TESORO PETROLEUM CORPORATION
533 BUSBY DRIVE
512-TAYLOR 4-0261
SAN ANTONIO, TEXAS 78209

January 14, 1966

State of New Mexico
Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Attention Mr. Dan S. Nutter

Re: OCC Case No. 3353, Hospah Sand Unit, Hospah Field, McKinley County, New Mexico

Gentlemen:

The referenced case was set for hearing on application of Tesoro Petroleum Corporation for the purpose of modifying and amending certain portions of Order No. R-2807 which resulted from the hearing on Case No. 3132 concerning the application of secondary recovery to the Hospah Field. Hearing on the referenced case was held January 5, 1966, and during the course of this hearing certain additional information was requested. In compliance with this request there is attached a brief summary of the history of each well drilled in the Hospah Sand Unit since the issuance of Order No. R-2807 on November 24, 1964 and a structure map and isopach map which incorporate the new data.

The concept of the water-injection program for the Hospah Sand Unit as presented in the testimony in Case No. 3132 was that water-injection wells were to be drilled on the periphery of the oil-productive sand in the Hospah Sand Unit area and that by the injection of water into these wells, additional oil reserves would be obtained from the field. By Order No. R-2807 locations for eight proposed injection wells on what was then thought to be the periphery of the productive area were approved. At that time, and as is indicated in the testimony submitted in Case No. 3132, the original oil-water contact at the north end of the field was thought to be at a +5320 feet, and the area between the two faults (see attached plats) was thought to be at a +5350 feet above sea level. The new information indicates that both of the contacts have moved up at least 5 feet and that they are now at +5325 and +5355 feet above sea level.

The first well that was drilled is what is now known as well No. 63 located in Unit F, 980 feet from the North line and 2310 feet from the West line of Section 36, Township 18 North, Range 9 West. This is a regular location

insofar as Unit F is concerned and was drilled to confirm the geological interpretation on the northwest side of the Unit area. The sand top was encountered approximately 10 feet higher than anticipated, and as a result we were able to establish commercial production in well No. 63, and the geological interpretation was altered significantly by the new data.

The second well drilled is what is now known as well No. 64 located in Unit H, 1650 feet from the North line and 660 feet from the East line of Section 36, Township 18 North, Range 9 West. At the time of the secondary-recovery hearing the injection wellon this northeast side of the Unit area was to be created by reworking the old producing well, No. 30-A, located in the same Unit. However, with the indication of a broader and flatter nosing of the structure obtained from drilling well No. 63, it was thought that if the sand top were also found to be 10 feet higher on the northeast side of the field, converting well No. 30-A into a water-injection well, would prevent the injection water from sweeping a portion of productive sand and, therefore, would be inadvisable. Well No. 64 was, therefore, repositioned at the aforementioned location, drilled and tested. The sand top in well No. 64 was encountered at 5328 feet above sea level. This is where the sand top was anticipated, and it serves to confirm the structure map presented at the secondary-recovery hearing. As is reflected on the attached well record a 45-day pumping test of well No. 64 showed a final test of 140 barrels per day of fluid with a trace to one per cent oil. The well was considered to be noncommercial and was equipped as an injection well.

The third well drilled was No. 68, located in Unit B, 2310 feet from the East line and 990 feet from the North line of Section 36. The original injection plan called for the northernmost injection well to be created by reworking the old producing well No. 29 in Unit G, Section 36, Township 18 North, Range 9 West. However, as a result of the new geological information obtained from wells Nos. 63 and 64, it appeared advisable to move the location of the injection well north to achieve the peripheral injection plan as originally envisioned. Core analyses on well No. 68 indicated that the entire section was wet, and this well was completed as an injection well.

The fourth well drilled was No. 62 on the northwest side of the field. This well was originally scheduled to be drilled in Unit K, Section 36, Township 18 North, Range 9 West; however, the new geological information dictated that the location of this well should be moved westward if it were to used as an injection well. As a result, well No. 62 was located 1900 feet from the South line and 1140 feet from the West line of Section 36. This is an irregular location, being only 180 feet west of the East line of Unit L, this position being

dictated by the position of the oil pipeline leading from the field. The sand top in well No. 62 was encountered about 35 feet higher than anticipated by the original geological interpretation and approximately 15 feet higher than anticipated at the time the location was made. As a result of this we were able to establish commercial production from well No. 62.

The fifth well drilled was No. 61, located in Unit E of Section 1 on the southwest side of the Unit area. To afford a location for the rig it was necessary to locate this well 10 feet north of the location approved in Order No. R-2807. As is indicated on the attached well history, this well was tested and proved noncommercial before being converted to an injection well.

The next well drilled was No. 60 located in Unit L of Section 1 on the southwest side of the Unit area. To avoid the flood plain of a dry creek which runs through the property, well No. 60 was located 10 feet east of the location approved by Order No. R-2807. As is indicated on the attached well history, this well was tested and proved noncommercial before being converted to injection.

The next wells drilled were Nos. 65 and 66 located in Unit P of Section 36 and Unit A of Section 1 respectively on the east side of the Unit area. Both of these wells were drilled at the locations approved by Order No. R-2807, were tested, found noncommercial, and completed as injection wells.

The next well drilled was No. 67 in Unit H, Section 1 on the southeast side of the Unit area. To avoid the drainage area of the dry creek which flows through the property, this location was moved 20 feet north of the location approved by Order No. R-2807. This well is located well inside the Unit area and was not tested prior to equipping it as an injection well.

The next well drilled was No. 69 located in Unit E of Section 36 on the northwest side of the Unit area. This well was drilled at a regular location, and core analysis indicated that the entire sand section was wet; therefore, the well was completed as an injection well.

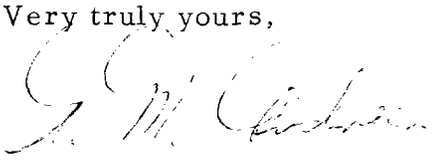
The last well drilled was No. 71 located in Unit N of Section 36, 1310 feet from the South line and 2000 feet from the West line. This well was drilled and completed as a producing well to replace No. 18 located in Unit K of Section 36. Testimony in regard to this well is already of record in Case No. 3353.

As previously stated, it is thought that the original oil-water contact has moved upstructure approximately 5 feet in both areas of the field. The present oil-water contact and the original oil-water contact are indicated on the attached

structure map. It is evident from the attached map that the entire oil-productive volume of the Hospah Sand underlying the Hospah Sand Unit lies within the unitized area and will be effectively swept by injection wells Nos. 60, 61, 64, 65, 66, 67, 68 and 69. It is possible that performance of the flood will dictate the drilling of one additional injection well westsouthwest of well No. 62.

As a result of utilizing new information as it was obtained to relocate the injection wells in the north part of the Hospah Sand Unit, Tesoro substantially increased the volume of reservoir rock which will be swept by the injected water, and as a result the future oil potential of the area is considerably enhanced. The new drilling also defined the productive limitations of the field, all of which lie within the Hospah Sand Unit area. It is requested that Order No. R-2807 be modified to approve the location of the eight injection wells as they now exist and that permission be granted to produce wells Nos. 62, 63 and 71.

Very truly yours,



GMA:nbd
Attachment

Gilbert M. Andreen

Summary of Well History
Hospah Sand Unit, Hospah Field
McKinley County, New Mexico

Well No. 60

(Unit L, 2310' from the South line and 1060' from the West line of Section 1, Township 17 North, Range 9 West)

To avoid the flood plain of a dry creek which runs through the Hospah Sand Unit, this well was drilled at the aforementioned location which is ten feet east of the location approved by Order No. R-2807.

Spudded 8-18-65. Ran 4 1/2" casing 8-21-65. Perforated 1559-90 and 1600-01. Tested 6 days with 1 1/2" pump, 36" stroke, 14 strokes per minute. Final production test 110 barrels per day of water with rainbow of oil. Well noncommercial. Equipped for use as injection well.

Well No. 61

(Unit E, 3650' from the South line and 1000' from the West line of Section 1, Township 17 North, Range 9 West)

To obtain suitable location for the drilling rig, this well was drilled at the aforementioned location which is 10 feet north of the location approved by Order No. R-2807.

Spudded 8-12-65. Ran 4 1/2" casing 8-17-65. Perforated 1632-34, 1636-38 and 1640-56. Tested 6 days with 1 1/2" pump, 36" stroke, 10 strokes per minute. Final test 75 barrels a day of water with trace of oil. Well noncommercial. Equipped for use as injection well.

Well No. 62

(Unit L, 1900' from the South line and 1140' from the West line of Section 36, Township 18 North, Range 9 West)

This well was drilled at the aforementioned regular location and was not covered by Order No. R-2807.

Spudded 8-8-65. Ran 4 1/2" casing 8-10-65. Perforated 1666-68, 1670-72, 1678-80, 1683-85, 1688-90 and 1696-98. Tested 3 days with 1 1/2" pump, 36" stroke, 10 strokes per minute. On final test well made 44 barrels of fluid per day, 90 per cent water and 10 per cent oil with water decreasing. Well considered commercial. Equipped as a producer.

Well No. 63

(Unit F, 1980' from the North line and 2310' from the West line of Section 36, Township 18 North, Range 9 West)

This well was drilled at the aforementioned regular location as the first well in the new development program for the purpose of confirming the geological interpretation in the northwest portion of the Hospah Sand Unit. The sand was encountered approximately 10 feet higher than anticipated, and as a result the geological concept of the areal extent of the productive section in this portion of the field was altered.

Spudded 7-18-65. Ran 4 1/2" casing, 7-23-65. Perforated 1732-42. Tested 6 days with 1 1/2" pump, 36" stroke, 10 strokes per minute. Final test 33 barrels per day of total fluid of which 27 barrels were water and 6 barrels oil. Well considered commercial and equipped as a producer.

Well No. 64

(Unit H, 660' from the East line, 1650' from the North line, Section 36, Township 18 North, Range 9 West)

Because of the new geological information obtained from the drilling of Well No. 63 this well was drilled at the aforementioned location which is 340' north and 20' west of the location approved for an injection well by Order No. 2807.

Spudded 7-27-65. Ran 4 1/2" casing 7-31-65. Perforated 1774-88 and 1798-1800. Tested 45 days with 1 1/2" pump, 30" stroke, 22 strokes per minute. Final test 140 barrels per day of fluid, trace to 1 per cent oil. Well noncommercial. Equipped for injection.

Well No. 65

(Unit P, 990' from the South line and 250' from the East line of Section 36, Township 18 North, Range 9 West)

This well was drilled at the aforementioned location which is the same as that approved by Order No. 2807.

Spudded 8-22-65. Ran 4 1/2" casing 8-26-65. Perforated 1644-48, 1652-54, 1662-72, 1674-76, 1682-84 and 1690-92. Tested 4 days with 1 1/2" pump, 36" stroke, 12 strokes per minute. Well pumped off in short time. Final test 5 barrels per day of fluid, 60 per cent water, increasing. Well considered noncommercial. Equipped for injection.

Well No. 66

(Unit A, 330' from the North line and 330' from the East line of Section 1, Township 17 North, Range 9 West)

This well was drilled at the aforementioned location which is the same as that approved by Order No. R-2807.

Spudded 8-27-65. Ran 4 1/2" casing 8-30-65. Perforated 1616-18, 1622-26, 1632-34, 1639-41 and 1652-54. Tested 4 days with 1 1/2" pump, 36" stroke, 12 strokes per minute. Well pumped off in short time. Final test 6 barrels of fluid per day, 60 per cent water, increasing. Well noncommercial. Equipped as injection well.

Well No. 67

(Unit H, 3210' from the South line and 1590' from the East line of Section 1, Township 17 North, Range 9 West)

To avoid the flood plain of a dry creek which runs through the sand Unit, this well was drilled at the aforementioned location which is 20 feet north of the location approved by Order No. R-2807.

Spudded 8-31-65. Ran 4 1/2" casing 9-3-65. No production test run. Well equipped for use as injection well.

Well No. 68

(Unit B, 2310' from the East line and 990' from the North line of Section 36, Township 18 North, Range 9 West)

This well was drilled at the aforementioned location as a result of the new geological information obtained from the drilling of wells Nos. 63 and 64. This well lies approximately 960' north and 350' west of well No. 29 whose conversion to injection was approved by Order No. R-2807.

Spudded 8-3-65. Ran 2 7/8" fiberglass casing 8-6-65. Perforated 1760-80. Cores indicated entire section water productive. No production tests. Completed for use as injection well.

Well No. 69

(Unit E, 2310' from the North line and 940' from the West line of Section 36, Township 18 North, Range 9 West)

Well No. 69 (continued)

This well was drilled at the aforementioned location as a result of the new geological information obtained from the drilling of wells Nos. 62, 63, 64 and 68.

Spudded 9-10-65. Ran 2 7/8" fiberglass casing 9-13-65. Cores indicated entire section water-productive. No production test. Well equipped for use as injection well.

Well No. 70

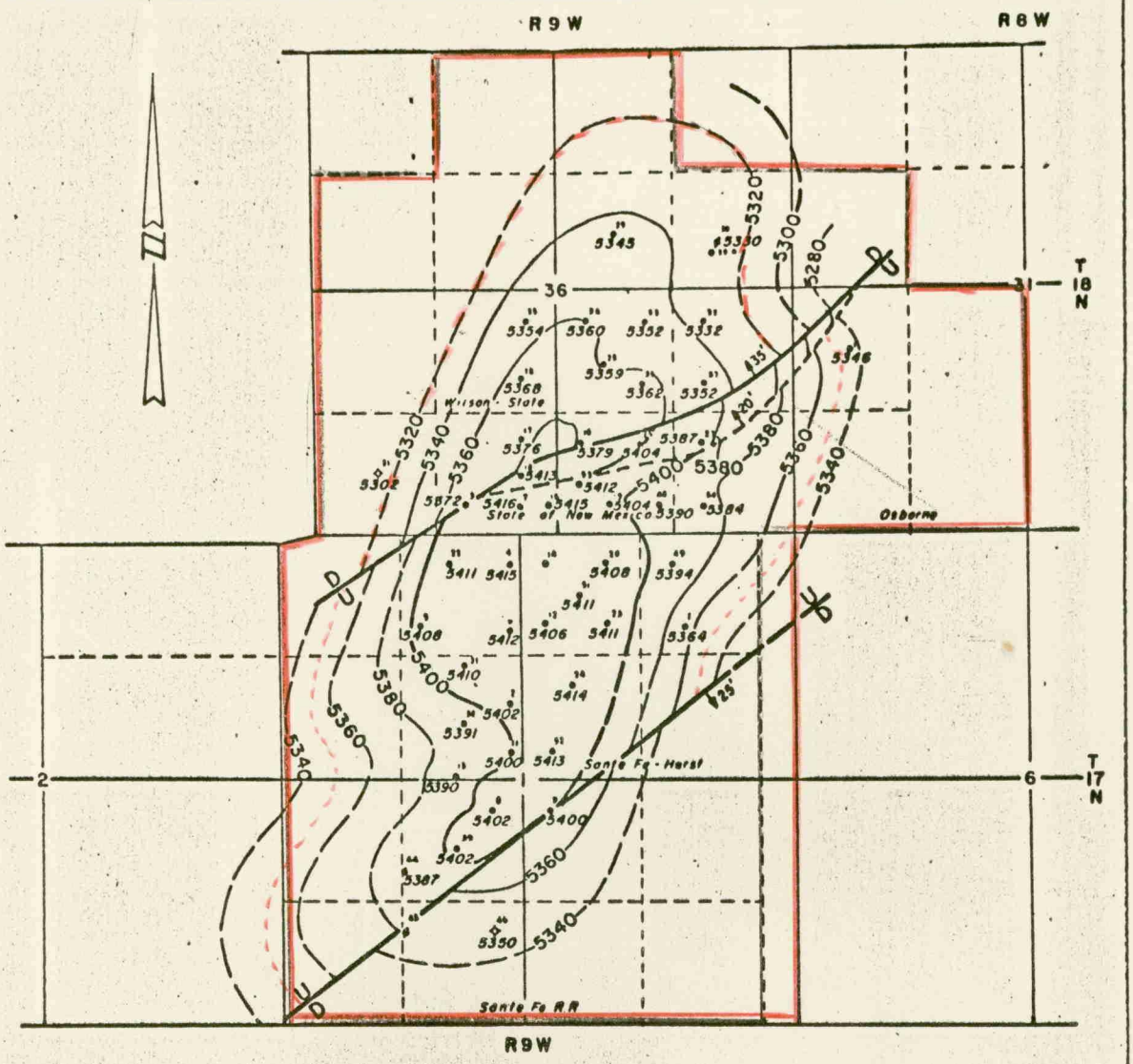
Not drilled

Well No. 71

(Unit N, 1310' from the South line and 2000' from the West line of Section 36, Township 18 North, Range 9 West)

This well was drilled as a producing well to replace No. 18 which was plugged and abandoned due to casing failure.

Spudded 9-16-65. Ran 4 1/2" casing 9-20-65. Perforated 1667-78, 1688-91, 1700-05 and 1714-17. Tested 4 days with 1 1/2" pump, 36" stroke, 12 strokes per minute. Final test 39 barrels per day total fluid, 32 barrels water and 7 barrels oil. Well shut in awaiting approval of Oil Conservation Commission.



LEGEND

HOSPAH FIELD UNIT OUTLINE

-- ORIG. O/W CONTACT

Figure 2

STRUCTURE MAP

TOP HOSPAH SAND

HOSPAH FIELD

McKINLEY COUNTY, NEW MEXICO

CONTOUR INTERVAL: 20 FEET

1000' 0 1000 2000 3000 4000'

CORE LABORATORIES, INC.

ENGINEERING & CONSULTING DEPT

APRIL 1, 1964