Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Carlsbad Field Office

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMNM05039A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
POKER LAKE UNIT 474Y

2. Name of Operator
BOPCO LP
Contact: TRACIE J CHERRY
E-Mail: tracie_cherry@xtoenergy.com

9. API Well No.
30-015-44938-00-S1

3a. Address
6401 HOLIDAY HILL RD BLDG 5 SUITE 200
MIDLAND, TX 79707

3b. Phone No. (include area code)
Ph: 432-221-7379

10. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 27 T25S R30E NESE 2010FSL 980FEL
32.099371 N Lat, 103.863600 W Lon

11. County or Parish, State
EDDY COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

BOPCO LP respectfully submits this sundry notice of intent to add gas line to the previously approved flow-line route submitted in the original APD.

Proposal is for a low pressure surface gas line to provide gas for gas lift to the subject well. Line will be 4" SDR 9 poly, MAWP of 125 psi or less and run from the Poker Lake Unit 421 Battery located in SESE, Sec 27, 25S-30E.

The line will be +/- 1650' in length and follow the flowline route approved in the APD for Poker Lake Unit #474H (30-015-43425). There will be no additional disturbance beyond what has already been approved. BLM will be notified of any changes.

NM OIL CONSERVATION
ARTESIA DISTRICT
NOV 14 2018
RECEIVED

GC 11-20-18
Accepted for record - NMOCD

See attached

Approved CCR 10/24/2018. DOI-BLM-NM-P020-2019-0015-EA. Stipulations

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #421488 verified by the BLM Well Information System
For BOPCO LP, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 05/30/2018 (18PP1835SE)

Name *(Printed/Typed)* TRACIE J CHERRY — Title REGULATORY ANALYST

Signature (Electronic Submission) — Date 05/24/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Cody R. Layton — Title AFM - LPN — Date 10/26/18

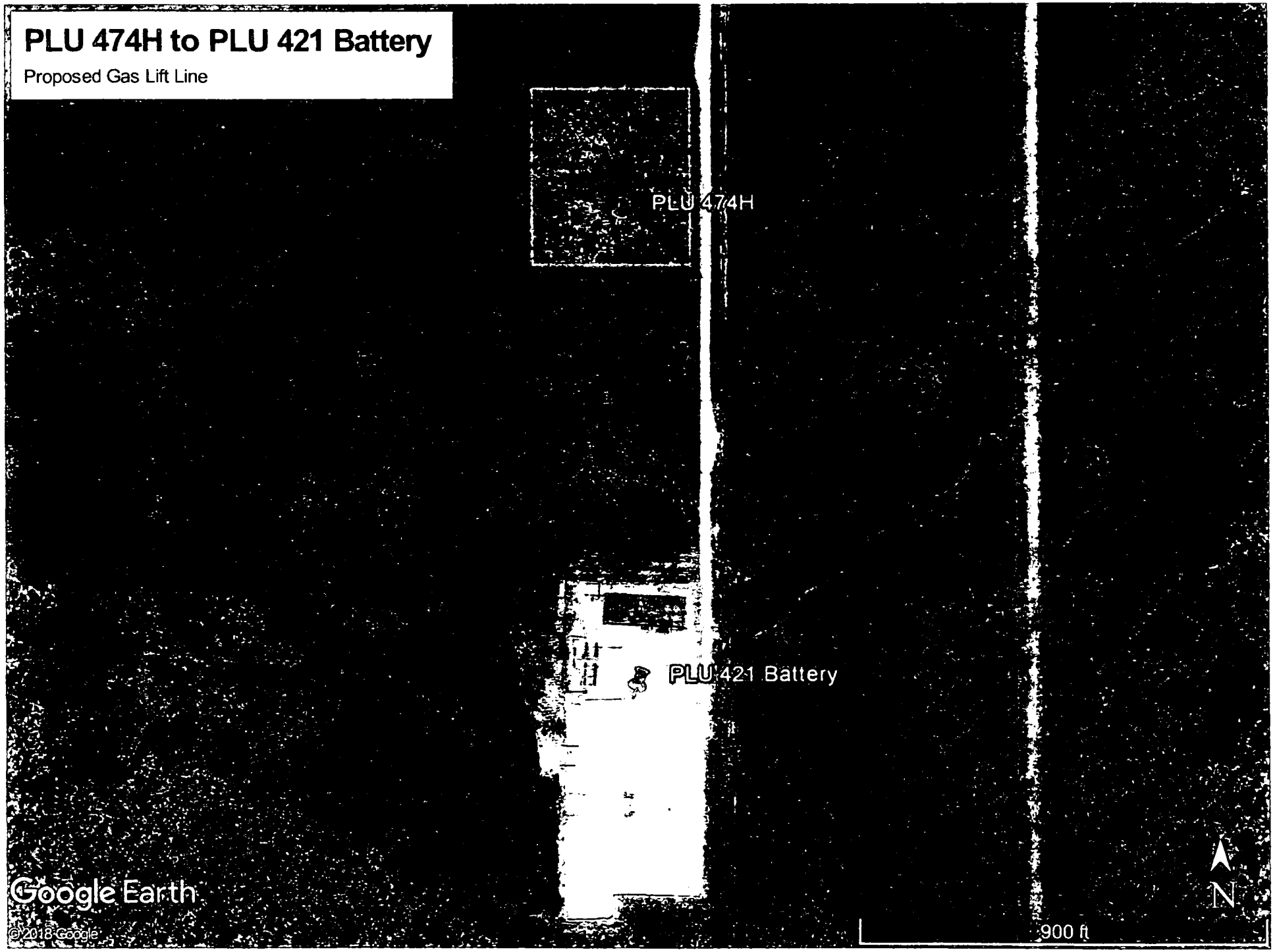
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office CFO

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****


PLU 474H to PLU 421 Battery
Proposed Gas Lift Line
PLU 474H
PLU 421 Battery
Google Earth
©2018 Google
900 ft
N

United States Department of the Interior
Bureau of Land Management

BLM
Carlsbad Field Office

Environmental Assessment DOI-BLM-NM-P020-2019-0015-EA

BOPCO LP
NMNM030456
Poker Lake Unit #474H
Sundry Notice for Surface Flowline

U.S. Department of the Interior
Bureau of Land Management
Pecos District
Carlsbad Field Office
620 E Greene Street
Carlsbad, NM 88220
Phone: (575) 234-5972
FAX: (575) 885-9264

Confidentiality Policy
Any comments, including names and street addresses of respondents, you submit may be made available for public review. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

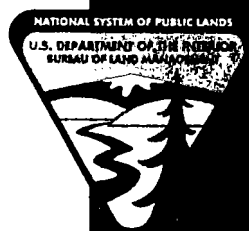


TABLE OF CONTENTS

PURPOSE AND NEED FOR ACTION

Background

Bopco LP (Bopco) has applied via sundry notice, requesting permission to construct, operate, and maintain a surface pipeline located on federal surface approximately 18.9 miles southeast of Loving, NM. The legal land description of the proposed project is described as follows:

From: Poker Lake Unit 474H, Eddy County
T. 25 S., R. 30 E, Section 27

To: Poker Lake Unit 421 Battery, Eddy County
T. 25 S., R. 35 E, Section 27

Preparing Office:
Pecos District, Carlsbad Field Office
620 East Greene Street
Carlsbad, NM 88220

Purpose and Need for Action

The purpose for the action is to provide the applicant with reasonable access to develop a federal oil and gas lease.

The need for the action is established by BLM's responsibility under the Mineral Leasing Act of 1920 as amended, the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976, the National Materials and Minerals Policy, Research and Development Act of 1980 and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 to allow reasonable access to develop a federal oil and gas lease.

Decision to be Made

Based on the information provided in this EA, the BLM Field Manager will decide whether to approve the sundry notice with appropriate mitigation measures, or whether to reject it.

Conformance with Applicable Land Use Plan(s)

The proposed action is in conformance with the 1988 Carlsbad Resource Management Plan, as amended by the 1997 Carlsbad Approved Resource Management Plan Amendment and the 2008 Special Status Species Approved Resource Management Plan Amendment have been reviewed, and it has been determined that the proposed action conforms with the land use plan terms and conditions as required by 43 CFR 1610.5.

Name of Plan: 1988 Carlsbad Resource Management Plan
Date Approved: September 1988
Decision: [Page 10] "In general, public lands are available for utility and transportation facility development..." [Page 13] "BLM will encourage and facilitate the development by private industry of public land mineral resources so that national and local needs are met, and environmentally sound exploration, extraction, and reclamation practices are used."

Name of Plan: 1997 Carlsbad Approved Resource Management Plan Amendment
Date Approved: October 1997
Goal: [Page 4] "Provide for leasing, exploration and development of oil and gas resources within the Carlsbad Resources Area." The proposed action aids in the development of oil and gas resources and complies with the Surface Use and Occupancy Requirements.

Name of Plan: 2008 Special Status Species Approved Resource Management Plan Amendment
Date Approved: April 2008
Decision: [Page 5] "For all other projects in the Planning Area, public land will be open to the consideration of granting ROWs under the guidelines in Appendix 2 of the 1997 Roswell RMP and 1997 Carlsbad RMPA." [Page 6] "...ROWs will be granted only after site-specific analysis." The proposed action will utilize best management practices when developing oil and gas resources in Lesser Prairie-Chicken and Sand Dune Lizard Habitat. Special mitigation measures will be included into the Pecos District Conditions of Approval.

Relationship to Statutes, Regulations or Other Plans

The following is a list of statutes that may apply to a proposed action:

Archaeological and Historic Preservation Act of 1974 (16 USC 469) - Provides for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of (1) flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency or (2) any alteration of the terrain caused as a result of any Federal construction project or federally licensed activity or program.

Archaeological Resources Protection Act of 1979, as amended (16 USC 470 et seq.) - Secures, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals.

Clean Air Act of 1970, as amended (42 USC 7401 et seq.) - Defines EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer.

Clean Water Act of 1977, as amended (30 USC 1251) - Establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

Endangered Species Act of 1973 (16 USC 1531 et seq.) - Protects critically imperiled species from extinction as a consequence of economic growth and development untempered by adequate concern and conservation.

Federal Cave Resources Protection Act of 1988 (16 USC 4301 et seq.) - Protects significant caves on federal lands by identifying their location, regulating their use, requiring permits for removal of their resources, and prohibiting destructive acts.

Lechuguilla Cave Protection Act of 1993 - Protects Lechuguilla Cave and other resources and values in and adjacent to Carlsbad Caverns National Park.

Migratory Bird Treaty Act of 1918 (16 USC 703-712) - Implements the convention for the protection of migratory birds.

Mineral Leasing Act of 1920 (30 U.S.C. 225) – Requires the BLM to ensure that lessees "use all reasonable precautions to prevent waste of oil or gas developed in the land..."

Mining and Mineral Policy Act of 1970, as amended (30 USC 21) - Fosters and encourages private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs.

National American Graves Protection and Repatriation Act of 1990 (25 USC 301) - Provides a process for museums and Federal agencies to return certain Native American cultural items such as human remains, funerary objects, sacred objects, or objects of cultural patrimony to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations and includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking.

National Historic Preservation Act of 1966, as amended (16 USC 470) - Preserves historical and archaeological sites.

Wild and Scenic Rivers Act of 1968, as amended (16 USC 1271 et seq.) - Preserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

Wilderness Act of 1964 (16 USC 1131 et seq.) - Secures for the American people of present and future generations the benefits of an enduring resource of wilderness.

Air quality standards in New Mexico are under the jurisdiction of the New Mexico Environment Department/Air Quality Bureau (NMED/NMAQB). The Environmental Improvement Act, NMSA 1978, and the Air Quality Control Act, NMSA 1978, dictate state air quality standards. Also, 40 CFR § 60 "Standards of Performance for New Stationary Sources" is administered by the NMED/NMAQB.

Additionally, **Bopco LP** would comply with all applicable federal, state, and local laws and regulations; obtain the necessary permits for drilling, construction, completion, and operation; and certify that Surface Use Agreements have been reached with the private landowners, where required.

Scoping, Public Involvement, and Issues

The Carlsbad Field Office (CFO) publishes Land Use Planning (LUP) and National Environmental Policy Act (NEPA) documents to the national register known as ePlanning. The register allows you to review and comment online on BLM NEPA and planning projects. A hard copy of this NEPA project has been made available in the Carlsbad Field Office as well as in electronic format on ePlanning (https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do).

The CFO uses Geographic Information Systems (GIS) in order to identify resources that may be affected by the proposed action. A map of the project area is prepared to display the resources in the area and to identify potential issues.

The proposed action was circulated among CFO resource specialists in order to identify any issues associated with the project. The issues that were raised include:

- How would air quality be impacted by the proposed action?
- How would climate change be impacted by the proposed action?
- How would range management be impacted by the proposed action?
- How would soils be impacted by the proposed action?
- How would vegetation be impacted by the proposed action?
- How would watershed resources be impacted by the proposed action?
- How would wildlife habitat be impacted by the proposed action?
- How would visual resources be impacted by the proposed action?
- Could noxious weeds be introduced to the project area as a result of the proposed action?
- How would cultural resources be impacted by the proposed action?
- How would paleontological resources be impacted by the proposed action?

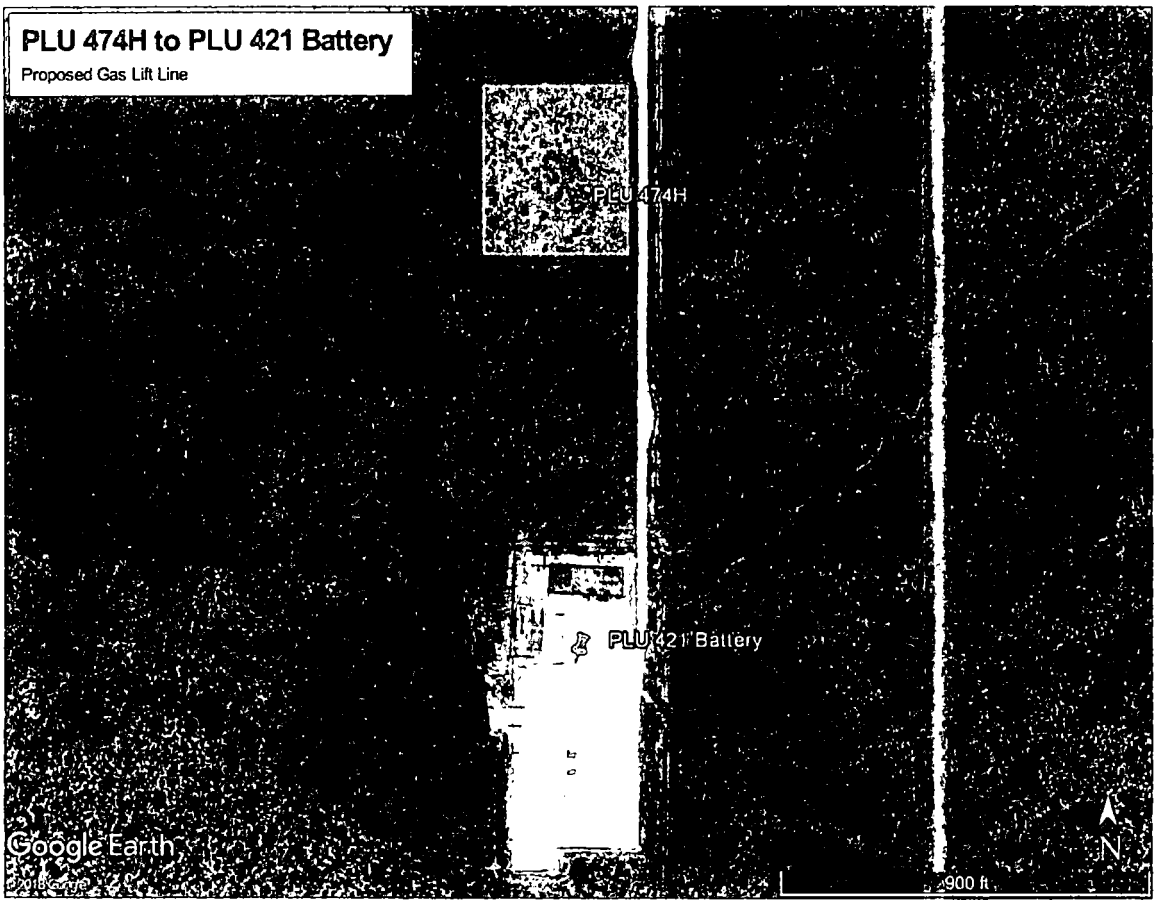
PROPOSED ACTION AND ALTERNATIVE(S)

Proposed Action

The BLM Carlsbad Field Office is proposing to allow Bopco LP to install a surface 4 inch SDR 9 poly flowline from the Poker Lake Unit #474H in the NESE quarter of Sec.27, T25S, R30E. to the Poker Lake Unit 421 Battery in the SESE quarter of Sec.27, T25S, R30E. The proposed pipeline would be transporting gas and would have an operating pressure of 125 psi or less. The pipeline would exit off the southwest corner of the well pad and travel east along the south edge of the pad. The pipeline would then turn south and travel along an existing access road. The pipeline would then turn west, and travel along the north edge of the Poker Lake Unit 421 Battery pad. The pipeline would then turn south and travel along the west edge of the Poker Lake Unit Battery pad until it intercepts the tank battery. When the pipeline would follow existing roads, the pipeline would be routed 10 feet from and parallel to the existing roads. The total length of the proposed surface line would be approximately 1,650 feet T and 30.0 ft. wide.

The legal lands description is located in Eddy County, New Mexico and described as follows:
Section 27 T. 25 S., R. 30 E

Figure 1 Proposed Route for Surface Flowline



Proposed Action Total Surface Disturbance:

Action	Length (ft.)	Width (ft.)	Acres
Buried Pipeline	1,650	30	1.1
Total	-	-	**1.1**

Mitigation Measures:
The Pecos District Conditions of Approval including special requirements for surface flowlines and for protecting the watershed.

No Action

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity will not take place. This option is provided in 43 CFR 3162.3-1 (h) (2). This alternative would deny the approval of the proposed application, and the current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

Alternatives Considered but Eliminated from Detailed Study

Field investigation of all areas of proposed surface disturbance for the Proposed Action were inspected to ensure that potential impacts to natural and cultural resources would be minimized through the implementation of mitigation measures. These measures are described for all resources potentially impacted in Chapter 3 of this EA. Therefore, no additional alternative other than those listed above have been considered for this project.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Projects requiring approval from the BLM such as right of way grants can be denied when the BLM determines that adverse effects to resources (direct or indirect) cannot be mitigated to reach a Finding of No Significant Impact (FONSI). Under the No Action Alternative, the proposed project would not be implemented and there would be no new impacts to natural or cultural resources from the proposed project. The No Action Alternative would result in the continuation of the current land and resource uses in the project area and is used as the baseline for comparison of environmental effects of the analyzed alternatives.

During the analysis process, the interdisciplinary team considered several resources and supplemental authorities. The interdisciplinary team determined that the resources discussed below would be affected by the proposed action.

Air Resources

3.1.1. Affected Environment

The two components of air resources are air quality and climate. Much of the information referenced in this section is incorporated from the Air Resources Technical Report for Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (herein referred to as Air Resources Technical Report). This document summarizes the technical information related to air resources and climate change associated with oil and gas development and the methodology and assumptions used for analysis.

Air Quality

The Air Resources Technical Report lists the National Ambient Air Quality Standards (USDI, BLM 2013, pp.4-5), describes the types of data used for description of the existing conditions (USDI BLM, 2011, p. 5-6) and how the pollutants are related to the activities involved in oil and gas development (USDI BLM, 2011, pp.6-14). Monitored values of criteria pollutants in the Carlsbad Field Office (CFO) are described below.

Criteria Pollutants

EPA's Green Book web page (EPA, 2012) reports that the Permian Basin is in attainment for all National Ambient Air Quality Standards (NAAQS) as defined by the Clean Air Act. The CFO recently contracted with Applied Enviro Solutions (AES) to provide an emissions inventory for the field office area, including Chaves, Eddy and Lea Counties (AES, 2011). This information is more recent than that available from EPA's most recent emissions inventory and is specific to the field office area.

Error! Reference source not found. shows monitored design values for ozone for the recent past in the CFO. Design values are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. Monitored design values for the other criteria pollutants are shown in **Error! Reference source not found.**. There is no monitoring conducted for lead and carbon monoxide (CO) in southeastern New Mexico; however, concentrations of these pollutants are expected to be low in rural areas and are therefore not monitored. The New Mexico Environment Department discontinued monitoring for SO_2 in

Eddy County due to very low monitored concentrations. Monitoring data for PM_{10} and $PM_{2.5}$ in southeastern New Mexico are not available due to incomplete data collection.

Table 1. Ozone Monitored Design Values for the Carlsbad Field Office Area (ppm)

Site	2006-2008	2007-2009	2008-2010	2009-2011	NAAQS
Hobbs (Lea County)	0.068	0.063	0.059	0.061	0.075
Carlsbad-Artesia (Eddy County)	0.069	0.066	0.067	0.069	0.075

Source: AES, 2011
EPA, 2013

Hazardous Air Pollutants

The Air Resources Technical Report discusses the relevance of hazardous air pollutants (HAPs) to oil and gas development and the particular HAPs that are regulated in relation to these activities (USDI BLM 2013, pp. 11-13). The EPA conducts a periodic National Air Toxics Assessment (NATA) that quantifies HAP impacts by county in the U.S. The purpose of the NATA is to identify areas where HAP emissions result in high health risks and further emissions reduction strategies are necessary. A review of the results of the 2005 NATA shows that cancer, neurological, and respiratory risks in Chaves, Eddy and Lea Counties are generally lower than statewide and national levels (EPA, 2013).

Table 2. 2011 Design Concentrations of Criteria pollutants in Lea and Eddy counties (EPA, 2012)

Pollutant	Design Value	Averaging period	NAAQS	NMAAQS
O_3	0.069 ppm (Lea County) 0.061 ppm (Eddy County)	8-hour	0.075 ppm[1]	
NO_2	6 ppb (Lea County) 3 ppb (Eddy County)	Annual	53 ppb	50 ppb
NO_2	42 ppb	1-hour	100 ppb[2]	

[1] Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
[2] 98th percentile, averaged over 3 years

Climate

The planning area is located in a semiarid climate regime typified by dry windy conditions, limited rainfall, hot summers and mild winters. Summertime maximum temperatures are generally in the 90s (all temperatures are in Fahrenheit degrees) with occasional temperatures over 110. Winter minimum temperatures are generally in between 20s and 30s with extremes remaining above zero degrees. Precipitation is mainly in the form of summer thunderstorms associated with the Southwest Monsoon though occasional Pacific storms drop south into New Mexico during the winter. **Error! Reference source not found.** shows climate normal 1981-2010 for Carlsbad.

Table 2. Climate Normals for Carlsbad, 1981-2010

Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temperature (°F)	42.6	47.2	54.0	62.4	71.5	79.3	81.2	79.9	73.2	62.9	51.5	42.8
Average Maximum Temperature (°F)	57.5	62.7	70.2	78.5	86.9	94.4	94.6	93.1	87.0	78.1	67.1	57.5
Average Minimum Temperature (°F)	27.6	31.7	37.9	46.2	56.0	64.3	67.7	66.6	59.4	47.7	35.8	28.0
Average Precipitation (inches)	0.47	0.54	0.51	0.64	1.17	1.53	2.01	1.83	2.11	1.16	0.81	0.63

Source: NOAA, 2011

The Air Resources Technical Report summarizes information about greenhouse gas emissions from oil and gas development and their effects on national and global climate conditions. While it is difficult to determine the spatial and temporal variability and change of climatic conditions; what is known is that increasing concentrations of GHGs are likely to accelerate the rate of climate change.

3.1.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Methodology and assumptions for calculating air pollutant and greenhouse gas (GHG) emissions are described in the Air Resources Technical Document (USDI BLM, 2013). This document incorporates the sections discussing the modification of calculators developed by the BLM to address emissions for one well. If more than one well is being proposed, the emissions and percentage of area emissions listed below need to be multiplied by the number of wells. The calculators give an approximation of criteria pollutant, HAP, and GHG emissions to be compared to regional and national levels (USDI BLM, 2013). Also incorporated into this document are the sections describing the assumptions that the CFO used in developing the inputs for the calculator (USDI BLM, 2013, pp.27-29).

Air Quality

Criteria Pollutants

Table 3 shows estimated emissions for criteria pollutants for a variety of activities including construction, maintenance and operations. Because the calculators are not able to estimate ozone emissions, volatile organic compounds (VOCs), a precursor to ozone, are estimated instead. Based on past development, emissions have been calculated for a maximum, minimum, and average development scenario. With the exception of operations, these emissions would be temporary and short lived.

Table 3. Criteria Pollutant Emissions Estimated for the Proposed Action Activities (tons)

Emissions	Construction	Well (Re)Completion	Well Workover	Annual Operations	Annual Road Maintenance	Reclamation
PM_{10} Max	2.64	0.27	0.03	1.45	0.00	0.02
PM_{10} Min	0.10	0.00	0.00	0.02	0.00	0.01
PM_{10} Avg	0.49	0.04	0.01	0.03	0.00	0.01
$PM_{2.5}$ Max	0.74	0.00	0.01	0.21	0.00	0.00
$PM_{2.5}$ Min	0.14	0.00	0.00	0.02	0.00	0.00
$PM_{2.5}$ Avg	0.30	0.00	0.01	0.02	0.00	0.00
NO_x[a] Max	9.46	11.67	0.22	1.14	0.00	0.00
NO_x[a] Min	1.96	0.00	0.04	0.46	0.00	0.00
NO_x[a] Avg	3.77	0.16	0.13	0.47	0.00	0.00
SO_2 Max	0.20	3.05	0.00	0.00	0.00	0.00
SO_2 Min	0.04	0.00	0.00	0.00	0.00	0.00
SO_2 Avg	0.08	0.04	0.00	0.00	0.00	0.00
CO Max	2.61	0.08	0.08	1.35	0.00	0.00
CO Min	0.50	0.00	0.01	0.92	0.00	0.00
CO Avg	1.05	0.04	0.05	0.92	0.00	0.00
VOC Max	0.74	0.04	0.02	50.02	0.00	0.00
VOC Min	0.14	0.00	0.00	3.50	0.00	0.00
VOC Avg	0.30	0.01	0.01	4.13	0.00	0.00

[a] Nitrogen oxides

Table 5 compares emissions from annual operations with total human-caused emissions for Chaves, Eddy and Lea Counties in 2007.

Table 4. Emissions from Annual Operations Compared with Area Emissions for 2007 (tons)

Emissions	Annual Operations	Area Emissions	Project Emissions as a % of Area Emissions
PM_{10} Max	1.45	78,855	0.00184
PM_{10} Min	0.02	78,855	0.00003
PM_{10} Avg	0.03	78,855	0.00004
$PM_{2.5}$ Max	0.21	10,673	0.00197
$PM_{2.5}$ Min	0.02	10,673	0.00019
$PM_{2.5}$ Avg	0.02	10,673	0.00019
NO_X Max	1.14	44,749	0.00255
NO_X Min	0.46	44,749	0.00103
NO_X Avg	0.47	44,749	0.00105
SO_2 Max	0.00	61,956	0.00000
SO_2 Min	0.00	61,956	0.00000
SO_2 Avg	0.00	61,956	0.00000
CO Max	1.35	60,898	0.00222
CO Min	0.92	60,898	0.00151
CO Avg	0.92	60,898	0.00151
VOC Max	50.02	15,898	0.31463
VOC Min	3.50	15,898	0.02202
VOC Avg	4.13	15,898	0.02598

[a] AES, 2011

Hazardous Air Pollutants (HAPs)

The formulas used for calculating HAPs in the calculators are very imprecise. For many processes it is assumed that emission of HAPs will be equivalent to 10% of VOC emissions. Therefore the HAP emissions reported here should be considered a very gross estimate and likely an overestimate. The calculator estimates that a minimum of 0.22 tons/year, an average of 0.31 tons/year, and a maximum of 5.63 tons/year of HAPs would be emitted during the construction, and first year of operation of a typical gas well in the Permian Basin. The emissions are a combination of HAP constituents existing in natural gas and released during the completion and operation process. Most gas vented during the completion process is flared, which substantially reduces the quantity of HAPs released.

Greenhouse Gases (GHGs)

Information about GHGs and their effects on national and global climate is presented in the Air Resources Technical Report (USDI BLM, 2013, pp. 22-23). Analysis of the impacts of the proposed action on GHG emissions are reported below. Only the GHG emissions associated with exploration and production of oil and gas will be evaluated because the environmental impacts of GHG emissions from oil and gas consumption, such as refining and emissions from consumer-vehicles, are not effects of the proposed action as defined by the Council on Environmental Quality because they do not occur at the same time and place as the action. Thus, GHG emissions from consumption of oil and gas do not constitute a direct effect that is analyzed under NEPA. Nor is consumption an indirect effect of oil and gas production because production is not a proximate cause of GHG emissions resulting from consumption. However, emissions from consumption and other activities are accounted for in the cumulative effects analysis.

The two primary GHGs associated with the oil and gas industry are carbon dioxide (CO_2) and methane (CH_4). Because CH_4 has a global warming potential 23 times greater than the warming potential of CO_2, the EPA's Office of Transportation and Air Quality (OTAQ) uses the CO_2 equivalent (CO_{2e}) which takes the difference in warming potential into account for reporting the national inventory for GHG emissions. The EPA is also moving towards using the CO_{2e} metric to characterize the benefits of its voluntary programs to be consistent with international practice and to allow for ease in comparison of emissions from different GHGs. Emissions will generally be expressed in metric tons of CO_{2e} in this document.

Estimated emissions from the calculator based on a maximum, minimum, and average development scenario are presented in

.

Table 5. Estimated GHG Emissions

Emissions	Construction	Well (Re)Completion	Well Workover	Annual Operations	Annual Road Maintenance	Reclamation
CO_2 Max	1052.10	411.0	17.8	278.2	0.09	0.54
CO_2 Min	213.20	0.2	3.5	62.1	0.09	0.40
CO_2 Avg	421.30	10.1	10.6	65.0	0.09	0.42
CH_4 Max	0.01	0.0	0.0	37.6	0.00	0.00
CH_4 Min	0.00	0.0	0.0	0.4	0.00	0.00
CH_4 Avg	0.00	0.0	0.0	1.0	0.00	0.00
N_2O[a] Max	0.01	0.0	0.0	0.0	0.00	0.00
N_2O[a] Min	0.00	0.0	0.0	0.0	0.00	0.00
N_2O[a] Avg	0.00	0.0	0.0	0.0	0.00	0.00
CO_{2e} Max	1055.90	411.1	17.9	1068.7	0.09	0.55
CO_{2e} Min	214.00	0.2	3.5	70.6	0.09	0.40
CO_{2e} Avg	422.80	10.1	10.7	86.0	0.09	0.43
CO_{2e} metric tons Max	958.10	373.0	16.2	969.8	0.08	0.5
CO_{2e} metric tons Min	194.20	0.2	3.2	64.1	0.08	0.36
CO_{2e} metric tons Avg	383.70	9.2	9.7	78.0	0.08	0.39

[a] Nitrous oxide

Cumulative Impacts

The CFO manages federal hydrocarbon resources in Eddy, Lea, and part of Chavez County. There are approximately 23,500 wells in these counties. About 16,060 of the wells in these counties are federal wells. Data from 2000 to 2010 indicate on average approximately 418 wells are drilled in these counties on federal mineral lands annually in the CFO.

The following analysis of cumulative impacts of the proposed action on air quality will be limited to the Permian Basin area of New Mexico. The cumulative impacts of GHG emissions and their relationship to climate change are evaluated at the national and global levels in the Air Resource Technical Report (USDI BLM, 2013).

Activities that contribute to levels of air pollutant and GHG emissions in the Permian Basin include fossil fuel industries, vehicle travel, industrial construction, potash mining, and others. A complete inventory of criteria pollutant emissions can be found in a report titled "Southeast New Mexico Inventory of Air Pollutant Emissions and Cumulative Air Impact Analysis 2007" (AES 2011). The Air Resources Technical Report includes a description of the varied sources of national and regional emissions that are incorporated here to represent the past, present and reasonably foreseeable impacts to air resources (USDI BLM, 2013). It includes a summary of emissions on the national and regional scale by industry source. Sources that are considered to have notable contributions to air quality impacts and GHG emissions include electrical generating units, fossil fuel production (nationally and regionally), and transportation.

The emissions calculator estimated that there could be very small direct increases in several criteria pollutants, HAPs, and GHGs as a result of the proposed action. Altogether, the emissions resulting from the proposed action could result in a 0.003% increase of criteria and HAP emissions in Eddy, Lea, and

Chavez Counties and a 0.001% increase in GHG emissions in New Mexico (Eddy, Lea, and Chaves County GHG emissions are not currently available).

Air Quality

The very small increase in emissions that could result from approval of the proposed action would not result in Eddy, Lea, or Chavez County exceeding the NAAQS for any criteria pollutants. The applicable regulatory threshold for HAPs is the oil and gas industry National Emissions Standards for Hazardous Air Pollutants, which are currently under review by the EPA. The emissions from the proposed well are not expected to impact the 8-hour average ozone concentrations, or any other criteria pollutants in the Permian Basin.

Climate Change

The Air Resources Technical Report discusses the relationship of past, present, and future predicted emissions to climate change and the limitations in predicting local and regional impacts related to emissions. It is currently not feasible to know with certainty the net impacts from particular emissions associated with activities on public lands. However, the small incremental increase in GHGs from this project will not have a measurable impact on climate.

Mitigation Measures

None.

Range

Affected Environment

The proposed action would be located within the Phantom Banks cell allotment, #77040. This allotment is a yearlong cow-calf deferred rotation operation. Range improvement projects such as windmills, water delivery systems (pipelines, storage tanks, and water troughs), earthen reservoirs, fences, and brush control projects are located within the allotment. In general, an average rating of the range land within this area is 6 acres per Animal Unit Month (AUM). In order to support one cow, for one year, about 72 acres are needed. This equals about nine cows per section.

Impacts from the Proposed Action

Direct and Indirect Impacts

The loss of 1.1 acres of vegetation would not affect the AUMs authorized for livestock use in this area. There could be occasional livestock injuries or deaths due to accidents such as collisions with vehicles, falling into excavations, and ingesting plastic or other materials present at the work site. If further development occurs, the resulting loss of vegetation could reduce the AUMs authorized for livestock use in this area.

Impacts to the ranching operation are reduced by standard practices such as utilizing existing surface disturbance, utilizing steel tanks instead of reserve pits, repairing or replacing deteriorated cattle guards along the existing access road to the project, placing parking and staging areas on caliche surfaced areas, reclaiming the areas not necessary for production, and seeding these reclaimed areas to reestablishing vegetation on the reclaimed areas.

Mitigation Measures

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s). Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations. A gate shall be constructed on one side of the cattleguard and fastened securely to H-braces.

Fence Requirement

Where entry granted across a fence line, the fence must be braced and tied off on both sides of the passageway prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Livestock Watering Requirement

Structures that provide water to livestock, such as windmills, pipelines, drinking troughs, and earthen reservoirs, will be avoided by moving the proposed action.

-OR-

Any damage to structures that provide water to livestock throughout the life of the well, caused by operations from the well site, must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

Soils

Affected Environment

The area of the proposed action is mapped as Berino complex (0-3% slope). These are sandy soils and are described below:

Typically, these soils are deep, well-drained to excessively drained, non-calcareous to weakly calcareous sands. They are found on undulating plains and low hills in the "sand country" east of the Pecos River. Permeability is moderate to very rapid, water-holding capacity is low to moderate, and little runoff occurs. These soils are susceptible to wind erosion and careful management is needed to maintain a cover of desirable forage plants and to control erosion. Reestablishing native plant cover could take 3-5 years due to unpredictable rainfall and high temperatures.

Low stability soils, such as the sandy and deep sands found on this area, typically contain only large filamentous cyanobacteria. Cyanobacteria, while present in some locations, are not significant. While they occur in the top 4 mm of the soil, this type of soil crust is important in binding loose soil particles together to stabilize the soil surface and reduce erosion. The cyanobacteria also function in the nutrient cycle by fixing atmospheric nitrogen, contributing to soil organic matter, and maintaining soil moisture. Cyanobacteria are mobile, and can often move up through disturbed sediments to reach light levels necessary for photosynthesis. Horizontally, they occur in nutrient-poor areas between plant clumps. Because they lack a waxy epidermis, they tend to leak nutrients into the surrounding soil. Vascular plants such as grasses and forbs can then utilize these nutrients.

Impacts from the Proposed Action

Direct and Indirect Impacts

There is a potential for wind and water erosion due to the erosive nature of these soils once the cover is lost. There is always the potential for soil contamination due to spills or leaks. The biological soil crusts are susceptible to compressional damage, which is due to vehicle traffic. Disruption of the crust can result in decreased soil organism diversity, soil nutrient levels, soil stability, and organic matter. These impacts

are expected to be limited to new oil and gas roads, pipeline right-of-ways and well pads. Soil contamination from spills or leaks can result in decreased soil fertility, less vegetative cover, and increased soil erosion. Impacts to soil resources are reduced by standard practices such as utilizing existing surface disturbance, minimizing the well pad and access road total surface disturbance, utilizing steel tanks instead of reserve pits, minimizing vehicular use, placing parking and staging areas on caliche surfaced areas, reclaiming the areas not necessary for production and quickly establishing vegetation on the reclaimed areas.

Mitigation Measures and Residual Impacts

None.

Vegetation

Vegetation within this project area is dominated by warm season, short and midgrasses such as black grama, bush muhly, various dropseeds, and three-awns. Bluestems, bristlegrass, lovegrasses, and hooded windmillgrass make up some of the less common grasses. Shrubs include mesquite, shinnery oak, sand sagebrush, broom snakeweed, and yucca. A large variety of forbs occur and production fluctuates greatly from year to year, and season to season. Common forbs include bladderpod, dove weed, globemallow, annual buckwheat, and sunflower.

Impacts from the Proposed Action

Direct and Indirect Impacts

Very little vegetation would be removed when the surface pipeline is installed. Typical surface pipeline installation practices do not require blading or clearing the right-of-way corridor. Disturbance to vegetation would include compression of the vegetation caused by construction vehicles traveling along the right-of-way corridor. Vegetation should quickly return to the disturbed area without requiring the application of a seed mixture.

Impacts to vegetation will also be reduced by following standard practices such as utilizing existing surface disturbance and quickly establishing vegetation on the disturbed areas.

Mitigation Measures

Interim reclamation will be conducted on all disturbed areas not needed for active support of production operations, and if caliche is used as a surfacing material it will be removed at time of reclamation to enhance re-establishment of vegetation.

Visual Resource Management

Affected Environment

The Visual Resource Management (VRM) program identifies visual values, establishes objectives in the RMP for managing those values, and provides a means to evaluate proposed projects to ensure that visual management objectives are met.

This project occurs within a Visual Resource Management Class IV zone. The objective of VRM Class IV is to provide management for activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic landscape elements of color, form, line and texture.

Impacts from the Proposed Action

Direct and Indirect Impacts

This project will cause some short term and long-term visual impacts to the natural landscape. Short term impacts occur during construction operations. These include the presence of construction equipment vehicle traffic.

Long term impacts are visible to the casual observer through the life of the pipeline. These include the visual evidence of piping which cause visible contrast to form, line, color, and texture. Those contrasts will be visible to visitors in the area.

After final abandonment, the pipeline and associated infrastructure will be removed, reclaimed, recontoured and revegetated, if necessary, thereby eliminating visual impacts.

Short and long term impacts are minimized by best management practices such as utilizing existing surface disturbance, no blading in the right-of-way, color selection and screening facilities with natural features and vegetation.

Mitigation Measures

All surface pipelines will not be placed on top of bushes or trees.

Wildlife

Affected Environment

This project occurs in the Chihuahuan Desert habitat type. The Chihuahuan desert is one of the four most biologically rich and diverse desert ecoregions in North America. Numerous plant species live in this desert. The Chihuahuan Desert stretches from the southeastern corner of Arizona across southern New Mexico and west Texas to the Edwards Plateau in the United States. It runs deep into central Mexico, including parts of the states of Chihuahua, northwest Coahuila, northeast Durango and several others. This Desert is bounded by the Sierra Madre Occidental to the west and the Sierra Madre Oriental to the east, extending as far south as San Luis Potosi and to the isolated islands of the Chihuahuan vegetation in the Mexico states of Queretaro and Hidalgo. In New Mexico, Chaves and Eddy Counties, west of the Pecos River, consist largely or entirely of Chihuahuan Desert habitat type. The dominant plant species throughout the Chihuahuan desert is creosote bush. Depending on diverse factors such as type of soil, altitude, and degree of slope, creosote bush, can be found in association with other woody and grass species.

The Chihuahuan desert supports a large number of wide-ranging mammals, herpetofauna, and avian species. Mammals include but are not limited to: pronghorn antelope, mule deer, grey fox, collared peccary, bobcat, desert cottontail, black tailed jack rabbit, kangaroo rat, pocket mice, woodrats and deer mice. Herpetofauna include but are not limited to: Texas horned lizard, greater earless lizard, several species of spiny and whip tail lizards, and several species of venomous and non-venomous snakes. Avain species include but are not limited to the following: greater roadrunner, curve-billed thrasher, scaled quail, Scott's oriole, black-throated sparrow, phainopepla, Worthen's sparrow, and cactus wren. In addition, numerous raptors inhabit the desert and include the great horned owl, burrowing owl, Aplomado falcon, and red-tailed hawk.

Impacts from the Proposed Action

Direct and Indirect Impacts

Impacts of the proposed action to wildlife in the localized area may include but are not limited to: possible mortality, habitat degradation and fragmentation, avoidance of habitat during construction and drilling activities and the potential loss of burrows and nests.

Standard mitigation measures and elements of the proposed action minimize these impacts to wildlife. These include: the NTL-RDO 93-1(modification of open-vent exhaust stacks to prevent perching and entry from birds and bats), nets on open top production tanks, interim reclamation, closed loop systems, exhaust mufflers, berming collection facilities, minimizing cut and fill, road placement, avoidance of: wildlife waters, stick nests, drainages and playas and dunal features.
These practices reduce mortality to wildlife and allow habitat to be available in the immediate surrounding area thus reducing stressors on wildlife populations at a localized level. Impacts to local wildlife populations are therefore expected to be minimal.

Mitigation Measures

None.

Noxious Weeds and Invasive Plants

Affected Environment

There are four plant species within the CFO that are identified in the New Mexico Noxious Weed List Noxious Weed Management Act of 1998. These species are African rue, Malta starthistle, Russian olive, and salt cedar. African rue and Malta starthistle populations have been identified throughout the Carlsbad Field Office and mainly occur along the shoulders of highway, state and county roads, lease roads and well pads (especially abandoned well pads). The CFO has an active noxious weed monitoring and treatment program, and partners with county, state and federal agencies and industry to treat infested areas with chemical and monitor the counties for new infestations

Currently there are no known populations of invasive, non-native species within the proposed project vicinity.

Impacts from the Proposed Action

Direct and Indirect Effects

Any surface disturbance could increase the possibility of establishment of new populations of invasive, non-native species. The construction of the proposed action may contribute to the establishment and spread of African rue and Malta starthistle. The main mechanism for seed dispersion would be by equipment and vehicles that were previously used and/or driven across noxious weed infested areas. Noxious weed seed could be carried to and from the project area by construction equipment and transport vehicles.

Mitigation Measures

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

Cultural and Historical Resources

Affected Environment

The project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 11,500 – 7,000 B.C.), Archaic (ca. 6,000 B.C. – A.D. 500), Ceramic (ca. A.D. 500 – 1400), Post Formative Native American (ca. A.D. 1400 – present), and Historic Euro-American (ca. A.D. 1865 to present). Sites representing any or all of these periods are known to occur within the region. A more complete discussion can be found in *Permian Basin Research Design 2016-2026 Volume I: Archaeology and Native American Cultural Resource published in 2016 by* SWCA Environmental Consultants, Albuquerque, New Mexico.

Native American Religious Concerns
The BLM conducts Native American consultation regarding Traditional Cultural Places (TCP) and Sacred Sites during land-use planning and its associated environmental impact review. In addition, during the oil & gas lease sale process, Native American consultation is conducted to identify TCPs and sacred sites whose management, preservation, or use would be incompatible with oil and gas or other land-use authorizations. With regard to Traditional Cultural Properties, the BLM has very little knowledge of tribal sacred or traditional use sites, and these sites may not be apparent to archaeologists performing surveys in advance of drilling.

Impacts from the Proposed Action

Direct and Indirect Effects

The project falls within the area covered by the Permian Basin Programmatic Agreement (PA). The Permian Basin PA is an optional method of compliance with Section 106 of the National Historic Preservation Act for energy related projects in a 28 quadrangle area of the Carlsbad Field Office. The PA is a form of off-site mitigation which allows industry to design projects to avoid known NRHP eligible cultural resources and to contribute to a mitigation fund in lieu of paying for additional archaeological inventory in this area that has received adequate previous survey. Funds received from the Permian Basin PA will be utilized to conduct archaeological research and outreach in Southeastern New Mexico. Research will include archaeological excavation of significant sites, predictive modeling, targeted research activities, as well as professional and public presentations on the results of the investigations.

The proponent chose to participate in the Permian Basin PA by planning to avoid all known NRHP eligible and potentially eligible cultural resources. The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any skeletal remains that might be human or funerary objects are discovered by any activities, the project proponent will cease activities in the area of discovery and notify the BLM within 24 hours as required by the Permian Basin PA.

Mitigation Measures

As currently proposed, there are no mitigation measures required for this project.

Paleontology

Affected Environment

Paleontological resources are any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth. Fossil remains may include bones, teeth, tracks, shells, leaves, imprints, and wood. Paleontological resources include not only the actual fossils but also the geological deposits that contain them and are recognized as nonrenewable scientific resources protected by federal statutes and policies.

The primary federal legislation for the protection and conservation of paleontological resources occurring on federally administered lands are the Paleontological Resources Preservation Act of 2009 (PRPA), the Federal Land Policy and Management Act of 1976 (FLPMA), and the National Environmental Policy Act of 1970 (NEPA). BLM has also developed policy guidelines for addressing potential impacts to paleontological resources (BLM, 1998a,b; 2008, 2009). In addition, paleontological resources on state trust lands are protected by state policy from unauthorized appropriation, damage, removal, or use.

The Potential Fossil Yield Classification (PFYC) is a tool that allows the BLM to predict the likelihood of a geologic unit to contain paleontological resources. The PFYC is based on a numeric system of 1-5, with PFYC 1 having little likelihood of containing paleontological resources, whereas a PFYC 5 value is a geologic unit that is known to contain abundant scientifically significant paleontological resources. The

fossil resources of concern in this area are the remains of vertebrates, which include species of fish, amphibians, and mammals.

3.9.2. Impacts from the Proposed Action

Direct and Indirect Effects

Direct impacts would result in the immediate physical loss of scientifically significant fossils and their contextual data. Impacts indirectly associated with ground disturbance could subject fossils to damage or destruction from erosion, as well as creating improved access to the public and increased visibility, potentially resulting in unauthorized collection or vandalism. However, not all impacts of construction are detrimental to paleontology. Ground disturbance can reveal significant fossils that would otherwise remain buried and unavailable for scientific study. In this manner, ground disturbance can result in beneficial impacts. Such fossils can be collected properly and curated into the museum collection of a qualified repository making them available for scientific study and education.

The location of the proposed project is within a PFYC 2, where management concern in negligible. A pedestrian survey for paleontological resources was not necessary and there should be no impacts to paleontological resources.

Mitigation Measures

There are no mitigation measures for this project, as currently proposed.

Watershed

Affected Environment

The proposed action occurs in a location that drains in a southeast direction into Brushy Draw approximately 0.4 miles away and is within the Upper Pecos-Black Watershed as defined by the 8-digit Hydraulic Unit Code (HUC) 13060011. Stream flow occurs during times of heavy rain, and it is likely a source of groundwater recharge. The ground water recharge is from local precipitation entering through playas, sinkholes and swallets. Water quality and quantity is influenced by physical, chemical, and biological reactions that occur as water moves over and through the land surface toward streams and into aquifers. The rate at which water moves through the watershed strongly affects these reactions.

Impacts from the Proposed Action

Direct and Indirect Effects

Ephemeral surface water from local rain events will wash down-slope through the area of the proposed action. Localized decreases in vegetative surface cover combined with the caliche covering the road could result in decreased infiltration rates and increased runoff volume and velocity. This causes increased erosion, top soil loss, and sedimentation.

Water quality can be adversely affected following the occurrence of an undesirable event such as a leak or spill.

Standard practices or design features of the proposed project that minimize impacts to the watershed, water quality and wildlife habitat include: utilizing a closed loop system with no reserve pits, utilizing existing surface disturbance, minimizing the well pad and access road total surface disturbance, minimizing vehicular use, surfacing parking and staging areas with caliche and reclaiming the areas not necessary for production and quickly reestablishing vegetation on the reclaimed areas.

Mitigation Measures

Surface Pipeline COAs Only:

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Cumulative Impacts

Cumulative impacts are the combined effect of past projects, specific planned projects, and other reasonably foreseeable future actions within the project study area to which oil and gas exploration and development may add incremental impacts. This includes all actions, not just oil and gas actions that may occur in the area including foreseeable non-federal actions.

The combination of all land use practices across a landscape has the potential to change the visual character, disrupt natural water flow and infiltration, disturb cultural sites, cause minor increases in greenhouse gas emissions, fragment wildlife habitat and contaminate groundwater. However, the likelihood of these impacts occurring is minimized through standard mitigation measures, special Conditions of Approval and ongoing monitoring studies.

All resources are expected to sustain some level of cumulative impacts over time, however these impacts fluctuate with the gradual abandonment and reclamation of wells. As new wells are being drilled, there are others being abandoned and reclaimed. As the oil field plays out, the cumulative impacts will lessen as more areas are reclaimed and less are developed.

SUPPORTING INFORMATION

List of Preparers

Prepared by: Colleen Cepero Rios, Natural Resource Specialist, BLM-CFO

Date: 10/02/2018

The following individuals aided in the preparation of this document:
Elia Perez, Archaeologist, BLM-CFO
Dustin Mudgett, Wildlife Biologist, BLM-CFO
Brianna Truebe, Range Management Specialist, BLM-CFO
Jeffery Robertson, Natural Resource Specialist, BLM-CFO
Bob Ballard, Natural Resource Specialist, BLM-CFO

References

Applied Enviro Solutions (AES). 2011. Southeast New Mexico Inventory of Air Pollutant Emissions and Cumulative Air Impact Analysis 2007. BLM. Carlsbad Field Office.

Bohannon, Paul 2009. The RCRA Exploration & Production Exemption. http://bohannonlegal.com/pauls-oil-gas-manual-the-rcra-ep-exemption/

Environmental Protection Agency. 2013. The Green Book Non Attainment Areas for Criteria Pollutants. http://www.epa.gov/airquality/greenbk/ (Accessed 3/15/2013).

Environmental Protection Agency. 2013. 2005 National-Scale Air Toxics Assessment.

Summary of Results. http://www.epa.gov/ttn/atw/nata2005.

Environmental Protection Agency. 2013. Air Trends: Design Values. http://www.epa.gov/airtrends/values.html.

Fletcher, S. M. 2012. Risk Assessment of Groundwater Contamination from Hydraulic Fracturing Fluid Spills in Pennsylvania. Thesis (S.M. in Technology and Policy)--Massachusetts Institute of Technology, Engineering Systems Division, Technology and Policy Program. http://hdl.handle.net/1721.1/72885.

Fitzgerald LA, Painter CW, Sias DS, Snell HL (1997) The range, distribution, and habitat of Sceloporus arenicolus in New Mexico: final report submitted to the New Mexico Department of Game and Fish (Contract #80-516.6-01).

Groundwater Protection Council (GWPC). 2009. Modern Shale Gas Development in the United States: A Primer. Prepared for the U.S. Department of Energy, Office of Fossil Energy, and National Energy Technology Laboratory (NETL). DE-FG26-04NT15455. Oklahoma City, OK. http://www.netl.doe.gov/technologies/oilgas/publications/epreports/shale_gas_primer_2009.pdf.

NOAA. 2011. NOAA's 1981-2010 Climate Normals. National Climatic Center. http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html. (Accessed July 1, 2011).

Railey, J. A. 2016. *Permian Basin Research Design 2016-2026 Volume I: Archaeology and Native American Cultural Resources*. SWCA Environmental Consultants, Albuquerque, New Mexico.

USDI. BLM. 2013. Air Resources Technical Report for Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas. New Mexico State Office.

Wenzel, C. 2012. A Case Study—Hydraulic Fracturing Geography: The Case of the Eagle Ford Shale, TX, USA. Thesis (M.S.)--Texas State University-San Marcos, Department of Geography. https://digital.library.txstate.edu/handle/10877/4247.