

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

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

CASE NO. 11973  
ORDER NO. R-11027

APPLICATION OF SHAHARA OIL L.L.C.  
FOR A WATERFLOOD PROJECT AND  
QUALIFICATION FOR THE RECOVERED  
OIL TAX RATE PURSUANT TO THE "NEW  
MEXICO ENHANCED OIL RECOVERY ACT",  
EDDY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on May 28 and June 11, 1998, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 3rd day of August, 1998, the Division Director, having considered the testimony, the record and the recommendations of the Examiner,

FINDS THAT:

(1) Due public notice has been given and the Division has jurisdiction of this case and its subject matter.

(2) The applicant, Shahara Oil, L.L.C. (Shahara), seeks authority to institute a waterflood project on its Beeson "F" Federal Lease, which comprises the following described 440 acres, more or less, in Eddy County, New Mexico, by the injection of water into the Queen, Grayburg and San Andres formations, Loco Hills Queen-Grayburg-San Andres Pool through twelve injection wells described on Exhibit "A" attached to this order:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM

Section 29: S/2 SW/4, SW/4 SE/4

Section 31: NE/4, SW/4

(3) Division records and testimony presented by the applicant indicate that by Order No. R-2031, entered in Case No. 2334 on July 13, 1961, the Division authorized General American Oil Company of Texas (General American) to institute a waterflood project on that portion of its Beeson "F" Federal lease comprising the NE/4 and SW/4 of Section 31, Township 17 South, Range 30 East, NMPM, and on that portion of State Lease No. B-1778 comprising the SE/4 SE/4 of Section 36, Township 17 South, Range 29 East, NMPM, by the injection of water into the Loco Hills Queen-Grayburg-San Andres Pool through seven initial injection wells.

(4) The project was expanded by the addition of six injection wells by the following Division orders:

<u>Order Number</u>	<u>Order Date</u>
R-2031-A	October 3, 1962
WFX-155	November 8, 1963
WFX-165	January 31, 1964
WFX-186	October 30, 1964

(5) Division records further indicate that water injection within the General American waterflood project ceased during the early to mid 1970's.

(6) Pursuant to Division Rule No. 705.C, injection authority within the General American waterflood project has terminated.

(7) According to applicant's evidence and testimony, it acquired and assumed operation of the Beeson "F" Federal lease August 1, 1995.

(8) Applicant's evidence and testimony indicate that it proposes to:

- a) re-establish injection into the Beeson "F" Federal Well Nos. 2, 5, 6, 7, 11 and 13 and establish injection into the Beeson "F" Federal Well Nos. 3, 8, 9, 12, 26 and 27;
- b) alter the injection pattern utilized by General American;
- c) utilize the Beeson "F" Federal Well Nos. 18, 19, 20, 21, 22, 23, 24 and 25 as producing wells within the proposed project;

- d) establish waterflood operations within the S/2 SW/4 and SW/4 SE/4 of Section 29, which area has not previously been subject to secondary recovery operations; and
  - e) utilize micro-organisms within the fluid injection stream to improve the sweep efficiency of the project.
- (9) The evidence and testimony presented in this case indicate that:
- a) the applicant currently owns approximately 74.5 percent of the working interest within the proposed project area. The remaining interest (along with Shahara's) has been consolidated by means of an operating agreement dated August 1, 1995;
  - b) the addition of injection wells and resultant change in the injection pattern proposed to be utilized by the applicant within the subject waterflood project represents a more efficient injection pattern than that previously utilized by General American;
  - c) the inclusion of the S/2 SW/4 and SW/4 SE/4 of Section 29, an area which has not previously been subject to secondary recovery operations, within the proposed project should increase the recovery of oil within the project; and
  - d) applicant's proposed injection of micro-organisms represents a change in the technology utilized for secondary recovery purposes which should result in a greater sweep efficiency within the reservoir.

(10) Applicant testified that the proposed waterflood operations within the project area should result in the recovery of an additional 800,000 barrels of oil which would otherwise not be recovered, thereby preventing waste.

(11) The estimated cost to implement the proposed secondary recovery operation within the project area is \$2.8 million dollars.

(12) Approval of the proposed waterflood project should result in the recovery of additional oil from the project area which may otherwise not be recovered, thereby preventing waste, and will not violate correlative rights.

(13) At the time of the hearing the applicant requested approval of five unorthodox oil well locations within the proposed secondary recovery project area described as follows:

<u>Well Name &amp; Number</u>	<u>Well Location</u>
Beeson "F" No. 18	1000' FSL & 2225' FWL (Unit N) Section 31, T-17S, R-30E
Beeson "F" No. 19	337' FSL & 1279' FWL (Unit N) Section 31, T-17S, R-30E
Beeson "F" No. 22	1974' FNL & 992' FEL (Unit H) Section 31, T-17S, R-30E
Beeson "F" No. 23	361' FSL & 2334' FEL (Unit O) Section 29, T-17S, R-30E
Beeson "F" No. 24	1340' FNL & 904' FEL (Unit H) Section 31, T-17S, R-30E

(14) Approval of the proposed unorthodox oil well locations is beyond the call of this case, and therefore, the applicant should be required to obtain approval for the above-described unorthodox oil well locations from the Division's Artesia District Office pursuant to Rule No. 104.F.(1).

(15) The injection of water into the wells shown on Exhibit "A" should be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforations. The casing-tubing annulus in each well should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(16) The evidence presented by the applicant indicates that the following described five wells, located within the "area of review" of the applicant's proposed injection wells, are not adequately plugged so as to confine the injected fluid to the proposed injection interval:

<u>Well Name &amp; Number</u>	<u>Well Location</u>
Aston & Fair State No. 1-B	3630' FNL & 3630' FEL (Unit K) Section 32, T-17S, R-30E
Yates Petroleum Corporation Yates "A" No. 9	990' FNL & 911' FWL (Unit D) Section 6, T-18S, R-30E

Roland R. Woolley Arnold No. 9D	1650' FSL & 1650' FEL (Unit J) Section 29, T-17S, R-30E
Yates Petroleum Corporation Brigham No. 2	2310' FSL & 990' FEL (Unit I) Section 31, T-17S, R-30E
R.R. Woolley Woolley No. 12-D	330' FNL & 330' FWL (Unit D) Section 33, T-17S, R-30E

(17) Prior to commencing injection operations into any of the wells shown on Exhibit "A", the applicant should be required to re-enter and re-plug the above-described wells in a manner which will ensure that these wellbores will not provide a conduit for the injected fluid to escape to other formations or to the surface.

(18) Prior to commencing injection operations into the Beeson "F" Federal Well No. 13, the applicant should run 4 ½-inch casing from surface to a depth of approximately 3,200 feet and cement to surface in accordance with the procedure outlined on its Form C-108 presented at the hearing.

(19) Prior to commencing injection operations into any of the wells shown on Exhibit "A", the casing in each well should be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(20) Within 90 days from initiating injection operations and every two years thereafter, the applicant should be required to conduct an injection tracer survey on the Beeson "F" Federal Well Nos. 2, 3, 5, 6, 7, 8, 9, 11 and 12 in order to demonstrate external mechanical integrity.

(21) The injection wells or pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to that shown on Exhibit "A", or to a pressure not to exceed 0.2 psi per foot of depth to the uppermost injection perforation or casing shoe.

(22) The Division Director should have the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(23) The operator should give advance notification to the supervisor of the Division's Artesia District Office of the date and time it intends to perform: 1) re-plugging operations on the wells described in Finding No. 16; 2) injection equipment installation and mechanical integrity pressure tests; and 3) injection tracer surveys on the wells described in Finding No. 20, in order that the same may be witnessed.

(24) The proposed waterflood project should be approved and the project should be governed by the provisions of Rule Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(25) The injection authority granted herein for the wells shown on Exhibit "A" should terminate one year after the effective date of this order if the operator has not commenced injection operations into these wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(26) The applicant further requested that the proposed waterflood project be approved by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "New Mexico Enhanced Oil Recovery Act", Sections 7-29A-1 through 7-29A-5, NMSA 1978.

(27) The evidence presented indicates that the proposed waterflood project meets all the criteria for approval.

(28) The approved project area should initially comprise the SW/4 and NE/4 of Section 31 and the S/2 SW/4 and SW/4 SE/4 of Section 29.

(29) To be eligible for the EOR credit, the operator must request from the Division a Certificate of Qualification prior to commencing injection operations, which certificate will specify the project area as described above.

(30) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations and the specific wells which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

**IT IS THEREFORE ORDERED THAT:**

(1) The applicant, Shahara Oil, L.L.C., is hereby authorized to institute a waterflood project on its Beeson "F" Federal Lease which comprises the following described 440 acres, more or less, in Eddy County, New Mexico, by the injection of water and micro-organisms into the Queen, Grayburg and San Andres formations, Loco Hills Queen-Grayburg-San Andres Pool through twelve injection wells described on Exhibit "A" attached to this order:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM

Section 29: S/2 SW/4, SW/4 SE/4

Section 31: NE/4, SW/4

(2) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(3) The injection of water into the wells shown on Exhibit "A" shall be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforations; the casing-tubing annulus in each well shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(4) Prior to commencing injection operations into any of the wells shown on Exhibit "A", the casing in each well shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(5) Prior to commencing injection operations into any of the wells shown on Exhibit "A", the applicant shall re-enter and re-plug the following described wells in a manner which will ensure that these wellbores will not provide a conduit for the injected fluid to escape to other formations or to the surface:

<u>Well Name &amp; Number</u>	<u>Well Location</u>
Aston & Fair State No. 1-B	3630' FNL & 3630' FEL (Unit K) Section 32, T-17S, R-30E
Yates Petroleum Corporation Yates "A" No. 9	990' FNL & 911' FWL (Unit D) Section 6, T-18S, R-30E
Roland R. Woolley Arnold No. 9D	1650' FSL & 1650' FEL (Unit J) Section 29, T-17S, R-30E
Yates Petroleum Corporation Brigham No. 2	2310' FSL & 990' FEL (Unit D) Section 31, T-17S, R-30E
R.R. Woolley Woolley No. 12-D	330' FNL & 330' FWL (Unit D) Section 33, T-17S, R-30E

(6) Prior to commencing injection operations into the Beeson "F" Federal Well No. 13, the applicant shall run 4 1/2-inch casing from surface to a depth of approximately 3,200 feet and cement to surface in accordance with the procedure outlined on its Form C-108 presented at the hearing.

(7) Within 90 days from initiating injection operations and every two years thereafter, the applicant shall conduct an injection tracer survey on the Beeson "F" Federal Well Nos. 2, 3, 5, 6, 7, 8, 9, 11 and 12 in order to demonstrate external mechanical integrity.

(8) The injection wells or pressurization system shall be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to that shown on Exhibit "A", or to a pressure not to exceed 0.2 psi per foot of depth to the uppermost injection perforations or casing shoe.

(9) The Division Director shall have the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(10) The operator shall give advance notification to the supervisor of the Division's Artesia District Office of the date and time it intends to perform: 1) re-plugging operations on the wells described in Finding No. 16; 2) injection equipment installation and mechanical integrity pressure tests; and 3) injection tracer surveys on the wells described in Finding No. 20, in order that the same may be witnessed.

(11) The operator shall immediately notify the supervisor of the Division's Artesia District Office of the failure of the tubing, casing or packer in any of the injection wells, the leakage of water, oil or gas from or around any producing well, or the leakage of water, oil or gas from any plugged and abandoned well within the project area, and shall take such steps as may be timely and necessary to correct such failure or leakage.

(12) The project should be designated the Beeson "F" Federal Waterflood Project.

(13) The operator shall conduct injection operations in accordance with Division Rule Nos. 701 through 708 and shall submit monthly progress reports in accordance with Division Rule Nos. 706 and 1115.

(14) The Beeson "F" Federal Waterflood Project is hereby approved as an "Enhanced Oil Recovery Project" pursuant to the "New Mexico Enhanced Oil Recovery Act", Sections 7-29A-1 through 7-29A-5, NMSA 1978.

(15) The approved project area shall initially comprise the SW/4 and NE/4 of Section 31 and the S/2 SW/4 and SW/4 SE/4 of Section 29.

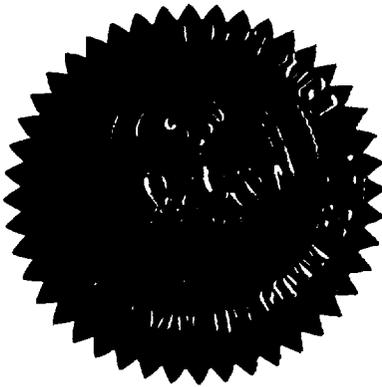
(16) To be eligible for the EOR credit, the operator must request from the Division a Certificate of Qualification prior to commencing injection operations, which certificate will specify the project area as described above.

(17) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations and the specific wells which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(18) The injection authority granted herein for the injection wells shown on Exhibit "A" shall terminate one year after the effective date of this order if the operator has not commenced injection operations into these wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

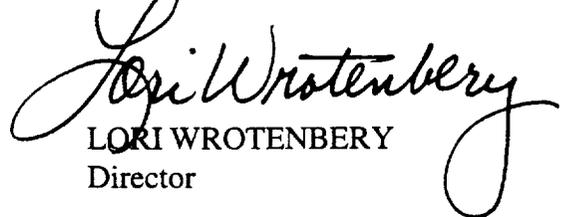
(19) Jurisdiction of this case is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



S E A L

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

  
LORI WROTENBERY  
Director

**EXHIBIT "A"**  
**DIVISION ORDER NO. R-11027**  
**APPROVED INJECTION WELLS**  
**BEESON FEDERAL WATERFLOOD PROJECT**

<u>Well Name &amp; Number</u>	<u>Well Location</u>	<u>Injection Interval</u>	<u>Packer Setting Depth</u>	<u>Max. Surface Inj. Pressure</u>
Beeson "F" Federal Well No. 2	330' FSL & 330' FWL, Unit M, Section 31, T-17S, R-30E	2,570'-3,014' (Est.)	2,470'	514 PSIG
Beeson "F" Federal Well No. 3	345' FSL & 2310' FWL, Unit N, Section 31, T-17S, R-30E	2,679'-3,200'	2,625'	536 PSIG
Beeson "F" Federal Well No. 5	2310' FNL & 1650' FEL, Unit G, Section 31, T-17S, R-30E	2,829'-3,101'	2,729'	566 PSIG
Beeson "F" Federal Well No. 6	2310' FNL & 330' FEL, Unit H, Section 31, T-17S, R-30E	2,859'-3,136'	2,759'	572 PSIG
Beeson "F" Federal Well No. 7	990' FNL & 330' FEL, Unit A, Section 31, T-17S, R-30E	2,826'-3,087'	2,726'	565 PSIG
Beeson "F" Federal Well No. 8	330' FSL & 1650' FEL, Unit O, Section 29, T-17S, R-30E	2,320'-3,350'	2,250'	464 PSIG
Beeson "F" Federal Well No. 9	330' FSL & 2310' FWL, Unit N, Section 29, T-17S, R-30E	2,537'-3,350'	2,475'	507 PSIG
Beeson "F" Federal Well No. 11	1650' FNL & 330' FEL, Unit H, Section 31, T-17S, R-30E	2,836'-3,100'	2,736'	567 PSIG
Beeson "F" Federal Well No. 12	990' FSL & 1571' FWL, Unit N, Section 31, T-17S, R-30E	2,814'-3,081'	2,714'	563 PSIG
Beeson "F" Federal Well No. 13	2310' FSL & 2232' FWL, Unit K, Section 31, T-17S, R-30E	2,618'-3,200' (Est.)	2,518'	524 PSIG
Beeson "F" Federal Well No. 26	1976' FSL & 820' FWL, Unit L, Section 31, T-17S, R-30E	2,806'-3,237'	2,725'	561 PSIG
Beeson "F" Federal Well No. 27	1015' FNL & 1524' FEL, Unit B, Section 31, T-17S, R-30E	2,789'-3,126'	2,700'	558 PSIG