

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 THE:

APPLICATION OF ALAMO PERMIAN RESOURCES, LLC FOR
REINSTATEMENT OF A WATERFLOOD PROJECT FOR ITS WEST ARTESIA
GRAYBURG WATERFLOOD UNIT AREA AND QUALIFICATION OF SAID
PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE
ENHANCED RECOVERY ACT, EDDY COUNTY, NEW MEXICO

CASE NO. 14611
ORDER NO. R-3357-C

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on March 17, 2011, at Santa Fe, New Mexico before Examiner William V. Jones.

NOW, on this 18th day of May, 2011, 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) Alamo Permian Resources, LLC ("Alamo" or "applicant"), seeks approval to re-instate its Grayburg formation waterflood within the West Artesia Grayburg Unit and qualify the project for the Enhanced Oil Tax Rate.
- (3) The West Artesia Grayburg Unit Agreement was approved by the State Land Office in 1967 and was the subject of Commission Case No. 3698, Order No. R-3356 issued December 22, 1967. The Unit covers 640 acres, more or less, of the following State and fee lands within Eddy County, New Mexico:

Township 18 South, Range 28 East, NMPM

Section 7: SE/4 NE/4 and E/2 SE/4

Section 8: S/2 NE/4, NW/4, W/2 SW/4, NE/4 SW/4, and N/2 SE/4
Section 17: N/2 NW/4

(4) The Commission issued Order No. R-3357 on December 22, 1967, approving a waterflood project on the lands of the West Artesia Grayburg Unit consisting of eight injection wells within the Grayburg formation, Artesia-Queen-Grayburg-San Andres Pool (Pool Code 3230).

(5) Commission Order No. R-3357-A, issued July 15, 1968, amended the previous approval by substituting the following six wells as injectors instead of those eight approved earlier:

TP State Well No. 13	Unit Letter I of Section 7	30-015-02636
Gulf State Well No. 1	Unit Letter C of Section 8	30-015-02645
Humble State Well No. 4	Unit Letter E of Section 8	30-015-02648
Marathon Well No. 6	Unit Letter G of Section 8	30-015-10328
Signal State Well No. 11	Unit Letter K of Section 8	30-015-02655
Mell Well No. 17	Unit Letter M of Section 8	30-015-02642

(6) Commission Order No. R-3357-B, issued March 5, 1969, once again amended the approved injection wells, substituting the following well as an injector instead of the Mell Well No. 17:

Leonard Well No. 18	Unit Letter D of Section 17	30-015-01899
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(7) Administrative Order WFX-359, issued August 10, 1971, added the following as an approved injection well:

Unit Well No. 12	Unit Letter L of Section 8	30-015-02649
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(8) The Signal State Well No. 11 was used for injection until 2009 and was plugged and abandoned June 24, 2010.

(9) This application asks for re-instatement of approval for injection for waterflood purposes into the six active wells previously approved and listed above. These wells have since been re-named as follows:

West Artesia Grayburg Unit Well No. 1	30-015-02645
West Artesia Grayburg Unit Well No. 4	30-015-02648
West Artesia Grayburg Unit Well No. 6	30-015-10328
West Artesia Grayburg Unit Well No. 12	30-015-02649
West Artesia Grayburg Unit Well No. 13	30-015-02636
West Artesia Grayburg Unit Well No. 18	30-015-01899

(10) The operator of this waterflood (at that time, Marbob Energy Corporation) failed to report any water injection during most of years 1999, 2000, and 2001 and therefore the permit to inject for the entire project expired as per Division Rule

19.15.26.12C NMAC. Since the days of Marbob operation, six other operators have been named for this project; Alamo became the operator of record for these wells in October of 2010. Alamo has shut in all injection on this project pending the outcome of this hearing.

(11) Although injection was again resumed in 2002, injection was at very low rates until 2009 when Doral Energy Corporation ramped up injection to approximately 600 barrels of water per day, apparently resuming injection for waterflood purposes. The injection rate for the entire project ranged from a total of approximately 160 barrels per day in 1993, declining to half of that amount by 2009.

(12) The proposed vertical extent of the proposed Waterflood Project is that productive interval within the Grayburg formation. The log on the West Artesia Grayburg Unit Well No. 9 is being used as the Unit Type Log. This log is not available on the Division's imaging web site for this well, but log exhibit(s) presented at the hearing indicate the Grayburg ranges in this well from 2020 feet to 2322 feet as measured and recorded on that well's gamma ray-neutron log.

(13) Only one of the proposed six injection wells has logs available on the Division's web site. The operator should supply any available logs for the following five proposed injection wells to the Hobbs district office for scanning within one year of the date of this order:

West Artesia Grayburg Unit Wells No. 1, 4, 12, 13, and 18.

(14) The wells within the Unit were drilled beginning in the 1950's through the 1990's. The cementing data submitted with this application and the Division's well records indicate that cement jobs during the early years were designed to only cover the Grayburg formation at the bottom of the hole.

(15) The West Artesia Grayburg Unit Well No. 19, API No. 30-015-01897, was drilled in April of 1957 to 2145 feet with an 8 inch bit and 5-1/2 inch casing was run and cemented with 30 sacks of cement. This well is producing from only the bottom portion of the hole at this time and offsetting Well No. 18 is injecting at depths of approximately 25 feet below the calculated cement top.

(16) Alamo should review cement top records and monitor bradenheads to ensure injection does not move vertically in these poorly cemented wells. Prior to adding additional perforated intervals within the upper Grayburg formation, Alamo should ensure all wells are protected with adequate cement to ensure bradenheads and fresh water intervals are protected from waterflood operations.

~~(17) Within one half mile from the six proposed injection wells, there are 68 total wells and 15 plugged (or dry) and abandoned wells.~~

(18) The following three abandoned wells have questionable cement coverage but should not be included in any required remediation. The first well listed below has already had a failed re-plugging attempt. All three wells are located almost one half mile

away from any injector and in an area not considered to be productive in the Grayburg formation.

Nix-State Well No. 1	P/8/18S/28E	30-015-06117
Humble State Well No. 1	L/9/18S/28E	30-015-02662
Humble State Well No. 1	G/7/18S/28E	30-015-02629

(19) The following well is within at least three of the Areas of Review and should be re-entered and re-plugged in order to isolate the injection interval from possible vertical migration of high pressure fluids:

Donnelly Kelly State Well No. 1 O/8/18S/28E 30-015-02367

(20) Alamo Permian Resources, LLC (OGRID 274841) is the operator of record of the wells located on this acreage. Alamo is in compliance with Division Rule 5.9 and therefore eligible for approval of disposal and injection permits.

(21) The applicant has notified all affected parties of the intent to inject into the proposed injection wells and has received no objections. No other parties appeared in this case or otherwise opposed this application.

(22) Alamo presented exhibits and testimony from a landman, geologist, and engineer indicating the following:

(a) The ownership within the Unit area is 81.25 percent State of New Mexico and 18.75 percent fee. The Unit area consists of 11 leases with Alamo owning 100 percent of the working interests in the Unit.

(b) The Grayburg formation structure is monoclinial and dips gently to the southeast without any evidence of faulting. The Grayburg formation consists of alternating beds of low porosity dolomite and higher porosity, radioactive sandstones. The targeted oil for waterflooding is located in the sandstones.

(c) Geologists, employed or contracted by Doral and then Alamo, have conducted a study using available logs and have identified additional pay intervals and additional intervals for waterflooding.

(d) This waterflood has already injected approximately 5.4 million barrels of water over the past 40 years. Alamo intends to use produced water from this and other leases and has no plans to inject fresh water into this reservoir.

~~(e) There is no evidence to date of harm to shallow underground~~
drinking waters from this injection. A nearby water well was sampled by Alamo, indicating the water table contains water with very low salt content.

(f) Alamo would like to ramp up the injected volumes and will need additional pressure allowable to reach this goal.

(23) The proposed waterflood within this Unit is feasible and should result in the recovery of additional oil and gas that would not otherwise be recovered.

(24) The estimated additional costs of the proposed waterflood operations will not exceed the estimated value of the additional oil and gas recovered plus a reasonable profit.

(25) The proposed project will prevent waste, protect correlative rights, and should be approved and called the West Artesia Grayburg Unit Waterflood Project. The area to be affected by this waterflood operation (project area) should consist of the entire West Artesia Grayburg Unit area.

(26) Alamo should be approved to inject into the proposed six wells at depths within the Grayburg formation and specified in its application. Provisions should be made for the operator of the Unit to apply administratively for additional or alternate injection wells as needed.

(27) One maximum injection pressure should apply to all wells within the waterflood. Alamo did not present adequate justification at the hearing to grant higher injection pressure limit(s) for its proposed wells than the normally allowed 0.2 psi per foot gradient. Alamo should run step rate tests and present evidence to the Division administratively seeking a higher injection pressure limit if a higher limit is needed.

(28) Alamo presented exhibits containing the information required by Division rules to qualify this project under the Enhanced Oil Recovery Act.

(29) The evidence establishes that the secondary recovery project meets all the criteria for certification by the Division as a qualified "Enhanced Oil Recovery (EOR) Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5). The certified project area should consist of the entire West Artesia Grayburg Unit area.

(30) The EOR project area and/or the producing wells within this area eligible for the recovered oil tax rate may be contracted or expanded depending upon the evidence presented by the applicant in its demonstration of the occurrence of a positive production response.

IT IS THEREFORE ORDERED THAT:

(1) Alamo Permian Resources, LLC ("Operator") [OGRID 274841] is hereby authorized to implement waterflood operations within the West Artesia Grayburg Unit ("WAGU") by injection of oil field produced waters (UIC Class II) into the Grayburg formation [Artesia-Queen-Grayburg-San Andres Pool (Pool Code 3230)] within the following six wells all located within Township 18 South, Range 28 East, NMPM, Eddy

County, New Mexico:

<u>Well</u>	<u>API</u>	<u>Location</u>	<u>Sec</u>	<u>Approved Interval</u>
WAGU Well No. 1	30-015-02645	Unit Letter C	Sec 8	1982 - 2264
WAGU Well No. 4	30-015-02648	Unit Letter E	Sec 8	1966 - 2270
WAGU Well No. 6	30-015-10328	Unit Letter G	Sec 8	2114 - 2277
WAGU Well No. 12	30-015-02649	Unit Letter L	Sec 8	2114 - 2253
WAGU Well No. 13	30-015-02636	Unit Letter I	Sec 7	1932 - 2208
WAGU Well No. 18	30-015-01899	Unit Letter D	Sec 17	2009 - 2279

(2) The West Artesia Grayburg Unit currently consists of 640 acres, more or less, of the following lands within Eddy County, New Mexico:

Township 18 South, Range 28 East, NMPM

Section 7: SE/4 NE/4 and E/2 SE/4

Section 8: S/2 NE/4, NW/4, W/2 SW/4, NE/4 SW/4, and N/2 SE/4

Section 17: N/2 NW/4

(3) The West Artesia Grayburg Unit Waterflood Project is hereby approved and shall consist of the entire West Artesia Grayburg Unit area.

(4) The vertical extent of this waterflood is hereby defined as extending within the Grayburg formation for equivalent depths as measured and recorded on the gamma ray-neutron log for the WAGU Well No. 9 from 2020 feet to 2322 feet.

(5) The Division Director may administratively authorize alternate or additional injection wells within this Unit as provided in 19.15.26.8 NMAC.

(6) All formerly issued injection permits pertaining to wells within this Unit are hereby superceded; including but not limited to, Commission Orders No. R-3357, R-3357-A, R-3357-B and WFX-359.

(7) Within six months of the date of this order, an attempt shall be made, under supervision and to the satisfaction of the Artesia district office inspectors, to re-enter and re-plug the Donnelly Kelly State Well No. 1 (API No. 30-015-02367) located in Unit Letter O of Section 8 in order to isolate the Grayburg formation from possible vertical migration of high pressure fluids. If the operator fails to initiate an attempt to re-plug this well within six months of the date of this order, the authority granted for injection in this Order shall terminate *ipso-facto*.

(8) The operator shall supply any available electric logs for the WAGU Wells No. 1, 4, 12, 13, and 18 to the Hobbs district office for scanning within one year of the date of this order.

(9) The operator shall take all steps necessary to ensure that the injected water enters only the permitted injection intervals and is not permitted to escape to other

formations or onto the surface from injection, production, or plugged and abandoned wells.

(10) The operator shall review cement top records and monitor bradenheads to ensure injection does not move vertically within any Unit wells. Prior to adding additional approved perforated intervals within the upper Grayburg formation, the operator shall ensure all wells are protected with adequate cement to ensure bradenheads and fresh water intervals are protected from waterflood operations.

(11) Injection into any approved injection wells within this project shall be accomplished through plastic-lined tubing installed in a packer located within 100 feet of the uppermost injection perforation. The casing-tubing annulus shall be filled with an inert fluid, and a gauge or approved leak-detection device shall be attached to the annulus in order to detect any leakage in the casing, tubing, or packer.

(12) The injection wells or pressurization system shall be equipped with a pressure control device or acceptable substitute that will limit the maximum surface injection pressure to 423 psi.

(13) The Division Director may administratively authorize a pressure limitation in excess of the above, upon a showing by the operator, supported by approved Step Rate Tests, that such higher pressure will not result in the fracturing of the injection formation or confining strata or damage to the reservoir.

(14) As per Division Rule 19.15.26.11A., the operator shall test each approved injection well for mechanical integrity prior to commencing injection into that well and every five years thereafter – or more frequently if directed by the Division's district office.

(15) The operator shall provide notice, 72 hours in advance, to the supervisor of the Division's district office of the date and time of the installation of injection equipment and of any mechanical integrity test so that the same may be inspected and witnessed.

(16) The operator shall provide written notice of the date of commencement of injection to the Division's district office. In accordance with Division rules, the operator shall submit monthly reports of the disposal operations on Division Form C-115.

(17) Without limitation on the duties of the operator as provided in Division rules, or otherwise, the operator shall immediately notify the Division's district office of any failure of the tubing, casing or packer in the well, or of any leakage or release of water, oil or gas from around any produced or plugged and abandoned well in the area, and shall take such measures as may be timely and necessary to correct such failure or leakage.

(18) The West Artesia Grayburg Unit Waterflood Project is hereby certified to the New Mexico Taxation and Revenue Department as an "Enhanced Oil Recovery

Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5).

(19) The area to be affected by the enhanced oil recovery project shall consist of the area within the West Artesia Grayburg Unit. Provided, the area and/or the producing wells eligible for the enhanced oil recovery (EOR) tax rate may be contracted or expanded based upon the evidence presented by the unit operator in its demonstration of a positive production response.

(20) At such time as a positive production response occurs, and within five years from the date the project was certified to the New Mexico Taxation and Revenue Department, the unit operator must apply to the Division for certification of a "positive production response." This application for "positive production response" shall identify the area benefiting from enhanced oil recovery operations and the specific wells eligible for the EOR tax rate.

(21) The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

(22) The injection authority granted under this order is not transferable except upon Division approval. The Division may require the operator to demonstrate mechanical integrity of any injection well that will be transferred prior to approving transfer of authority to inject.

(23) The Division may revoke this injection permit after notice and hearing if the operator is in violation of 19.15.5.9 NMAC.

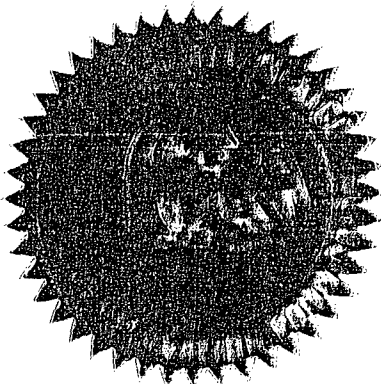
(24) The injection authority granted herein shall terminate two years after the effective date of this order if the operator has not commenced injection operations into at least one of the permitted injection wells, provided however, the Division, upon written request, mailed by the operator prior to the termination date, may grant an extension thereof for good cause.

(25) One year after all injection into the project area has ceased (or not reported), the authority to inject will terminate *ipso facto*.

(26) Compliance with this order does not relieve the operator of the obligation to comply with other applicable federal, state or local laws or rules, or to exercise due care for the protection of fresh water, public health and safety and the environment.

(27) Jurisdiction is retained by the Division for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh or protectable waters or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing (or without prior notice and hearing in case of emergency), terminate the injection authority granted herein.

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



SEAL

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JAMI BAILEY
Director