

**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. 14664
ORDER NO. R-13443**

**APPLICATION OF FRONTIER FIELD SERVICES, LLC FOR APPROVAL OF
AN ACID GAS DISPOSAL WELL, LEA COUNTY, NEW MEXICO**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on June 23, 2011, at Santa Fe, New Mexico, before Examiner William V. Jones.

NOW, on this 11th day of August, 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) The applicant, Frontier Field Services, LLC ("Frontier" or "applicant"), seeks authority to utilize its proposed Maljamar AGI Well No. 1 [(API No. 30-025-NA), the "subject well"], to be located 130 feet from the South line and 1813 feet from the East line, Unit O of Section 21, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, for disposal of Acid Gas and CO₂ from its Gas Processing Plant into the Lower Leonard and Wolfcamp formations through perforations at a gross interval of from approximately 9300 feet to 10,000 feet.

(3) The applicant's witnesses presented the following testimony:

a. The proposed disposal well is to be located on a [pending] federal surface lease within approximately 300 feet of the plant near the current H₂S flare.

- b. The Maljamar Gas Plant is handling an increased amount of mostly sour gas from Bone Spring and Paddock formation drilling. The Maljamar Plant air quality permits limit emissions, which in turn, limits the plant's gas handling capacity. The disposal well is needed to allow more plant throughput. The proposed disposal well should handle any plant expansion.
- c. Frontier expects disposed fluids to consist of 88 percent CO₂ and 12 percent H₂S.
- d. The plant uses a cryogenic process to break the produced gas into products for sale and inerts for flaring or disposal.
- e. In compliance with Division Rule 19.15.11.9 NMAC, Frontier has an H₂S Contingency Plan in place for the plant and is working with the Division's Environmental Bureau to extend this plan to include the proposed disposal well.
- f. This plant and proposed well are located just off the Caprock, in a heavily drilled area, approximately 3 miles south of the town of Maljamar and 1.5 miles north of highway 529.
- g. Disposal of gas plant wastes will improve air quality by reducing sulfur dioxide and carbon dioxide. Installation of this disposal well will enable the plant to expand and handle increased volumes of locally produced natural gas. This will in turn lower pipeline pressures for producers and enable increased recovery of gas from reservoirs.
- h. Frontier has run, processed, and interpreted 3-D seismic over this area and has shown the proposed disposal interval is isolated from any producing Wolfcamp intervals surrounding this location. The seismic survey indicates a Wolfcamp formation porosity pod of sufficient capacity to contain all plant waste gases including those gases associated with any proposed plant expansion.
- i. Frontier intends to permit this well and drill it through the Wolfcamp depths, case the well with casing designed to allow various packer setting depths depending on whether the Lower Leonard is to be completed, perforate, equip the well with injection tubing and packer, and commence disposal of H₂S and CO₂ gases under pressure.
- j. Frontier does not expect any waste of oil or gas to occur as a result of disposal into the Lower Leonard and Wolfcamp formations at this location.

- k. The well will be adequately equipped and cemented to isolate any fresh water intervals within these Triassic aged surface rocks.

(4) Wolfcamp production attempts located nearby the proposed Acid Gas well have indicated the Wolfcamp to be largely unproductive or very short lived. Division records indicate the Wolfcamp is being produced successfully approximately one mile to the northeast of this proposed location. The existing Wolfcamp formation producing wells have frequently been commingled with the more prolific Abo production located 8800 to 9000 feet deep. Below the Wolfcamp, the Pennsylvanian Cisco formation is producing in at least one well within Section 20 located to the west of the proposed well.

(5) Division records indicate the Wolfcamp and Abo production in this area is "sweet" or devoid of H₂S with API gravity of approximately 42.

(6) The "Lower Leonard" formation being proposed for disposal beginning at 9300 feet is called in Division records the "Wolfcamp formation" or sometimes the "upper Wolfcamp formation".

(7) Above the proposed disposal well in this Section 21, the MCA Unit (Grayburg San Andres formations, approximately 4400 feet deep) has been tested for tertiary recovery by injection of CO₂ in a small pilot project.

(8) The Division has previously approved the following Wolfcamp SWD disposal wells offsetting this location approximately one mile or more:

- a. The Queen B Well No 36 (API No. 30-025-00751), located in Unit D of Section 28 was approved in 1982 for disposal into the lower Wolfcamp formation by administrative permit SWD-241.
- b. The Federal BI Well No 1 (API No. 30-025-27068), located in Unit N of Section 28 was approved as a Wolfcamp disposal well by administrative permit SWD-1093.
- c. The Maljamar SWD 29 Well No 1 (API No. 30-025-39519), located in Unit O of Section 29 was approved as a Wolfcamp disposal well by administrative permit SWD-1179.

(9) The operator should evaluate the permitted disposal interval for rock stress direction and for potential production of hydrocarbons and supply copies of this new information to the Division, to the U.S. BLM, and to the following operators of surrounding deep wells – COG Operating LLC, ConocoPhillips Company, and V-F Petroleum, Inc.

(10) Per the application, this well should be permitted only for disposal of H₂S and CO₂ gases and not for disposal of waste waters.

(11) Division records indicate the following wells are completed in the Wolfcamp formation and located within 1.6 miles of the proposed Acid Gas well. The applicant shall ensure these wells or any other wells completed in the Wolfcamp formation within this distance are equipped with H2S warning flags – or other safety indicators as the U.S. BLM or Hobbs district office requires:

a. Baish A #14	D/22/17S/32E	30-025-30363
b. Federal BI #1	N/28/17S/32E	30-025-27068
c. Baish A #12	A/21/17S/32E	30-025-20568
d. Hudson #1	M/15/17S/32E	30-025-21226
e. Maljamar SWD29 #1	O/29/17S/32E	30-025-39519
f. Elvis #4	F/20/17S/32E	30-025-33949
g. Hudson Fed #1	K/15/17S/32E	30-025-25107
h. Elvis #2	O/17/17S/32E	30-025-33854

(12) Affected parties within one mile have been notified and no objections have been received. There were no other appearances at the hearing or objections to this application.

(13) The application has been duly filed under the provisions of 19.15.26.8 NMAC.

(14) The one mile Area of Review around this well contains six plugged and abandoned wells and six active wells that penetrated the disposal interval. The Area of Review wells are adequately cased and cemented in order to isolate the disposal interval.

(15) The applicant has presented satisfactory evidence that all requirements prescribed in 19.15.26.8 NMAC have been met and the operator is in compliance with 19.15.5.9 NMAC.

(16) This application as presented by Frontier should be approved.

IT IS THEREFORE ORDERED THAT:

(1) Frontier Field Services, LLC (“Frontier” or “operator”), is hereby authorized to utilize its proposed Maljamar AGI Well No. 1 (API No. 30-025-NA) to be located 130 feet from the South line and 1813 feet from the East line, Unit O of Section 21, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, for disposal of Acid Gas and CO₂ from its gas processing plant into the Lower Leonard and Wolfcamp formations through perforations from approximately 9300 feet to 10,000 feet through tubing and a packer set within 100 feet above the permitted disposal interval. This well is not permitted for disposal of waste waters.

(2) During and after drilling this proposed well, the operator shall evaluate the permitted disposal interval for potential production of hydrocarbons and determine the

primary rock stress direction for the purpose of predicting the most likely invasion path for disposed gases. A mudlog or log of lithology and hydrocarbon samples shall be obtained while drilling. After drilling, the operator shall attempt to run an oriented fracture finder or wellbore stress log and conventional electric logs including porosity and resistivity tools. As soon as the data is available, copies of both the mudlog and the electric logs including processed oriented stress log shall be supplied to the Division, to the U.S. BLM, and to the following operators of surrounding deep wells – COG Operating LLC, ConocoPhillips Company, and V-F Petroleum, Inc.

(3) Pursuant to the requirements in 19.15.11.9.D(2) NMAC, the operator shall submit a hydrogen sulfide contingency plan to include the Maljamar Gas Plant and the Maljamar AGI Well No. 1. Before disposal operations commence the Division must determine the contingency plan is adequate and will protect public health.

(4) Pursuant to the requirements in 19.15.11.14 NMAC, this well and flowline to this well shall be designed using equipment capable of safely handling and confining the disposal gases. In addition, all requirements in 19.15.11 NMAC, Sections 10, 11, 12, and 13, shall be complied with during drilling, equipping and operation of this well.

(5) A one-way subsurface automatic safety valve shall be placed on the injection tubing approximately 250 feet below the surface to prevent the injected acid gas from migrating upwards in case of an upset or emergency.

(6) The operator shall ensure the following wells, and any other wells which are completed in the upper or lower Wolfcamp formation and located within 1.5 miles of the approved Acid Gas well, are equipped with H₂S warning flags or other safety indicators as the U.S. BLM or the Division's Hobbs district office requires - until such time as the flagged well is permanently plugged back above the equivalent disposal interval:

a. Baish A #14	D/22/17S/32E	30-025-30363
b. Federal BI #1	N/28/17S/32E	30-025-27068
c. Baish A #12	A/21/17S/32E	30-025-20568
d. Hudson #1	M/15/17S/32E	30-025-21226
e. Maljamar SWD29 #1	O/29/17S/32E	30-025-39519
f. Elvis #4	F/20/17S/32E	30-025-33949
g. Hudson Fed #1	K/15/17S/32E	30-025-25107
h. Elvis #2	O/17/17S/32E	30-025-33854

(7) The operator shall take all steps necessary to ensure that the disposed fluids enter only the permitted disposal interval depths and are not permitted to escape to other formations or onto the surface through this well or any surrounding wells. If H₂S levels on any of the wells listed above in ordering paragraph (6) reaches 100 ppm, the subject well shall be shut-in until Frontier Field Services, LLC has plugged those wells exhibiting newly discovered H₂S.

(8) After installing tubing, the casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or an approved leak detection device in order to determine leakage in the casing, tubing, or packer. The casing shall be pressure tested from the surface to the packer setting depth to assure casing integrity.

(9) The well shall pass an initial mechanical integrity test ("MIT") prior to initially commencing disposal and prior to resuming disposal each time the disposal packer is unseated. All MIT testing procedures and schedules shall follow the requirements in Division Rule 19.15.26.11.A NMAC with the exception that this well shall be MIT tested every two years or more often as the Division and/or the U.S. Bureau of Land Management deems necessary.

(10) The wellhead injection pressure on the well shall be limited to **no more than 2973 psi**. In addition, the disposal well or system shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface tubing pressure to the maximum allowable pressure for this well.

(11) The Director of the Division may authorize an increase in tubing pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the disposed fluid from the target formation. Such proper showing shall be demonstrated by sufficient evidence including but not limited to an acceptable Step-Rate-Test.

(12) The operator shall notify the supervisor of the Division's Hobbs district office of the date and time of the installation of disposal equipment and of any MIT test so that the same may be inspected and witnessed. The operator shall provide written notice of the date of commencement of disposal to the Division's district office. The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Rules 19.15.26.13 NMAC and 19.15.7.24 NMAC.

(13) Without limitation on the duties of the operator as provided in 19.15.29 NMAC and 19.15.30 NMAC, 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 or 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.

(14) 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.

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

(16) The Division Director shall be authorized to amend this permit administratively after proper notice and opportunity for hearing except as to the disposal formation(s) or the footage location of the well.

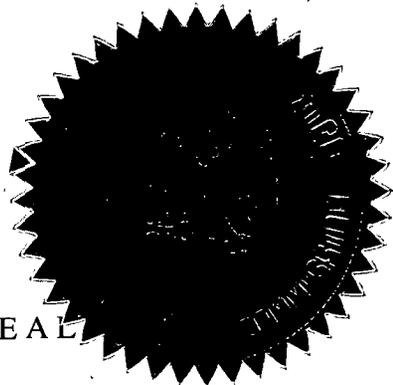
(17) The disposal authority granted herein shall terminate two years after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request, mailed by the operator prior to the termination date, may grant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

(18) One year after disposal into the well has ceased, the well will be considered abandoned and the authority to dispose will terminate *ipso facto*.

(19) 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.

(20) 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 prior to notice and hearing in event of an emergency, terminate the disposal authority granted herein.

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



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STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

A handwritten signature in cursive script, appearing to read "Jami Bailey".

JAMI BAILEY
Director