United States Department of the Interior
Bureau of Land Management

Environmental Assessment DOI-BLM-NM-F010-2014-0158

WPX Energy Production, LLC's Chaco 2306-18M Nos. 240H, 256H, &292H Oil and Natural Gas Wells Project

May 2014

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1. PURPOSE AND NEED FOR ACTION

1.1. Background

WPX Energy Production, LLC (WPX), has submitted three Applications for Permit to Drill (APDs) to the Bureau of Land Management – Farmington Field Office (BLM-FFO) for the Chaco 2306-18M Nos. 240H, 256H, and 292H (240H/256H/292H) project. The proposed action is the approval of the APDs by the BLM-FFO, located in Farmington, New Mexico.

The proposed project area is located on surface managed by the BLM-FFO. The proposed project would include the construction of one new well pad, access road, and well-connect pipeline corridor; the horizontal drilling and possible production of three Lybrook Gallup natural gas and oil wells from the well pad; the usage of facilities throughout the life of the wells; and the final abandonment of facilities. The proposed 240H, 256H, and 292H wells would access federal minerals associated with lease NMSF 78360.

The 240H, 256H, and 292H wells would each be permitted under an approved APD. The associated well pad, access road, and well-connect corridor (all of which are located on-lease) would be authorized by the three approved APDs.

New surface disturbance associated with the proposed project area would be 6.5 acres. This disturbance would include a 562-foot-long access road, a 1,700-foot-long well-connect corridor (which would parallel the proposed access road and an existing access road), and a 5.3-acre well pad (including construction zone). Of the 6.5 acres, 1.2 acres would be reseeded (but not recontoured) and 3.9 acres would be fully reclaimed following completion of the wells. The remainder (1.4 acres) would remain disturbed throughout the life of the project.

In addition, two previously disturbed staging areas (Elm Ridge Exploration Company LLC's [Elm Ridge's] Lybrook South No. 10 active well pad and Lybrook South No. 12 inactive well pad) would be used for the proposed project. The total original disturbance area of the well pads is approximately 2.7 acres (based on aerial photography). The proposed staging areas are located on surface managed by the BLM-FFO. The Lybrook South Nos. 10 and 12 well pads would be permitted for use under an agreement between WPX and Elm Ridge.

Oil and natural gas, vital components of the nation's energy supply, account for approximately 36 and 25 percent of total energy consumed in the U.S., respectively. These energy sources are used in residential and commercial buildings, in transportation, and by industry (U.S. Energy Information Administration 2012). Common uses for natural gas include space heating, water heating, cooling, cooking, waste treatment and incineration, metals preheating, drying and humidification, glass melting, food processing, fueling industrial boilers, vehicle fueling, and electricity generation. Gases such as butane, ethane, and propane can be extracted from natural gas to be used for products such as fertilizers and pharmaceuticals. Natural gas can also be used to create methanol, which is utilized in the production of formaldehyde, acetic acid, fuel cell sources, and additives for cleaner burning gasoline (Natural Gas Supply Association 2010). Most oil goes into fuels, including gasoline, jet fuel, and home-heating oil. Additionally, non-fuel compounds extracted from oil are used to develop lubricants; asphalt for roads; tar for roofing; waxes for food wrapping; solvents for paints; cosmetics and dry-cleaning products; plastics; and foams (U.S. Energy Information Administration 2012).

Approximately 84 percent of natural gas and 55 percent of oil consumed in the U.S. is produced in the U.S. Additionally, U.S.-produced natural gas and oil is also exported to other countries (U.S. Department of Energy 2011). Within the U.S., oil and natural gas reserves are concentrated within distinct fields. The BLM-FFO management area is within the San Juan Basin, one of the most prolific gas-producing basins in the country. Currently, the San Juan Basin produces small amounts of oil.

Taxes and royalties on oil, natural gas, and carbon dioxide production contribute approximately 25 percent of New Mexico's general fund, and the oil and gas industry is one of the largest private sector

employers in the state (New Mexico Bureau of Geology and Mineral Resources 2012). Additionally, the federal government receives royalties, or a share of the production income, for extracted federal minerals. In 2011, federal natural gas royalties totaled over 2 billion dollars (Office of Natural Resources Revenue 2012).

The proposed project area is under the jurisdiction of the BLM-FFO and is located within the San Juan Basin in Rio Arriba County, New Mexico. It is approximately 43 miles southeast of the town of Bloomfield, New Mexico, and 0.5 miles south of U.S. Highway 550 (See Figure A.1, Appendix A).

1.2. Purpose and Need for Action

The purpose of the proposed action is to allow WPX reasonable access to BLM-managed lands to develop their mineral lease.

The need for the proposed action is established by the BLM's responsibility under the Mineral Leasing Act of 1920, as amended (MLA; 30 U.S. Code [USC] 181 et seq.), which authorizes the BLM to lease public lands for the development of mineral deposits (including oil, gas, and other hydrocarbons) and permit the development of those leases. Per 43 Code of Federal Regulations (CFR) 3160 (Onshore Oil and Gas Operations), the BLM is required to respond to a request for an APD. It is the policy of the BLM, as derived from several laws, including the MLA and Federal Land Policy and Management Act of 1976 (FLPMA, 43 USC 1701 et seq.), to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

1.3. Decision to be Made

The BLM-FFO will decide whether or not to issue the APDs associated with the proposed project, and if so, under what terms and conditions. Under the National Environmental Policy Act (NEPA; Public Law 91-90, 42 USC 4321 et seq.), the BLM-FFO must determine if there are any significant environmental impacts associated with the proposed action warranting further analysis in an Environmental Impact Statement (EIS). The BLM-FFO Field Manager is the responsible officer who will decide one of the following:

- To approve the three APDs with design features as submitted
- To approve the three APDs with additional mitigation added
- To analyze the effects of the proposed action in an EIS
- To deny the three APDs

1.4. Conformance with Applicable Land Use Plan

The proposed action is in conformance with the 2003 BLM-FFO Resource Management Plan (RMP). Pursuant to 40 CFR 1508.28 and 1502.21, this site-specific EA tiers into and incorporates by reference the information and analysis contained in the BLM-FFO Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS; BLM 2003a). The RMP was approved by the September 29, 2003 Record of Decision (ROD; BLM 2003b), and updated in December 2003.

Specifically, the proposed action supports the following BLM policy:

> It is the policy of the BLM to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs, consistent with national objectives of an adequate supply of minerals at reasonable market prices. At the same time, the BLM strives to ensure that mineral development is carried out in a manner that minimizes environmental damage and provides for the rehabilitation of affected lands. (BLM 2003b, 2-2 – 2-3)

As required by NEPA, this EA addresses site-specific resources and effects of the proposed action that were not specifically covered within the PRMP/FEIS.

1.5. Relationship to Statutes, Regulations or Other Plans

WPX would comply with applicable federal, state, and local laws and regulations. Necessary permits and approvals for the project would be obtained prior to project implementation.

Many requirements regulating specific environmental elements are found in the appropriate elements sections of this EA (Chapter 3). Several permits, licenses, consultations, or other requirements are discussed below.

1.5.1. Clean Water Act

The proposed action is in conformance with the Clean Water Act, as amended (CWA; 33 USC 1251 et seq.).

Under Section 401 of the CWA, an applicant for a federal license or permit to conduct an activity that may result in a discharge into a water of the U.S. must provide the federal agency with a Section 401 certification declaring that the discharge would comply with the CWA. The certification would be granted by the New Mexico Environment Department (NMED).

Under Section 402 of the CWA, the U.S. Environmental Protection Agency (EPA) regulates storm water discharges from industrial and construction activities under the National Pollution Discharge Elimination System program. Permits are required if discharge results in a reportable quantity for which notification is required (pursuant to 40 CFR 117.21, 40 CFR 302.6, or 40 CFR 110.6) or if the discharge contributes to a violation of a water quality standard.

Under Section 404 of the CWA, the EPA regulates the discharge of dredged or fill material into waters of the U.S., including wetlands. The Section 404 program is administered by the EPA and U.S. Army Corps of Engineers (USACE). Under the CWA, the USACE has jurisdiction over waters of the U.S. Waters of the U.S. are considered jurisdictional because they have a “significant nexus” to traditional navigable waters. The BLM-FFO and USACE - Durango Regulatory Office have determined that jurisdictional waters (i.e., waters of the U.S.) may include U.S. Geological Survey (USGS) watercourses (i.e., “blue lines” on USGS 1:24,000 topographic maps) and potentially tributaries to these USGS watercourses.

The proposed well-connect corridor crosses two ephemeral, USGS watercourses. If these watercourses are considered jurisdictional by the USACE, the proposed well-connect crossings would be permitted under Nationwide Permit No. 12 for Utility Line Activities. Additionally, the proposed access road and well-connect corridor cross a third, ephemeral wash, which is not a USGS watercourse; a portion of this wash meanders into the proposed well pad construction zone. The BLM-FFO has determined that this watercourse is likely non-jurisdictional.

1.5.2. National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA; 16 USC 470) requires federal agencies to take into account the effects of their actions on historic properties, and allow the Advisory Council on Historic Preservation a reasonable opportunity to comment. Compliance with the requirements of the NHPA is met by following the Protocol Agreement between the New Mexico BLM and New Mexico State Historic Preservation Officer, which is authorized by the Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (1997).

1.5.3. Clean Air Act

The Clean Air Act of 1972, as amended (CAA; 42 USC 7401 et seq.), establishes national ambient air quality standards (NAAQS) to control air pollution. In New Mexico, the NMED has adopted most of the

CAA into the New Mexico Administrative Code (NMAC). The NMED issues construction and operating permits for air quality and enforces air quality regulations and permit conditions.

1.5.4. New Mexico State Regulations

The New Mexico Oil Conservation Division (NMOCD), which is in the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD), regulates oil and gas operations in New Mexico. The NMOCD has the responsibility of gathering production data, permitting new wells, establishing pool rules and allowables, issuing discharge permits, enforcing rules and regulations, monitoring underground injection wells, ensuring that abandoned wells are properly plugged, and ensuring that the land is responsibly restored. Oil and gas regulations administered by NMOCD are contained in NMAC 19.15. These regulations include the following, with which WPX would comply:

- The EMNRD requires operators to follow “Pit Rule” guidelines (NMAC 19.15.17) to reduce groundwater contamination from industry-related activities.
- NMAC 19.15.15 establishes requirements for well acreage spacing, obtaining approval of unorthodox well locations, and pooling or communitizing small acreage oil lots.
- NMAC 19.15.16.19 requires the disclosure of hydraulic fracture constituents.

1.6. Scoping, Public Involvement, and Issues

1.6.1. Scoping and Public Involvement

The BLM-FFO publishes a NEPA log for public inspection. This log contains a list of proposed and approved actions within the BLM-FFO. The log is located on the BLM’s New Mexico website (http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.html).

An on-site meeting was held at the proposed project area on February 20, 2014. WPX, BLM-FFO representatives, and an environmental consultant (Nelson Consulting Inc. [NCI]) attended the meeting. The Counselor Chapter of the Navajo Nation was invited to the on-site meeting by the BLM-FFO; no representatives of the chapter house attended the meeting. Public invitations to the on-site meeting were posted online (http://www.blm.gov/nm/st/en/fo/Farmington_Field_Office/ffo_oil_and_gas/ffo_onsites.html); no private citizens or groups attended the meetings. A BLM-FFO Interdisciplinary Team meeting was held on March 3, 2014, to discuss the proposed action. At the aforementioned meetings, potential issues of concern were identified by the BLM-FFO and NCI.

Based on the size and scale, routine nature, and potential impacts associated with the proposed action, no additional external scoping was conducted. No public comments were received for the proposed action.

1.6.2. Issues

Issues Analyzed

The following issues were identified during internal scoping as potential issues of concern for the proposed action. These issues will be addressed in this EA.

- How would dust and equipment emissions associated with the proposed project impact air resources?
- A portion of the proposed project area is classified by the BLM-FFO as having fragile soils. How would vegetation-clearing, proposed project activities, and final reclamation impact soils, including fragile soils?
- Would drilling the proposed wells impact groundwater?

- How would vegetation-clearing, proposed project activities, and final reclamation associated with the proposed project impact upland vegetation?
- Would vegetation-clearing, proposed project activities, and final reclamation associated with the proposed projects result in an increase in noxious weeds and invasive species in the area?
- How would vegetation-clearing, proposed project activities, and final reclamation impact wildlife, including migratory birds?
- How would vegetation-clearing, proposed project activities, and final reclamation impact the following BLM Special Status Species (SSS): Bendire's thrasher (*Toxostoma bendirei*), piñon jay (*Gymnorhinus cyanocephalus*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), and Townsend's big-eared bat (*Corynorhinus townsendii*)?
- How would surface-disturbing activities associated with construction of the proposed project impact cultural resources?

Issues Considered but not Analyzed

The following issues were identified during scoping as issues of concern that would not be impacted by the proposed action or that have been covered by prior environmental review. These issues will not be analyzed in this EA.

U.S. Fish and Wildlife Service (USFWS)-Listed Species

Under Section 7 of the Endangered Species Act of 1973 (ESA; 16 USC 1531-1544), all federal agencies are required to consult with the USFWS or National Marine Fisheries Service if they are proposing an action that may affect listed species or designated habitat. Consultation with the USFWS was conducted as part of the PRMP/FEIS to address the cumulative effects of RMP implementation (Consultation No. 2-22-01-1-389, Appendix M of the PRMP/FEIS; BLM 2003a). Based on a review of species currently listed by the USFWS as occurring in Rio Arriba County (USFWS 2013), as well as the location of the proposed project area and habitat within the proposed project area, the potential does not exist for USFWS-listed species to occur within the proposed project area. Water for drilling would be obtained from the permitted Blanco Trading Post (SJ 2105) water well; no unaccounted-for water depletions within USFWS-listed fish habitat would occur. Therefore, there is no need for additional Section 7 consultation.

Native American Religious Concerns

For the proposed action, identification efforts for Native American Religious Concerns were limited to a review of existing published and unpublished literature (e.g., Van Valkenburgh 1941, 1974; Brugge 1993; Kelly, et al. 2006), development of the site-specific Class III survey report prepared for the proposed action (La Plata Archaeological Consultants [LAC] Report No. 2014-5c [LAC 2014, BLM Report No. 2014(III)025F) and a review by the BLM's cultural resources program regarding the presence of Traditional Cultural Properties (TCPs) identified through ongoing BLM tribal consultation efforts. There are currently no known remains that fall within the purview of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001) or the Archaeological Resources Protection Act (ARPA; 16 USC 470) within the proposed project area. The proposed action would not impact any known TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere with or hinder the performance of traditional ceremonies and rituals pursuant to the American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996) or Executive Order (EO) 13007.

2. PROPOSED ACTION AND ALTERNATIVE(S)

2.1. Proposed Action

The proposed action is the BLM-FFO approval of three APDs associated with WPX's proposed project. The proposed project would include the drilling, production, and final abandonment of three oil and natural gas wells; the construction, use, and reclamation of an associated well pad (with construction zone), access road, and well-connect corridor; and the use and potential reclamation of two staging areas.

The primary objective of the wells would be to produce oil; however, it is likely that natural gas would be a byproduct.

Commencement of the proposed 240H/256H/292H project is projected for 2014.

Construction plats associated with the proposed project are provided in Appendix B. Photographs of the proposed project area are provided in Appendix C.

2.1.1. Location of Proposed Project Area

Maps of the proposed project area and staging areas are provided in Appendix A. The proposed project area is plotted on the Lybrook, New Mexico, 7.5-minute USGS quadrangle map (Figure A.2, Appendix A) and the 2011 Rio Arriba and Sandoval Counties, National Agriculture Imagery Program aerial photographs (Figure A.3, Appendix A).

The proposed project area is under the jurisdiction of the BLM-FFO and is located within the San Juan Basin in Rio Arriba County, New Mexico. It is approximately 43 miles southeast of the town of Bloomfield, New Mexico, and 0.5 miles south of U.S. Highway 550. The proposed project area is located approximately 0.1 mile south of Escrito Canyon, on the western side of an unnamed arm of Escrito Canyon.

The general region surrounding the project area is characterized by rolling hills, low mesas and cliffs, and broad valleys. Terrain within the proposed project area is generally flat to gently rolling. There is a general, moderate slope to the valley to the east. The northwestern portion of the construction zone is located atop a low, exposed, sandstone formation (10 to 15 feet in height). The elevation of the project area ranges from approximately 6,920 to 6,960 feet above mean sea level. There is one ephemeral drainage located east of the proposed construction zone; this drainage crosses the proposed access road/well-connect corridor to the north of the proposed well pad. Additionally, there are two ephemeral USGS washes that would be crossed by the proposed well-connect corridor northeast of the proposed well pad and construction zone.

Two staging areas, located on previously disturbed well pads, would be utilized for the proposed project. The active Lybrook South No. 10 well pad is located adjacent to the proposed access road in Rio Arriba County. The inactive Lybrook South No. 12 well pad is located in Sandoval County, approximately 0.4 mile south of the proposed project area. The Lybrook South No. 12 well pad is also on the western side of the unnamed arm of Escrito Canyon.

Oil and gas development (existing well pads, access roads, and well-connect corridors) and livestock grazing disturbances are present throughout the general region. There are several rural residences in the region; the proposed project area is visible from a residential area along U.S. highway 550 (approximately 0.5 mile to the north). The active Lybrook South No. 10 well pad (which would be used as a staging area) and an existing access road are located at the northern end of the proposed access road An existing road is located at the northeast end of the proposed well-connect corridor.

The legal location of the proposed project area and staging areas are provided in the table below.

Table 1. Legal Land Description for Proposed 240H/256H/292H Project Features

Facility	Legal Location (New Mexico Principal Meridian)		
	Quarter-Quarter	Section	Township & Range
Well-connect Corridor	W ½ of SW ¼	18	Township 23 North, Range 6 West
Well Pad, Construction Zone & Access Road	SW ¼ of the SW ¼		
Staging Areas			
Lybrook South No. 10			
Lybrook South No. 12	SW ¼ of the NW ¼	19	

2.1.2. Description of Proposed Project

For a detailed description of design features and construction practices associated with the proposed project, refer to the APDs on file at the BLM-FFO. The plats (Appendix B) provide additional details. WPX would comply with BLM guidance and standards established in *The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (*The Gold Book*; BLM and U.S. Forest Service [USFS] 2007).

Design Features and Best Management Practices

WPX would adhere to the Conditions of Approval (COAs) attached to the approved APDs. The following general design features and best management practices (BMPs) would occur.

Control of Waste

Liquid and solid wastes would be disposed of at an appropriate waste-disposal site. The proposed project area would be maintained in a sanitary condition. Hazardous substances would be handled and disposed of according to federal law.

WPX would use a closed-loop system for the proposed project. WPX would follow NMOCD “Pit Rule” guidelines and Onshore Order No. 1 (issued under Onshore Oil and Gas Operations [43 CFR 3160]) regarding closed-loop systems. No blow pits would be used for the proposed project.

Protection of Paleontological Resources

All paleontological resource stipulated would be followed as indicated in the COAs in the approved APDs. If a paleontological site is discovered, the BLM would be notified and the site would be avoided by personnel, personal vehicles, and company equipment. Workers would be informed that it is illegal to collect, damage, or disturb some such resources, and that such activities are punishable by criminal and/or administrative penalties.

Protection of Cultural Resources

All cultural resource stipulations would be followed as indicated in the Cultural Resource Records of Review, attached to the COAs in the approved APDs. These stipulations could include, but would not be limited to, temporary or permanent fencing or other physical barriers, monitoring of earth-disturbing construction, reduction of the proposed project area and/or establishment of specific construction avoidance zones, and employee education.

Employees, contractors, and sub-contractors associated with the proposed project would be informed by WPX that cultural sites are to be avoided by personnel, personal vehicles, and company equipment. These individuals would be informed that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and/or administrative penalties under the provisions of ARPA.

In the event of a cultural discovery during construction, WPX would immediately stop all construction activities in the immediate vicinity of the discovery and immediately notify the archaeological monitor, if present, or the BLM. The BLM would then evaluate or cause the site to be evaluated. Should a discovery be evaluated as significant (e.g., eligible for the National Register of Historic Places [NRHP] or protected under NAGPRA or ARPA), it would be protected in place until mitigating measures could be developed and implemented according to guidelines set by the BLM.

Protection of Flora and Fauna, including SSS and Livestock

Because the proposed project would disturb more than 4.0 acres of vegetation, if construction activities would occur during the migratory bird breeding season (May 15 through July 31), a migratory bird nest survey would take place one to two days prior to construction. This survey would be conducted by a BLM-FFO-approved biologist following BLM-FFO protocol. If, during the nest survey or during construction, active nests are located within or adjacent to the proposed project area, the BLM-FFO biologist would be notified and project activities would not be permitted until fledging has occurred. If postponement is not an option, the operator would contact the USFWS's Migratory Bird Permit Office regarding permitting.

Should any active raptor nests be observed within one-third mile of the proposed project area or should any SSS be observed within the proposed project area prior to or during construction, construction would cease and the BLM-FFO would be immediately contacted. The BLM-FFO would then ensure evaluation of the resource. Should a discovery be evaluated as significant (protected under the ESA, etc.), it would be protected in place until mitigation could be developed and implemented according to guidelines set by the BLM.

Wildlife hazards associated with the proposed project would be fenced, covered, and/or contained in storage tanks, as necessary.

The wells associated with the connected action would have a closed-loop system. As stated above (Design Features and Best Management Practices - Control of Waste), WPX would follow NMOCD "Pit Rule" guidelines and Onshore Order No. 1 (issued under Onshore Oil and Gas Operations [43 CFR 3160]) regarding the placement and operation of closed-loop systems.

Livestock grazing operators in the vicinity of the proposed project area would be contacted by WPX at least 10 days prior to construction. WPX would not cease or delay construction unless directed by the authorized BLM-FFO officer. No holes would be left open overnight. Open holes would be barricaded to ensure the safety of livestock and wildlife. If present, any range improvements (such as fences, gates, cattleguards, or waterlines) disturbed by construction activities would be repaired to the condition they were in prior to disturbance. Repairs, if needed, would take place immediately following construction.

The following design features would apply to the proposed well-connect corridor:

- No more than the amount of trench that could be worked in a day would be opened at one time.
- Backfilling operations would be performed within a reasonable amount of time to ensure that the trenches are not left open for more than 24 hours. If a trench is left open overnight, it would be fenced with a temporary fence or a night watchman would be utilized
- The ends of the pipe trenches would be sloped (3-to-1) to allow animals to escape.
- The ends of the pipes would be plugged to prevent animals from crawling into the pipe.
- If livestock is actively grazing within the proposed project area, escape ramps would be placed every 500 feet within the open trenches. The escape ramps would have a minimum 3-to-1 slope to allow for wildlife and/or livestock to escape the trenches.

- Established wildlife and/or livestock trails would be left in place as a crossover. Crossovers would be constructed above an open trench, would have a minimum 3-to-1 slope, would be a minimum of 10 feet wide, and would not be fenced.

- Before the trenches are closed, the trenches would be inspected for wildlife and/or livestock. Any trapped wildlife/livestock would be promptly removed and released at least 150 yards from the trenches.

Protection of Water Resources

The wells associated with the connected action would have a closed-loop system. As stated above (Design Features and Best Management Practices - Control of Waste), WPX would follow NMOCD "Pit Rule" guidelines and Onshore Order No. 1 (issued under Onshore Oil and Gas Operations [43 CFR 3160]) regarding the placement and operation of closed-loop systems.

Protection of Topsoil

Topsoil, which would be stripped from the surface of the proposed project area during the construction phase of the proposed project, would be stored and protected until it is redistributed during reclamation. Topsoil would be stored within the construction zone or well-connect corridor separately from subsoil material. The topsoil would be free of brush, tree limbs, trunks, and roots. Vehicle/equipment traffic would not be allowed to cross topsoil stockpiles. The topsoil would be protected using wattles or other BMPs so that erosion is minimized. If topsoil is stored for a length of time such that nutrients are depleted from the topsoil, amendments would be added to the topsoil as advised by the WPX environmental scientist or appropriate agent/contractor.

Protection of the Public

The hauling of equipment and materials for the proposed project on public roads would comply with Department of Transportation regulations. WPX would notify the public of potential hazards by posting signage, as necessary.

Prevention and Control of Weeds

It would be WPX's responsibility to monitor, control, and eradicate all invasive, non-native plant species within the proposed project area throughout the life of the project. WPX's weed-control contractor would contact the BLM-FFO regarding acceptable weed-control methods. If the contractor does not hold a current Pesticide Use Permit, a Pesticide Use Permit would be submitted prior to pesticide application. Only pesticides authorized for use on BLM lands would be used. The use of pesticides would comply with federal and state laws. Pesticides would be used only in accordance with their registered use and limitations. WPX's weed-control contractor would contact the BLM-FFO prior to using these chemicals.

Protection of Air Resources

The BLM's regulatory jurisdiction over field production operations has resulted in the development of BMPs designed to reduce impacts to air quality by reducing all emissions from field production and operations. Typical measures could include flaring hydrocarbons and gases at high temperatures in order to reduce emissions of incomplete combustion, requiring that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored, ensuring that compressor engines 300 horsepower or less have nitrogen oxide (NO_x) emissions limited to 2 grams per horsepower hour, revegetating areas not required for production facilities to reduce the amount of dust, and watering dirt roads during periods of high use in order to reduce fugitive dust emissions. Magnesium chloride, organic-based compounds, or polymer compounds could also be applied to roads or other surfaces to reduce fugitive dust. Neither petroleum-based products nor produced water would be used.

Noise

Production would comply with noise standards outlined in NTL 04-2 FFO (BLM 2004). WPX would adhere to the noise stipulations, if any, included in the COAs attached to the approved APDs.

Additional Design Features and BMPs

Vehicles would be restricted to the proposed disturbance area and existing areas of surface disturbance, such as existing roads and well pads.

No construction or routine maintenance activities would be performed during periods when the soil is too wet to adequately support construction equipment. If equipment would create ruts deeper than 6 inches, the soil would be deemed too wet for construction or maintenance.

Worker safety incidents would be reported to the BLM-FFO as required under Notice to Lessees (NTL) - 3A (USGS 1979). WPX would adhere to company safety policies, Occupational Safety and Health Administration regulations, and Department of Transportation regulations.

WPX would comply with Onshore Oil and Gas Order No. 2, issued under Onshore Oil and Gas Operations (43 CFR 3160).

The location of the wells would have an informational sign, as required by Onshore Oil and Gas Operations regulations (43 CFR 3160).

Erosion-control features, such as waterbars along the proposed well-connect corridor, would be applied as specified by the BLM-FFO Authorized Officer. If waterbars are constructed, the spacing requirements by hillslope grade are provided in the table below. The waterbars would follow the horizontal contour of the hillslope on which they would be placed. The placement of other water diversions within the proposed project area would be determined during reclamation.

Table 2. Waterbar Spacing Requirements by Percent Grade of Hillslope

Hillslope Percent Grade (%)	Waterbar Spacing (feet)
Less than 1	400
1-5	300
5-15	200
15-25	100

Proposed Project Phases

Under the proposed action, the following phases would occur.

During all phases of the proposed project, vehicles would use the proposed access road, as well as developed roads and highways in the region. Traffic would include light vehicles (such as cars and pick-up trucks) and heavy vehicles (such as water trucks and large tractor-trailers hauling equipment).

Upgrade of Existing Road

WPX would upgrade approximately 1,060 feet of the existing road where possible from the start of the proposed access road to the road's intersection with the next existing road to the northeast (Figure A.3, Appendix A). The road would be upgraded following *The Gold Book* (BLM and USFS 2007) and BLM Handbook 9113 (BLM 2011d and BLM 2011e).

Construction of Access Road and Well Pad

The BLM-FFO would be notified at least 48 hours prior to the start of construction. The construction phase for the well pad and the access road associated with the proposed project is expected to be less than two weeks.

The proposed well pad and access road would be cleared of vegetation. The vegetation (including trees less than 3 inches in diameter [at ground level] and slash/brush) would be chipped or mulched and incorporated into the topsoil as additional organic matter. Trees 3 inches in diameter or greater (at ground level) would be cut to ground level and delimbed. The subsurface portion of trees (tree stumps) would be placed in adjacent areas needing soil stabilization, or would be hauled to an approved facility.

The top 6 inches of topsoil, or as much as possible, would be stripped and stockpiled within the construction zone. The protection of topsoil is discussed in "Design Features and Best Management Practices – Protection of Topsoil," above.

The proposed access road and well pad would be leveled with a D-8 bulldozer to provide space and a level surface for vehicles and equipment. Excavated materials from cuts would be used on fill portions of the location. Construction would utilize native soil and materials available onsite. If sandstone is needed for surfacing, the sandstone would be retrieved from a permitted location.

The proposed 562-foot-long access road (a resource road) would be designed and maintained in accordance with *The Gold Book* (BLM and USFS 2007) standards and BLM Manual 9113, Sections 1 and 2 (BLM 2011d and BLM 2011e). The 30-foot-wide road corridor would accommodate clearing, cut-and-fill slopes, and drainage ditches. A culvert would be placed beneath the road where a large ephemeral wash crosses the proposed access road. The cattle guard and fence line located near the end of the proposed access road would be adjusted to accommodate the entrance to the proposed well pad. Within the corridor, there would be a 14-foot-wide running surface and adequate crowning and drainage on both sides. The proposed access road would be built up 18 to 24 inches following *The Gold Book* (BLM and USFS 2007) standards. The road would be constructed to meet the standards for anticipated traffic flow and all-weather requirements. Surfacing material would be used, if economically viable. The maximum road grade would be 6 percent.

The proposed well pad would measure 500 feet by 300 feet. The associated 50-foot-wide well pad construction zone would surround the pad. The size of the proposed well pad is slightly larger than typical well pads in the BLM-FFO area because the equipment (such as tanks) associated with the new hydraulic fracturing design requires a larger area. The maximum cut would be 10 feet on the northwestern corner (corner 6); the maximum fill would be 11 feet on the northeastern corner (corner 2).

The proposed staging areas would be used during this phase of the proposed project.

Drilling and Completion

Once construction is complete within the proposed project area, a drilling rig would be transported to the well pad and assembled. Horizontal drilling typically takes approximately 30 days per well. Once drilling is complete, the wells would be completed (the process in which the wells are able to produce oil and natural gas). Completion typically takes 30 days per well. The proposed staging areas would be used during this phase of the proposed project.

Facilities and equipment on the location during this time could include the following:

- Drilling rig
- Generator(s)
- Water and mud tanks
- Mud pumps
- Safety stations
- Equipment and material storage units
- Fuel storage

- Dog House (equipment control room)
- Construction trailers
- Various service company equipment (cement trucks, fracturing trucks & equipment, wireline trucks, etc.)

Approximately 10 to 40 personnel would be on the proposed site at any time during drilling and completion.

It is estimated that 23,000 barrels of useable water would be required to drill each well. Of the 23,000 barrels, approximately 10,000 to 11,000 barrels would be recovered for reuse. Water for drilling would be obtained from the San Juan Basin Water Haulers Association, who would obtain and truck their water from permitted water well (the Blanco Trading Post [SJ 2105] well). WPX would ensure that water would be obtained legally and that all required permits would be obtained prior to obtaining water.

Surface casing would be installed to a depth necessary to penetrate past freshwater zones. The casing would be pressure-tested to ensure that a seal has been created.

As stated in “Design Features and Best Management Practices – Control of Waste,” above, WPX would follow NMOCD “Pit Rule” guidelines and Onshore Order No. 1 (issued under Onshore Oil and Gas Operations [43 CFR 3160]) regarding the placement and operation of closed-loop systems. No blow pits would be used for the proposed project. WPX would not be utilizing a cuttings pit. Any other fluids or hazards on the location would be contained or fenced and properly maintained to ensure the safety of livestock and wildlife.

The proposed staging areas would be used during this phase of the proposed project

Construction of Well-Connect Pipelines

If the proposed wells are productive, well-connect corridor construction would commence. Four well-connect pipelines would be constructed in two trenches within the proposed pipeline corridor. Construction of well-connect pipelines would take two to three weeks.

Design features and mitigation associated with well-connect pipeline construction are listed in “Design Features and Best Management Practices,” above.

During this phase, the proposed staging areas would be used.

The proposed well-connect corridor would be cleared of vegetation and the top 6 inches of topsoil would be stored in the same manner as described for the proposed well pad and access road.

Trenching activities would be conducted using a trencher or backhoe. Within the 40-foot-wide well-connect corridor, two trenches would be excavated. The trenches would each contain one 6-inch-diameter, steel, natural gas/liquids well-connect and one 4–inch-diameter, poly, natural gas/liquids well-connect. The proposed well-connect pipelines would carry natural gas and oil; WPX would seek authorization to transport water within one of the poly lines. The trenches would be 4 to 5 feet in depth. The trenches would be 16 inches in width if a trencher is used or 24 inches in width if a backhoe is used. When stringing pipe, one joint of pipe would be set back every quarter mile.

After the pipes have been welded and coated, a side-boom tractor would be used to place them into the trenches. Prior to construction commencement, WPX would notify the BLM-FFO of additional types of construction equipment to be used.

After trenching and pipe placement in the trenches, the soils excavated from the trenches would be returned and compacted to prevent subsidence. Approximately 2 feet of fill would be placed in the trenches, and the ground surface would be leveled. The trenches would then be compacted.

Prior to the well-connects being placed in service, the pipes would be pressure tested.

Well-connect pipeline markers would be installed along the well-connect corridor within the line of sight, without voiding safety issues.

Post-Construction Reclamation

This phase would include interim reclamation within portions of the proposed well pad (including construction zone) and access road corridor, and final reclamation within the proposed well-connect corridor. Areas that would be fully reclaimed, reseeded only, or left unreclaimed during this phase are described in Section 2.1.3 (Surface Disturbance).

During this phase, WPX would repair any damage to the staging areas. The staging areas would be reseeded (with the exception of any portions of the staging areas that the facility operator prefers to remain unseeded). Reclamation details (including species included in the seed mixture) are provided in the Surface Reclamation Plan (Appendix D).

Interim reclamation within the proposed well pad (including construction zone) and access road corridor would be initiated within 120 days of construction. Final reclamation within the proposed well-connect corridor would occur following the completion of well-connect pipeline construction. The BLM-FFO would be notified at least 48 hours prior to the start of reclamation activities. Reclamation could occur simultaneously with production.

During this phase, a bulldozer and a tractor with seeding capabilities would be used for reclamation purposes. Approximately four personnel would be required.

In areas that would be fully reclaimed, slopes would be re-contoured to pre-construction topographical contours, if possible. WPX would diminish the evidence of cuts, fills, and flat well pad surfaces.

In areas that are to be fully reclaimed or just reseeded, stockpiled topsoil (if available) would be redistributed and the surface would be ripped and seeded. Sediment- and erosion-control features (including water diversions, silt traps, and culverts) would be installed, as necessary. The BLM-FFO Sagebrush-Grass Community Seed Mixture would be used for the proposed project.

Under the BLM-FFO Bare Soil Reclamation Procedures (BLM 2013b), monitoring reclaimed surfaces is required to document successful reclamation; monitoring and reporting are discussed in the Surface Reclamation Plan (Appendix D).

Production

The production phase of wells varies; the lifetime is anticipated to be 30 to 50 years. Production equipment that would remain on the proposed well pad could include the following:

- Wellhead
- Production unit
- Meter run
- Compressor
- Flare stack
- Water tanks
- Oil tanks

Production facilities would be located within a 300-by-100-foot facility area on the northern end of the well pad. The teardrop for the well pad would consist of a looped, 35-foot-wide driving surface; the teardrop would be used to access the wellhead and other facilities.

Site security guidelines would be followed, as identified in 43 CFR 3162.7-5 and Onshore Oil and Gas Order No. 3. With the exception of equipment subject to safety requirements, equipment would be painted Juniper Green to blend with the surrounding environment. Production facilities would be placed, to the extent practical, to minimize visual impacts.

During production, normal upkeep would be required to monitor production and resolve any problems. It is anticipated that one pick-up truck would visit the proposed well pad daily during the normal work week.

Occasionally, workover or recompletion of the proposed wells would be necessary to ensure that efficient production is maintained. Workovers and recompletions would be scheduled as needed to improve and maintain production of the proposed wells. Workover activities could include repairs to the wellbore equipment (e.g., casing, tubing, rods, and pump), wellheads, or production facilities. A 210-foot-by-180 foot workover area would surround each proposed wellhead. This workover area could be used for future activities within the well pad but would not be used for daily activities.

Abandonment and Post-Production Reclamation

If the proposed wells prove to be unproductive, or when the wells are no longer commercially viable, the wells would be plugged and abandoned. Downhole well abandonment would be carried out under current BLM-FFO and state regulations. The bore holes would be plugged with cement and the production facilities would be removed. An aboveground marker would be placed over each of the plugged holes. The marker would contain individual well identification information.

Final reclamation of the proposed well pad and access road would take place, unless the BLM-FFO considers the retention of these facilities necessary for the management of multiple uses of natural resources. Details of the final reclamation process (including species included in the seed mixture) are provided in the Surface Reclamation Plan (Appendix D).

The final reclamation phase is anticipated to take less than one week for the proposed project location. WPX would provide the BLM-FFO with technical and environmental aspects of the final plugging, abandonment, and reclamation procedures.

During this phase, a bulldozer and a tractor with seeding capabilities would be used. Approximately four personnel would be required.

The goal of final reclamation would be to return disturbed areas associated with the proposed project to pre-construction conditions, if possible, by diminishing the evidence of cuts, fills, and flat surfaces. Portions of the proposed project area that were not fully reclaimed during post-construction reclamation would be cleared (if vegetated), re-contoured to pre-construction topographical contours, covered with salvaged topsoil, and seeded. Sediment- and erosion-control measures would be implemented, as necessary. Water bars would be installed across the roads, and dead-end ditches and earthen barricades would be constructed at the entrance to reclaimed areas. Measures would be taken to control sedimentation and erosion, as necessary.

Under the BLM-FFO Bare Soil Reclamation Procedures (BLM 2013b), monitoring reclaimed surfaces is required to document successful reclamation; monitoring and reporting are discussed in the Surface Reclamation Plan (Appendix D).

2.1.3. Proposed Surface Disturbance

There would be 6.5 acres of new surface disturbance. Of this, 1.2 acre would be reseeded (but not recontoured) during post-construction reclamation, 3.9 acres would be fully reclaimed during post-construction reclamation, and 1.4 acres would remain disturbed throughout the life of the project. Two

previously disturbed staging areas would be used for the proposed project. The following table summarizes the disturbance and reclamation acreage associated with the proposed project.

Table 3. Acreage Associated with Proposed Project

Feature	Acreage		Description of Acreage Following Post-Construction Reclamation		
	Total	New Disturbance	Fully Reclaimed (Reseeded and Recontoured)	Reseed Only	Unreclaimed
Surface Disturbance					
Access Road Corridor	0.4	0.4	-	0.2 (1)	0.2 (1)
Well Pad	3.4	3.4	1.2	1.0 (1)	1.2 (1)
Construction Zone	2.1	1.9	1.9	-	-
Well-Connect Pipeline Corridor	1.6	0.8	0.8	-	-
Total	**7.5**	**6.5**	**3.9**	**1.2 (1)**	**1.4 (1)**
Staging Areas (Previously Disturbed Surface)					
Lybrook South No. 10	1.7	-	-	1.7 (2)	-
Lybrook South No. 12	1.0	-	-	1.0 (2)	-
Total	**2.7**	**-**	**-**	**2.7 (2)**	**-**

(1) These areas would be fully reclaimed when the proposed wells are plugged.
(2) Portions of staging areas would be reseeded, as described in text below.

The proposed project features are described further below.

Access Road Corridor

The proposed access road corridor would be 30 feet wide and 562 feet long, totaling 0.4 acre.

The 14-foot-wide running surface of the proposed access road and the bottoms of the bar ditches alongside the proposed access road (0.2 acre, total) would remain disturbed for the lifetime of the proposed project. The remainder of the access road corridor (0.2 acre) would be reseeded during post-construction reclamation.

Well Pad

The proposed well pad would measure approximately 500 by 300 feet (3.4 acres).

Of the 3.4 acres of new disturbance, approximately 1.2 acres, known as the “non-reseed working area,” would remain disturbed for the lifetime of the proposed project. The non-reseed working area would consist of the following:

- A 300-by-100-foot (0.7-acre) facility area would be located on the northern side of the proposed well pad.
- A teardrop with a 35-foot-wide (0.5-acre) driving surface would be located within the center of the proposed well pad.

Approximately 1.0 acre, known as the “reseed working area,” would be reseeded (but not recontoured) during post-construction reclamation. The reseed working area would consist of the following:

- The reseed working area would include the center of the teardrop (0.3 acre).

- It would also include an approximately 210-by180-foot (0.9-acre) workover area around each wellhead. After accounting for the portions of these polygons that overlap one another, the teardrop, and the teardrop center, this region would measure 0.7 acre.

The remainder of the proposed well pad (1.2 acres) would be fully reclaimed during post-construction reclamation.

Construction Zone

A proposed 50-foot-wide (2.1-acre) construction zone would surround the well pad. Approximately 0.1 acre would overlap the proposed access road. Additionally, the construction zone would be reduced by approximately 0.1 acre to protect environmental resources. Therefore, the construction zone would add 1.9 acres of new disturbance to the proposed project area. All new disturbance associated with the construction zone would be fully reclaimed during post-construction reclamation.

Well-Connect Pipeline Corridor

The proposed well-connect pipeline corridor would be 1,700 feet long and 40 feet wide (1.6 acres). Approximately 300 feet of this corridor would overlap the proposed well pad and construction zone. The remaining 1,400 feet would travel parallel and adjacent to the proposed access road and existing access road. Along this section of the corridor, approximately 15 feet of the corridor width would overlap the access road. The remainder of the corridor width (25 feet, or 0.8 acre) would result in new surface disturbance. All of this disturbance would be fully reclaimed following construction.

Staging Areas

Two previously disturbed well pads would be used as staging areas. During staging, WPX would stay within the boundaries of the existing disturbance area associated with the well pads. During interim reclamation, WPX would repair any damage to the staging areas and reseed the staging areas, unless the well pads' operator requests otherwise. These staging areas are listed below:

- Elm Ridge's active Lybrook South No. 10 well pad: The original disturbance area of the well pad is approximately 1.7 acres (based on aerial photos).

- Elm Ridge's inactive Lybrook South No. 12 well pad: The original disturbance area of the well pad is approximately 1.0 acre (based on aerial photos). The well pad is inactive, but was used/is being used as a staging area for WPX's Chaco 2306-19E Nos. 188H, 189H, and 205H (188H/189H/205H) project.

2.2. No Action

Under the No Action Alternative, the 240H, 256H, and 292H APDs would not be approved. The proposed wells would not be drilled and the proposed well pad, access road, and well-connect pipelines would not be constructed. Current land and resource uses would continue to occur in the proposed project area.

2.3. Alternatives Considered but Eliminated from Detailed Study

Natural gas and oil wells can be drilled vertically or directionally/horizontally. Vertical drilling places a well pad directly above the bottom hole, while directional/horizontal drilling allows for flexibility in the placement of the well pad and associated surface facilities. Directional/horizontal drilling often allows for "twinning," or drilling two or more wells from one shared well pad. Directional/horizontal drilling applications throughout the San Juan Basin have become relatively common. Generally, the use of this technology is applied when it is necessary to avoid or minimize impacts to surface resources.

Factors such as reservoir depth, angle of deviation, lateral displacement, completion technique, and risk are considered before deciding on the use of directional drilling applications. In addition, operating factors such as production efficiency; rod, pump, and tubing wear; and workover frequency is also a consideration. Generally, directional well completion and operating costs are 20 to 25 percent higher than

vertical well drilling costs. The primary economic factors that determine the feasibility of directional applications include, but are not limited to, incremental drilling, completion, and operating costs; oil and gas reserves; rates of production; oil and gas prices; royalties and taxes; and return on investment.

No feasible alternative surface locations were identified for the proposed project features that would result in less surface disturbance than the proposed location.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Under the No Action alternative, current land and resource issues within the proposed project area would continue; there would be no new impacts from oil and gas development. The No Action alternative would serve as the baseline for comparing the environmental impacts of the analyzed alternatives, and would not be further evaluated in this EA (BLM 2008b).

3.1. Air Resources

3.1.1. Affected Environment

The proposed project area is located in Rio Arriba County, New Mexico. General information on air quality in the area is contained in Chapter 3 of the PRMP/FEIS (BLM 2003a, 3-48 – 3-53). New information about greenhouse gases (GHGs) and their effects on national and global climate conditions have emerged since this document was prepared. Ongoing scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide, water vapor, and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions may cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes. These changes are typically referred to as “global warming.”

Much of the information referenced in this section is incorporated from the Air Resources Technical Report for BLM Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (herein referred to as the Air Resource Technical Report; BLM 2013a). 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.

The EPA has the primary responsibility for regulating air quality, including the regulation of six nationally regulated ambient air pollutants (criteria pollutants). These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2) and lead (Pb). The EPA has established NAAQS for criteria air pollutants. The NAAQS are protective of human health and the environment. The EPA has approved New Mexico’s State Implementation Plan, and the state enforces state and federal air quality regulations on all public and private lands within the state, with the exception of tribal lands and Bernalillo County.

Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology, and terrain. Air quality also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. The EPA has proposed or completed actions recently to implement CAA requirements for GHG emissions. Climate has the potential to influence renewable and non-renewable resource management.

Air Quality

Criteria Air Pollutants

The Air Resource Technical Report describes the types of data used in the description of the existing conditions of criteria pollutants, describes how the criteria pollutants are related to the activities involved in oil and gas development, and provides a table of current national and state standards (BLM 2013a). The EPA Green Book web page reports that all counties in the BLM-FFO analysis area, including San Juan, McKinley, Rio Arriba, and Sandoval Counties in New Mexico and La Plata County in Colorado, are in attainment of all NAAQS as defined by the CAA (EPA 2012). In addition, the area does not violate any New Mexico Ambient Air Quality Standards (NMAAQS). The current criteria pollutant “design

concentrations" in the analysis area are described below. Design Concentrations are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. Table 4 shows monitored design values for O_3 in recent years for each of the three San Juan County O_3-monitoring stations.

Table 4. Reported Ozone Values for San Juan County Ozone Monitoring Stations

State Air Monitoring Station	8-hour Ozone Design Value (ppm*)				NAAQS
	2007-2009	2008-2010	2009-2011	2010-2012	2008
Substation	0.067	0.063	0.063	0.067	0.075
Bloomfield	0.061	0.060	0.061	0.067	0.075
Navajo Lake	0.069	0.066	0.068	0.071	0.075

Source: NMED 2012
* parts per million

Table 5 summarizes monitored design values for other criteria pollutants in San Juan County.

Table 5. Criteria Pollutant Design Value Concentrations monitored in San Juan County

Pollutant	Design Value	Averaging Time	NAAQS	NMAAQS
NO_2	13 ppb	Annual	53 ppb	50 ppb
NO_2	39 ppb	1-hour	100 ppb(1)	0.10 ppm (24-hour)
PM_{10}	Data incomplete	24-hour	150 µg/m (3,4)	150 µg/m(3,4)
$PM_{2.5}$	4.5µg/m(3)	Annual	12 µg/m(3,5)	60 µg/m(3,4)
$PM_{2.5}$	14µg/m(3)	24-hour	35 µg/m(1,3)	--
SO_2	0.001ppm(7)	Annual	None	0.02 ppm
SO_2	20 ppb(8)	1-hour	75 ppb(6)	None
SO_2	0.008 ppm	24-hour	None	0.10 ppm

Source: EPA 2012
(1) 98th percentile, averaged over 3 years
(2) Not to be exceeded more than once per year
(3) Not to be exceeded more than once per year on average over 3 years
(4) The NMAAQS is a standard for total suspended particulate matter
(5) Annual mean, averaged over 3 years
(6) 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
(7) ppm: parts per million
(8) ppb: parts per billion

In 2005, the EPA estimated that there was less than 0.01 ton per square mile of Pb emitted in the analysis area, which is less than 2 tons total (BLM 2013a). No monitoring is conducted for Pb and CO in northwestern New Mexico; however, concentrations of these pollutants are expected to be low in rural areas, and are therefore not monitored.

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 (BLM 2013a). The EPA has identified 187 toxic air pollutants as HAPs. In March 2011, the EPA published the fourth in a series of National Scale Air Toxics Assessments (NATA) that quantifies HAP emissions for 2005 by U.S. County. The purpose of the NATA is to identify areas where HAP emissions result in high health risk. Computer models are used to develop estimates of risk of cancer or other health impacts. NATA presents risk hazard indexes for cancer, neurological problems, and respiratory problems for each county and census tract. Because techniques have changed over the years, each NATA is not comparable to those previously issued. The EPA also cautions that because data availability varies from state to state, the results are not necessarily comparable from one geographic area to another. The 2005 NATA analysis estimated tract level total cancer risk for the analysis area as 25 to 50 per one million; the estimated tract level total respiratory hazard index was zero to 1. The EPA estimates the average national cancer risk for 2005 was 50 per one million, meaning 1 person out of every 20,000 had an increased

likelihood of contracting cancer from breathing air toxics from outdoor sources if exposed to 2005 emission levels over their lifetime. A respiratory hazard index below 1 indicates that exposures in the area do not exceed reference levels that would have adverse effects for human health.

Climate

The analysis area is located in a semiarid climate regime typified by dry, windy conditions and limited rainfall. Summer maximum temperatures are generally in the range of 80 or 90 degrees Fahrenheit (°F), and winter minimum temperatures are generally in the teens to 20s. Temperatures occasionally reach above 100°F in June and July and have dipped below zero in December and January. Precipitation is divided between summer thunderstorms associated with the southwest monsoon and winter snowfall as Pacific weather systems drop south into New Mexico. Table 6 shows climate normals for the 30-year period from 1981 to 2010 for the Farmington, New Mexico, area.

Table 6. Climate Normals for the Farmington Area, 1981-2010

Month	Average Temperature*	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Precipitation (inches)
January	30.5	40.8	20.3	0.53
February	35.8	46.8	24.8	0.59
March	43.2	56.1	30.3	0.78
April	50.4	64.7	36.2	0.65
May	60.4	74.8	46.1	0.54
June	69.8	85.1	54.5	0.21
July	75.4	89.6	61.2	0.90
August	73.2	86.5	59.8	1.26
September	65.4	79.1	51.7	1.04
October	53.3	66.4	40.1	0.91
November	40.5	52.2	28.8	0.68
December	31.0	41.2	20.7	0.50

Source: BLM 2013a; data collected at New Mexico State Agricultural Science Center - Farmington
* degrees Fahrenheit

3.1.2. Impacts from the Proposed Action

Methodology and assumptions for calculating air pollutant and GHG emissions are described in the Air Resources Technical Report. This document incorporates the sections discussing the modification of calculators developed by the BLM to address emissions for one horizontal oil well. The calculators give an approximation of criteria pollutant, HAP, and GHG emissions to be compared to regional and national emissions levels. Also incorporated into this document are sections describing the assumptions used in developing the inputs for the calculator (BLM 2013a).

Direct and Indirect Impacts

Table 7 shows estimated emissions from one proposed horizontal oil well for criteria pollutants, volatile organic compounds (VOCs) and GHGs. For comparison, Table 8 shows total human-caused emissions for each of the counties in the BLM-FFO management area and La Plata County, Colorado, based on the EPA's 2008 emissions inventory (EPA 2011).

Table 7. Criteria Pollutant and VOC Emissions Estimated for Construction of One Horizontal Oil Well; Average 25 Days to Drill and Complete

Activity	NOx*	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CH_4	CO_2
One time operations (tons)*								
Construction	5.5	1.5	0.5	2.5	0.25	0.1	0.007	598.85
Completion	0.5	0.1	0.03	0.025	0.025	-	-	55.00
Interim reclamation	0.006	0.006	0.006	0.001	-	0.003	-	1.24
Final Reclamation	0.006	0.006	0.006	0.001	-	0.004	-	1.66
Ancillary Operations (tons)								
Workover	0.129	0.04	0.01	0.01	0.01	-	-	10.59
Road Maintenance	-	-	-	-	-	-	-	0.26
Road Traffic	-	-	-	-	-	-	-	0.06
Annual operations (tons/yr)								
Oil Haul Truck and small truck (100 bbl/day)	0.009	0.006	0.0012	0.0009	0.0008	-	0.0001	3.88
Total	**6.13**	**1.64**	**0.55**	**2.54**	**0.29**	**0.11**	**0.01**	**671.54**

* nitrogen oxide

Table 8. Analysis Area Emissions in Tons per Year, 2008

County	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2
McKinley	12,595.0	31,885.2	37,509.0	66,590.7	6,977.5	1,659.8
Rio Arriba	4,276.6	27,352.9	45,841.5	46,321.6	4,746.2	89.1
San Juan	35,651.7	54,549.5	46,994.9	69,655.7	8,108.3	11,471.0
Sandoval	4,780.1	33,290.5	31,733.6	36,232.3	4,056.3	123.4
Total	**57,303.4**	**147,078.1**	**160,079**	**218,800.3**	**23,897.3**	**13,343.3**

Source: EPA 2008

Oil storage tanks on the well locations may result in venting of VOCs. Oil well production is generally presented as barrels per day produced. The emissions calculator estimated that for every barrel per day produced there could be 0.12 tons of VOC vented per year. The average horizontal oil well in the BLM-FFO management area produces approximately 100 barrels per day. One hundred barrels per day is estimated to result in 12 tons of VOC emissions per year. Oil storage tanks would be subject to current EPA regulations regarding the capture or flaring of VOC emissions.

Table 9 displays the percent increase in total emissions expected in the analysis area as a result of constructing and operating one horizontal oil well.

Table 9. Percent Increase in Analysis Area Emissions from the Proposed Action

	NO_X	CO	VOC	PM_{10}*	$PM_{2.5}$ *	SO_2*
Total Emissions	57,303.4	147,078.1	160,079.0	218,800.3	23,897.3	13,343.3
Horizontal Oil Well Emissions	6.13	1.64	12.55(8)	2.54	0.29	0.11
Percent Increase	**0.01**	**0.001**	**0.009**	**0.001**	**0.001**	**0.0008**

*Values derived from average emissions for any well drilling in the analysis area. Calculated results available upon request.

Hazardous Air Pollutants

The formulas used for calculating HAPs in the calculators are very imprecise. For many processes it is assumed that emission of HAPs would be equivalent to 10 percent of VOC emissions. Therefore, the

estimated HAP emissions of 1.25 tons per year should be considered a very gross estimate. Most of the VOC emissions estimated for one horizontal oil well result from venting from oil storage tanks. Current EPA regulations require operators to reduce VOC emissions by 95 percent if their oil storage tanks emit over 6 tons of VOC emissions per year. A reduction of 95 percent of oil storage tank VOC emissions would reduce the estimated HAP emissions to 0.12 tons per year.

Total Greenhouse Gases

The available statewide GHG summary combines GHG emissions from CO_2 and CH_4 (NMED 2010). To compare the GHG emissions from the proposed action (estimated by the calculator) with statewide GHG emissions, equivalent CO_{2e} emissions for both CH_4 and CO_2 were summed. The total statewide GHG emission estimate for 2007 was 76,200,000 metric tons of CO_{2e} (76.2 million metric tons; NMED 2010). The estimated CO_{2e} metric tons emissions from one horizontal oil well (609.2 metric tons) would represent a 0.0008-percent increase in New Mexico CO_2 emissions.

Cumulative Impacts

The BLM-FFO manages federal hydrocarbon resources in San Juan, Sandoval, Rio Arriba, and McKinley counties. There are approximately 23,522 wells in the San Juan Basin. About 16,435 of the wells in these counties are federal wells. Analysis of cumulative impacts for reasonable development scenarios and reasonably foreseeable development scenarios for oil and gas wells on public lands in the BLM-FFO was presented in the RMP. This included modeling of impacts on air quality (BLM 2003b). A more detailed discussion of cumulative effects can be found in the Air Resources Technical Report (BLM 2013a).

The primary sources/activities that contribute to levels of air pollutants and GHG emissions in the Four Corners area are electricity-generation stations, fossil fuel industries, and vehicle travel. 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 (BLM 2013a). It includes a summary of emissions on the national and regional scale by industry source. Sources/activities 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 and indirect increases in several criteria pollutants, HAPs, and GHGs as a result of implementing the proposed alternative. The very small increase in emissions that could result would not be expected to result in exceeding the NAAQS for any criteria pollutants in the analysis area.

The very small increase in GHG emissions that could result from implementing the proposed action would not produce climate change impacts that differ from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from the action alternatives cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from the action alternatives on global or regional climate.

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 (BLM 2013a). It is currently not feasible to know with certainty the net impacts from particular emissions associated with activities on public lands.

3.2. Soil Resources

3.2.1. Affected Environment

Soils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. This material has been mixed and sorted in transport and has a wide

range of mineralogy and particle size. The parent material of sedimentary rock consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

The Natural Resources Conservation Service (NRCS) has mapped the soils in the proposed project area and staging areas. Complete soil information for the proposed project area and the Lybrook South No. 10 staging area is available in the NRCS's *Soil Survey of Rio Arriba County Area, New Mexico: Parts of Rio Arriba and Sandoval Counties* (NRCS 2008a). Complete soil information for the Lybrook South No. 12 staging area is available in the NRCS's *Soil Survey of Sandoval County Area, New Mexico: Parts of Los Alamos, Sandoval, and Rio Arriba Counties* (2008b). Within the proposed project area and staging areas, five soil map units are present: Blancot-Councelor-Tsosie association (0- to 5-percent slopes); Pinavetes-Florita complex (2- to 10-percent slopes); Sparank clay loam (0- to 1-percent slopes); Sparank-San Mateo silt loams, saline, sodic (0- to 3-percent slopes); and Vessilla-Menefee-Orlie complex (1- to 30-percent slopes).

The BLM-FFO has developed procedures for reclamation and stabilization of fragile soils. Fragile soils are defined as having a high erosion risk due to a combination of soil erodibility characteristics, slope length, and slope gradient (BLM 2014). Within areas with fragile soils, it can be difficult for project proponents to stabilize and reestablish vegetation. Four potentially fragile soil types were identified in Rio Arriba County, two of which (Pinavetes-Florita complex and Sparank-San Mateo silt loams) are located within the proposed project area. Slope gradient within the portion of the proposed project area where fragile soils exist is gentle to flat.

Table 10. Soil Map Units within the Proposed Project Area and Staging Areas

Map Unit Name (Composition %) [4]	Slope (%)	Potential for Erosion		Depth to Water Table	Available Water Capacity (inches)	Location within Proposed Project Area & Staging Areas
		Water	Wind			
Blancot (40)-Councelor (30)-Tsosie (25) association[2]	0-5	Moderate	Very High	Very Deep	7.2-9.8	Portion of the Lybrook South No. 12 staging area
Pinavetes (50)-Florita (40) complex[1,3]	2-10	Severely Susceptible	Very High	Very Deep	3.6-6.9	Northeastern terminus of the well-connect corridor
Sparank (85) clay loam[2]	0-1	Very low	High	Very Deep	10.3	Portion of the Lybrook South No. 12 staging area
Sparank (55)-San Mateo (30) silt loams, saline, sodic[1,3]	0-3	Slight to Moderate	Susceptible	Very Deep	6.5-9.0	Eastern ¼ of the well pad and construction zone, entire access road, majority of the well-connect corridor, and the Lybrook South No. 10 staging area
Vessilla (45)-Menefee (25)-Orlie (20) association[1]	1-30	Moderate to High	Slight to High	Very Deep	2.0-10.9	Western ¾ of the well pad and construction zone

[1] Source: NRCS 2008a
[2] Source: NRCS 2008b
[3] Source: BLM 2014
[4] Composition percent is provided for map units classified as a complex or an association

Blancot-Counselor-Tsosie association (0-5 percent slopes)

The parent material of Blancot, Counselor, and Tsosie soils primarily consists of fan alluvium, eolian deposits, and stream alluvium derived from sandstone and shale. This soil association is typically found along valley side/floor, ridge, fan remnant, stream terrace, and alluvial fan landforms, and within loamy, sandy, and salt flat ecological sites. The potential plant community for this soil association is usually comprised of James' galleta (*Pleuraphis jamesii*), Indian ricegrass (*Achnatherum hymenoides*), needleandthread (*Hesperostipa comata*), New Mexico feathergrass (*Hesperostipa neomexicana*), inland saltgrass (*Distichlis spicata*),western wheatgrass (*Pascopyrum smithii*), squirreltail (*Elymus elymoides*), blue grama (*Bouteloua gracilis*), dropseed (*Sporobolus* spp.), alkali sacaton (*Sporobolus airoides*), winterfat (*Krascheninnikovia lanata*), big sagebrush (*Artemisia tridentata*), Mormon tea (*Ephedra viridis*),greasewood (*Sarcobatus* spp.),shadscale saltbush (*Atriplex confertifolia*), and fourwing saltbush (*Atriplex canescens*) (NRCS 2008b).

Pinavetes-Florita complex (2-10 percent slopes)

The parent material of Pinavetes and Florita soils primarily consists of eolian deposits derived from sandstone. This soil complex is typically found along dune and hill landforms within sandy and loamy ecological sites. Pinavetes-Florita complex is considered fragile due to its severe susceptibility to water erosion (BLM 2014). The topography in the vicinity of the proposed project area where these soils occur is flat with a gentle slope. The potential plant community for this soil complex is usually comprised of western wheatgrass, James' galleta, muttongrass (*Poa fendleriana*), bluestem (*Andropogon* spp.), Indian ricegrass, sand sagebrush (*Artemisia filifolia*), piñon pine (*Pinus edulis*), and oneseed juniper (*Juniperus monosperma*) (NRCS 2008a).

Sparank clay loam, moderately saline, sodic (0-1 percent slopes)

The parent material of this soil primarily consists of stream alluvium derived from sandstone and shale. Sparank clay loam, moderately saline, sodic is typically found along floodplain, valley side, alluvial fan, stream terrace, and valley floor landforms and within salty bottomland ecological sites. The potential plant community for this soil type is usually comprised of James' galleta, western wheatgrass, alkali sacaton, greasewood, and fourwing saltbush (NRCS 2008b).

Sparank-San Mateo silt loams, saline, sodic (0-3 percent slopes)

The parent material of Sparank and San Mateo soils primarily consists of stream alluvium derived from sandstone and shale. This soil complex is typically found along floodplain landforms and within salty bottomland ecological sites. Sparank-San Mateo silt loams, saline, sodic is considered fragile due to its moderate susceptibility to water erosion and its susceptibility to wind erosion (BLM 2014). The topography in the vicinity of the proposed project area and staging area where these soils occur is flat with a gentle slope. The potential plant community for this map unit is usually comprised of alkali sacaton, western wheatgrass, squirreltail, James' galleta, fourwing saltbush, and greasewood (NRCS 2008b).

Vessilla-Menefee-Orlie association (1-30 percent slopes)

The parent material of Vessilla, Menefee, and Orlie soils primarily consists of slope alluvium over residuum weathered from sandstone, colluvium over residuum weathered from shale, and slope alluvium derived from sandstone and shale. The potential plant community for this soil complex is usually comprised of western wheatgrass, James' galleta, Indian ricegrass, needleandthread, blue grama, big sagebrush, fourwing saltbush, piñon pine, oneseed juniper, and Gambel oak (*Quercus gambellii*; NRCS 2008a).

3.2.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Within the proposed project area (6.5 acres, total), vegetation would be cleared, topsoil would be stripped, and leveling would occur. Approximately 1.4 acres would remain as bare, compacted surface for the life of the proposed project. Approximately 1.2 acres would be reseeded (but not recontoured) during post-construction reclamation. The remainder (3.9 acres) would be fully reclaimed (reseeded and recontoured) during post-construction reclamation.

Two previously disturbed well pads (totaling 2.7 acres) would be used as staging areas for the proposed project. These locations have already been disturbed and are barren of vegetation. WPX would stay within the boundaries of the existing well pads. During post-construction reclamation, WPX would repair any damage to and reseed the staging areas (unless the well pads' operator requests that portions of the well pads remain unvegetated).

Soils in the proposed project area and staging areas are classified as being slightly to very highly susceptible to wind erosion and have a very low to high water erosion potential (NRCS 2008a and 2008b). Fragile soils have been mapped within the eastern portion of the proposed well pad (including construction zone), the entirety of the access road, the entirety of the well-connect corridor, and the Lybrook South No. 10 staging area. However because of the flat terrain in these areas, fragile soil erosion would likely be minimal (BLM 2014). The clearing of vegetation within the proposed project area would result in the exposure of soils to water, wind, and direct human disturbances; erosion in these areas would potentially increase, especially for fragile soils. Construction activities within the proposed project area would result in the mixing, displacement, and compaction of soils. The degree of erosion would be dependent upon precipitation and wind. Following construction, the compaction of soils, reclamation of portions of the proposed project area, and implementation of erosion-control measures would limit soil impacts due to erosion.

Cumulative Impacts

The spatial analysis area for cumulative soil impacts is the proposed project area and staging areas, immediately surrounding lands, and points immediately downstream. Within the spatial analysis area, existing disturbance and signs of erosion include the following:

- The staging areas (Lybrook South No.10 and Lybrook South No. 12 well pads) have already been disturbed. The active Lybrook South No. 10 well pad is unvegetetated, while the inactive Lybrook South No. 12 well pad was used/is being used as a staging area for the 188H/189H/205H project. Therefore, the Lybrook South No. 12 well pad could be barren and/or vegetated with reseed vegetation.

- An existing access road and well pad are located at the northern terminus of the proposed access road.

- An existing road is located at the northeastern terminus of the proposed well-connect corridor.

- The majority of the proposed well-connect corridor parallels an existing access road

No other reasonably foreseeable future disturbance is anticipated within the spatial analysis area.

The proposed project would contribute to ongoing soil erosion (associated with the aforementioned features) within and immediately downstream of the spatial analysis area.

3.3. Groundwater Resources

3.3.1. Affected Environment

There are two recorded water wells within an approximately 1-mile radius of the proposed well pad. One of the wells (SJ 00681 27) has no groundwater data associated with it; however, SJ 01156 has a depth to groundwater of 200 feet (New Mexico Office of the State Engineer 2011).

3.3.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Stimulation (i.e., hydraulic fracturing or "fracking") is a process used to maximize the extraction of underground resources by allowing oil or natural gas to move more freely from the rock pores to production wells that bring the oil or gas to the surface. Fluids, commonly made up of water (99 percent) and chemical additives (1 percent), are pumped into a geologic formation at high pressure during fracking (EPA 2004). Chemicals added to stimulation fluids may include friction reducers, surfactants, gelling agents, scale inhibitors, acids, corrosion inhibitors, antibacterial agents, and clay stabilizers. When the fracking pressure exceeds the rock strength, the fluids open or enlarge fractures that typically extend several hundred feet away from the well bore, and may occasionally extend up to 1,000 feet from the well bore. After the fractures are created, a propping agent (usually sand) is pumped into the fractures to keep them from closing when the pumping pressure is released. After fracking is completed, a portion of the injected fracking fluids returns to the wellbore and is recovered for future fracking operations (EPA 2004) or disposal. Stimulation techniques have been used in the U.S. since 1949 and in the San Juan Basin since the 1950s. Over the last 10 years, advances in multi-stage and multi-zone fracking have allowed for the development of gas fields that previously were uneconomic, including the San Juan Basin.

Fracking is a common process in the San Juan Basin and applied to nearly all wells drilled. The producing zone targeted by the proposed project is well below any underground sources of drinking water. The Mancos Shale formation is also overlain by a continuous confining layer. The geological confining layer is the Lewis Shale formation, which is located above both the Mancos Shale and Mesaverde formations. The Lewis Shale formation provides an impermeable layer that isolates the Mancos Shale and Mesaverde formations from both identified sources of drinking water and surface water. On average, the total depth of the proposed well bores would be about 5,000 feet below the ground surface. Fracking in the Basin Mancos formation is not expected to occur above depths of 4,000 feet below the ground surface. Fracking could possibly extend into the Mesaverde formation overlying the Basin Mancos; however, the formation has not been identified as an underground source of drinking water based on its depth and relatively high levels of total dissolved solids. No impacts to surface water or freshwater-bearing groundwater aquifers are expected to occur from fracking of the proposed wells.

Cumulative Impacts

As no direct or indirect impacts to groundwater are anticipated as a result of the proposed project, there would be no cumulative impacts.

3.4. Upland Vegetation

3.4.1. Affected Environment

The proposed project area is located within the Arizona/New Mexico Plateau ecological region. This ecological region occurs primarily in Arizona, Colorado, and New Mexico; a small portion is located within Nevada. This ecological region encompasses approximately 45,870,500 acres (185,632 square kilometers), and the elevation ranges from 2,165 to 11,949 feet AMSL. The ecological region's landscapes include low mountains, hills, mesas, foothills, irregular plains, alkaline basins, some sand dunes, and wetlands. This ecological region is a large transitional region between the semiarid grasslands to the east; the drier shrublands and woodlands to the north; and the lower, hotter, less-vegetated areas to the west and south. Vegetation communities include shrublands with big sagebrush,

rabbitbrush (*Ericameria nauseosa*), winterfat, shadscale saltbush, and greasewood; and grasslands of blue grama, western wheatgrass, green needlegrass (*Nassella viridula*), and needleandthread grass. Higher elevations may support piñon pine and juniper woodlands. This ecological region includes the urban areas of Santa Fe and Albuquerque, New Mexico. Important land uses within this ecological region include irrigated farming, recreation, rangeland, wildlife habitat, and some natural gas production (Griffith, et al. 2006).

The general region is characterized by interspersed sagebrush shrublands and grasslands. There are scattered piñon pine and juniper trees throughout these vegetation communities.

The proposed project area is located within a sagebrush shrubland vegetation community; however, a small stand of piñon-juniper woodland is located in the northwestern portion of the proposed well pad and construction zone. The ground cover within the sagebrush shrubland community is approximately 60 to 70 percent. The dominant species in the area include big sagebrush and blue grama. Additional plant species identified within the proposed project area include oneseed juniper, piñon pine, prickly pear (*Opuntia polyacantha*), beehive cactus (*Coryphantha* sp.), rubber rabbitbrush (*Ericameria nauseosa*), slender buckwheat (*Eriogonum microthecum*), broom snakeweed (*Gutierrezia sarothrae*), biscuitroot (*Cymopterus bulbosus*), broadbeard beardtongue (*Penstemon angustifolius*), goosefoot (*Chenopodium* sp.), hairy false goldenaster (*Heterotheca villosa*), larkspur (*Delphinium* sp.), pincushion cactus (*Escobaria vivipara*), prickly phlox (*Phlox* sp.), sunflower (*Helianthus annuus*), Indian ricegrass, James' galleta, purple threeawn (*Aristida purpurea*), dropseed (*Sporobolus* sp.), squirreltail, kochia (*Bassia scoparia*),and Russian thistle (*Salsola tragus*).

There are approximately 28 piñon pine and juniper trees within the proposed project area; approximately 85 percent of these trees are mature, 10 percent are juvenile, and 5 percent are standing dead. The trees are scattered throughout the proposed project area; however, most of the trees are concentrated along the hilltop in the northwest portion of the proposed well pad and construction zone.

The staging areas have already been disturbed and are barren and/or vegetated by reseed vegetation, such as rabbitbrush.

3.4.2. Impacts from the Proposed Action

Direct and Indirect Impacts

The proposed project would result in the removal of approximately 6.5 acres of sagebrush shrubland vegetation community, including approximately 28 trees, within the proposed project area. Because the staging areas (approximately 2.7 acres, total) have already been disturbed and are barren and/or vegetated by reseed vegetation, little to no desirable vegetation would be removed from within these areas.

During the construction phase of the proposed project, all vegetation within the proposed project area and the staging areas would be cleared.

During post-construction reclamation, approximately 3.9 acres of the proposed project area would be fully reclaimed (recontoured and reseeded). Approximately 1.2 acres within the proposed project area and up to 2.7 acres of the staging areas would only be reseeded. The remaining 1.4 acres of the proposed project area would remain as compacted, barren surface for the life of the proposed wells.

Once the proposed 240H, 256H, and 292H wells are plugged, WPX would fully reclaim all portions of the proposed project area that were not fully reclaimed (recontoured and reseeded) during post-construction reclamation. This would include clearing the vegetation from within the 1.2-acre portion of the well pad and access road that were only reseeded (not recontoured) during post-construction reclamation.

During interim and final reclamation, the BLM Sagebrush-Grass Community Seed Mixture would be utilized; the species included in this mixture are listed in the Surface Reclamation Plan (Appendix D). Re-established vegetation would consist of native grass, forb, and shrub species included in the seed

mixture, as well as native species that are not deliberately planted. It is also possible that invasive, non-native species could become established within the proposed project area, as such species could be transported by project equipment and tend to thrive in disturbed areas. Following the reclamation process, the resulting vegetation communities could differ from the native plant communities surrounding the proposed project area. Within reclaimed areas, it is not expected that the vegetation communities would return to native conditions within 20 years (BLM 2003a, 4-18).

The deposition of fugitive dust generated during vegetation-clearing activities, during the use of the well pad/construction zone, and during wind events could reduce photosynthesis and productivity of the surrounding vegetation (Thompson, et al. 1984; Hirano, et al. 1995), increase water loss in plants near the proposed project area (Eveling and Bataille 1984), and result in injury to leaves of surrounding vegetation.

Cumulative Impacts

The spatial analysis area is the proposed project area, staging areas, and immediately adjacent lands.

Within the spatial analysis area, the following vegetative disturbances have occurred:

- The staging areas (Lybrook South No.10 and Lybrook South No. 12 well pads) have already been disturbed. The Lybrook South No. 10 well pad is active and the Lybrook South No. 12 well pad is inactive. The Lybrook South No. 10 well pad is unvegetetated, while the Lybrook South No. 12 well pad was used/is being used as a staging area for the 188H/189H/205H project. Therefore, the Lybrook South No. 12 well pad could be barren and/or vegetated with reseed vegetation.
- An existing access road and well pad are located at the northern terminus of the proposed access road.
- An existing road is located at the northeastern terminus of the proposed well-connect corridor.
- The majority of the proposed well-connect corridor parallels an existing access road.
- Active wildlife and livestock grazing occurs in the area. The proposed project area and staging areas are within a BLM-FFO grazing allotment (Venado, Allotment No. 5112) that is permitted for grazing by 79 head of cattle.

No reasonably foreseeable future disturbances (other than the proposed project) are expected in the spatial analysis area.

Indirectly, fugitive dust or deposition associated with existing roads and well pads in the immediate area could impact the vegetation within the analysis area, and could continue to do so throughout the life of the project. Aside from those discussed, no additional impacts to vegetation are expected within the analysis area for the reasonably foreseeable future.

The proposed project would contribute to direct and indirect vegetation disturbance and fugitive dust and/or deposition within the spatial analysis area.

3.5. Noxious Weeds and Invasive Species

3.5.1. Affected Environment

Management of invasive and non-native plant species is mandated under several pieces of legislation, including the Lacey Act, as amended (16 USC 3371-3378); the Federal Noxious Weed Act of 1974, as amended (7 USC 2801 et seq.); the New Mexico Noxious Weed Management Act of 1998; and EO 13112 regarding Invasive Species. Under EO 13112, Federal agencies are ordered not to authorize or carry out actions that would cause or promote the introduction of invasive species.

In the San Juan Basin, invasive plants are frequently found in areas that have been disturbed by surface activities. A mission of the BLM-FFO is to detect new invasive plant species populations, prevent the spread of these new populations, manage existing populations, and eradicate invasive populations. This is to be accomplished in a timely manner, using the safest environmental methods available. For all actions on BLM-FFO lands that involve surface disturbance or reclamation, reasonable steps are required to prevent the introduction or spread of invasive plants (BLM 2003a).

The U.S. Department of Agriculture (USDA) has designated certain plants as federally listed noxious weeds (NRCS 2010). The New Mexico Department of Agriculture (NMDA) has designated certain plants as state-listed noxious weeds (NMDA 2009). A total of 212 invasive and poisonous weed species have been identified on BLM-FFO lands. The PRMP/FEIS lists the invasive, non-native plant species of concern in the BLM-FFO area (BLM 2003a).

During the surveys of the proposed project areas, no noxious weeds listed by the USDA, NMDA, or BLM-FFO were identified. However, kochia and Russian thistle were found; these species were found mostly along the proposed access road and proposed well-connect corridors. Although these species are not included on the USDA, NMDA, or BLM-FFO noxious weed lists, they are known to outcompete desirable, native vegetation (Colorado State University 2012 and Whitson, et al. 1992).

3.5.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Invasive species are generally tolerant of disturbed conditions, and disturbed soils within the proposed project area may provide an opportunity for the introduction and establishment of non-native, invasive species. Seeds or other propagules of invasive species may be transported to the proposed project area from infested areas by heavy equipment or other vehicles associated with the proposed project.

Invasive species may also spread from established populations near the proposed project area and colonize soils disturbed by proposed project activities. The longer time periods required for the re-establishment of plant communities in arid regions may create an increased potential for the establishment and spread of invasive species. Invasive plant species typically develop high population densities and tend to exclude most other plant species, thereby reducing species diversity and potentially resulting in long-term effects. The establishment of invasive species within or adjacent to the proposed project area may greatly reduce the success of native plant community restoration efforts and create a source of future colonization and degradation of adjacent undisturbed areas.

The establishment of invasive species, particularly annual grasses, such as cheatgrass (*Bromus tectorum*), which produce large amounts of easily ignitable fuel over large contiguous areas, may also alter fire regimes. This situation may result in an increase in the frequency and intensity of wildfires, and in some areas, such as in some desert-scrub communities, a fire regime may be created where none was present before. In plant communities that are not adapted to frequent or intense fires, native species, particularly shrubs and trees, may be adversely affected, and their populations may be greatly reduced, creating opportunities for greater increases in invasive species populations (Brooks and Pyke 2001). Increases in fire frequency or severity may thus result in a reduction of biodiversity and may promote the conversion of some habitats (such as forest, shrubland, or shrub-steppe) to other types, prolonging or preventing the development of mature native habitats (BLM and U.S. Department of Energy 2010).

Cumulative Impacts

The spatial analysis area is the proposed project area, staging areas, and immediately adjacent lands. Existing disturbance within this spatial analysis area is listed in Section 3.4.2 (Upland Vegetation – Impacts from the Proposed Action– Cumulative Impacts). Existing disturbance has resulted in the introduction of Russian thistle and kochia to the region. The proposed project would potentially contribute to the spread of these species, as well as the introduction of additional species.

3.6. Wildlife

3.6.1. Affected Environment

Migratory Birds

EO 13186, dated January 17, 2001, calls for increased efforts to more fully implement the Migratory Bird Treaty Act of 1918. In keeping with this mandate, the BLM-FFO has issued an interim policy to minimize unintentional take, as defined by the EO, and to better optimize migratory bird efforts related to BLM-FFO activities. In keeping with this policy, a list of priority birds of conservation concern which occur ecological regions similar to the proposed project area was compiled through a review of existing bird conservation plans, including the following:

- USFWS Birds of Conservation Concern
- New Mexico Partners in Flight New Mexico Bird Conservation Plan
- Comprehensive Wildlife Conservation Strategy for New Mexico
- Gray Vireo Recovery Plan
- The North American Waterbird Conservation Plan
- Recovery plans and conservation plans/strategies prepared for federally listed candidate species

The selected species have a known distribution in the BLM-FFO area and may be affected by various types of perturbations. The species with the potential to occur in the proposed project area and a brief assessment of their habitats are listed in the table below.

Table 11. Migratory Birds with Potential to Occur in the Proposed Project Area

Species Name	Habitat Associations
Bendire's thrasher (*Toxostoma bendirei*)	On the Colorado Plateau, inhabits open sagebrush with scattered junipers; sparse or degraded understory, lower elevations. Avoids riparian areas and arroyos with dense shrub cover
Brewer's sparrow (*Spizella breweri*)	Closely associated with sagebrush, preferring dense stands broken up with grassy areas.
Gray vireo (*Vireo vicinior*)	In northern NM, stands of piñon pine and Utah juniper 5,800 – 7,200 feet AMSL open with a shrub component and mostly bare ground; antelope bitterbrush, mountain mahogany, Utah serviceberry and big sagebrush often present. Broad, flat or gently sloped canyons, in areas with rock outcroppings, or near ridge-tops.
Loggerhead shrike (*Lanius ludovicianus*)	Open country interspersed with improved pastures, grasslands, and hayfields. Nests in sagebrush areas, desert scrub, and woodland edges.
Mountain bluebird (*Sialia currucoides*)	Open piñon-juniper woodlands, mountain meadows, and sagebrush shrublands; requires larger trees and snags for cavity nesting.
Mourning dove (*Zenaida macroura*)	Open country, scattered trees, and woodland edges. Feeds on ground in grasslands and agricultural fields. Roost in woodlands in the winter. Nests in trees or on ground.
Sage sparrow (*Amphispiza belli*)	Large and contiguous areas of tall and dense sagebrush. Negatively associated with seral mosaics and patchy shrublands and abundance of greasewood.
Sage thrasher (*Oreoscoptes montanus*)	Shrub-steppe dominated by big sagebrush.
Vesper sparrow (*Pooecetes gramineus*)	Dry montane meadows, grasslands, prairie, and sagebrush steppe with grass component; nests on ground at base of grass clumps.

Based on habitat and range, the potential exists for numerous migratory birds to occur within the proposed project area. The piñon jay was the only bird species identified during the survey of the proposed project area:

General Wildlife

The vegetation community found within the proposed project area provides habitat for a variety of vertebrate and invertebrate species. The objectives of the BLM wildlife management program are to "ensure optimum populations and a natural abundance and diversity of fish and wildlife values by restoring, maintaining, and enhancing habitat conditions for consumptive and non-consumptive uses" (BLM 2003b, 2-24). The proposed project area is dominated by big sagebrush and blue grama. It receives year-long use by mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*) and lesser small mammals. Its significance to the overall Lybrook/Upper Largo ecosystem is that it represents a metapopulation with respect to mule deer and elk.

Prior to the survey of the proposed project area, no prairie dog colonies had been recorded within or adjacent to the proposed project area (BLM 2012b); the closest recorded colony is approximately 12 miles north of the proposed project area. No prairie dogs or prairie dog sign was observed during the survey of the proposed project area.

The following terrestrial wildlife species or sign were identified during the survey of the proposed project area:

- Desert cottontail (*Sylvilagus audubonii*) scat and tracks
- Mule deer tracks and scat
- Packrat (*Neotoma* sp.) middens and scat

3.6.2. Impacts from the Proposed Action

Direct and Indirect Impacts

During the construction phase of the proposed project, all vegetation within the proposed project area would be cleared. The proposed project would result in the removal of approximately 6.5 acres of sagebrush shrublands, including approximately 28 trees. The proposed project area would be converted to a reseed community following interim reclamation and final reclamation. The impacts to the vegetation community are described in detail in Section 3.4 (Upland Vegetation).

There is available, similar habitat in the surrounding area that wildlife could utilize. However, the clearing of vegetation would remove potential habitat. The transformation of the proposed project area to a reseed community could remove potential habitat for numerous wildlife species. Displacing these animals would add competition for food, water, and space in other areas that are already occupied.

Approximately 562 feet of new access road would be constructed for the proposed project. The proposed access road would result in direct habitat fragmentation. The proposed well-connect pipeline corridor, which would parallel the proposed access road and an existing access road, would not result in new habitat fragmentation.

For the long term, occasional human and vehicle presence within the vicinity of the proposed project area and staging areas would increase above present levels. Additional well equipment could also cause increased noise levels in the vicinity. Audial and visual disturbances associated with the proposed project could cause indirect habitat loss and fragmentation by deterring wildlife from using available habitat adjacent to the proposed project area and staging areas.

If interim and final reclamation are successful, the sagebrush shrubland community would become re-established within the proposed project area. However, as discussed in Section 3.4 (Upland Vegetation), the re-establishment of a mature, native plant community could require decades, and it is possible that the plant community could never fully recover from disturbance (BLM 2003a, 4-18).

Migratory Birds

Due to the mobility of adult birds, they would be unlikely to be directly harmed by the proposed project. As discussed in Section 2.1.2 (Description of Proposed Project - Protection of Flora and Fauna, Including SSS and Livestock), if the vegetation-clearing phase of construction is scheduled to occur during migratory bird breeding season, a pre-construction migratory bird nest survey would be conducted within the proposed project area. Therefore, it is unlikely that nests, eggs, or young birds within the proposed project area would be directly harmed. If project activities occur during migratory bird breeding season, birds nesting outside of but near the proposed project area could abandon existing nests as a result of visual and audial disturbances.

It is difficult to predict the effects of the project on migratory birds. The increased activity, noise, and disturbed vegetation associated with the proposed project could result in the increased usage of the immediate area by some migratory bird species, while decreasing usage by other species. Studies have shown mixed impacts of oil and gas development on nesting migratory birds. According to a study by Ortega and Francis (2007), the presence of oil and gas compressors affected bird species differently; however, there was no difference in overall nest density on plots with and without compressors. A study by Holmes and King (2006) found that the sage sparrow had lower nest survival in an area with ongoing gas development; however, the Brewer's sparrow had higher nest survival rates in a developed gas field when compared with populations in an undeveloped control area.

General Wildlife

It is possible that burrowing animals could be killed or injured during the construction phase of the proposed project, as equipment digs into the earth and rolls over the surface of the ground. The disruption to the proposed project area could stress wildlife and result in the loss of valuable energy resources. As discussed in Section 2.1.2 (Description of Proposed Project – Protection of Flora and Fauna, Including SSS and Livestock), design features and BMPs would be implemented during the construction phase of the proposed well-connect pipelines to assist in the prevention of injury, stress, or death of wildlife.

Cumulative Impacts

The spatial analysis area includes the proposed project area, staging areas, and an approximately 2-mile radius around the proposed well pad. Within this spatial analysis area, disturbance exists, and the region has been fragmented. Existing and reasonably foreseeable future disturbances within the spatial analysis area include the following:

- 40 active oil and/or gas wells and associated well pads
- 15 plugged oil and/or gas wells
- 15 proposed oil and/or gas well pads and associated access roads and utility corridors
- Approximately 4 miles of U.S. Highway 550
- Approximately 1 mile of County Road 378
- Approximately 23 miles of other roads
- Numerous utility corridors
- Livestock and wildlife grazing
- Few scattered rural residences

Habitat disturbance and fragmentation in the spatial analysis area is primarily the result of oil and gas development (including well pads, access roads, and well-connect corridors). The direct and indirect

habitat disturbance, fragmentation, and human activities associated with these disturbances could deter wildlife from utilizing portions of the analysis area. The proposed action would contribute to direct and indirect habitat disturbance and fragmentation in the analysis area.

3.7. Special Status Species

3.7.1. Affected Environment

The BLM manages certain species which are not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. BLM SSS include BLM Sensitive Species and BLM-FFO Special Management Species (SMS).

New Mexico BLM State Directors have developed a list of BLM Sensitive Species for the State of New Mexico (BLM 2011a, BLM 2011b, BLM 2011c, BLM 2012a). In accordance with BLM Manual 6840, the BLM-FFO has prepared a list of BLM-FFO SMS to focus species management efforts toward maintaining habitats under a multiple-use mandate (BLM 2008a, BLM 2008c). BLM-FFO SMS include some BLM Sensitive Species and other species for which the BLM-FFO has determined special management is appropriate (BLM 2008c). The authority for this policy and guidance is established by the ESA; Title II of the Sikes Act, as amended (16 USC 670a-670o, 74 Stat. 1052); FLPMA; and Department of Interior Manual 235.1.1A.

Based on known range and habitat, several BLM SSS have the potential to occur within the proposed project area. These species, their habitat descriptions, and their potential to occur within the proposed project area are provided in the table below.

Table 12. BLM SSS with Potential to Occur within Proposed Project Area

Species	Status	Documented Occurrence Within BLM-FFO Region	Habitat	Potential to Occur in Proposed Project Area (PPA)
Bendire's thrasher (*Toxostoma bendirei*)	Sensitive	Summer range (Sibley 2000). Known to occur within BLM-FFO (BLM 2011a).	Sparse desert shrublands, degraded grasslands, and open woodlands with scattered shrubs. On the Colorado Plateau, open sagebrush shrublands with scattered junipers. Avoids riparian areas and arroyos with dense shrub cover (NMPIF 2007).	POSSIBLE: Sagebrush shrublands within the PPA could be utilized for foraging and nesting by Bendire's thrashers.

Species	Status	Documented Occurrence Within BLM-FFO Region	Habitat	Potential to Occur in Proposed Project Area (PPA)
Ferruginous hawk (*Buteo regalis*)	SMS	Year-round range (NMPIF 2007). Known to nest in BLM-FFO (BLM 2012c).	Open areas with broad expanses of prairie grassland or shrub-steppe vegetation, areas with low to moderate agricultural coverage, transitional edges between grasslands and piñon-juniper woodlands, sagebrush shrublands, and desert scrub (NMPIF 2007, NatureServe 2012). Nests in elevated locations on the ground (if in grasslands), in isolated tree stands, on rock outcrops/spires, or on utility poles (NMPIF 2007).	POSSIBLE: Potential foraging habitat present within PPA. No suitable nesting habitat within or adjacent to PPA.
Golden eagle (*Aquila chrysaetos*)	SMS	Year-round range (Sibley 2000). Known to nest in BLM-FFO (BLM 2012c).	Open to semi-open country with elevated perches, including grasslands, prairies, open woodlands, shrublands, and barren areas. Prefers hilly or montane regions. Nests on rock ledges on cliffs or in large trees (NatureServe 2012, NMPIF 2007, Wheeler 2003).	POSSIBLE: Potential foraging habitat present within PPA. No suitable nesting habitat within or adjacent to PPA.
Piñon jay (*Gymnorhinus cyanocephalus*)	Sensitive	Year-round range (Sibley 2000). Known to occur within BLM-FFO (BLM 2011a).	Piñon-juniper woodlands. Occasionally areas dominated by ponderosa pine, sagebrush, or chaparral (NMPIF 2007).	KNOWN: Potential foraging and nesting habitat present within and adjacent to PPA. Piñon jays were observed during the biological survey.
Prairie falcon (*Falco mexicanus*)	SMS	Year-round range (NMPIF 2007). Known to nest in BLM-FFO (BLM 2012c).	Arid, very open areas with short grass or scrub vegetation. Nests on cliffs at least 20 feet high. Breeding cliffs may be within semi-open to dense woodlands several miles from open foraging habitat (Wheeler 2003).	POSSIBLE: Potential foraging habitat is present within PPA. No suitable nesting habitat within or adjacent to PPA.

Species	Status	Documented Occurrence Within BLM-FFO Region	Habitat	Potential to Occur in Proposed Project Area (PPA)
Townsend's big-eared bat (*Corynorhinus townsendii*)	Sensitive	Known to occur within BLM-FFO (BLM 2011b).	Desert scrub, desert mountains, oak-woodlands, piñon-juniper woodlands, and coniferous forests. Roost mostly in caves, mines, or abandoned buildings (BLM 2011b).	POSSIBLE: Potential foraging habitat present within PPA. No suitable roosting habitat within or adjacent to PPA.

One BLM SSS (piñon jays) was observed during the survey of the proposed project area.

Six BLM SSS (Bendire's thrasher, piñon jay, ferruginous hawk, golden eagle, prairie falcon, and Townsend's big-eared bat) have the potential to occur within the proposed project area; these species are discussed in detail below.

There are no recorded BLM SSS raptor nests in the vicinity of the proposed project area. The closest recorded raptor nest (a golden eagle nest) is approximately 6 miles northeast of the proposed project area (BLM 2012c).

Bendire's Thrasher

The Bendire's thrasher occurs in New Mexico during the summer/breeding season. In New Mexico, the thrasher breeds in scattered locations within the central and western portions of the state. This species typically inhabits sparse desert shrublands and degraded grasslands. It may also be found in open woodlands with scattered shrubs. On the Colorado Plateau, this species can be found in sagebrush shrublands with scattered junipers. It may also use vegetation around human habitation and agricultural areas (NMPIF 2007). The Bendire's thrasher does not use areas with dense vegetation, such as riparian woodlands, although it may use the edges of such habitats. Nests are placed in low trees, shrubs, or cacti; nests are usually 3 to 5 feet off of the ground, but could be less than 2 feet to more than 11 feet off of the ground (NatureServe 2012).

The sagebrush shrublands and scattered piñon and juniper trees found within the proposed project area could be used by the Bendire's thrasher for foraging and nesting. No Bendire's thrashers were observed during the survey of the proposed project area.

Ferruginous Hawk

Ferruginous hawks may occur in the BLM-FFO region year-round. These hawks occur in open areas with broad expanses of prairie grassland or shrub-steppe vegetation. Ferruginous hawks use areas with low to moderate (less than 50-percent) agricultural coverage. Transitional edge habitats between grasslands and juniper savannah or piñon-juniper woodland are also used (NMPIF 2007). Sagebrush and desert scrub may also be used by ferruginous hawks (NatureServe 2012). The terrain within ferruginous hawk habitat can vary between flatlands, gently rolling hills, large hills, and badlands. The preferred habitat for this hawk species usually includes trees, buttes, large boulders, or rock spires (Wheeler 2003). Ferruginous hawks typically avoid high elevations, forest interiors, narrow canyons, and areas with intensive agriculture or human activity (NatureServe 2012, NMPIF 2007). In New Mexico, nesting typically occurs in isolated tree stands, rock spires, or on rock outcrops; utility poles or artificial platforms are sometimes used for nesting. In the BLM-FFO region, nesting often occurs on rock spires (NMPIF 2007).

The sagebrush shrublands found within the proposed project area could provide foraging habitat for ferruginous hawks. Appropriate nesting habitat is not present within or adjacent to the proposed project area. The nearest recorded ferruginous hawk nest is approximately 23 miles west of the proposed project area (BLM 2012c). No ferruginous hawks were observed during the survey of the proposed project area.

Golden Eagle

Golden eagles may be found in the BLM-FFO region year-round. These raptors occur in open to semi-open country, including open wooded areas, grasslands, shrublands, or barren areas. They prefer hilly or mountainous areas with elevated perches (NMPIF 2007, NatureServe 2012, and Wheeler 2003). Golden eagles may also be found in areas with light agricultural use, but rarely inhabit rural areas. During the breeding season, these eagles are primarily found in areas with mountain cliffs or canyons (NMPIF 2007). Nesting habitat for golden eagles consists of embankments or cliffs and/or flat to moderate areas with scattered large trees (Wheeler 2003). Dense forests are avoided for nesting. In New Mexico, most nests are within steep-walled mountain canyons (NMPIF 2007). During the summer, golden eagles may be found above timberline. During the winter, they are typically found below timberline and may forage in moderate agricultural areas (Wheeler 2003).

The sagebrush shrublands found within the proposed project area could provide foraging habitat for golden eagles. Appropriate nesting habitat is not present within or adjacent to the proposed project area. The nearest recorded golden eagle nest is approximately 6 miles northeast of the proposed project area (BLM 2012c). No golden eagles were observed during the survey of the proposed project area.

Prairie falcon

Prairie falcons may occur in the BLM-FFO region year-round. These falcons inhabit arid, very open areas, especially mountainous, steppe, plains, or prairie habitats (NatureServe 2012). During the summer, this falcon species prefers areas with cliff formations that are at least 20 feet high. Locally, prairie falcons utilize short grass or scrub vegetation communities (Wheeler 2003). They prefer areas with low vegetation height and large areas of bare ground (NatureServe 2012). Prairie falcons nest on cliffs along buttes, hillside escarpments, or canyons. Cliffs used for nesting are typically located in semi-open regions with scattered conifer trees; however, on occasion, nesting sites are amidst dense conifer woodlands several miles from open foraging habitat (Wheeler 2003). On occasion, trees, utility poles, buildings, and steep-sided arroyos are used for nesting (NMPIF 2007). In the winter, foraging habitat is often the same as summer habitat but without a requirement for cliffs (Wheeler 2003). During the winter, prairie falcons will also forage within agricultural cropland (NatureServe 2012).

The sagebrush shrublands found within the proposed project area could provide foraging habitat for prairie falcons. There is no appropriate nesting habitat immediately within the proposed project area. The nearest recorded prairie falcon nest is approximately 18 miles north of the proposed project area (BLM 2012c). No prairie falcons were observed during the survey of the proposed project area.

Piñon Jays

Piñon jays may occur in the BLM-FFO region year-round, with a preference for the foothill regions of New Mexico. This bird species inhabits piñon-juniper woodlands and has a strong association with piñon pine trees. Piñon jays also have the potential to occur in areas dominated by Ponderosa pine (*Pinus ponderosa*), sagebrush, or chaparral vegetation. During the piñon jay summer breeding/ nesting season (mid-February through late summer/fall), this bird species is highly social and breeds in large breeding colonies. The colonial nesting sites are typically located in dense, mature stands of piñon-juniper woodlands (NMPIF 2007).

Approximately 28 piñon pines and juniper trees are found within the sagebrush shrubland vegetation community within the proposed project area. The proposed project area could be used by piñon jays for foraging and nesting. Several piñon jays were seen perched and flying throughout the proposed project area during the biological survey.

Townsend's Big-Eared Bat

Townsend's big-eared bats, which are nocturnal, are a permanent resident of the BLM-FFO area. This bat species inhabits various habitat types, including oil fields, conifer woodlands, mixed woodlands, chaparral, savannas, riparian, and forests. In the southwestern United States, they are known to inhabit sagebrush steppe, piñon-juniper woodland, mountain brush vegetation, desert scrub, and oak woodland

habitats. Townsend's big-eared bats require areas such as caves, large tree cavities, or abandoned mine tunnels for night roosting. They do not roost in cracks or crevices (NatureServe 2012).

Approximately 28 piñon pines and juniper trees are found within the sagebrush shrubland vegetation community within the proposed project area. The proposed project area could be used by Townsend's big-eared bats for foraging. The No appropriate roosting caves, tree cavities, or abandoned mines were identified within or immediately adjacent to the proposed project area during the biological survey. No Townsend's big-eared bats were observed during the survey of the proposed project area.

3.7.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Habitat disturbance and audial/visual disturbances to wildlife SSS would be similar to those described for wildlife (Section 3.6.2 [Wildlife]).

Ferruginous Hawk, Golden Eagle, and Prairie Falcon

These three BLM SSS could potentially utilize the proposed project area for foraging. Due to the mobility of adult birds and the lack of potential nesting sites within or adjacent to the proposed project area, it is unlikely that these raptors would be directly harmed by activities associated with the proposed project.

Bendire's Thrasher and Piñon Jay

Direct and indirect impacts to Bendire's thrashers and piñon jays would be similar to those described for migratory birds (Section 3.6.2 [Wildlife]).

Townsend's Big-Eared Bat

Townsend's big-eared bats are nocturnal, and would likely be roosting during daylight hours, when the vegetation-clearing phase of the proposed project would occur. Because there are no roosting sites available within the proposed project area, it is unlikely that Townsend's big-eared bats would be directly impacted as a result of the proposed project.

Cumulative Impacts

The spatial analysis area includes the proposed project area, staging areas, and an approximately 2-mile radius around the proposed well pad. Within the spatial analysis area, there is existing and proposed disturbance, and the region has been fragmented. Existing and reasonably foreseeable future disturbances within the spatial analysis area are listed in Section 3.6.2 (Wildlife – Direct and Indirect Impacts – Cumulative Impacts).

Cumulative impacts to wildlife SSS would be similar to those described for wildlife (Section 3.6.2 [Wildlife]).

3.8. Cultural Resources

3.8.1. Affected Environment

The proposed project area is located within the archaeologically rich San Juan Basin of northwestern New Mexico. In general, the history of the San Juan Basin can be divided into five major periods: PaleoIndian (circa [ca.] 10,000 B.C. to 5,500 B.C.); Archaic (ca. 5,500 B.C. to A.D. 400); Basketmaker II-III and Pueblo I-IV (aka Anasazi; A.D. 1-1,540); and historic (A.D. 1,540 to present), which includes Native American as well as later Hispanic and Euro-American settlers. Detailed descriptions of these various periods are provided in the BLM-FFO PRMP/FEIS (BLM 2003a, 3-65 – 3-84) and will not be reiterated here. Additional information can also be found in an associated documented, the Cultural Resources Technical Report (Science Applications International Corporation 2002).

Cultural sites vary considerably, and can include but are not limited to simple artifact scatters, domiciles of various types with a myriad of associated features, rock art and inscriptions, ceremonial/religious features, and roads and trails.

The entire Area of Potential Effect (APE) for the proposed action was archaeologically surveyed by LAC at a BLM Class III (100-percent) level. The archaeological report, LAC Report No. 2014-5c (2014; BLM Report No. 2014(III)025F) was prepared and submitted to the BLM in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005). The Class III inventory resulted in the identification of one newly discovered cultural site within the APE. The site is recommended as being eligible for inclusion in the NRHP (LAC 2014). No TCPs are known to exist in the APE.

3.8.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Direct impacts normally include alterations to the physical integrity of a cultural site. If a cultural site is significant for other than its scientific information, direct impacts may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. A potential indirect impact from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal of or other alteration to cultural sites in the area.

Significant cultural sites (e.g., sites eligible for the NRHP) would be avoided with the implementation of design features such as, but not limited to, reduction of construction areas, installation of temporary barriers, and site monitoring. These design features are detailed in the Cultural Resource Record of Review, attached to the COAs in the approved APDs. The proposed action would not be expected to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere with or otherwise hinder the performance of traditional ceremonies/rituals. The proposed action would have no direct or indirect impact on significant cultural sites.

Cumulative Impacts

There would be no negative cumulative impact on cultural resources as significant cultural sites would be avoided. A positive cumulative effect is the additional scientific information yielded by the archaeological survey.

4. SUPPORTING INFORMATION

4.1. Tribes, Individuals, Organizations, or Agencies Consulted

The following tribes, individuals, organizations, and/or agencies were consulted during the development of this EA:

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- Lacey Granillo, WPX
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This EA was prepared by NCI in conformance with the standards of and under the direction of the BLM-FFO. The following individuals assisted in the preparation of this EA:

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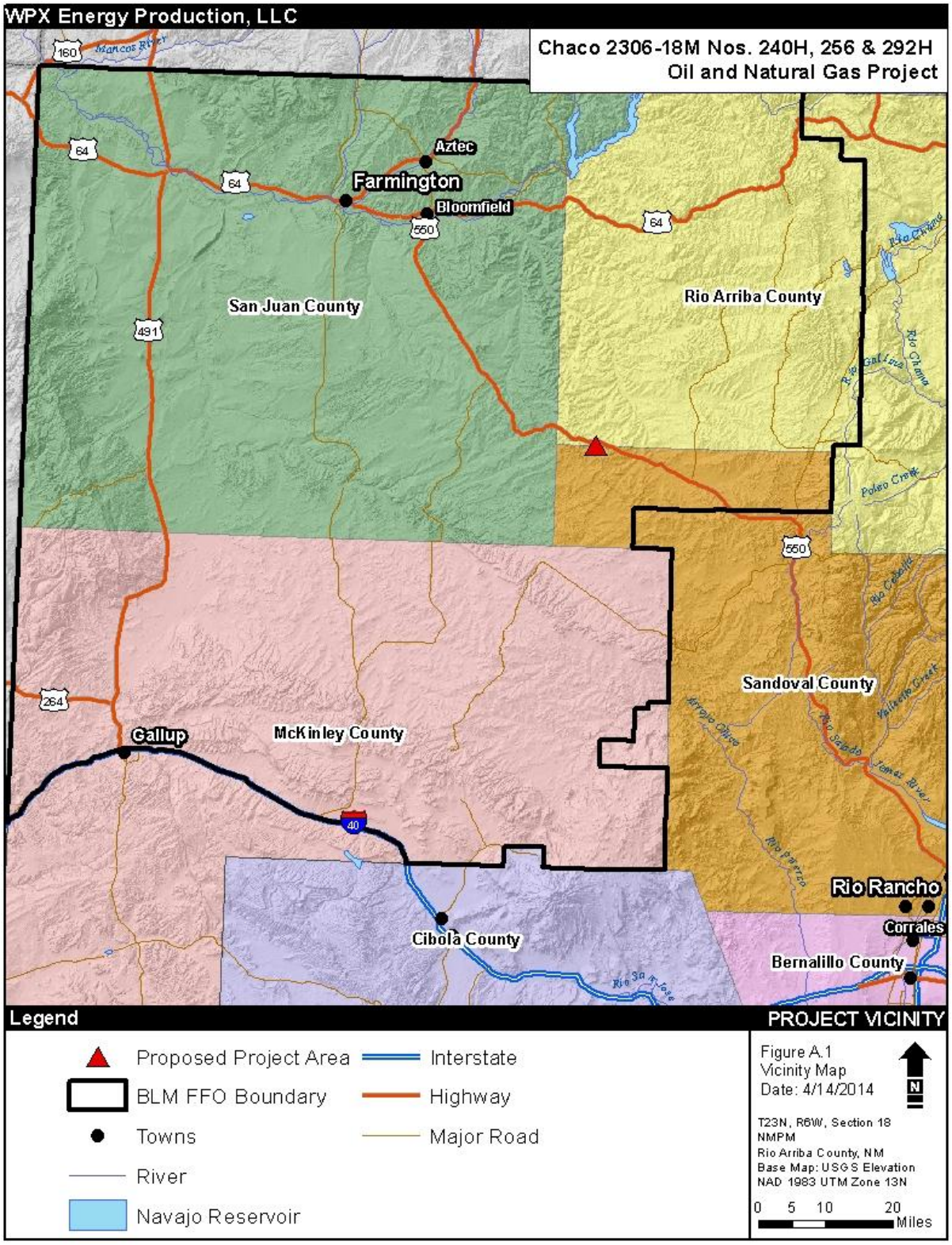
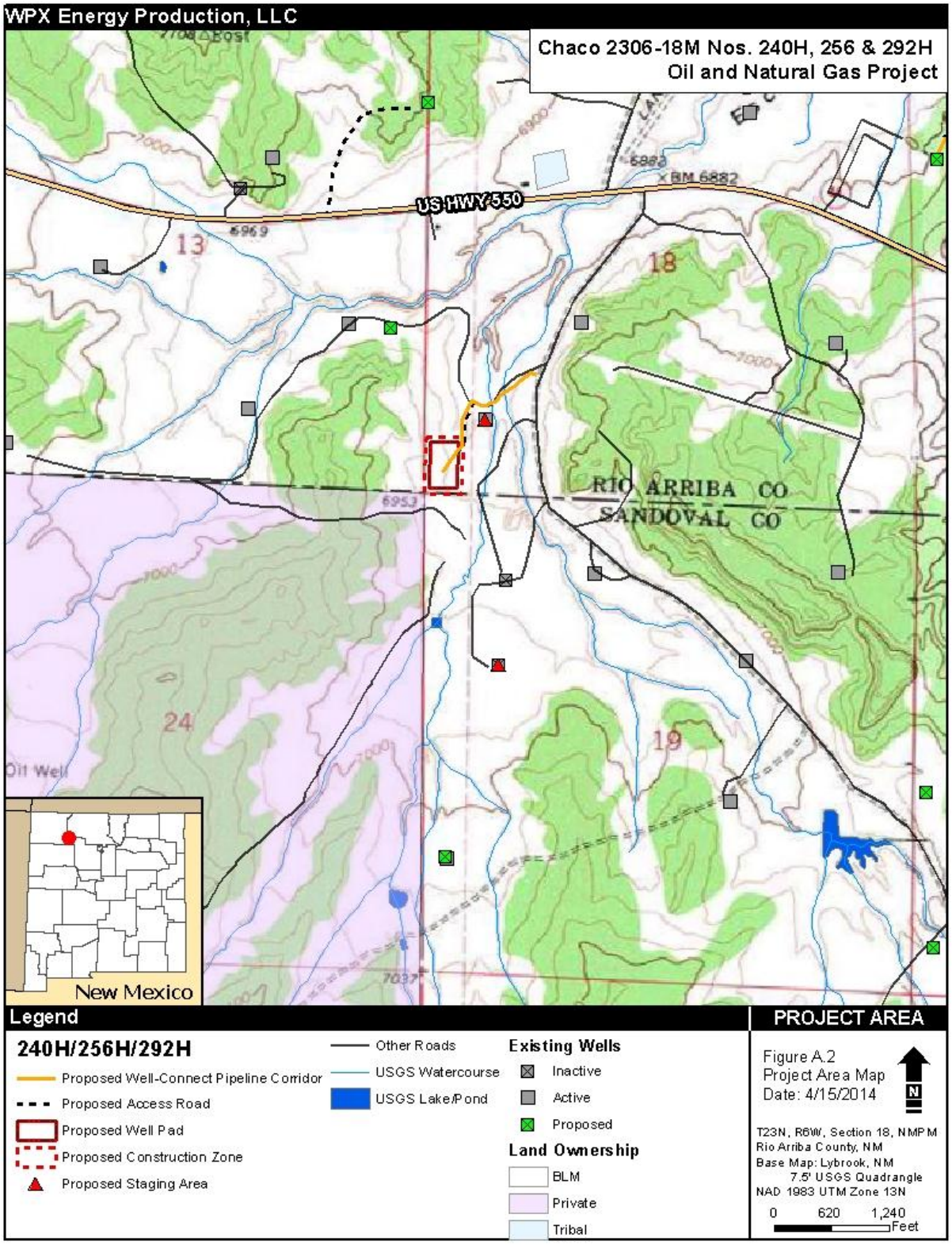
APPENDIX A. MAPS

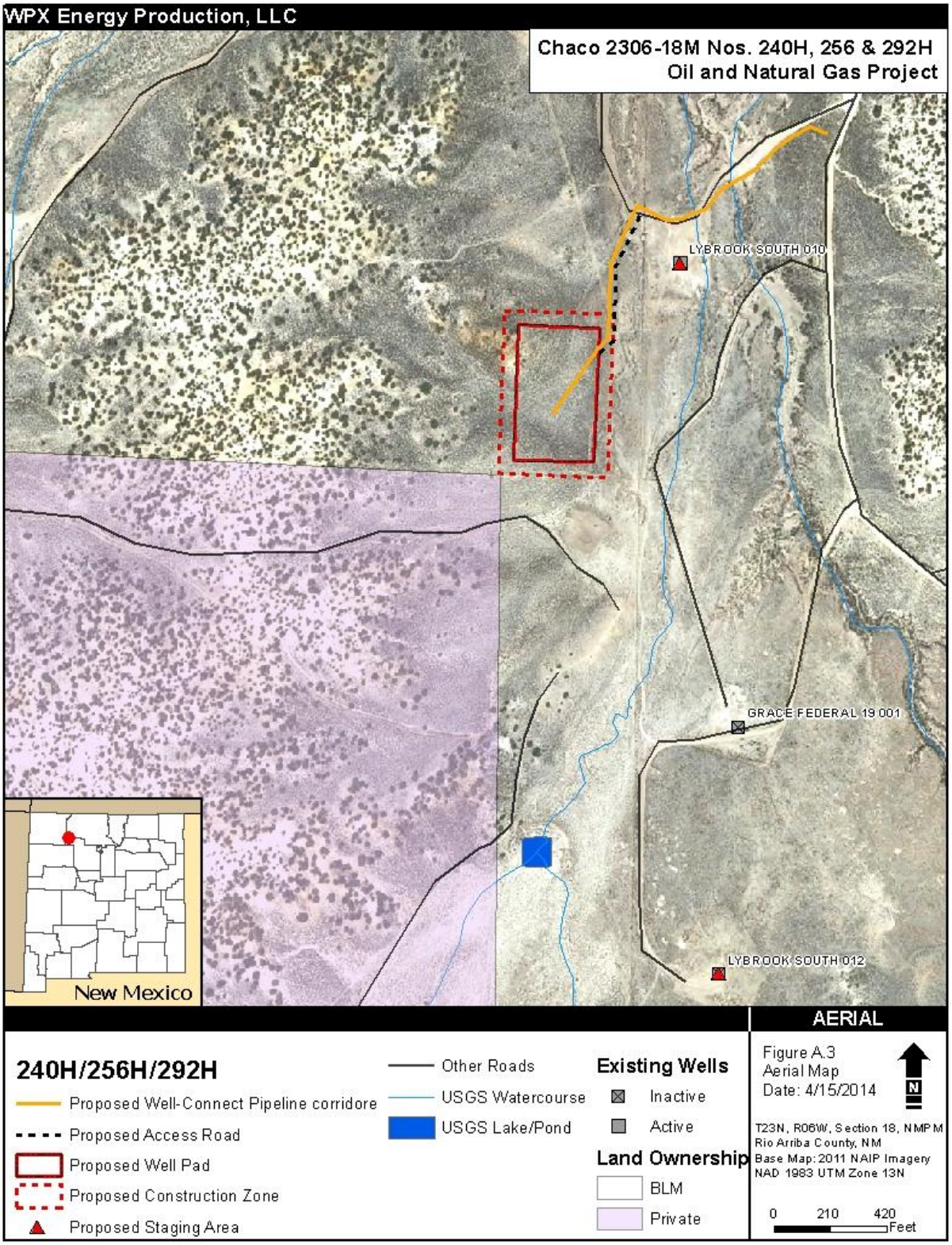
A.1. Vicinity Map



A.2. Project Area Map



A.3. Aerial Map



APPENDIX B. PLATS

District I
1625 N. French Drive, Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720

District II
811 S. First Street, Artesia, NM 88210
Phone (575) 748-1283 Fax (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6170

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number	*Pool Code	*Pool Name
	42289	LYBROOK GALLUP

*Property Code	*Property Name	*Well Number
	CHACO 2306-18M	240H

*OGRID No.	*Operator Name	*Elevation
120782	WPX ENERGY PRODUCTION, LLC	6938'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	18	23N	6W	4	231	SOUTH	195	WEST	RIO ARRIBA

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	13	23N	7W		83	SOUTH	230	WEST	RIO ARRIBA

*Dedicated Acres	*Joint or Infill	*Consolidation Code	*Order No.
160.00 Acres S/2 S/2 - Section 13			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

END-OF-LATERAL
83' FSL 230' FWL
SECTION 13, T23N, R7W
LAT: 36.21970 °N
LONG: 107.5134 °W
DATUM: NAD1927

LAT: 36.21971 °N
LONG: 107.53535 °W
DATUM: NAD1983

POINT-OF-ENTRY
84' FSL 380' FEL
SECTION 13, T23N, R7W
LAT: 36.21944 °N
LONG: 107.51918 °W
DATUM: NAD1927

LAT: 36.21946 °N
LONG: 107.51977 °W
DATUM: NAD1983

SURFACE LOCATION
231' FSL 195' FWL
SECTION 18, T23N, R6W
LAT: 36.21882 °N
LONG: 107.51722 °W
DATUM: NAD1927

LAT: 36.21883 °N
LONG: 107.51783 °W
DATUM: NAD1983

17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

E-mail Address

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised MARCH 17, 2014
Survey Date: DECEMBER 31, 2013

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269

District I
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WELL LOCATION AND ACREAGE DEDICATION PLAT

[1]API Number	[2]Pool Code	[3]Pool Name
	42289	LYBROOK GALLUP

[4]Property Code	[5]Property Name	[6]Well Number
	CHACO 2306-18M	256H

[7]OGRID No.	[8]Operator Name	[9]Elevation
120782	WPX ENERGY PRODUCTION, LLC	6938'

[10] Surface Location

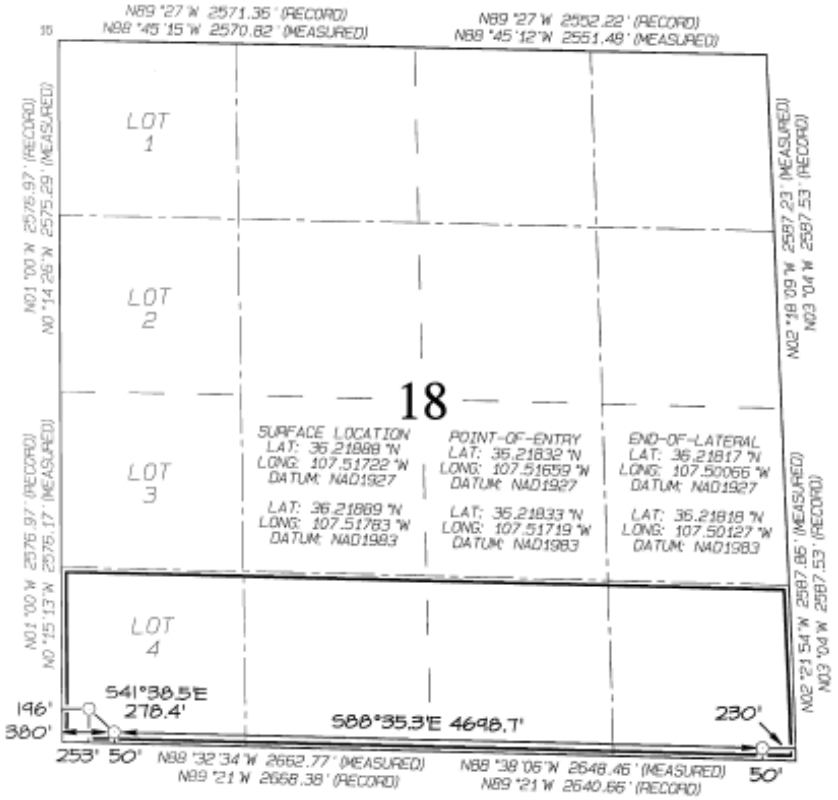
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	18	23N	6W	4	253	SOUTH	196	WEST	RIO ARRIBA

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	18	23N	6W		50	SOUTH	230	EAST	RIO ARRIBA

[12]Dedicated Acres	[13]Joint or Infill	[14]Consolidation Code	[15]Order No.
160.81 Acres S/2 S/2 - Section 18			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

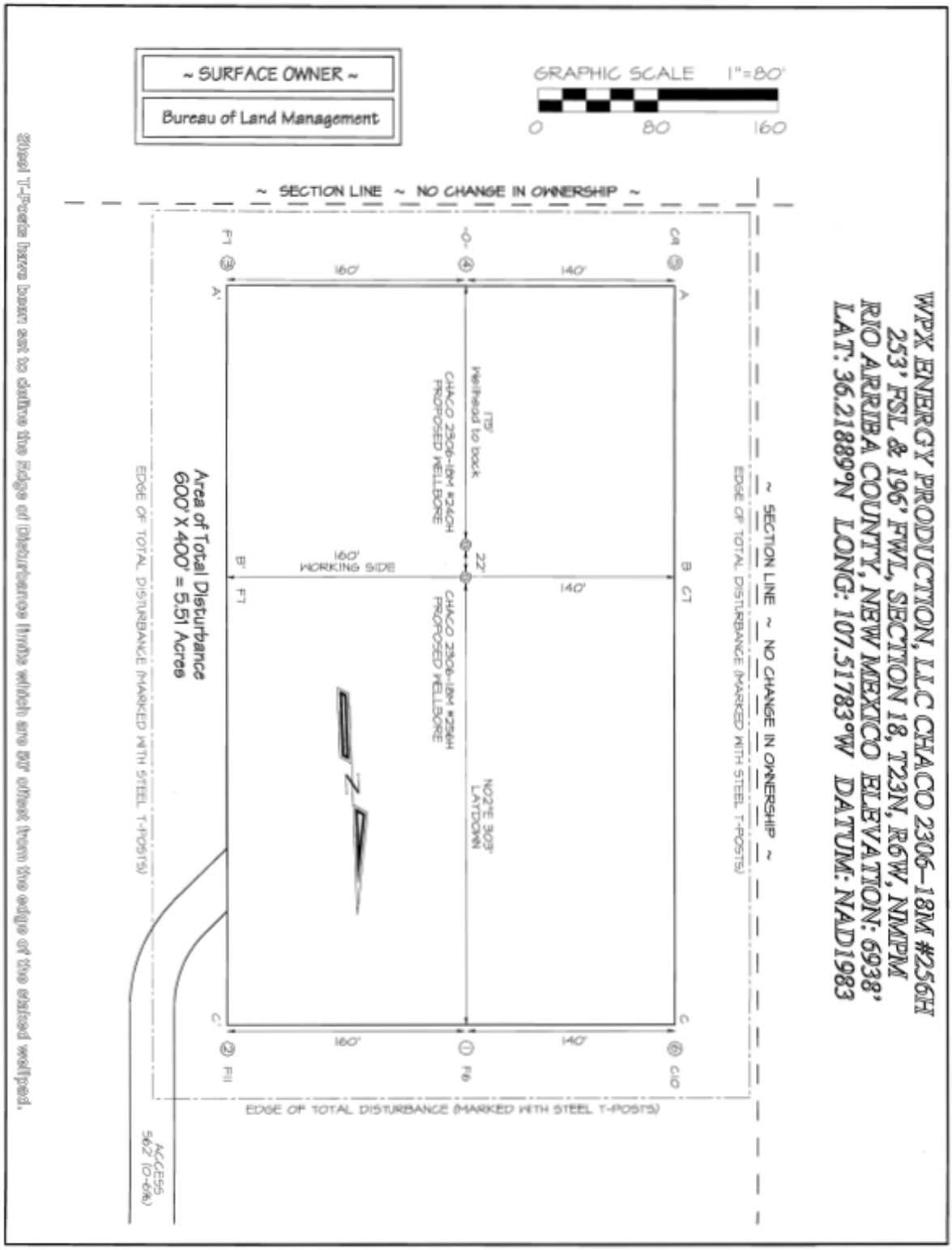
Date Revised: MARCH 18, 2014
Survey Date: DECEMBER 31, 2013

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS

Certificate Number 15269

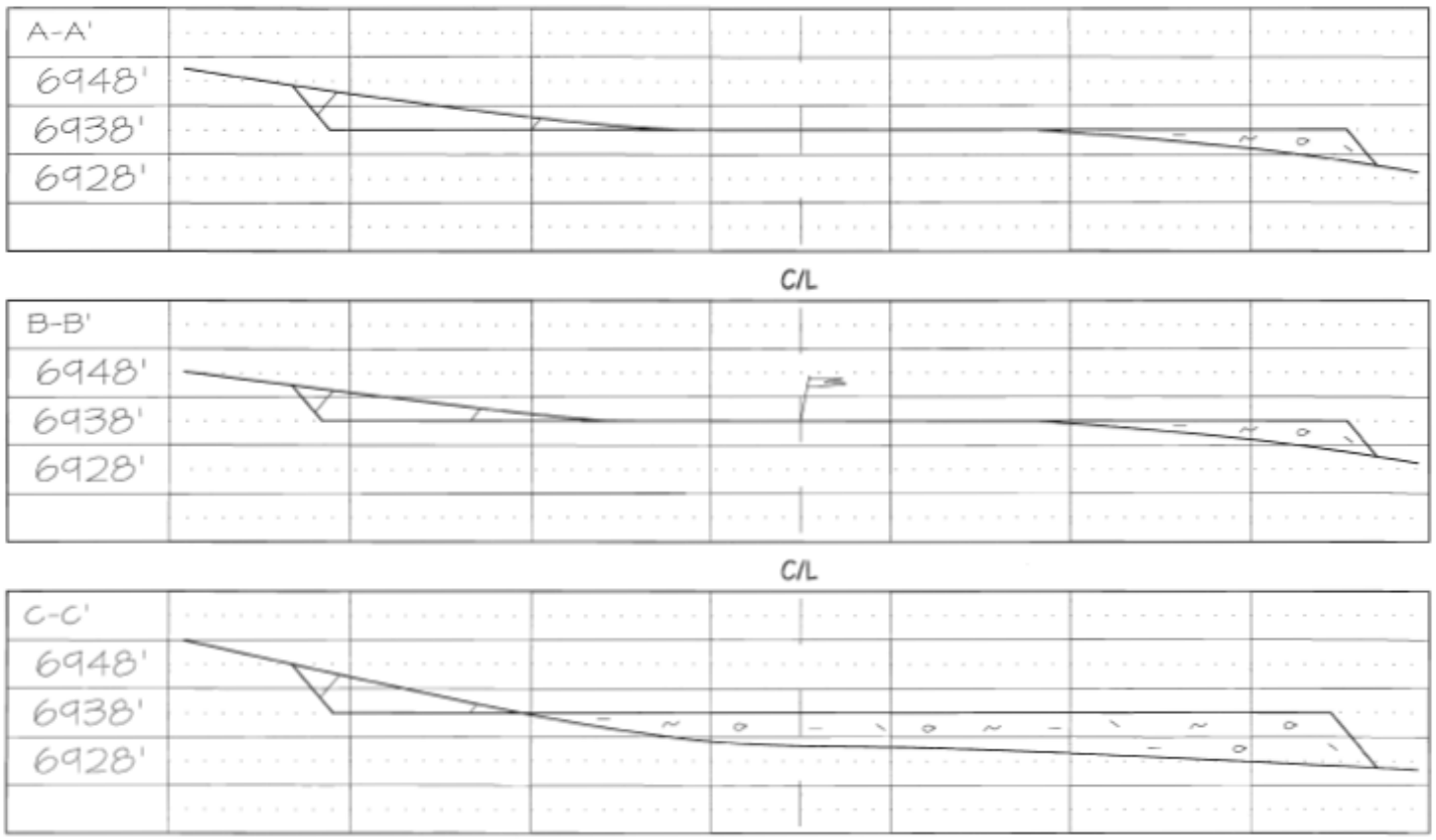


Steel T-Posts have been set to define the Edge of Disturbance limits which are 60' offset from the edge of the staked wellpad.

WPX ENERGY PRODUCTION, LLC CHACO 2306–18M #256H
253' FSL & 196' FWL, SECTION 18, T23N, R6W, NMPM
RIO ARRIBA COUNTY, NEW MEXICO ELEVATION: 6938'

HORIZONTAL SCALE 1"=40'

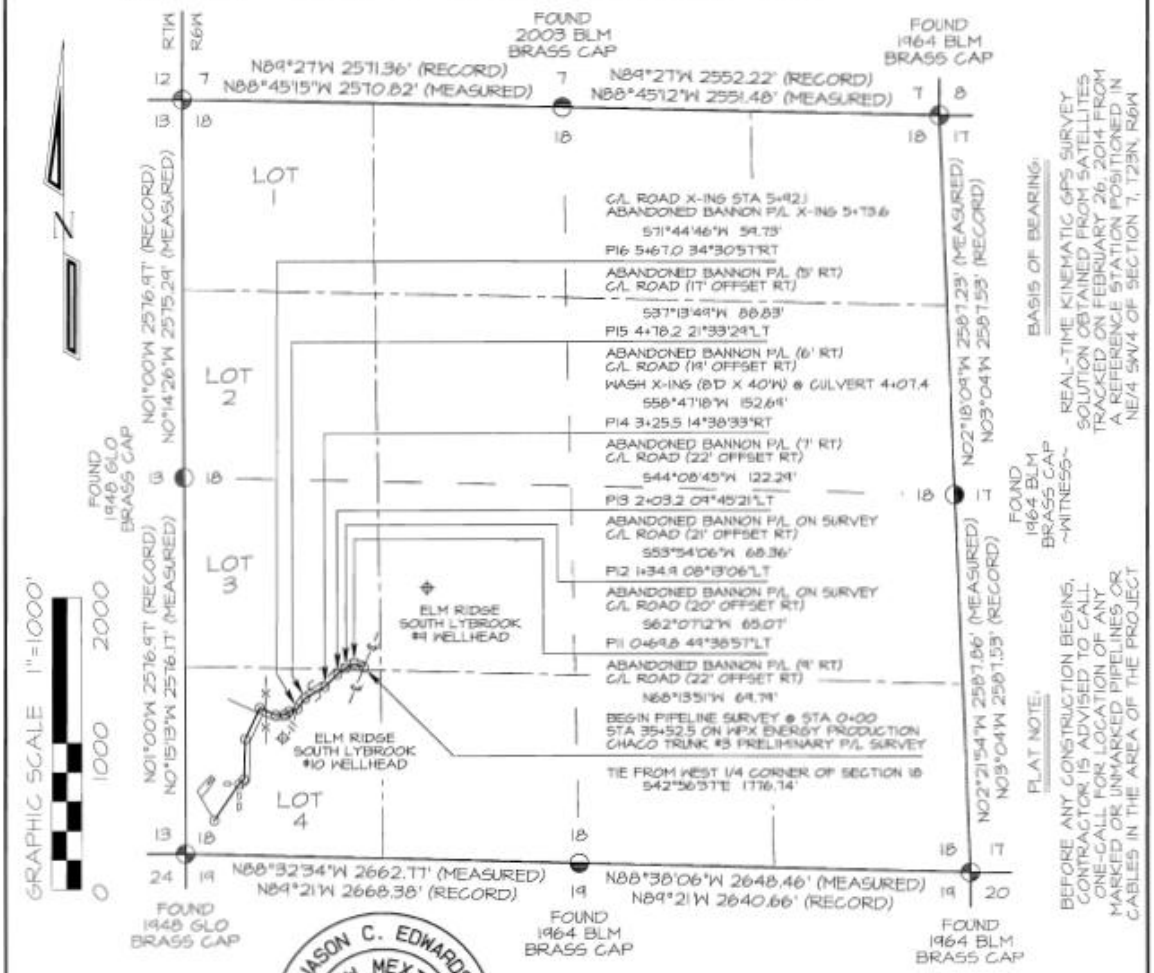
VERTICAL SCALE 1"=30'



NCE SURVEYS IS NOT LIABLE FOR LOCATION OF UNDERGROUND UTILITIES OR PIPELINES.

CONTRACTOR SHOULD CONTACT ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED UNDERGROUND UTILITIES OR PIPELINES ON WELLPAD AND/OR ACCESS ROAD AT LEAST TWO WORKING DAYS PRIOR TO CONSTRUCTION.

WPX ENERGY PRODUCTION, LLC CHACO 2306–18M #240H
PROPOSED PIPELINE SURVEY LOCATED IN THE
W/2 SW/4 OF SECTION 18, T23N, R6W, NMPM
RIO ARRIBA COUNTY, NEW MEXICO



~ SURFACE OWNERSHIP ~ Bureau of Land Management	
0+00 TO 17+00.1	1700.1 FT / 103.0 RODS

I, Jason C. Edwards, a registered Professional Surveyor under the laws of the State of New Mexico, hereby certify that this plat was prepared from field notes of an actual survey meeting the minimum requirements of the standards for easement surveys and is true and correct to the best of my knowledge and belief.

JASON C. EDWARDS Date: March 18, 2014

Jason C. Edwards, P.L.S.
New Mexico L.S. #15269

Prepared for:
WPX ENERGY PRODUCTION
P.O. BOX #640
AZTEC, NM 87410

N C E

Land Surveyor:
Jason C. Edwards

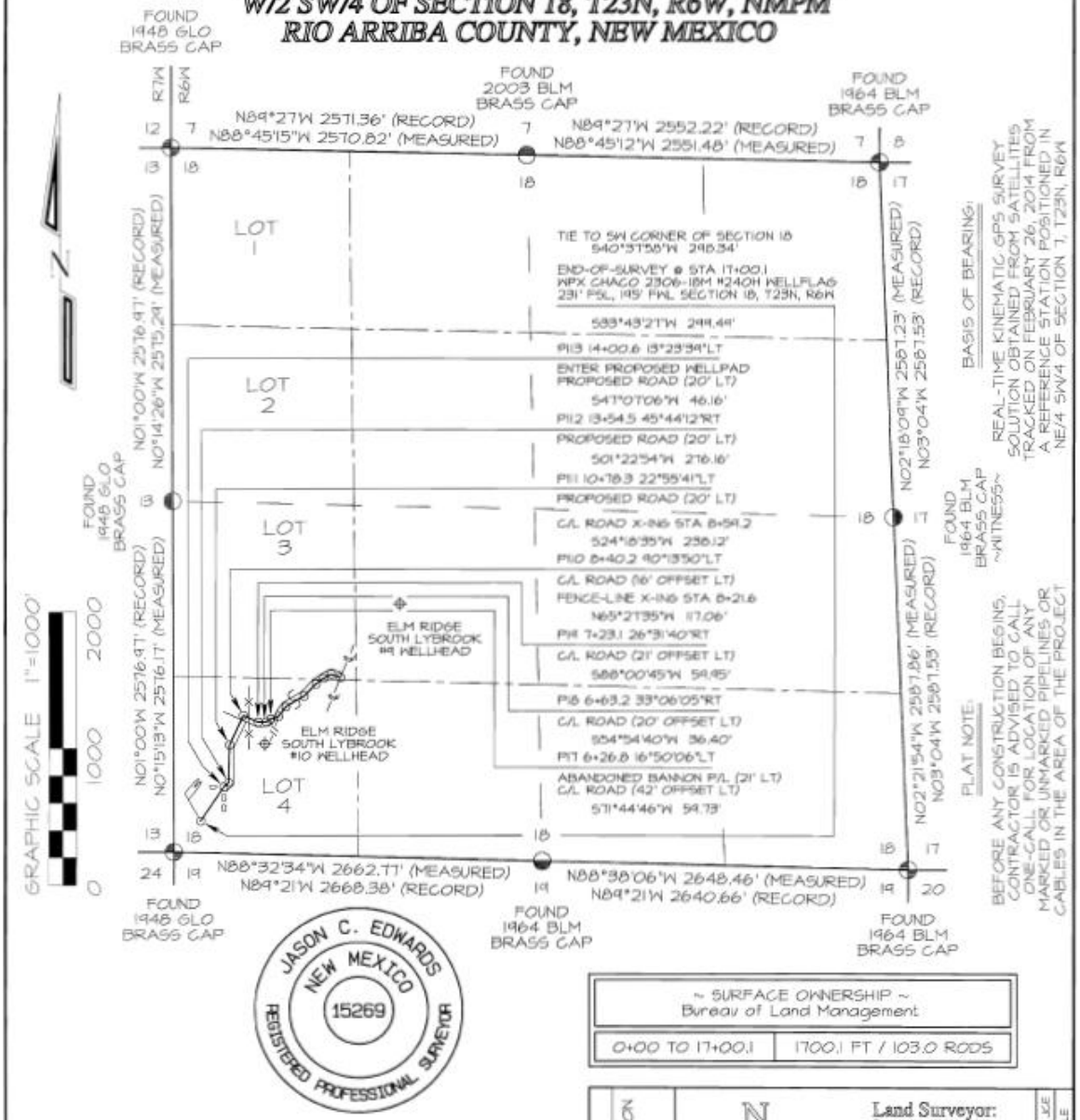
Mailing Address:
Post Office Box 6612
Farmington, NM 87499

Business Address:
111 East Pinon Street
Farmington, NM 87402
(505) 325-2654 (Office)
(505) 326-5650 (Fax)

SURVEYS, INC.

SHEET 4 OF 6 | CHECKED BY: JCE
FILENAME: 2306JCE | DRAWN BY: SJE

WPX ENERGY PRODUCTION, LLC CHACO 2306–18M #240H
PROPOSED PIPELINE SURVEY LOCATED IN THE W/2 SW/4 OF SECTION 18, T23N, R6W, NMPM
RIO ARRIBA COUNTY, NEW MEXICO



~ SURFACE OWNERSHIP ~ Bureau of Land Management	
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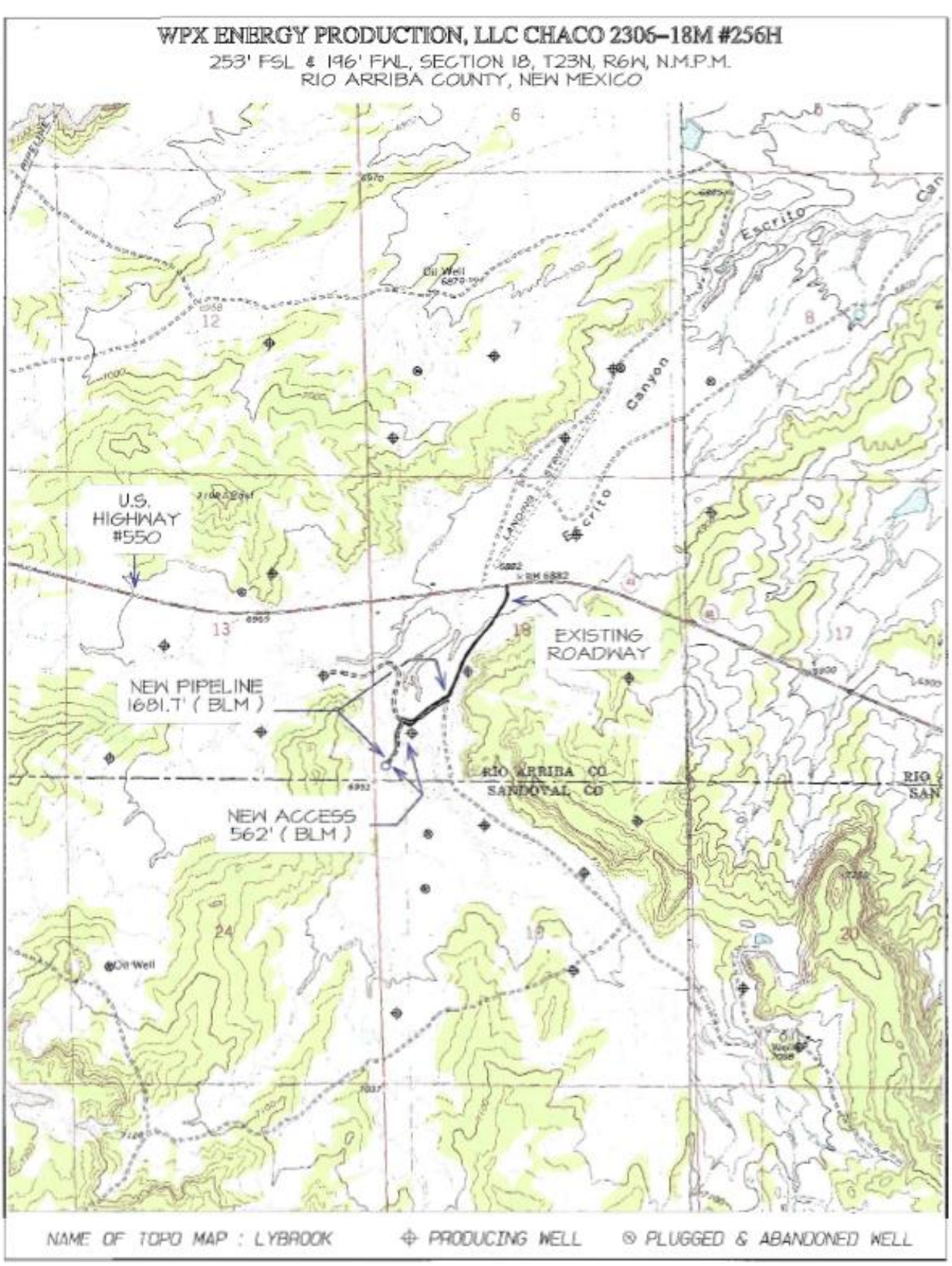
Jason C. Edwards, P.L.S.
New Mexico L.S. #15269

Prepared for:
WPX ENERGY PRODUCTION
P.O. BOX 640
AZTEC, NM 87410

N C E

Land Surveyor:
Jason C. Edwards
Mailing Address:
Post Office Box 6612
Farmington, NM 87499
Business Address:
111 East Pinon Street
Farmington, NM 87402
(505) 325-2654 (Office)
(505) 326-5650 (Fax)
SURVEYS, INC.

CHECKED BY: JCE
DRAWN BY: SLE
SHEET 5 OF 6
FILENAME: 2306.DGN


WPX ENERGY PRODUCTION, LLC CHACO 2306-18M #256H
253' FSL & 196' FWL, SECTION 18, T23N, R6W, N.M.P.M.
RIO ARRIBA COUNTY, NEW MEXICO
U.S. HIGHWAY #550
EXISTING ROADWAY
NEW PIPELINE 1681.7' (BLM)
NEW ACCESS 562' (BLM)
RIO ARRIBA CO.
SANDOVAL CO.
Escrito
Canyon
Oil Well
NAME OF TOPO MAP : LYBROOK
PRODUCING WELL
PLUGGED & ABANDONED WELL

APPENDIX C. PHOTOGRAPHS

Proposed Access Road and Southern portion of Well-connect Corridor: From start (northern terminus) of proposed access road, looking southwestward toward well pad

Proposed Access Road and Southern Portion of Well-connect Corridor: From end (southern terminus) of proposed access road, looking northward towards existing access road

Proposed Well Pad: Viewed from southwestern corner (corner 5) looking northeastward

Proposed Well Pad: Viewed from northwestern corner (corner 6) looking southeastward

Proposed Well Pad: Viewed from northeastern corner (corner 2) looking southwestward

Proposed Well Pad: Viewed from southeastern corner (corner 3) looking northwestward

APPENDIX D. SURFACE RECLAMATION PLAN