitable disposal site for as much as 30,000 barrels of brine per day;

(i) there is no evidence that the fifteen years of operation by Pollution Control Inc has adversely impacted the hydrological system in the vicinity of Laguna Gatuna and that continued operations as proposed will not endanger the pre-1969 conditions;

(j) Laguna Gatuna is a satisfactory repository for solid oil-field waste products; and,

(k) the utilization of Laguna Gatuna for the disposal of water produced in conjunction with the production of oil or gas, or both, and oil field waste products, including drill cuttings and drilling muds will not constitute a hazard to fresh water supplies that may exist in the vicinity of said lake.

(6) That the applicant should be authorized the proposed expansion of its disposal operations at Laguna Gatuna.

IT IS THEREFORE ORDERED:

(1) That the applicant, Pollution Control Inc., is hereby authorized the expansion of its Laguna Gatuna disposal operation by approval of a second disposal site located in the SW/4 SW/4 of Section 17, Township 20 South, Range 32 East, NMPM, Lea County, New Mexico, and for disposal of solid oil-field wastes including drilling mud and cuttings at this and/or the original disposal site.

PROVIDED HOWEVER, that the total disposal rate of salt water into Laguna Gatuna at both sites shall not exceed 30,000 barrels per day.

PROVIDED FURTHER, that the applicant shall not permit any oil from the disposal operations to migrate to the surface of Laguna Gatuna and shall contain any oil contaminated waste products in earthen structures at the disposal sites.

(2) That jurisdiction of this cause is 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.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JOE D. RAMEY,
Director

S E A L

Don Stevens, Socorro
asked for this
re PetroThermo
application

This is the hydrologist's
testimony in Case
4047

Call 8781

Case 4047
Exception to Order R3221
3/19/69

A They told me to go ahead and file a special land use permit. I told them what I wanted to do, and they said that whatever the Oil Conservation Commission said, that it was fine with them.

Q You haven't as yet received the permit, is that correct?

A No, sir, it is pending the outcome of this hearing, as I understand it.

MR. KELLAHIN: That is all.

MR. PORTER: Does anyone else have a question? The witness may be excused.

ED L. REED

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q State your name, please.

A My name is Ed L. Reed.

Q What business are you engaged in, Mr. Reed?

A I am a consulting hydrologist.

Q Where are you located?

A Midland, Texas.

Q Have you done hydrological work in the State of New

Mexico?

A Yes, sir.

Q Have you ever testified before the Oil Conservation Commission of New Mexico, and made your qualifications a matter of record?

A Yes, sir.

MR. KELLAHIN: Would the Commission care to hear the witness's qualifications?

MR. PORTER: The Commission considers Mr. Reed qualified, Mr. Kellahin, since his qualifications have been made a matter of record.

However, if Mr. Matkins would like to question Mr. Reed, why, that is all right.

MR. MATKINS: Is it a matter of having him qualified as an expert in hydrology?

MR. KELLAHIN: That's correct.

MR. MATKINS: I have no objection to that.

Q (By Mr. Kellahin) Mr. Reed, are you familiar with the application of Larry C. Squires in Case 4047 before the Commission at the present time?

A Yes, sir.

Q Have you done some work for Mr. Squires in connection with this application?

A I have.

Q Did you make an investigation of the three lakes involved in this application?

A Yes, I did.

Q Did you personally visit those lakes and make an inspection on the ground?

A Yes, sir.

Q Have you made a study of the subsurface information that is available in this area?

A Yes, I have.

Q Would you state for the Commission just what procedures you followed in making this study?

A Procedures we followed in examining the area of the three salt lakes was, first, to go to the published literature on this area, principally the Bureau of Mines publications in Lea County and Eddy County, produced in cooperation with the United States Geological Survey.

We then went to the well inventory records and maps of the State Engineer's Office in the four townships embraced by these four lakes, and examined the well inventory records, water level measurements, and chemical analysis data, and total depths of wells drilled within the four-township area.

We examined the two topographic quadrangle maps which

cover this area. We secured radiation logs and electrical logs on most of the oil wells that have been drilled in the four-township area; and from this data constructed two contour maps which are presented on one map, the upper one being the top of the Triassic sequence, which had previously been mapped by the U.S.G.S.; and a second contour map on the top of the Rustler, which would, for all practical purposes, be the base of the Triassic sequence.

We made two trips to the field, and examined on the ground in detail the three lakes, walking around substantial portions of the three. In the course of this field investigation, samples of springs were secured, samples of water in the lake, and soil in one of the lakes was secured. Additional water level measurements were made in wells which were still open and could be measured. Two additional water well samples were secured, and analyses made of this data.

Triassic outcrops were examined in Laguna Gatuna, which had not previously been so indicated on the reports in the Lea County Report, which is Report No. 6 of the State Bureau of Mines and Mineral Resources.

Earlier chemical analyses of wells, springs, and surface water which had been secured both by Mr. Kellahin and Mr. Squires were examined, and all of this data has been put on

a map, a composite map reflecting the total knowledge that we have of the geology and the groundwater of this area.

Q Will you have that marked as Exhibit 1, please?

Mr. Reed, directing your attention to Applicant's Exhibit 1, would you identify that exhibit?

A Yes, I will. Exhibit Number 1 is a sectionized map of Townships 19 and 20 South, Ranges 32 and 33 East. On this map, I have shown in blue the outline of the three salt lakes, Laguna Gatuna, Laguna Plata, and Laguna Tonto. A fourth lake which has been filled in, Laguna Toston, is also indicated.

I have shown on the map in yellow, contours reflecting the top of the Triassic; and in the broad dashed lines, contours on the top of the Rustler.

I have posted on the map all of the water wells, and all of the springs which I have any knowledge of, either from personal visits or from inventory records of the State Engineer's Office. I have indicated by a half circle those wells which we think are producing from Quaternary alluvial sediments, as distinguished from wells producing from Triassic sands.

On each of the wells, I have posted all of the data which is available, including the elevation where it is available, the total depth of the well, the water level where

available, and partial chemical analysis where available. Now, I have outlined in blue the water level elevations of those wells producing from Quaternary alluvial sands. I have indicated with red underlying those, water samples which are considered brackish or too high in chlorides or sulfates, or both, to be useful in domestic or stock purposes.

I have indicated in black, the areas of Triassic outcrops, the large one which is at the north side of Laguna Plata, three smaller areas which I have examined on the west side and south side of Laguna Gatuna. Finally, I have indicated with blue areas the general direction of groundwater movement in the shallow Quaternary alluvial sediment as determined from water level data in those wells.

Very briefly, this area is west of the most westerly outcrop of Ogalalla sediments, with the possible exception of an outlayer of Ogalalla to the southeast some several miles. The eastern edge of the -- the western edge of the Ogalalla would be along the so-called Mescalero Ridge at Monument. There are some remnants of Ogalalla material on the west side of Laguna Gatuna above the water table, very thin remnants of Ogalalla material as outlined, but well above the water table.

Groundwater in this area is contained in sediments of two different geological ages. Most of the water is derived,

and most of the potable water is derived from Triassic sands and gravels to depths of 600 or 700 feet below the land surface. In isolated areas, low areas, there are thin sequences of Quaternary alluvial sands above the Triassic, which produce good quality water.

The area structurally is occupied by a broad synclinal trough, as reflected at the top of the Triassic; this being the 3,500-foot contour, the 3,450-foot contour, a broad synclinal area, the lowest part of which is in the area of Laguna Plata, and the other two lakes being in the central portion of what is the regional synclinal area. The Triassic rises significantly to the southeast, culminating in a major northeast-southwest trending ridge, which is off the map, which serves to separate a southeasterly basin hydrologically from groundwater in this area. This northeast-southwest trending ridge extends clear over to the Ogalalla outcrop, and has been described in the U.S.G.S. Bureau of Mines Bulletin.

As far as the area of immediate concern, the area of immediate interest is concerned, the elevation of the Triassic, at least to this point where the Triassic is at an elevation of 3,600 feet, and perhaps to this point --

Q Would you state what point, Mr. Reed?

A The point extending diagonally across the central

portion of 20 South, 33 East, the Triassic would be above the regional water level in the Quaternary alluvial section. This Triassic ridge has had the effect of diverting the movement of water in the Quaternary from what would perhaps be a southerly direction to a southwesterly direction, there being no water over this Triassic ridge, Triassic divide. The general movement of water in the Quaternary section then would be from north to south, to southwest, the direction being diverted by this structural arch. The Rustler or the base of the Triassic dips to the east. The top of the Triassic, of course, is dipping to the west, as I have explained. This results in a divergence of the top of the Triassic, the top of the Rustler sequence going easterly, the interval on the top of the Triassic to the top of the Rustler is of the order of 850 feet on the west side of the area up to 1,400 feet on the east side.

I think this is a little bit more than academic, in that there has been some suggestion that the waters discharging into Laguna Gatuna, for example, might be leaking out of Laguna Gatuna into the Rustler. I think it is significant that Laguna Gatuna is underlain by a slump structure in the Rustler, involving undoubtedly solution of the underlying salado, and collapse of the Rustler sequence, and an overthickening of the Triassic in the same area.

This is a phenomenon that has been observed in other areas. For example, in the Half Way oil fields to the west, I studied slump structure of this same type, somewhat the same magnitude in 1943, where the Triassic has thickened to accommodate an additional thickness or additional elevation resulting from the solution and collapse of the underlying Rustler sequence. This solutioning and collapse of the Rustler would, of necessity, have taken place prior to or during the deposition of the Triassic. We now have in this area some 1,300 feet of Triassic sediment between the surface and the top of the Rustler, with Triassic still outcropping around the margin of Laguna Gatuna, even though there has been substantial solution and slumping of the Rustler.

Q Would that prevent any leaking of the Laguna Gatuna into the Rustler?

A Yes, because of the great thickness of impermeable playas into the Triassic sequence. The three lakes which we are discussing, Laguna Plata, Laguna Tonto, and Laguna Gatuna are true playas in that they are water table lakes, they are areas in which the land surface has been depressed to the point of intersection with the water table, and are receiving groundwater discharge both at the surface and by underflow, and discharging the water by evaporation. They are also

receiving surface water influx, which is discharged by evaporation. These are lakes of interior drainage, and as a result of no significant outlet, have accumulated thicknesses which, as far as I am concerned, of evaporides, particularly gypsum, calcium sulfate, magnesium sulfate, sodium sulfate, and sodium chloride, at least at the surface, of a typical lake deposit, fine-grained, highly organic.

Groundwater is discharging into Laguna Plata from the northeast. We have examined four springs. There are others, smaller ones, but we have examined four springs discharging into the northeast side of Laguna Plata, and we have had these samples analyzed, and the records of analyses will go into the record, by Southwestern Laboratories of Midland. The springs are generally of the same concentration, chlorides of the order of 7,500 to 8,000 parts per million; sulfates, 11,755 to 12,743; high both in chlorides and sulfates.

A shallow well, Well No. 13, on Mr. Squires' land, was drilled some years ago. This well has been abandoned, because it was not potable. We do not have an analysis of it, and it cannot be entered.

A well between Laguna Plata and Laguna Gatuna, Well No. 33, which was drilled to 130 feet, has a chloride concentration of 9,744, a sulfate concentration of 1,878, which would no

be considered potable.

A Triassic well on the northwest side of Laguna Gatuna with a deep water level, a water level of about 250 feet, nevertheless has a high chloride sulfate concentration, chlorides are 21,000 and a little more, the sulfates about 3,900.

There are two springs on the west side of Laguna Gatuna discharging into the lake. One which I have identified as No. 55 has a chloride concentration of 27,657, and sulfate concentration of nearly 38,000.

To the northeast, No. 56, the chlorides are about 11,000, and the sulfates nearly 14,000.

MR. PORTER: Is that a spring?

THE WITNESS: That is a spring. Now, I wish to point out that some of this water in the two springs, and some of the dissolved solids may be derived from a salt water disposal pit, which is situated just to the north and a little west of Spring 56, and which theoretically would seep out of the pipe and move southward toward this little arm or bay of Laguna Gatuna; and it is not possible to determine to what extent this spring flow is derived from the pits, or to what extent it is of consequence, except to say that the sulfate concentration of 37,979 is more than ten times as much as the sulfate concentration in the produced brines in this general field area. Brine in the oil well

to the north has a sulfate concentration of 2,250. Here is one well at 5,500, another oil well with sulfate concentration of 2,600.

MR. PORTER: So all the pit water could do would be to serve to dilute, as far as sulfates are concerned?

THE WITNESS: This is correct. It would also serve to dilute, as far as the chlorides are concerned, because the brines in the salt lake field, based upon the analysis we have, is substantially lower than the chlorides in the springs.

In the Bass No. 1, the chlorides are 6,600, the sulfates are 2,600.

In the Well T-74, which is another spring and can be related directly from the chemical analysis sheet, the chlorides are 5,900, the sulfates are 2,250.

The Well T-73, the chlorides are 6,700, the sulfates are 3,200. This seems to be about an average concentration of the brines in the field that could relate to the quality of water in the spring.

There is another spring on the south side of Laguna Gatuna south of the highway, which was sampled in October of 1968 -- not by me, but analysis furnished to me -- with a chloride concentration of 51,736, the sulfate concentration of 73,590. In attempting to duplicate this and get as near the

same locality as possible, we went into a ravine south of the highway, a tributary to Laguna Gatuna, and on one week in February of this year it was dry. We dug a hole and got very little water, insufficient to sample. We returned a week later and found water in the hole after a rain, which may have contributed some, but obviously not much. We took a sample then from this locality south of the highway, south of the bridge, and in February of this year the chlorides were 163,105, and the sulfates were 24,594. At the same time, a hole was dug north of the highway, north of the bridge, at the early date, and in a sample a week later the chlorides were 12,333, sulfates were 24,273.

We took another sample in February on the other southeast side of the lake, some standing water, the chlorides were 66,600, the sulfates were 29,728.

A sample taken somewhere in the lake -- and I can't give you an exact location for it, I put it in the middle because I don't know precisely where it was taken -- in 1968, had a chloride concentration of 158,000, and a sulfate concentration of 125,000.

Going then to -- well, let me summarize. In the case of Laguna Gatuna, we have Triassic outcrops along the northwest side which I have observed. Incidentally, an oil well at this

point has a water level almost precisely equal in elevation to the top of the Triassic, a very fine alluvial section discharging directly into the lake on top of the Triassic, Triassic outcrops in the west central part of the lake and just south of the spring sample south of the highway. I can't say that there are continuous Triassic outcrops along the west side of the lake, because most of it is covered and cannot be determined except by drilling.

The east side of the lake below the ridge just at the break of the hills coming out of the lake has a deposit of red sands which are derived from the Triassic. I would like to say they are bedded Triassic sands, but they are not. They are reworked Triassic sands. The indication is that the Triassic is near the surface on the east side of the lake, but I could not find any bedded material.

Going on to Laguna Tonto, I found no fresh water springs discharging into Laguna Tonto. Laguna Tonto is a deep lake, a small lake, substantial bluffs around it. There is an area on the northeast side which I walked to, where there are substantial oval travertine deposits situated at an elevation of ten or twelve feet above the present bed of the lake. These travertine deposits are spring deposits; they are evidences of at one time fresh water discharge into the lake at a time when

the water table was at least ten feet, perhaps higher, regionally than it is today.

Examining these travertine deposits would suggest that these springs have not been active for many years, perhaps a hundred years, perhaps longer. However, there are Indian remains around those springs, in further substantiation of the existence of at one time fresh water. This is characteristic that the water table has declined many hundred feet in the last hundred years.

We were not able to get a water sample, because it was just entirely too soft to get out, but we did take a sample of soil in the north part of the lake, and had a one-to-one extract made and analyzed, and in the one-to-one extract of the soil sample, the chlorides were 48,931, sulfates were 37,698. We also collected some samplesof the evaporites, the crystalline deposits that formed as a thin veneer on top of the lake during Triassic periods. These crystals, these evaporite deposits were analyzed with the results showing as a percentage by weight -- these were not corrected for water content, they were high in water content -- by weight, chloride is 4.2 per cent, and sulfates are 29.23 per cent by weight, a very high sulfate-chloride ratio.

The well southeast of Laguna Tonto, 24, has been sampled

twice. In 1965, chlorides were 2,382, and the electric conductivity was 10,175, which would convert to about 9 million parts per million.

The elevation of this lake at the bottom is about 3,525 feet above sea level. This is the highest of the three lakes; Laguna Gatuna being about 3,495, and the other one about 3,431.

The elevation of the groundwater near Well No. 24 is 3,520, which is lower than the bottom of the lake of Laguna Tonto, and would suggest -- in fact, it would strongly indicate, together with the quality of the water in Well 24, that water is escaping by underflow from Laguna Tonto in a southeasterly direction to the area of Well 24. Well 24, on the other hand, is higher than the bottom of Laguna Gatuna, and I have indicated a flow path from Well 24 into Laguna Gatuna.

MR. PORTER: Mr. Reed, your blue arrows indicate the direction of the flow?

THE WITNESS: Yes, sir.

MR. PORTER: Thank you.

THE WITNESS: Likewise for Well 34, the movement would be into Laguna Gatuna. From Well 21, there are three wells, 21, 22, and 23, which have an elevation of 2,541, fairly high, and does not quite fit the Triassic contouring, and I can't

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resolve the question, so I left it alone.

Water is moving northward into Laguna Gatuna from the high point southwest of Laguna Gatuna Well No. 18, at an elevation of 2,538. The movement is northeasterly into Laguna Gatuna.

The wells at Half Way Bar are alluvial wells and extremely good quality. Chlorides are 85, the sulfates are 82. The water level is 3,516, as compared to our estimate of 3,495, or very close to it. These are not surveyed elevations. They have been taken from the topographic map. But it is evidence that water has never leaked out of Laguna Gatuna into the area of Well 17.

West of Well 18, the movement is probably regional to the west or southwest. There appears to be no flow across between Laguna Gatuna and Laguna Plata, as I once thought when I first started this investigation.

In summary, it is my opinion that the three salt lakes are three playas, into which both groundwater and surface water has discharged for thousands of years into the lake area. Wind action has continued to keep the surface elevation of these lakes within a very narrow limit of the elevation of the water table, by wind action in piling up of the debris on the eastern side with the characteristic dunes formed on the eastern side

of the lakes.

As the water table has risen or fallen, the lake bed has risen or fallen in accordance, except for Laguna Toston, which is a fossil playa lake. It has finally caught up and is being filled up.

It is my judgment that with the exception of Laguna Tonto, and with the possible exception of the west side of Laguna Plata, for which we have no data, the movement of water is into the lakes rather than away from the lakes.

It would be my judgment that it would be acceptable, and that no damage would occur to the quality of groundwater presently existing in the area to use Laguna Gatuna and Laguna Plata for salt water disposal; and Laguna Tonto, in my judgment, could be used since the movement, in my opinion, toward Laguna Gatuna in Well No. 24 is already high. But it is a small lake, about a quarter-section, a very deep one, and my client advises that he would not insist on this one being included.

MR. PORTER: Are these relatively deep lakes?

THE WITNESS: They are relatively deep. Water levels in the Triassic are substantially lower than the water levels in the Quaternary. The Triassic water is under artesian conditions, that is to say, it has a pressure exerted on it, as opposed to the Quaternary water which is under water table

conditions or conditions of gravity.

There is adequate thicknesses of clays, of an impermeable nature to isolate the alluvial water completely from the Triassic water, except or unless a well is drilled through both zones, with the upper zones remaining open. In this instance, with the Quaternary water having a higher head, the interchange would be from the Quaternary down to the Triassic.

It is my opinion that the use of these lakes in the disposal of oil field brine would be preferable to the use of salt water disposal pits on the lands; even in areas where locally there is no Quaternary water because there are patches of Quaternary water, such as the one at Half Way Back, which is this one, and this one here, and possibly one up in here, which would contain a good quality water, and into which water seeping down to the top of the Triassic, in finding no home, will continue to move in response to the topography of the Triassic surface until it reaches the groundwater.

MR. PORTER: Mr. Reed, in this exhibit there is a well located here, I believe. What is that, Section 21?

THE WITNESS: Yes.

MR. PORTER: In the northwest part of that section?

THE WITNESS: Yes.

MR. PORTER: The analysis of which shows 3,518 parts

per million of chlorides, and sulfates 905?

THE WITNESS: Yes, sir.

MR. PORTER: Do you have any idea why that well would have that higher chloride content?

THE WITNESS: I suspect it is in response to this general circulation of water from Tonto into Laguna.

MR. PORTER: You think it would be the influence of Tonto, perhaps?

THE WITNESS: Perhaps.

MR. PORTER: That would be a possibility?

THE WITNESS: Yes.

MR. PORTER: But the direction of flow here is into Laguna.

Q (By Mr. Kellahin) Mr. Reed, in examining this area, to sum this up, the only fresh water you found in the area is that lying south of the highway, is that correct?

A In the Quaternary?

Q Yes. Did you find any fresh water, also, in the Quaternary?

A Well 14, is north of the highway, and it is about what Midland used to drink when they used to complain, but it is acceptable.

Q Where is that located?

A Section 23, 20 South, 32.

Q Would the use of these lakes for salt water disposal have any effect on this salt water supply?

A In my opinion, it would not.

Q Would the use of these lakes have any effect on any fresh water supply in the vicinity?

A In my opinion, it would not.

Q What volume of water do you feel could safely be discharged into these lakes?

A Mr. Kellahin, in view of the fact that there has been no mention of a volume of water available to put into these lakes, and because Laguna Plata is so large, something more than 1,200 acres, I have not made a detailed study as to the potential maximum amount that any one lake could accept.

I have determined the area of Laguna Gatuna and Laguna Plata, and those numbers look like this. Laguna Gatuna has approximately 383 acres within the lowest closing contour. Laguna Plata has 1,241 acres within the lowest closing contour.

I believe in the case of Lane Lake in northwest Lea County, detailed studies of this lake were made, indicating that volumes, as I recall, up to 30,000 barrels per day could safely be disposed. Lane Lake is slightly smaller than Laguna Gatuna. The evaporite is slightly lower at Lane Lake than in Laguna Gatuna,

so I would say that within the limits of a foot of impounded water, the same maximum limits would apply to Laguna Gatuna, in the order of 30,000 barrels per day.

Laguna Plata, I haven't made an effort to calculate, because I should think it's safe rate would exceed the total volume of water that could conceivably be transported into this area.

Q In connection with the presentation of the case in Lane Lake, you recommended that observation wells be drilled at certain points around the lake to determine the effect of water disposal there. Do you feel that that is necessary in this case?

A Not really. Well, let me modify that. I think the necessity for a monitor hole or holes, assuming we are speaking only of Laguna Gatuna and Laguna Plata, necessity would be remote in the case of Laguna Plata. It would be my judgment that it would be desirable in the case of Laguna Gatuna, only if the discharge volumes would approach something like half of the suggested maximum rate, or 15,000 barrels per day. There is so much evidence of Triassic cutoff on the south and west side of Laguna Gatuna, there seems to be such a distinct possibility which has not been defined, and can't be without extensive core drilling, of a continuous Triassic ridge along the west side of

Laguna Gatuna. It would take very little imagination to connect the three outcrop areas up. I have not done it, because I am not certain of it.

But with the relative elevations of the groundwater in Laguna Gatuna and out spring discharges both from the south and from the west, I think the necessity of a monitor hole would not make itself known until substantial quantity of water were put into the lake, sufficient to raise the level of the lake four to six inches across the entire 370 acres. At that point, I think it might be desirable.

MR. PORTER: That is in relation to Laguna Gatuna?

THE WITNESS: Yes, sir.

Q In your testimony you have used some water analyses. Do you have those available?

A I do, yes. These are copies of all of the analyses that have been used, with the exception of the analyses that have been taken directly from a map prepared by the State Engineer's Office, from their records, and which is titled, Well Location, Well Depth, Depth to Water, and Chemical Quality of Water, Capitan Underground Water Basin, Lea and Eddy Counties, New Mexico, sheet 2 of 6, by the State Engineer's Office.

For the record, I have also used in the preparation of this map, the quadrangle Laguna Gatuna, New Mexico, 1963, and

the Clayton Basin, New Mexico, quadrangle, 1944, both at a scale of 1 to 62,500.

Q The maps to which you referred are presently here and available for inspection?

A Yes, sir.

Q I hand you what has been marked as Applicant's Exhibit Number 2, will you identify that, please.

A Applicant's Exhibit Number 2 is a series of 13 water and soil samples collected by my office, and analyzed by Southwestern Laboratories of Midland.

Q Are those the analyses you used in the preparation of Exhibit Number 1?

A Yes, sir.

Q I hand you what has been marked as Exhibit Number 3, and ask you to identify that, please.

A These are analyses of five water wells and springs, or surface samples; and six brines from six oil wells in the salt lake field, prepared by United Chemical Corporation and used in the preparation of the map.

Q Was Exhibit Number 1 prepared by you or under your supervision?

A Yes.

MR. KELLAHIN: At this time, I would like to offer in

evidence Exhibits 1, 2, and 3.

MR. PORTER: If there is no objection, the exhibits will be admitted.

(Whereupon, Applicant's Exhibits Numbers 1, 2, and 3 were admitted in evidence.)

MR. KELLAHIN: That completes the direct examination of the witness.

CROSS EXAMINATION

BY MR. PORTER:

Q Now, I would assume from your testimony here, Mr. Reed, that it is your opinion that just about 100 per cent of the water that goes into Laguna Gatuna goes out by evaporation?

A Yes, sir.

Q There is no other outlet?

A That's correct, yes.

Q Now, over in Laguna Plata, at the time you were making your examinations, did you find any water being discharged into that lake from National Potash Mine?

A I did not go to the west side of Laguna Plata, which I understand is the point that water is being introduced. I did not see it, no, sir.

Q And you say there is a possibility that the water from the west side of that lake might flow west?

A I just leave that as an open question.

Q You don't have information on it?

A No, sir.

MR. PORTER: Mr. Matkins, do you wish to examine?

MR. MATKINS: No, I have no further questions.

MR. PORTER: Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Reed, your map specifically identifies the water levels, and you have discussed them in considerable detail of the Quaternary wells. However, there are some Triassic water wells in the area also?

A Yes, sir.

Q Now, what is the source bed of the water in the Triassic beds in the area?

A The source of the water?

Q What sands or what zone produces this water?

A I suspect from the well records, there are several different zones. They might be lumped either as Santa Rosa equivalent or younger. I think there are probably shallower sands than the so-called Santa Rosa, if it can be identified over here and I rather think it can.

Q Now, the Triassic beds also include some non-permeable

clays, and things like this, don't they?

A For the most part, it is composed of non-permeable.

Q So then you would have maybe a streak of permeable sand, which would be carrying the water where you have water wells?

A Yes, sir. This is the reason for the Artesian head upon the Triassic sands. Each of these individual sand beds are overlain by impermeable red clays, which hold the water in under pressure, and the intake obviously is at some higher elevation.

Q Why is it that you believe that the water that is discharged into these lakes leaves only by means of evaporation, and doesn't flow out through the bottom of the lake or into the Triassic beds?

A Principally because the Triassic, at least in the outcrop, is quite impermeable. It is a red or gray clay, and a well drilled immediately on the west side of Laguna Gatuna found it necessary to go about 400 feet to get any water. As a matter of fact, it went 450 feet.

Q We take the difference between the two contour lines that you have drawn on your map, and we find that the Triassic bed would run anywhere from 850 to 1,000 feet thick.

A 1,400 feet on the east side.

Q Just in the vicinity of the two lakes?

A That's correct.

Q And so you would have approximately 1,000 feet, then, of impermeable clays or impermeable Triassic rocks, interlaced with possible aquifers containing Triassic water?

A That's correct, yes, sir.

Q On Plate 2 in Groundwater Report, Nicholson and Clebsch, shows a definite depression in the asymptomatic table there for the Triassic water, and then they theorize on page 57 of that report that there may be some enhanced verticle permeability because of this slumping, and you showed the slumping underneath Laguna Gatuna, and they think there is a possibility that the water discharged into this area does permeate downward into the Permian rocks.

What is your theory on this feeling?

A Well, in examining the logs, and I can't tell from their report, and I am not remembering the date of the drilling of these wells, but I rather think that there is some data available today that was not available at that time, showing the magnitude of the slumping of the Rustler under Laguna Gatuna. There have been wells drilled out in the lake that reflect this over-thickening of the Triassic sequence.

This is not greatly unlike the problem on the Colorado

River where it was postulated that because of faulting involving Triassic beds, salt water was moving upward along fault plains and escaping into the Colorado River.

It is my personal opinion that the Triassic, made up as it is primarily of extra-fine grained clays, there was very low permeability in the clays and relatively permeability in the sands, and are incompetent to maintain porosity, either by fracturing or by faulting.

I would also like to say that the chances of faulting occurring with respect to the slumping under Laguna Gatuna, in my judgment, are quite remote. In examining the structure of Rustler Hills in Eddy County, which is a similar product but where we can examine the Rustler at the surface, and examine the manner in which the Rustler responded to solution in slumping, it is quite evident that that took place at a time when there was a substantial amount of overburden; because the Rustler, rather than being fractured and faulted, is folded into structures upward of 45 degrees of depth. I think this of necessity would involve a massive amount of overburden. Very little faulting is exhibited in the competent and brittle Rustler dolamite.

I think here we have the same phenomena occurring essentially at the same time, and a thickening of the Triassic sequence over this slumped structure. Even though there may have been continued movement throughout the deposition of the Triassic, this movement would have been reflected by solid flow, rather than by faulting in the Triassic, or if it were faulted, it would seal itself up.

Q In other words, if you feel that the Triassic beds are incompetent to maintain porosity as a result of any slumping or faulting, that would also hold true for permeability? You feel that the beds would be incompetent to maintain permeability?

A That would be my opinion.

Q You don't ascribe to the theory that the movement would be downward into the Permian rocks?

A No, sir.

Q And all the outlet would have to be by means of evaporation?

A Yes, sir.

Q As far as we know the direction of movement with respect to Laguna Gatuna, we have some springs which would indicate the flow from the east side into the lake, and you don't have knowledge of the direction of flow on the south, west, or north side of the lake?

A It would be the other way around then. We have springs on the west side of the lake.

Q I am talking about Laguna Plata. You have springs on the east side there?

A That's correct.

Q And we don't have knowledge of the flow from the north, west or south?

A Except that there is a massive outcrop of Triassic on the north, which presumably would eliminate any flow in the Quaternary; and the U.S.G.S. did not indicate any springs on the topographic maps, other than three of the four that I have identified on the northeast side.

Now, this is not to say they are not there, because, as I recall, they did not indicate springs in the Laguna Gatuna, and these are rather small ones, and you would not be impressed by their size. The springs on the northeast side of Laguna Plata are substantial springs, flowing upwards perhaps five or six gallons per minute.

Q They are seeps, then?

A They are more than seeps. They are flowing into the lake bottom in rivulets carved into the evaporide sequence. The U.S.G.S. chose to identify these springs and show them on the maps. We simply verified their existence, and added one or two

to them, and took their samples.

Q Is there any evidence of Triassic formation on the south and southeast side of Laguna Plata?

A Not that I can identify, no, sir. I will have to say I didn't walk all that out.

Q That is a good-size lake?

A It really is.

Q Generally speaking, Mr. Reed, don't the surface contours follow the contours of your Triassic beds shown in yellow on your Exhibit 1? Just generally speaking, isn't the surface contour pretty much reflected by the Triassic contour?

A Yes, sir.

Q There is another depression to the west of here known as Williams Sink. Are you generally familiar with Williams Sink?

A Excuse me, Mr. Nutter, let me see if I can find it and see if I am familiar with it. By that name, I think I am not. I have not been to Williams Sink. We have been to Laguna Toston. We have not been to Williams Sink.

Q Well, the general surface contours here, this is the head, so to speak, of a cynclinal feature that flows to the west and on over into the Pecos River Valley, and what I was concerned with was if the outlet here to the Laguna Plata would be westward?

In response to a question by Mr. Porter, you didn't know just what the situation is on the west, and I was wondering if there would be a connection then from Laguna Plata westward into Williams Sink, and thence on down into the Pecos River Valley?

A Mr. Nutter, I can't answer that question. I don't know.

Q But the only evidence you do know of of Triassic beds around Laguna Plata would be those beds you show on your map on the north side?

A That's correct.

MR. NUTTER: I believe that is all.

MR. PORTER: Mr. Reed, did you have occasion to observe whether or not the west side of Laguna Plata, that is the base of the lake, was higher than the east side?

THE WITNESS: No. Let me see what the map reflects. I have not examined that precisely, no, sir. There is an elevation at the northwest corner of Section 10, 20 South, 32, of 3,431. And there is an elevation of a drill hole in the north center of the northwest quarter of Section 11 to the southeast, of 3,433, which is two feet higher.

MR. PORTER: So it is relatively level, apparently?

THE WITNESS: Yes, sir. And a little bit lower on the west, but essentially level.

MR. PORTER: Let's take a ten-minute recess.

MR. KELLAHIN: I want to ask one question, and perhaps we will be through with Mr. Reed.

MR. PORTER: Does anyone else have any questions of this witness?

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Reed, in connection with the question on the west side of Laguna Plata, did you take into consideration the fact that this Commission granted an areawide exception to the provisions of the salt water disposal Order R-3221, in considering the situation over there?

A I did.

Q Was that the reason you did not make an inspection of the west side of the lake?

A It is.

MR. KELLAHIN: If the Commission please, I would like the Commission to take notice of its own order which granted an exception on the Order R-3221, to the area immediately west of Laguna Plata.

MR. PORTER: The Commission will take administrative notice of that order.

Are there any further questions of this witness?

RECROSS EXAMINATION

BY MR. UTZ:

Q Mr. Reed, it is my understanding that your testimony was that there is some leakage from Laguna Tonto, which comes south and eventually ends up in Laguna Gatuna. Now, if there were surface disposal in the area of Sections 9, 10, 15, and 16, and 20 South and 33 East, would it be your opinion that that surface water would eventually find its way into Laguna Gatuna?

A Yes, sir.

MR. UTZ: That is all I have.

MR. PORTER: If there are no further questions, the witness may be excused, and we will take a ten-minute recess.

(Thereupon, a recess was taken.)

MR. PORTER: The hearing will come to order, please. The Commission will recognize Mr. Kellahin.

MR. KELLAHIN: If the Commission please, that completes our direct testimony in the application of Larry Squires. We may have some additional testimony to offer after the presentation of the other side, and the objections.

MR. PORTER: You will have the privilege of recalling the witness, if you feel it is necessary.

Mr. Matkins.

MR. MATKINS: Thank you. Mr. Harroun, would you take

Jason Kellahin
W. Thomas Kellahin
Karen Aubrey

KELLAHIN and KELLAHIN
Attorneys at Law
El Patio - 117 North Guadalupe
Post Office Box 2265
Santa Fe, New Mexico 87504-2265

Telephone 982-4285
Area Code 505

May 28, 1986

RECEIVED
MAY 28 1986
OIL CONSERVATION DIVISION

Case File
RLS

Mr. Richard L. Stamets
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

"Hand Delivered"

Re: Application of Snyder Ranches, Inc.
and Pollution Control Inc. for
Rehearing of Commission Case 8781(DeNovo)
Order R-8161-A

Dear Mr. Stamets:

On behalf of Snyder Ranches, Inc., and Pollution Control Inc., I wish to inform you that we will be filing an Application for Rehearing of the referenced case, as required by Section 70-2-25 NMSA-1978.

Any action taken by Petro-Thermo Corporation in reliance upon Order R-8161-A, Case 8781(DeNovo), will be at its risk.

Very truly yours,

W. Thomas Kellahin

WTK:ca

cc: J. W. Neal, Esq.
P. O. Box 278
Hobbs, New Mexico 88241

John Weber, Esq.
Maddox, Renfrow & Saunders
P. O. Box 5370
Hobbs, New Mexico 88241

Mr. Roy Soto
Commissioner of Public Lands
P. O. Box 1148
Santa Fe, New Mexico 87504

cc: Mr. Joe D. Ramey
P. O. Box 6016
Hobbs, New Mexico 88241

Mr. Tim Kelly
Geohydrology Associates, Inc.
4015 Carlisle, N.E., Suite A
Albuquerque, New Mexico 87107

Mr. Francis R. Cherry, Jr.
District Manager
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501-2088
(505) 827-5800

June 20, 1986

Mr. John Paul Weber
Maddox, Renfrow and Saunders
Attorneys and Counselors at Law
P. O. Box 5370
Hobbs, New Mexico 88241

Dear Mr. Weber:

This letter will confirm the Commission's action on June 19, 1986, relative to the request for rehearing in Case No. 8781 De Novo filed by Snyder Ranches, et al., June 9, 1986.

This Case will be reopened on August 7, 1986, and additional testimony will be accepted in all or part of the Grounds for Rehearing set out in the application by Mr. Kellahin dated June 9, 1986, as set out below:

5. Additional evidence will be heard relative to the issues raised in this paragraph.

6. Additional evidence wil be heard relative to the issues raised in this paragraph.

7. The Commission will accept briefs by August 4, 1986, on the general issues raised in this paragraph and will accept testimony relative to the allegation that "migration of contaminated waste water will destroy the grazing grasses and vegetation under the ownership and control of Snyder Ranches, Inc." Based upon the briefs filed, the Commission may or may not choose to accept testimony as to any other issue raised in this paragraph.

The rehearing will be limited to the above-described issues only. Snyder Ranches et al., as applicant for the rehearing, will be expected to present their case first. This case will be scheduled first on the docket, and in keeping with current practice, the Commission would hope to make our decision immediately at the conclusion of the rehearing.

If there are any questions on this matter, please do not hesitate to call me.

Sincerely,

R. L. STAMETS
Director

RLS:dp

cc: Jerry Sexton
Fran Cherry, BLM

MADDOX, RENFROW & SAUNDERS
PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS AT LAW
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JAMES P. SAUNDERS, JR.

SCOTTY HOLLOMAN
JOHN PAUL WEBER
GARY L. CLINGMAN

JUL 21 1986

July 16, 1986

Cont'd Sept 10
Called Webers office
Note to Tom K
RLL

R. L. Stamets
Director, Oil Conservation Division
Energy and Minerals Department
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501-2088

RE: Application of Petro-Thermo Corporation for an Exception to Division Order No. R-3221, as amended, and for Authorization to Dispose of Association Waste Hydrocarbons And Other Solids Obtained In Conjuction With The Drilling And Production Of Oil And Gas Into Unlined Pits, Lea County, New Mexico, Case No. 8781 De Novo, Order No. R-8161-A

Dear Mr. Stamets:

Reference is made to your June 20, 1986 letter confirming that the above-styled and numbered case will be reopened on August 7, 1986.

This is written to respectfully request that the August 7, 1986 rehearing be continued until the next regularly scheduled meeting of the Oil Conservation Commission. This request is based upon the unavoidable absence, from the State, of expert witnesses who would testify relative to the issues identified in your letter.

If we could be notified of the decision of the Oil Conservation Commission relative to this request, we would be most appreciative.

Should you have any questions concerning this matter, please do not hesitate to telephone.

Very truly yours,

John Paul Weber

JPW:sfp

xc: Petro-Thermo Corporation
Daniel B. Stephens & Associates, Inc.

AMERADA HESS CORPORATION

P. O. DRAWER "D"
MONUMENT, NEW MEXICO 88265

August 15, 1986

Petro Thermo
Case File
Case 8781

State of New Mexico
Energy & Minerals Dept.
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Re: Application for Solids and
Produced Water Disposal Site

I would like to reiterate my position with regard to Petro-Thermo Corporation's application for an approved Waste Disposal Site. The recent concern expressed by the State of New Mexico and the Environmental Improvement Agency over ground water contamination in the State underlines the need for State approved, environmentally safe disposal sites such as the one proposed by Petro-Thermo. The site, to be located in the NE4 of Sec. 16, T-20S, R-32E of Lea County, will provide additional waste disposal capacity for the Oil and Gas Industry inhancing the economics of oil and gas production as well as reducing the associated risks to the environment in more populous areas. The industry needs such sites if we are to remain a viable and significant contributor to the economics of New Mexico.

Yours truly,

S.W. Small

XC: Petro-Thermo Corporation
P.O. Box 2069
Hobbs, New Mexico 88240
ATTN: Mr. R.W. Abbott

PETRO-THERMO CORPORATION

P.O. BOX 2069 PHONES (505) 393-2417 — 397-3557

HOBBS, NEW MEXICO 88241-2069

August 18, 1986

Mr. R. L. Stamets, Director
Oil Conservation Division
Energy and Minerals Department
State of New Mexico
Post Office Box 2088
Santa Fe, New Mexico 87501-2088

Re: Rescinding of Authorization
for Temporary Disposal Pit

Dear Mr. Stamets:

Reference is made to your August 12, 1986 letter rescinding temporary authority for the disposal use of the earthen pit located at the Blinebry-Drinkard Salt Water Disposal System, Well No. A-22, located in Section 22, Township 22 South, Range 37 East.

As you are aware, Petro-Thermo Corporation originally made application for a hearing before the Oil Conservation Commission to consider it's request for an exception to Order No. R-3221 November 19, 1985. In response to comprehensive testimony presented at two hearings, the Commission entered Order Numbers R-8161 and R-8161-A. In view of these Orders, it is apparent that the Oil Conservation Commission fully recognizes the importance of additional approved oilfield related waste disposal sites.

Presently, because of competitive reasons, Petro-Thermo Corporation has been effectively cut off from disposing at Parabo Inc. operated by Unichem International (Rowland Trucking) and Pollution Control, Inc. (General Petroleum) operated by Mr. Larry Squires. In addition, the New Mexico State Land Office has not yet acted on our December 6, 1985 Application for a Business Lease covering the Eastern one-half Section 16, Township 20 South, Range 32 East, N.M.P.M., Lea County, New Mexico.

In an attempt to comply with your request to remove all solid and liquid waste from our temporary disposal pit, I am forwarding today a proposal to Mr. Jim Baca requesting the New Mexico State Land Office expedite approval of our application for a Business Lease so that we may begin

construction on the first series of earthen pits at Plata Disposal in accordance with the Disposal Site Plan previously submitted.

Petro-Thermo Corporation solicits the help of the Commission in overcoming the aforementioned obstacles to facilitate resolving this matter expeditiously. In this regard it is our desire to cooperate fully.

Sincerely,

Petro-Thermo Corporation

Robert W. Abbott
Vice President

RWA/aj

xc: Mr. Jim Baca
Mr. John Weber
Mr. Jerry Sexton
Mr. Ernest Padilla

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

October 27, 1986

POST OFFICE BOX 2088
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SANTA FE, NEW MEXICO 87501
(505) 827-5800

Mr. Thomas Kellahin
Kellahin & Kellahin
Attorneys at Law
Post Office Box 2265
Santa Fe, New Mexico

Re: CASE NO. 8781
ORDER NO. R-8161-B

Applicant:

Petro-Thermo Corporation

Dear Sir:

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

Sincerely,

R. L. STAMETS
Director

RLS/fd

Copy of order also sent to:

Hobbs OCD x
Artesia OCD x
Aztec OCD

Other John Paul Weber

UNICHEM INTERNATIONAL

707 NORTH LEECH P.O.BOX 1499

HOBBS, NEW MEXICO 88240

COMPANY : SNYDER RANCHES
DATE : 9-10-86
FIELD,LEASE&WELL : RANCH 3 7/6
SAMPLING POINT: SNYDER RANCH
DATE SAMPLED : 9-4-86

SPECIFIC GRAVITY = 1
TOTAL DISSOLVED SOLIDS = 1618
PH = 7.72

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	2.5	50.7
MAGNESIUM	(MG)+2	3.8	47.2
SODIUM	(NA),CALC.	21.1	485.
ANIONS			
BICARBONATE	(HCO3)-1	1.4	85.4
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	3.1	150
CHLORIDES	(CL)-1	23	800
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		.7
BARIUM	(BA)+2	0	0
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) =.032

SCALING INDEX	TEMP
	30C 86F
CARBONATE INDEX	.555
CALCIUM CARBONATE SCALING	LIKELY
CALCIUM SULFATE INDEX	-17.
CALCIUM SULFATE SCALING	UNLIKELY

Petro Thermo
Core File

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time	Date
	0830	9/16/86

Originating Party	Other Parties
R. ANDERSON - OCD	DAN WILLIAMS WILLIAMS BRINE SVC - 885-6514

Subject: MINING OF SALT FROM LAGUNA PLATA - HOW + WHERE USED?

Discussion: WILLIAMS BRINE SVC MINES DRY SALT FROM LAGUNA ~2 MONTHS OF THE YEAR. THEY STOCK PILE IT FOR THE OTHER 10 MOS. IT IS SOLD IN DRY FORM TO CULLIGAN DISTRIBUTORS AND IN SOLUTION TO EPNG, CHEVRON (EL PASO) AND EL PASO REFINING (EL PASO). COMPOSITION OF SALT IS .029% MOISTURE, 96.597% $NaCl$ .038% Na_2O, .003% $FeO + Al_2O_3$, .954% $CaSO_4$, .035% $MgSO_4$ .572 Na_2SO_4 + 1.781 KCl

Conclusions or Agreements

Distribution

Signed RC Anderson

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time	Date
	0845	9/16/86

Originating Party	Other Parties
R. ANDERSON - OCD	D. Campbell - EPNG
	BRIAN Collier - EPNG

Subject

EFFECTS OF POSSIBLE DESOLVED HYDROCARBONS IN BRINE THEY RECEIVE FOR THEIR WATER SOFTENERS

Discussion

THEY ARE ALREADY INVESTIGATING THE BRINE PURCHASED FROM WILLIAMS DUE TO ITS POOR QUALITY. THEY HAVE SULFONATED POLYSTYRENE RESINS IN THEIR SOFTENERS. HYDROCARBONS MAY RENDER THESE RESINS INEFFECTIVE OR MAY DESTROY THEM. HOWEVER, THEY SEEM MORE CONCERNED WITH THE DILUTION EFFECT ON THE NaCl BRINE BY THE POSSIBLE INTRODUCTION OF Ca OR K BRINES.

Conclusions or Agreements

Distribution

Signed RC Anderson

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time: 0930

Date: 9/16/86

Originating Party	Other Parties
R. ANDERSON - OCD	EVERETT SEWELL CULLIGAN - 885-4044

Subject: EFFECT OF HYDROCARBONS ON THEIR RESINS

Discussion: THEY RECEIVE SALT FROM WILLIAMS IN SOLID FORM, REDESOLVE IN, ALLOW IT TO SETTLE AND PASS IT THROUGH THREE FILTERS. THIS SOL'N IS USED ONLY IN INDUSTRIAL APPLICATION, DUE TO ITS POOR QUALITY. IF ANY HYDROCARBONS ARE PRESENT IN THE DRY SALT THEY WOULD BE IN VERY LOW CONCENTRATIONS AND THEIR PROCESS WOULD PROBABLY VOLITIZE THEM. DISOLVED HYDROCARBONS IN VERY LOW CONCENTRATIONS WILL PROBABLY HAVE NO ADVERSE AFFECT ON THEIR SYSTEMS

Conclusions or Agreements

Distribution

Signed R. C Anderson

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time: 1000

Date: 9/16/86

Originating Party: R ANDERSON - OCD

Other Parties: ERIC KLIN - REG MGR CONTINENTAL PRODUCTS - 915-337-4691

Subject: EFFECTS OF DISSOLVED HC ON THEIR WATER SOFTNER RESINS.

Discussion: CONTINENTAL SUPPLIES THE SULFANATED POLY STYRENE RESINS. CONCENTRATIONS OF BENZENE OR TOLUENE OF 5-10% WILL HAVE AN ADVERSE AFFECT ON THEIR RESINS. MR KLIN STATED THAT DUE TO THE VOLITILITY OF THESE HC's THE CONCENTRATION (IF ANY) OF THEM REACHING THE SALTS AT THE MINING LOCATION WOULD HAVE NO AFFECT. BY THE TIME THE SALT HAS DRIED ENOUGH FOR MINING VIRTUALLY ALL THE HC'S WILL HAVE EVAPORATED

Conclusions or Agreements

Distribution

Signed R. Anderson

Exhibit #3

11-18-86

Dept of oil conservation

Dear Sir

I. G. L. Plumbe live at 207 W. Roxana St in Hobbs. Would appreciate if something could be done about Brine water and sand dilat times that comes out of Pure chemical or P.T. yard at south end of yard in St in front of my Home, the about company had Trucks Pick up Fluid in St act 7 nov 15-86. the Problem has happend numerous of times the last 6 or 7 yrs

Sincerly G. L. Plumbe