NOTICE OF AVAILABILITY

THE BUREAU OF INDIAN AFFAIRS (BIA) AND THE THREE AFFILIATED TRIBES ARE PLANNING ON DRILLING ONE OIL/GAS WELL, WITH ACCESS ROAD AND RELATED INFRASTRUCTURE ON *Eagle 14-30H* ON THE FORT BERTHOLD RESERVATION. CONSTRUCTION IS SCHEDULED TO BEGIN IN THE FALL OF 2009.

BASED ON THE ENVIRONMENTAL ASSESSMENT (EA), IT HAS BEEN DETERMINED THAT THE ACTION WILL NOT RESULT IN SIGNIFICANT IMPACTS TO THE QUALITY OF THE HUMAN ENVIRONMENT; THEREFORE, AN ENVIRONMENTAL IMPACT STATEMENT IS NOT REQUIRED.

FOR FURTHER INFORMATION OR TO OBTAIN A COPY OF THE FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND EA, CONTACT HOWARD BEMER, SUPERINTENDENT AT THE FORT BERTHOLD AGENCY AT 701-627-4707.

THE FONSI IS A FINDING ON ENVIRONMENTAL EFFECTS, NOT A DECISION TO PROCEED WITH AN ACTION, THEREFORE CANNOT BE APPEALED.

Finding of No Significant Impact

Red Willow Great Plains, LLC
Eagle 14-30H

Fort Berthold Indian Reservation
McLean County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for one oil/gas well, access road and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 30 of Township 148 North, Range 89 West, McLean County. Associated federal actions by BIA include determination of effect regarding cultural resources, approval of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Application for Permit to Drill.

Potential of the proposed action to impact the human environment is analyzed in the attached Environmental Assessment (EA), as required by the National Environmental Policy Act. Based on the recently completed EA, I have determined that the proposed project will not significantly affect the quality of the human environment. No Environmental Impact Statement is required for any portion of the proposed activities.

This determination is based on the following factors:

1. Agency and public involvement was solicited and environmental issues related to the proposal were identified.

2. Protective and prudent measures were designed to minimize impacts to air, water, soil, vegetation, wetlands, wildlife, public safety, water resources, and cultural resources. The remaining potential for impacts was disclosed for both the proposed action and the No Action alternative.

3. Guidance from the U.S. Fish and Wildlife Service has been fully considered regarding wildlife impacts, particularly in regard to threatened or endangered species.

4. The proposed actions are designed to avoid adverse effects to historic, archaeological, cultural and traditional properties, sites and practices. Compliance with the procedures of the National Historic Preservation Act is complete.

5. Environmental justice was fully considered.

6. Cumulative effects to the environment are either mitigated or minimal.

7. No regulatory requirements have been waived or require compensatory mitigation measures.

8. The proposed projects will improve the socio-economic condition of the affected Indian community.

Regional Director

9-17-09
Date

ENVIRONMENTAL ASSESSMENT

United States Bureau of Indian Affairs

Great Plains Regional Office
Aberdeen, South Dakota

Red Willow Great Plains, LLC

Bakken Exploratory Oil Well:
Eagle 14-30H

Fort Berthold Indian Reservation

September 2009

For information contact:
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Division of Environment, Safety and Cultural Resources
115 4th Avenue SE
Aberdeen, South Dakota 57401
605-226-7656

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1. Purpose and Need for the Proposed Action

Red Willow Great Plains, LLC (Red Willow) is proposing to drill one exploratory oil and gas well on the Fort Berthold Indian Reservation (Reservation) to evaluate, and possibly develop, the commercial potential of natural resources. The development has been proposed on land held in trust by the United States in McLean County, North Dakota. The U.S. Bureau of Indian Affairs (BIA) is the surface management agency for potentially affected tribal lands and individual allotments. The BIA manages lands held in title by the tribe and tribal members to subsurface mineral rights. As shown in Figure 1, a development has been proposed in the following location:

- **Eagle 14-30H:** SE¼ SW¼ of Section 30, Township 148 North, Range 89 West, McLean County

The economic development of available resources and associated BIA actions are consistent with BIA's general mission. Leasing and development of mineral resources offers substantial economic benefits to both the Three Affiliated Tribes of the Mandan, Hidatsa and Arikara Nation and to individual tribal members. Oil and gas exploration and development activities are conducted under authority of the Indian Mineral Leasing Act of 1938 (25 USC 396a, *et seq*.), the Indian Mineral Development Act of 1982 (25 USC 2101, *et seq*.), the Federal Onshore Oil and Gas Royalty Management Act of 1982 (30 USC 1701, *et seq*.), and the Energy Policy Act of 2005 (42 USC 15801, *et seq*.). BIA actions in connection with the proposed project are largely administrative and include approval of leases, easements and rights-of-way, a determination regarding the effect on cultural resources and recommendations to the Bureau of Land Management (BLM) regarding approval of the Application for Permit to Drill (APD).

These proposed federal actions require compliance with the *National Environmental Policy Act* of 1969 (NEPA) and regulations of the Council on Environmental Quality (CEQ, 40 CFR 1500-1508). Analysis of the proposed project's potential to impact the human environment will be documented and will guide federal decision making. An APD submitted by Red Willow Great Plains, LLC, describes developmental, operational and reclamation procedures and practices that contribute to the technical basis of this Environmental Assessment (EA). The procedures and practices described in the application are critical elements in both the project proposal and the BIA's decision regarding environmental impacts. This EA will result in either a Finding of No Significant Impact (FONSI) or a decision to prepare an Environmental Impact Statement (EIS).

There are several components to the proposed action. Both new and improved roads are needed to access the proposed well site. A well pad would be constructed to accommodate drilling operations. Pits for drill cuttings would be constructed, used and reclaimed. Drilling and completion information could result in long-term commercial production at the site, in which case supporting facilities would be installed. The working portions of the well pad and the access road would remain in place during commercial production. All project components would eventually be abandoned and reclaimed, as specified in this document and the APD and according to any other federal conditions, unless formally transferred with federal approval to either the BIA or the landowner. The proposed well is exploratory, in that results could also support developmental decisions on other leases in the surrounding area, but this EA addresses only the installation and possible long-term operation of this well and directly associated infrastructure and facilities. Additional NEPA analysis, decisions and federal actions will be required prior to any other development.

Any authorized project will comply with all applicable federal, state and tribal laws, rules, policies, regulations and agreements. No construction, drilling or other ground-disturbing operations will begin until all necessary leases, easements, surveys, clearances, consultations, permissions, determinations and permits are in place.

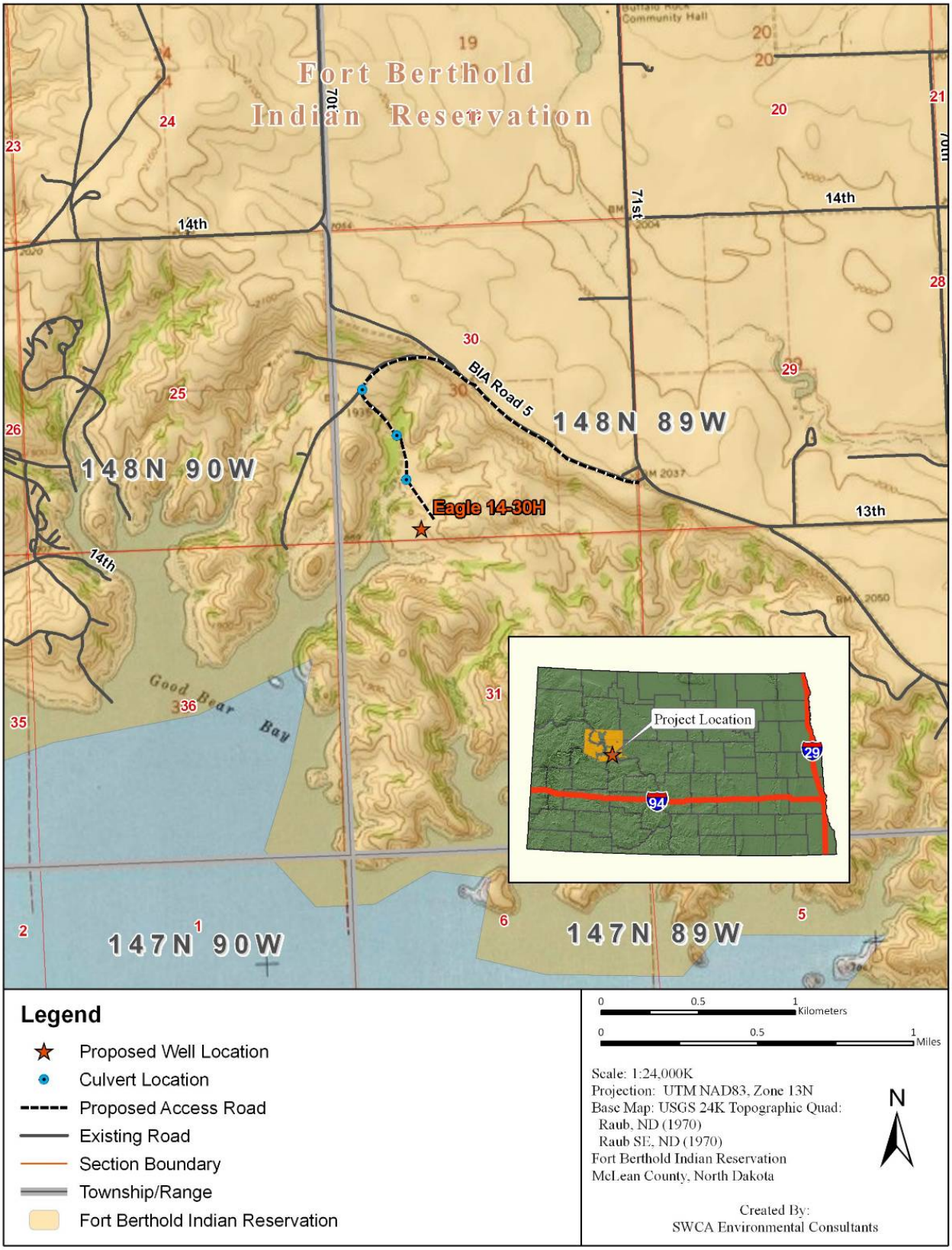

Figure 1: Project location.

2. Proposed Action and Alternatives

The **No Action Alternative** must be considered within an Environmental Assessment. If this alternative is selected, BIA would not approve leases, rights-of-way or other administrative proposals for the proposed project. The Application for Permit to Drill (APD) for this well location would not be approved. Current land use practices would continue at a No Action site. Development under other oil and gas leases would remain a possibility, but No Action is the only available or reasonable alternative to the specific proposal considered in this document.

This document analyzes the potential impacts of a specific proposed action – an exploratory oil/gas well on allotted surface and mineral estate within the boundaries of the Fort Berthold Indian Reservation in McLean County, North Dakota. The proposed well would test the commercial potential of the Middle Bakken Dolomite Member of the Bakken Formation. Site-specific actions would or might include several components, including an access road, construction of a well pad, drilling operations, installation of production facilities, tanker traffic and reclamation.

All construction activities would follow lease stipulations, practices and procedures outlined in this document, the APD, guidelines and standards in *Surface Operating Standards for Oil and Gas Exploration and Development* (BLM/US Forest Service, Fourth Edition, also known as the Gold Book), and any conditions added by either BIA or BLM. All lease operations would be conducted in full compliance with applicable laws and regulations, including 43 CFR 3100, *Onshore Oil and Gas Orders 1, 2, 6 and 7*, approved plans of operation and any applicable Notices to Lessees.

2.1 Field Camps

Self-contained trailers may house a few key personnel during drilling operations, but any such arrangements would be very short-term. No long-term residential camps are proposed. Construction and drilling personnel would commute to the project site, most likely from within or around the Reservation. Human waste would be collected in standard portable chemical toilets or service trailers located on-site, then transported off-site to a state-approved wastewater treatment facility. Other solid waste would be collected in enclosed containers and disposed of at a state-approved facility.

2.2 Access Roads

Up to 1,320.00 feet (0.25 mile) of new access road would be constructed for the proposed well location and 1,161.60 feet (0.22 mile) of two-track will be upgraded and improved. Signed agreements would be in place allowing road construction across affected surface allotments and private land surfaces, and any applicable approach permits and/or easements would be obtained prior to any construction activity. A maximum disturbed right-of-way (ROW) width of 66 feet for the access road would result in up to 2 acres of new surface disturbance. The access road will connect to 71st Avenue NW and follow a part of BIA 5. Red Willow would reclaim the disturbance back to approximately 46 feet. A photograph of the proposed road alignment is provided as Figures 2.2a and 2.2b.

Construction would follow road design standards outlined in the Bureau of Land Management (BLM) guidebook *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (U.S. Department of the Interior and U.S. Department of Agriculture 2007). Care would be taken during road construction to avoid disturbing or disrupting any buried utilities that may exist along BIA 5. Details of road construction are addressed in the Application for the Permit to Drill (APD).

Figure 2.2a. Proposed upgraded and improved access road (BIA 5) for the Eagle 14-30H well pad, facing west.

Figure 2.2b. Proposed new access road for the Eagle 14-30H well pad, facing southeast.

2.3 Well Pad

The proposed well pad would consist mainly of 1) an area leveled for the drilling rig and related equipment; and 2) a pit excavated for drilling fluids, drill cuttings and fluids produced during drilling. The well pad area would be cleared of vegetation, stripped of topsoil and graded to the specifications in the approved APD. Topsoil would be stockpiled and stabilized until disturbed areas were reclaimed and re-vegetated. Excavated subsoil would be used in pad construction, with the finished well pad graded to ensure positive water drainage away from the drill site. Erosion control would be maintained through prompt re-vegetation and by constructing all necessary surface water drainage controls, including berms, diversion ditches and waterbars.

The level area of the well pad used for drilling would be approximately 240 by 320 feet (1.96 acres). The production pad after reclamation will be 240 by 240 feet (1.32 acres). Estimated dirt work for this pad will include approximately 8,810 cubic yards of cut and 3,760 cubic yards of fill. Details of pad construction and reclamation are diagrammed in the APD. A photograph of the proposed well pad location is provided as Figure 2.3a and Figure 2.3b shows the well pad schematic. One salt water storage tank and six oil stock tanks will be located on cut.

Figure 2.3a: Proposed Eagle 14-30H well pad location, looking south.

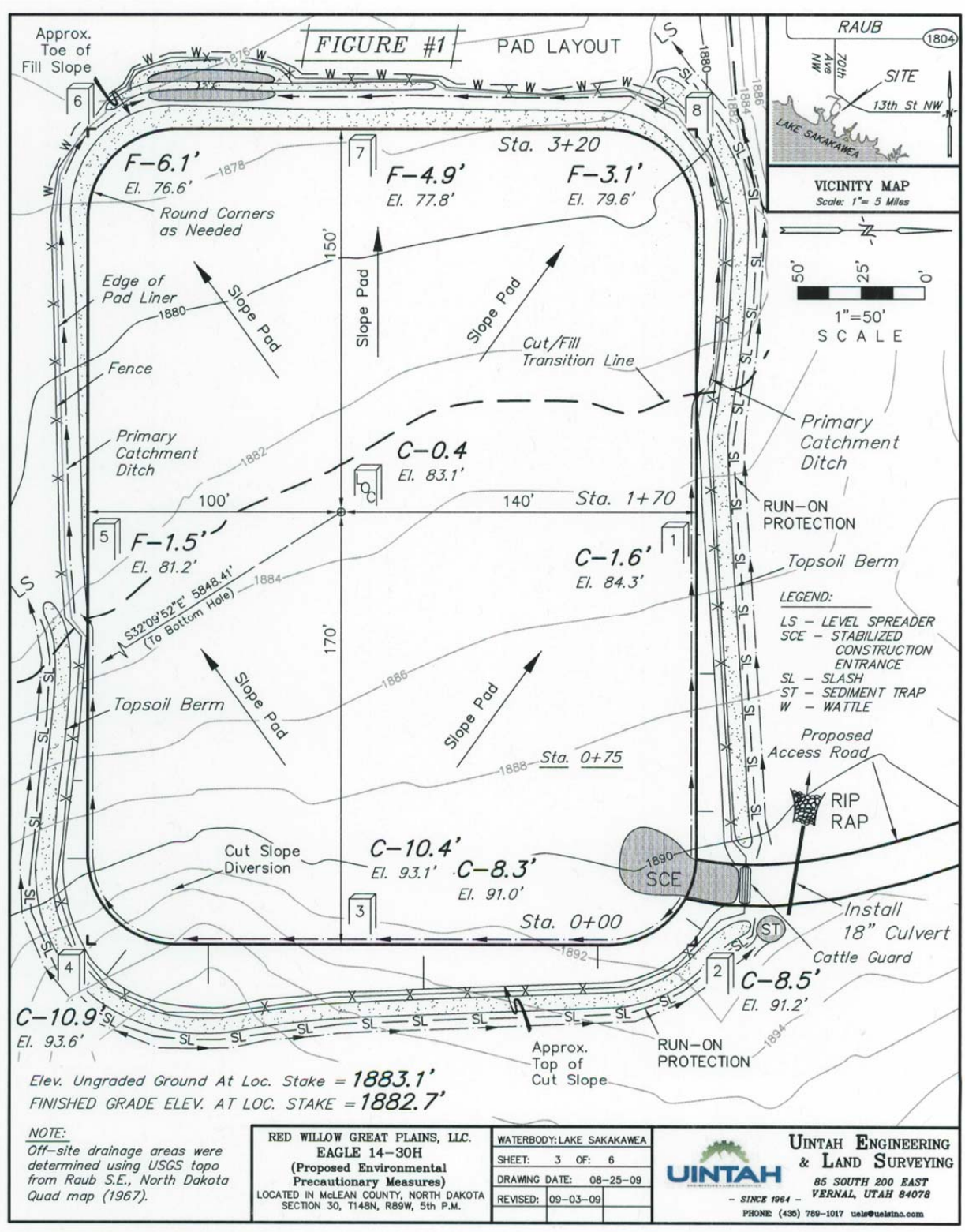

Figure 2.3b: Well pad schematic for the Eagle 14-30H well pad.

2.4 Drilling

After securing mineral leases, Red Willow submitted an APD to the BLM on September 10, 2009, proposing to drill one well. Also, a Section 10 permit was submitted to the United States Army Corps of Engineers on September 10, 2009.

The Bakken drilling target for the proposed well is as follows (Table 2.4a):

- **Eagle 14-30H:** 550 feet from east line (FEL) and 550 feet from south line (FSL) in the SE¼ SE¼ of Section 31, Township 148 North, Range 89 West; approximately 5,848.41 feet southeast of the surface hole location (Figure 2.4a).

Table 2.4a. Drilling information for the Bakken exploratory well.

Purposed Well	Initial Vertical Depth (feet)	Setback Minimum Achieved by Directional Drilling (feet)	Depth (vertical) at which Drilling Would Become Roughly Horizontal (feet)	Depth (measured) at which Drilling Would Become Roughly Horizontal (feet)	Completed Drill String Measured Depth (feet)
Eagle 14-30H	9,600	550	9,400	9,785	14,892

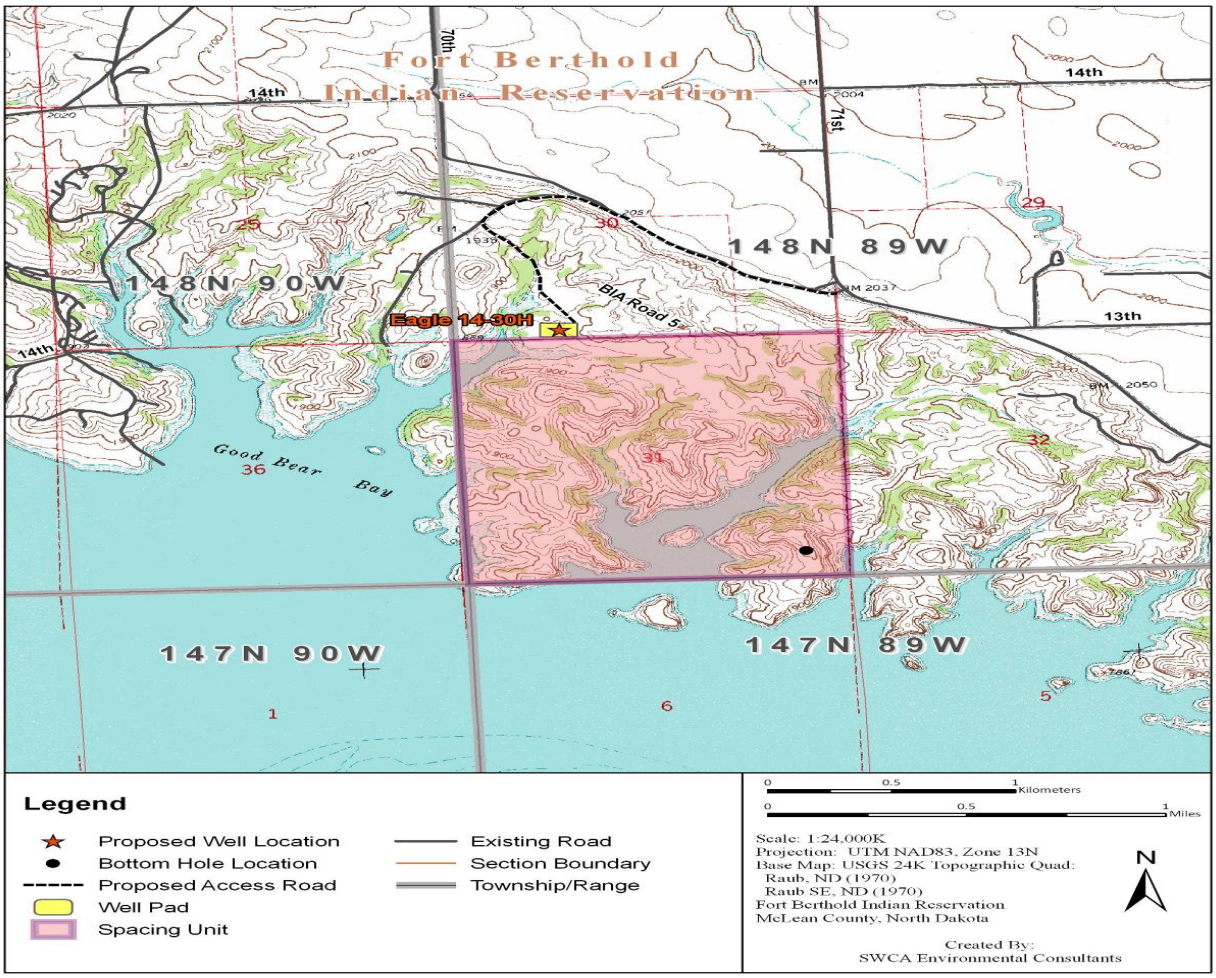

Figure 2.4a. Eagle 14-30H proposed location showing spacing unit and the bottom hole location.

The BLM North Dakota Field Office forwarded copies of the APD to BIA's Fort Berthold Agency in New Town, North Dakota, for review and concurrence. BLM will not approve an APD until BIA completes its NEPA process and recommends APD approval. No drilling will begin until an approved permit has been obtained from the BLM.

The minimum setback of 500 feet (NDCC 43-02-03-18.2) from section lines would be maintained or achieved through directional drilling.

Rig transport and on-site assembly would take roughly eight days. Drilling would require approximately 34 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 18,000 to 25,000 feet. For the first 2,300 feet drilled, a freshwater-based mud system with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage, using approximately 7.4 gallons of water per foot drilled.

After setting and cementing the near-surface casing, an oil-based mud system (75% diesel fuel and 25% water) would be used to drill to the 7.0- and 4.5-inch casing points. Oil-based drilling fluids reduce the potential for hole sloughing while drilling through water-sensitive salt and shale formations. Approximately 5,811 gallons of water and 17,432 gallons of diesel fuel would be used to complete the vertical drilling. The lateral reach of the borehole would be drilled using 5,745 gallons of diesel fuel and 1,915 gallons of fresh water as mud. Weighted and unweighted oil-based mud will be used to sweep the hole clean as necessary. Approximately 4.2 gallons of diesel fuel will be deployed per foot of hole drilled, of which approximately 55% is typically recovered for rental return or re-use elsewhere. During frac-ing, various volumes of water and other components will be used (Table 2.4b). A typical drilling rig is shown in Figure 2.4b

Table 2.4b. Volumes of water and other components used in frac-ing.

Component	Volumes Used (gallons)
Fresh Water	335,550
Biocide	57,000
Breaker	239
Catalyst	336
Clay Control	470
Surfactant	336

Cuttings generated from drilling would be deposited in the reserve pit(s) on the well pad. Reserve pits would be lined with an impervious (plastic/vinyl) liner to prevent drilling fluid seepage and contamination of the underlying soil. Liners would be installed over sufficient bedding (either straw or dirt) to cover any rocks, would overlap the pit walls, extend under the mud tanks, and would be covered with dirt and/or rocks to hold it in place. Prior to use, the entire location would be fenced completely with a cattle guard at the access road into location, in order to protect both wildlife and livestock. Fencing would be installed in accordance with Gold Book guidelines and maintained until the reserve pits are backfilled.

Figure 2.4b: Typical drilling rig

2.5 Casing and Cementing

Surface casing would be set at an approximate depth of 2,300 feet and cemented back to the surface using a pre-set rig prior to moving in the big rig. This will isolate and protect all near-surface freshwater zones and aquifers in the project area. (The Fox Hills Formation is approximately 1,700 feet and the Pierre Formation is roughly 2,200 feet.) The Dakota Formation potentially contains a hydrocarbon zone expected at a depth of approximately 4,680 feet. Therefore, 7-inch intermediate casing would be set and cemented from 9,785 feet back to surface. (This range is from the start of the lateral Bakken up to surface.) Production casing (4.5-inch) would be set and cemented from total depth of the lateral back to surface. Casing and cementing operations would be conducted in full compliance with Onshore Oil and Gas Order #2 (Title 43 Code of Federal Regulations 3160).

2.6 Completion and Evaluation

After the well has been drilled and cased, a completion (work-over) unit would be moved onto the site. For wells of the depth proposed, about thirty (30) days are usually needed to clean out the well bore, pressure test the casing, perforate and fracture the horizontal portion of the hole, and run production tubing for commercial production. If the target formation is to be fractured to stimulate production, the typical procedure is to pump a mixture of sand and a carrier (e.g., water and/or nitrogen) under extreme pressure downhole. The resulting fractures are propped open by the sand, increasing the capture zone of the well and maximizing efficient drainage of the field. After fracturing, the well is typically flowed back to the surface to recover fracture fluids and remove excess sand. Fluids utilized in the completion procedure would be captured either in the reserve pit or in tanks for disposal in strict accordance with NDIC rules and regulations.

2.7 Commercial Production

If drilling, testing, and production support commercial production from the proposed location, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, tanks, and a flare pit. Commercial production would be discussed more fully in subsequent National Environmental Policy Act (NEPA) analyses.

Initially, oil would be collected in tanks and periodically trucked to an existing oil terminal for sales. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both product and water would depend on volumes and rates of production (Table 2.7a). In the future, Red Willow would consider connections to pipelines and electric lines as they become available. A typical producing rig is shown in Figure 2.7b and more detail is included in the APD.

Table 2.7a. Expected oil and water production initially and after one year for the proposed well.

Proposed Well	Oil Production		Water Production	
	Initially	After 1 Year	Initially	After 1 Year
Eagle 14-30H	200	106	30	20

Figure 2.7b: Typical commercial operation

Large volumes of gas are not expected from this location. Small volumes would be flared in accordance with Notice to Lessees (NTL) 4A and NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (NDCC 38-08-06.4). Results could also encourage additional exploration on the Reservation. Should future oil/gas exploration activities be proposed by Red Willow Great Plains on the Fort Berthold reservation, those proposals and associated federal actions would require

additional NEPA analysis and BIA consideration prior to implementation.

2.8 Reclamation

The reserve pit and drill cuttings would be treated, solidified, backfilled and buried as soon as possible after well completion. Any oily residue is dispersed and captured, preventing coalescence and release to the environment at significant rates in the future. Controlled mixing of cuttings with a non-toxic reagent causes an irreversible reaction that quickly results in an inert, solid material. The alkaline nature of the stabilized material also chemically stabilizes various metals that may be present, primarily by transforming them into less soluble compounds. Treated material would then be buried in the reserve pit, overlain by at least four feet of overburden as required by NDIC regulations.

If commercial production equipment is installed, the well pad would be reduced in size to about 300' x 200', with the rest of the original pad reclaimed. The working area of each well pad and the running surface of access roads would be surfaced with scoria or crushed rock obtained from a previously approved location. Other interim reclamation measures to be accomplished within the first year include reduction of the cut and fill slopes, redistribution of stockpiled topsoil, installation of erosion control measures, and reseeding. The back slope portions of roads would be covered with stockpiled topsoil and re-seeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to about 28' wide.

Final reclamation would occur either in the very short term if the proposed well is commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed, reflecting the BIA view of oil and gas exploration and production as temporary intrusions on the landscape. All facilities would be removed, well bores would be plugged with cement and dry hole markers would be set. Access roads and work areas would be leveled or backfilled as necessary, scarified, re-contoured and re-seeded. Exceptions to these reclamation measures might occur if the BIA approves assignment of an access road either to the BIA roads inventory or to concurring surface allottees. The Surface Use Plan within the APD contains additional details regarding both interim and final reclamation measures. Figure 2.8 shows an example of reclamation from the Gold Book.

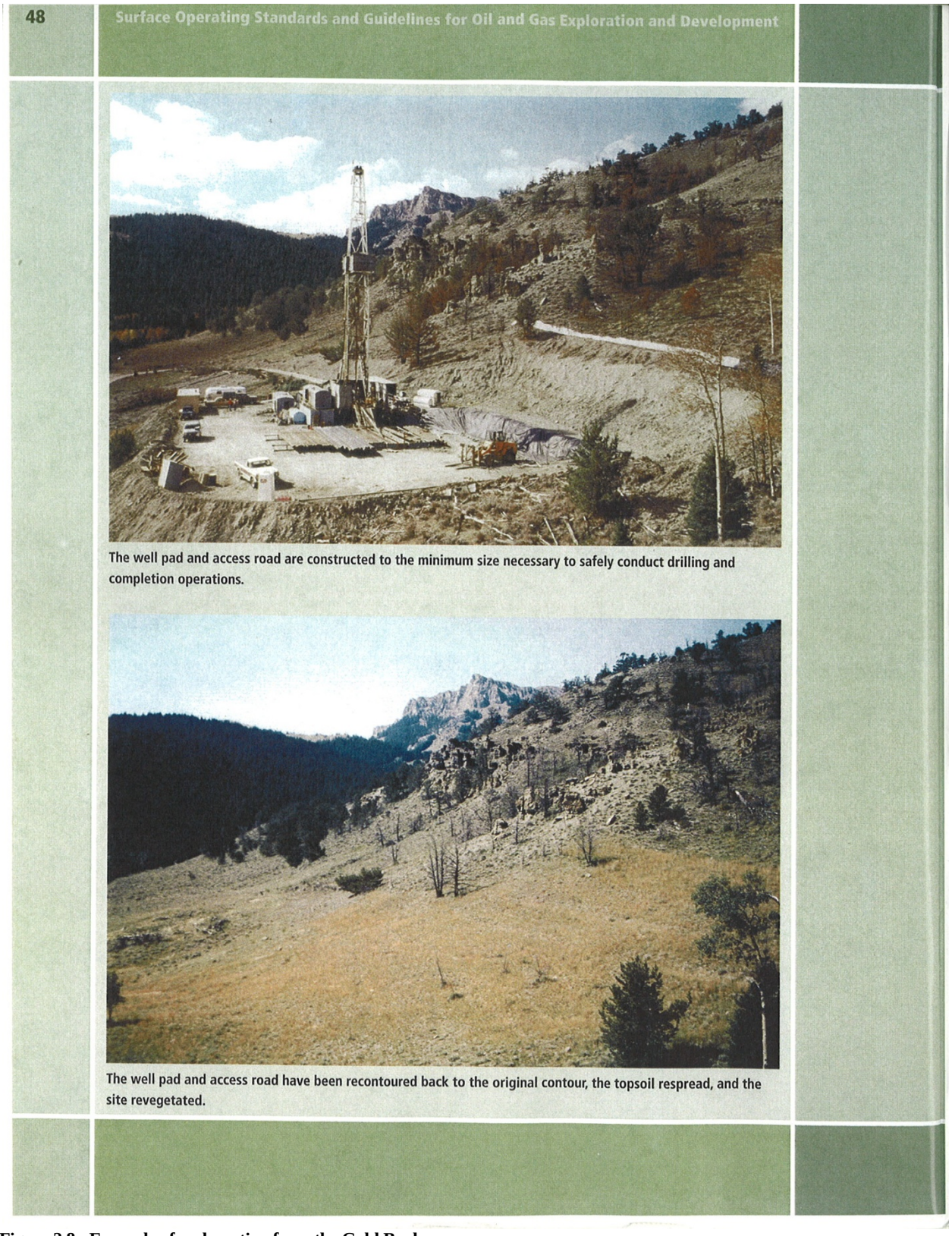

Figure 2.8: Example of reclamation from the Gold Book

2.9 Construction Details at Individual Sites

The proposed Eagle 14-30H well would be located in the SE¼ SW¼ of Section 30, Township 148 North, Range 89 West in McLean County and would access a 640-acre spacing unit that would include all of Section 31. The well pad is located on an area with ½ to 1 degree slopes. A new road approximately 1,320 feet long would have to be constructed and approximately 6,758 feet of existing road would have to be upgraded or improved from the existing access at 71 Avenue NW to the proposed well location. The upgraded and improved road would consist of 5,597 feet of gravel road (BIA 5) improved with a cattle guard and 1,162 feet of two track improved. The access road would range in slopes from 0 to 8 degrees. A map of the proposed access road and placement of culverts is provided as Figure 1 and a map of the proposed spacing unit and bottom hole are shown in Figure 2.4a. Photographs of the proposed access road and well location are provided as Figures 2.2a, 2.2b and 2.3a. Vertical drilling would be completed with a pilot hole at approximately 9,600 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 9,400 feet. The total drill string would total approximately 14,892 feet at the TVD, including approximately 5,107 feet of lateral reach into the Bakken Formation, terminating at the bottom hole location in the SE¼ SE¼ of Section 31.

2.10 Preferred Alternative

The preferred alternative is to complete all administrative actions and approvals necessary to authorize or facilitate oil and gas developments at this proposed well location.

3. The Affected Environment and Potential Impacts

The Fort Berthold Indian Reservation is the home of the Three Affiliated Tribes of the MHA Nation. Located in west-central North Dakota, the Reservation encompasses more than one million acres, of which almost half are held in trust by the United States for either the MHA Nation or individual allottees. The remainder of the land is owned in fee simple title, sometimes by the MHA Nation or tribal members, but usually by non-Indians. The Reservation occupies portions of six counties, including Dunn, McKenzie, McLean, Mercer, Mountrail and Ward. In 1945, the Garrison Dam was completed, inundating much of the Reservation. The remaining land was divided into three sections by Lake Sakakawea, an impoundment of the Missouri River upstream of the Garrison Dam.

The proposed well and access road is situated geologically within the Williston Basin, where the shallow structure consists of sandstones, silts and shales dating to the Tertiary Period (65 to 2 million years ago), including the Sentinel Butte and Golden Valley Formations. The underlying Bakken Formation is a well-known source of hydrocarbons; its middle member is targeted by the proposed project. Although earlier oil/gas exploration activity within the Reservation was limited and commercially unproductive, recent economic changes and technological advances now make accessing oil in the Bakken Formation feasible.

The Reservation is within the northern Great Plains ecoregion, which consists of four physiographic units: 1) the Missouri Coteau Slope north of Lake Sakakawea; 2) the Missouri River trench; 3) the Little Missouri River badlands; and 4) the Missouri Plateau south and west of Lake Sakakawea (Williams and Bluemle 1978). Much of the Reservation is on the Missouri Coteau Slope. Elevations of the formerly glaciated, gently rolling landscape ranges from a normal pool elevation of 1,838 feet at Lake Sakakawea to over 2,600 feet on Phaelan's Butte near Mandaree. Annual precipitation on the plateau averages between 15 and 17 inches. Mean temperatures fluctuate between -3° and 21° F in January and between 55° and 83° F in July, with 95 to 130 frost-free days each year (Bryce et al. 1998; High Plains Regional Climate Center 2008).

The proposed well site and spacing units are in a rural area consisting primarily of mixed grass prairie that is currently either idle or used to graze livestock. This grassland is intermixed with scattered woody cover and/or dense shrubby areas on north facing slopes and scattered seasonal drainages The landscape has been

previously disturbed by dirt trails and graveled and paved roadways. The broad definition of the human and natural environment under NEPA leads to the consideration of the following elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. Potential impacts to these elements are analyzed for both the No Action Alternative and the Preferred Alternative. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. This EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts. In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* in itself require preparation of an EIS.

3.1 The No Action Alternative

Under the No Action Alternative, the proposed project would not be constructed, drilled, installed, or operated. Existing conditions would not be impacted for the following critical elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, and environmental justice. There would be no project-related ground disturbance, use of hazardous materials, or trucking of product to collection areas. Surface disturbance, deposition of potentially harmful biological material, trucking, and other traffic would not change from present levels. Under the No Action Alternative, the MHA Nation, Tribal members, and allottees would not have the opportunity to realize potential financial gains resulting from the discovery of resources at this well location.

3.2 Air Quality

The North Dakota Department of Health (NDDH) network of Ambient Air Quality Monitoring (AAQM) stations includes Watford City in McKenzie County, Dunn Center in Dunn County, and Beulah in Mercer County. These stations are located west, south and southeast of the proposed well site. Criteria pollutants tracked under National Ambient Air Quality Standards (NAAQS) of the Clean Air Act include sulfur dioxide (SO_2), particulate matter (PM_{10}), nitrogen dioxide (NO_2) and ozone (O_3). Two other criteria pollutants – lead (Pb) and carbon monoxide (CO) – are not monitored by any of three stations. Table 3.2 summarizes federal air quality standards and available air quality data from the three- county study area.

Table 3.2 Air quality standards and data for Dunn, McKenzie, and Mercer Counties, North Dakota

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	NAAQS (ppm)	County		
				Dunn	McKenzie	Mercer
SO_2	24-Hour	365	0.14	0.004 ppm	0.004 ppm	0.011 ppm
	Annual Mean	80	0.030	0.001 ppm	0.001 ppm	0.002 ppm
PM_{10}	24-Hour	150	--	50 ($\mu g/m^3$)	35 ($\mu g/m^3$)	35 ($\mu g/m^3$)
	Annual Mean	50	--	--	--	--
$PM_{2.5}$	24-Hour	35	--	--	--	--
	Weighted Annual Mean	15	--	--	--	--

NO_2	Annual Mean	100	0.053	0.002 ppm	0.001 ppm	0.003 ppm
CO	1-Hour	40,000	35	--	--	--
	8-Hour	10,000	9	--	--	--
Pb	3-Month	1.5	--	--	--	--
O_3	1-Hour	240	0.12	0.071 ppm	0.072 ppm	0.076 ppm
	8-Hour	--	0.08	0.061 ppm	0.066 ppm	0.067 ppm

Source: U.S. Environmental Protection Agency (EPA) 2006. $\mu g/m^3$ = micrograms per cubic meter. ppm = parts per million.

North Dakota was one of only nine states in 2006 that met standards for all criteria pollutants. The state also met standards for fine particulates and the eight-hour ozone standards established by the U.S. Environmental Protection Agency (EPA) (NDDH 2007). The three counties addressed in Table 3.2 are also in full attainment and usually far below established limits (American Lung Association 2006). The Clean Air Act mandates prevention of significant deterioration in designated attainment areas. Class I areas are of national significance and include national parks greater than 6,000 acres in size, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres and designated prior to 1977. There is a Class I airshed at nearby Theodore Roosevelt National Park, which covers about 110 square miles in three units within the Little Missouri National Grassland between Medora and Watford City, 30-40 miles west of the proposed well site. The Reservation can be considered a Class II attainment airshed, which affords it a lower level of protection from significant deterioration.

The proposed project is similar to other projects installed nearby with the approval of state offices. Construction, drilling and tanker traffic would generate temporary, intermittent and nearly undetectable gaseous emissions of particulates, SO_2, NO_2, CO, and volatile organic compounds. Road dust would be controlled as necessary and other best management practices implemented as necessary to limit emissions to the immediate project area (BLM 2005). No detectable or long-term impacts to air quality or visibility are expected within the airsheds of the Reservation, state, or Theodore Roosevelt National Park. No laws, regulations or other requirements have been waived; no monitoring or compensatory measures are required.

3.3 Public Health and Safety

Health and safety concerns for the project area would largely include traffic hazards from the type and number of vehicles and equipment that would be using the existing and new access roads. The nearest home is 0.43 mile northwest of the well pad and there are approximately 53 homes within a 5-mile radius (10 homes to the north, 12 to the east, 9 to the south, and 22 to the west).

One other public safety concern would include the possible release of hydrogen sulfide (H_2S), a toxic gas, during some of the drilling operations. Per BLM Onshore Order #6, *Hydrogen Sulfide Operations*, Red Willow would develop and implement both an H_2S Drilling Operation Plan and a Public Protection Plan to protect both the drilling crew and the public.

Environmental Precautions

Red Willow's location is near Lake Sakakawea. The hills and the proximity to easy runoff situations due to the coulees and drainage pathways along the lake make extra precautions a requirement.

A) The top 6 inches of topsoil will be used for building berms on the uphill sides of the location to divert stormwater away from the location. Run-on protection will be in front of the berms.
B) The location will have a liner(s) under the limestone used on top of the location. The liner(s) will extend 10 to 15 feet beyond the outer edge of the location. The purpose of the additional liner(s) along the edge is discussed below in item F. After the well is drilled the location will be reduced in size. The excess rock and liner(s) will be removed to create a smaller location footprint. The excess rock will be stored and reused on a future well.
C) The total liner thickness under the limestone location would be 40 mils. If deemed necessary by Red Willow, an extra liner and additional limestone will be placed on top of the location under the mud pits, rig, gas buster, centrifuge, and mud pumps due to the use of oil-based mud from a depth of 2,300 feet to TD. There will be small trenches around the rig and mud pits to drain fluids to the drainage ditch for collection. The trench system will be coordinated with the drilling contractor's Spill Prevention, Control, and Countermeasure (SPCC) Plan.
D) This well is required to use a semi-closed loop mud system. Cuttings will be disposed of at an appropriate location but will not be buried near the lake. *If* there is a pit for frac flowback, it will have one or two liners depending on the thickness available. The liner(s) will extend 5 feet beyond the edge of the pit so it 1) is visible to anyone who visits the location, and 2) allows flexibility if adjustments in the pit need to be made. *If* there is a pit, it will have a drain pipe below the liner(s) to monitor the pit for leaks. The drain pipe will extend to the downhill side of the pit to a lined catchment area for collection.
E) Red Willow wants to contain drilling mud and other fluids leaving the rig floor so there will be added protection under the rig. The KatchKan system will be used under the rig floor. This will take extra time on rig up and rig down but Red Willow feels it is justified.
F) A combination of berms, drainage /runoff ditches, culverts, waddle, and run-on protection will be built around three sides of the location. The drainage/runoff ditches will utilize the 10 to 15 feet of extra liner that extends around the location. The ditch should be approximately 3 feet deep and 3 feet across. The ditch will be rock lined and designed to prevent chemicals, petroleum products, and other fluids leaving the location. Vacuum trucks will empty the ditch. This is to prevent oil, grease, and fuel runoff getting into the lake. If the ditch is kept clean, the sun can bake any petroleum residue into the limestone lining the ditch. Then the residue should stay locked up in the rock even if it rains. Red Willow is utilizing primary and secondary catchment areas for fluid collection in addition to keeping chemicals and petroleum products cleaned up with drainage ditches, limestone, liners, and vacuum trucks.
G) The primary catchment area will be built into the downhill side of the location so the vacuum trucks can empty the drainage ditches without interfering with drilling. Due to the proximity to the lake, there will be a rock-lined spillway in event of over topping that will lead to a second limestone-lined catchment area.
H) A flare will be used during drilling to burn off excess gas from the mud system. A liner with limestone on top will be under the flare stack area to catch any fluids that go out the flare stack that are not ignited.

Negative impacts from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about sixty days during construction, drilling and well completion, and then diminish sharply during commercial operations. For this proposed well site it is anticipated that about 50 trips over the course of several days would be required to transport the drilling rig and associated equipment to the site, with the same traffic later needed to remove the rig and other temporary facilities.

If the well proves productive, one small truck would travel to the pad each day to check the pump. Gas would be flared initially, while oil and produced water would be hauled out by tankers, with tanker traffic depending directly on productivity. Established load restrictions for state and BIA roadways would be followed and haul permits would be acquired as appropriate. All traffic must be confined to approved routes and conform to speed limits.

The U.S. EPA specifies chemical reporting requirements under Title III of the *Superfund Amendments and Reauthorization Act* (SARA) of 1986, as amended. No materials used or generated by this project for production, use, storage, transport, or disposal are on either the SARA list or on EPA's list of extremely hazardous substances in 40 CFR 355. Project design and operational precautions mitigate against impacts from toxic gases, hazardous materials or traffic. All operations, including flaring, would conform to instructions from BIA fire management staff. Impacts from the proposed project are considered minimal, unlikely and insignificant. No laws, regulations or other requirements have been waived; no compensatory mitigation measures are required

3.4 Water Resources

Surface Water

The proposed Eagle 14-30H is located in the Good Bear Bay sub-watershed (Hydrologic Unit Code 101101013001) of the Buffalo Creek Coulee Watershed (Figure 3.4a). It is part of the Lake Sakakawea subbasin, Little Missouri basin, Little Missouri subregion, and Missouri region. Runoff from the well pad will flow to the west into Good Bear Bay of Lake Sakakawea. Runoff from the well pad will need to travel 1,602.66 feet (0.3 mile) southwest in ephemeral swales and creek channels prior to reaching perennial waters in Lake Sakakawea (Figure 3.4b).

Given the topography of the individual sites over the project area, runoff occurs largely as sheet-flow. Runoff that concentrates near the Eagle 14-30H well will flow to unnamed ephemeral channels above Lake Sakakawea. However, the proposed project will be engineered and constructed to minimize the concentration of well pad runoff and to avoid disruption of drainages. In addition to the erosion control measures described above, best management practices (BMPs) will be applied during reclamation to prevent the mobilization of disturbed soils in the project area, and stop any sediment from being transported to channelized areas via runoff water. No surface water will be used in well drilling operations. Any chemicals or potentially hazardous materials will be handled in accordance with Red Willow's SPCC Plan. Provisions established under this plan will minimize potential impacts to any surface waters associated with an accidental spill.

The proposed project has been sited to avoid direct impacts to surface water and minimize disruption of drainages. Roadway engineering and erosion control measures would mitigate the potential migration of sediments downhill or downstream. No measureable increase in runoff or impacts to surface water is expected as a result of project approval.

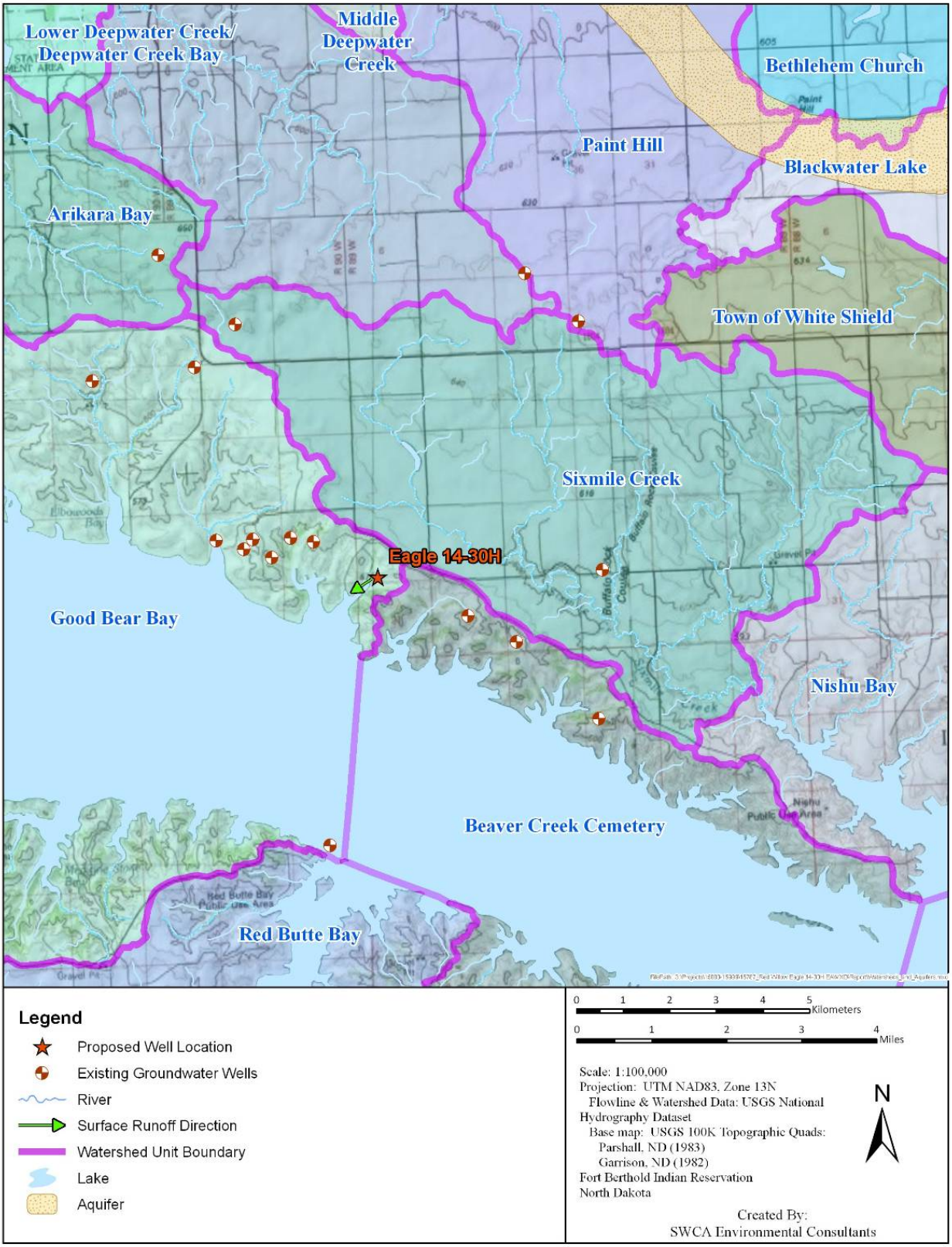

Figure 3.4a Water resources.

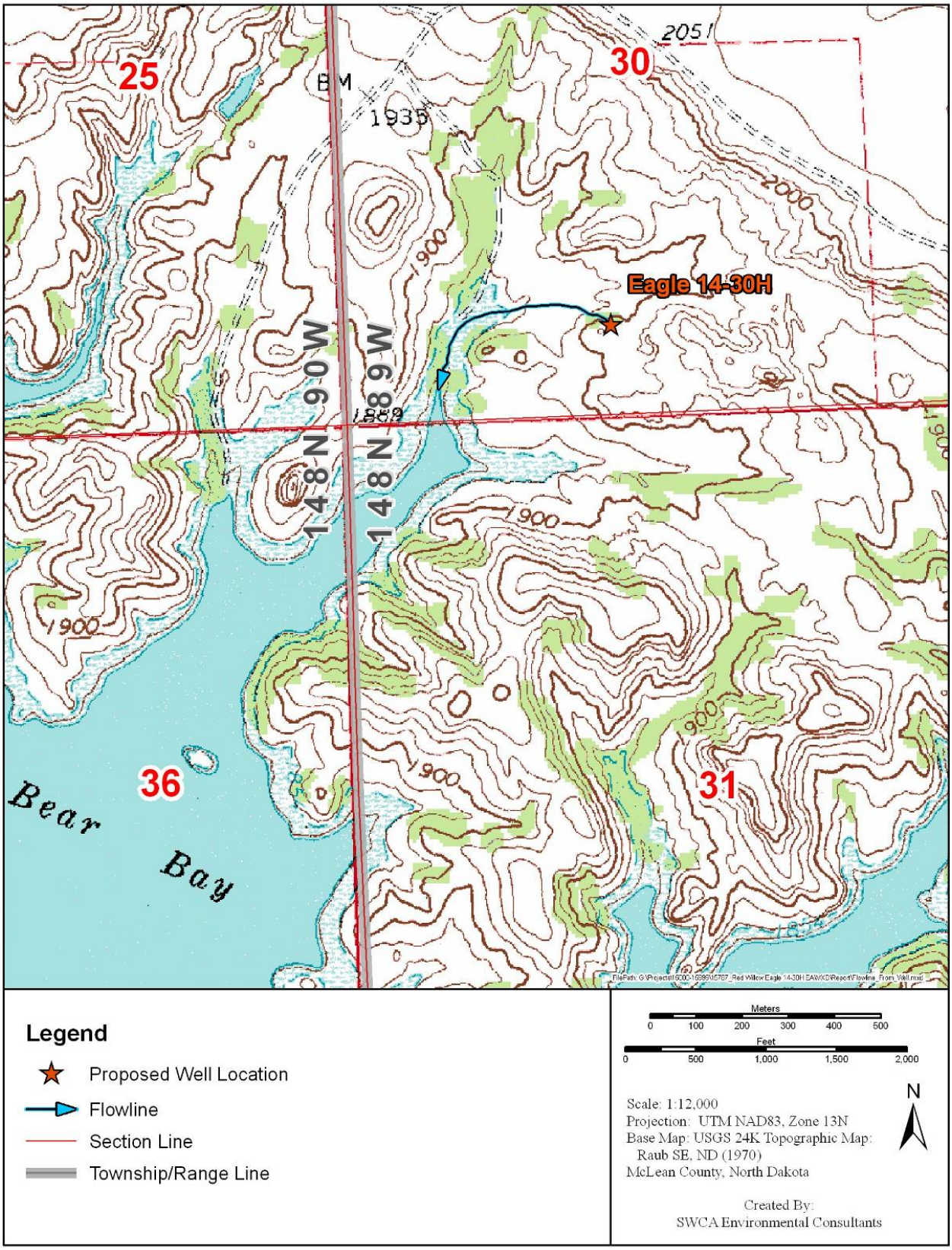

Figure 3.4b. Surface water flow line

Groundwater

Groundwater in McLean County is obtainable from aquifers composed of sand and gravel in the glacial deposits and sandstone and lignite in the preglacial rocks.

The aquifers with greatest potential for development are those in the glacial deposits. Most are associated with buried valleys and melt-water channels. A large interconnected system of aquifers is associated with buried valleys in east-central McLean County. The aquifers, which are named Lake Nettie, Strawberry Lake, Turtle Lake, and Horse Shoe valley, contain about 940,000 acre-feet of groundwater in available storage. Well yields of as much as 1,500 gallons per minute (gpm) are possible from the Lake Nettie aquifer. Other aquifers having well yields of as much as 1,500 gpm are the Fort Mandan and Painted Woods Lake, which are associated with melt-water channels adjacent to the Missouri River in southern McLean County. Well yields of as much as 1,000 gpm should be obtainable from the White Shield aquifer, which occupies a former valley of the Missouri River in western McLean County. Several other aquifers in the glacial deposits in McLean County have potential well yields of as much as 1,000 gpm. Water from the aquifers in the glacial deposits is predominantly a sodium bicarbonate or calcium bicarbonate type and is usually hard to very hard.

The availability of water for domestic, industrial, and irrigation supplies from principal aquifers in Mercer and Oliver counties occur in the consolidated rocks of the Fox Hills, Hell Creek, and Tongue River formations that underlie the entire two-county area. Wells tapping these aquifers will generally yield less than 150 gpm, and the water probably is not suitable for irrigation because of higher sodium content.

The largest yields and best quality water are obtainable from the relatively undeveloped glacial-drift and alluvial aquifers. These are generally 1 to 5 miles in width, have a maximum thickness of approximately 250 feet, and store about 2,640,000 acre-feet of groundwater. In places the glacial-drift and alluvial aquifers will yield more than 500 gpm. About 1,215,000 acre-feet of water from these aquifers would be suitable for irrigation use.

Several shallow aquifers related to post-glacial outwash composed till, silt, sand, and gravel are located in McLean County. However, none are within the proposed project areas. Detailed analyses are available from the North Dakota Geological Survey, Bulletin 60, Part III, 1974, and Bulletin 56, Part III, 1973.

Review of electronic records of the North Dakota State Water Commission revealed 23 existing water wells within an approximate 5-mile boundary of the proposed project areas (Table 3.4a). The closest groundwater well to the pad is approximately 0.99 mile to the northwest. Since none of the proposed project area lies within the boundaries of the post-glacial outwash aquifers, low porosity bedrock near the project well will act as confining layers to prevent impacts to groundwater resources. Additionally, project well completion methods will prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells are also a great distance from the project well, and therefore have minimal hydrologic connection.

Table 3.4a. Existing water wells near the project area (North Dakota State Water Commission 2009).

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer
148-089-04CDD	Viola Shettler	2001	4	T148N/ R89W	Domestic	217	Unknown
148-089-10CB	Leon Billadeau	1972	10	T148N/ R89W	Stock	170	Unknown
148-089-27CDC	Helen Wilkinson	1973	27	T148N/ R89W	Domestic	80	Unknown
148-089-32	Almit Breuer	1978	32	T148N/ R89W	Stock	1,040	Unknown

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer
148-089-33CC	Almit Breuer	1986	33	T148N/ R89W	Stock	1,387	Unknown
148-090-03	Wilbur Schettler	1984	3	T148N/ R90W	Stock	825	Unknown
148-090-11	Wilbur Schettler	1984	11	T148N/ R90W	Stock	80	Unknown
148-090-15AAA	Larry Treujill	1985	15	T148N/ R90W	Domestic/Stock	96	Unknown
148-090-16ABC	Gene Voigt	1982	16	T148N/ R90W	Domestic	290	Unknown
148-090-25BC	Gary Beasley	1998	25	T148N/ R90W	Domestic	285	Unknown
148-090-25BC	Rod Green	1999	25	T148N/ R90W	Domestic	265	Unknown
148-090-25BC	Byron Holton	1999	25	T148N/ R90W	Domestic	220	Unknown
148-090-25BC	Gary Beasley	1999	25	T148N/ R90W	Domestic	246	Unknown
148-090-25BC	Byron Holton	1995	25	T148N/ R90W	Unknown	215	Unknown
148-090-25BC	Art Mielke	1995	25	T148N/ R90W	Domestic	200	Unknown
148-090-25BC	Robert Sherr	2002	25	T148N/ R90W	Domestic	314	Unknown
148-090-25BDD	Byron Holton	2000	25	T148N/ R90W	Stock	1,436	Unknown
148-090-26	Byron Holton	1973	26	T148N/ R90W	Domestic	139	Unknown
148-090-26AC	Byron Holton	1996	26	T148N/ R90W	Domestic/Stock	320	Unknown
148-090-26BC	Byron Holton	1974	26	T148N/ R90W	Domestic	300	Unknown
148-090-26DA	Byron Holton	2002	26	T148N/ R90W	Domestic	274	Unknown
147-089-03CCD	Darnell Sorenson	2005	3	T147N/ R89W	Domestic	321	Unknown
147-090-13	Pat Giese	2003	13	T147N/ R90W	Domestic	217	Unknown

3.5 Wetland/Riparian Habitat and Threatened or Endangered Species

Wetland/Riparian Habitat
National Wetland Inventory maps maintained by the U.S. Fish and Wildlife Service (USFWS) do not identify any jurisdictional wetlands within the proposed well pad or access road. No wetlands were observed along the access road ROW or at the well site during surveys conducted by SWCA Environmental Consultants (SWCA) biologists in July 2009. No riparian or wetland habitats would be directly or indirectly impacted by the proposed access road or well.

Wildlife
Species may be listed by the USFWS as threatened or endangered under the Endangered Species Act (ESA). Tribes and states may recognize additional species of concern; such lists are taken under advisement by federal agencies but are not legally binding in the manner of the ESA.

The USFWS identifies six federally listed species occurring in McLean County (Table 3.5a). An informal Section 7 consultation has not yet occurred but can be conducted based on the information presented below. The following is a discussion of potentially affected habitat associated with these species.

Table 3.5a. Potential effect on threatened and endangered species likely to occur in the project area.

Common Name	Scientific Name	Potential Effect
Dakota skipper	*Hesperia dacotae*	May affect, but is not likely to adversely affect
Gray wolf	*Canis lupus*	No effect
Interior least tern	*Sterna antillarum*	May affect, but is not likely to adversely affect
Pallid sturgeon	*Scaphirhynchus albus*	May affect, but is not likely to adversely affect
Piping plover	*Charadrius melodus*	May affect, but is not likely to adversely affect
Whooping crane	*Grus americana*	May affect, but is not likely to adversely affect

No adverse effects on listed species would be expected due to the unlikely nature of their occurrence within the proposed project area. Interim reclamation and the use of BMPs over the life of the project would further reduce long-term impacts to all wildlife. Monitoring of species in the area would occur as part of the normal monitoring processes. Lake Sakakawea and the Little Missouri River contain suitable nesting sites for the piping plover and the interior least tern. The pallid sturgeon also inhabits these bodies of water and could be indirectly impacted by runoff if proper BMPs were not deployed. Table 3.5b summarizes the straight-line distances to Lake Sakakawea and the Little Missouri River from the well. Other wildlife observed during the site visit include an active vesper sparrow (*Pooecetes gramineus*) nest, turkey vultures (*Cathartes aura*), and Franklin's gulls (*Larus pipixcan*).

Table 3.5b. Straight-line distance to Lake Sakakawea and the Little Missouri River from the proposed well.

Proposed Well	Miles to Lake Sakakawea	Miles to Little Missouri River
Eagle 14-30H	0.15	9.12

3.6 Soils

A site visit was conducted during July 2009 to document existing soil conditions at the proposed well location and the associated proposed and existing access road. Specialists determined that the existing portions of the access roads are in good condition with no signs of erosion.

Site Description

The proposed access road for this location would extend west from 71st Avenue NW and follows an existing gravel road (BIA 5) for approximately 5,597 feet. The proposed access road would then travel southeast on an existing two-track for approximately 1,162 feet. Finally, 1,320 feet of new access road would be constructed to the south and attach to the 240- by 320-foot well pad. The following information was collected from a soil pit at the proposed new access road and well pad:

New Access Road

- At a depth of 0 to 8 inches, the soil texture is a silty clay loam, Munsell color 10YR 3/1 (very dark gray).
- At a depth of 8 to 16 inches, the soil texture is a clay loam, Munsell color 10YR 5/2 (grayish-brown).
- The pit was excavated on a slope of approximately 1 to 3 degrees.

Well Pad

- At a depth of 0 to 9 inches, the soil texture is a silty clay, Munsell color 10YR 3/1 (very dark gray).
- At a depth of 9 to 16 inches, the soil texture is a clay, Munsell color 10YR 3/2 (very dark grayish-brown).
- The pit was excavated on a slope of approximately 1 degree.

Conclusion

According to the Natural Resources Conservation Service (NRCS), the predominant soil type on which the access road and well location will be constructed is classified as a Cabba complex (Table 3.6a). The soil data collected on site is similar to the NRCS soil description of the Cabba series. The characteristics of this dominant soil type make it suitable for construction. In the areas where the Cabba Complex is present, the soil will have a very low runoff potential due to the soil's low erosion potential. Erosion will also be minimal due to a planned construction slope of 0.5 to 1.0 degree. The Cabba Complex shows characteristics such as a diverse group of native plants known to grow in these soils as well as being a well-drained soil. These characteristics should make reclamation successful at the time it is warranted.

Table 3.6a Soil series for currently undisturbed land that will require new construction.

Location	Soil Series	Percentage of Location	Acres
New Access Road	Cabba Complex	90	1.80
New Access Road	Regent Silty Clay Loam	10	0.20
Well Location	Cabba Complex	100	1.96

3.7 Vegetation and Invasive Species

Josh Ruffo, SWCA biologist, conducted the site visit in July 2009 to document existing vegetation conditions at the proposed location.

The access road was vegetated with purple coneflower (*Echinacea angusifolia*), porcupine grass (*Stipa spartea*), green needle grass (*Nassella viridula*), western wheatgrass (*Pascopyrum smithii*), and fringed sagewort (*Artemisia frigida*). The well pad was vegetated with goat's beard (*Tragopogon dubius*), western wheatgrass, fringed sage, wormwood (*A. absinthium*), common sagewort (*A. campestris*), black-eyed Susan

(*Rudbeckia hirta*), cheatgrass (*Bromus tectorum*), wild prairie rose (*Rosa blanda*), plains pricklypear (*Opuntia polycantha*), green ash (*Fraxinus pennsylvanica*), and silver buffaloberry (*Shepherdia argentea*). Wormword is listed as a noxious weed in the state of North Dakota and cheatgrass is considered an invasive plant. The land is currently being used for pasture.

The proposed project would create approximately 3.32 acres of short- and long-term surface disturbance, during which removal of existing vegetation could introduce noxious weeds into the project area. Infestations within the project area could spread to neighboring lands resulting in reductions in the quality or quantity of forage. Any risk of infestation on the well location will be reduced by the liner and rock covering at the location.

The APD and this Environmental Assessment (EA) require the developer to control noxious weeds within the project area. BMPs that would help prevent the spread of noxious weeds include:

- cleaning vehicles that have been driven in areas that contain non-native species with high-pressure water spray equipment before entering the project area;
- prohibiting vehicles and equipment from driving outside road ROWs and well pad locations;
- adding mulch to disturbed areas;
- planting cover crops to compete with weed species;
- using mechanical weed control; and
- educating project personnel about the importance of preventing the spread of noxious weeds.

No surface disturbance, including disturbance created by driving equipment or vehicles, outside of the approved ROW or well pad location would occur. Red Willow would conduct interim reclamation, as required by Onshore Order #1, to restore areas not needed following construction. Areas stripped of topsoil, with the exception of long-term disturbance on the well pads, would be reclaimed at the earliest opportunity. Seeding would occur after cessation of construction activities in the fall (September to November). If fall seeding cannot be completed, spring seeding should take place in February or March, as conditions dictate. Certified weed-free straw and seed would be used for all construction, seeding, and reclamation efforts.

3.8 Cultural Resources

Cultural resources is a broad term encompassing sites, objects, or practices of archaeological, historical, cultural and religious significance. Cultural resources on federal or tribal lands are protected by many laws, regulations and agreements. The *National Historic Preservation Act of 1966* (16 USC 470 *et seq*.) at Section 106 requires, for any federal, federally assisted or federally licensed undertaking, that the federal agency take into account the effect of that undertaking on any district, site, building, structure or object that is included in the National Register of Historic Places (National Register) before the expenditure of any federal funds or the issuance of any federal license. Eligibility criteria (36 CFR 60.6) include association with important events or people in our history, distinctive construction or artistic characteristics, and either a record of yielding or a potential to yield information important in prehistory or history. In practice, properties are generally not eligible for listing on the National Register if they lack diagnostic artifacts, subsurface remains or structural features, but those considered eligible are treated as though they were listed on the National Register, even when no formal nomination has been filed. This process of taking into account an undertaking's effect on historic properties is known as "Section 106 review," or more commonly as a cultural resource inventory.

The area of potential effect (APE) of any federal undertaking must also be evaluated for significance to Native Americans from a cultural and religious standpoint. Sites and practices may be eligible for protection under the *American Indian Religious Freedom Act of 1978* (42 USC 1996). Sacred sites may be identified by a tribe or an authoritative individual (Executive Order 13007). Special protections are afforded to human remains,

funerary objects, and objects of cultural patrimony under the *Native American Graves Protection and Repatriation Act* (NAGPRA, 25 USC 3001 *et seq.*).

Whatever the nature of the cultural resource addressed by a particular statute or tradition, implementing procedures invariably include consultation requirements at various stages of a federal undertaking. The MHA Nation has designated a Tribal Historic Preservation Officer (THPO) by Tribal Council resolution, whose office and functions are certified by the National Park Service. The THPO operates with the same authority exercised in most of the rest of North Dakota by the State Historic Preservation Officer (SHPO). As a result, BIA consults and corresponds with the THPO on all projects proposed within the exterior boundaries of the Fort Berthold Reservation. The SHPO may have useful information, but has no official role regarding proposed federal actions on trust land. The MHA Nation has also designated responsible parties for consultations and actions under NAGPRA and cultural resources generally.

A cultural resource inventory of this well pad and access road was conducted by personnel of SWCA Environmental Consultants, Inc., using a pedestrian methodology. Approximately 12.96 acres were intensively inventoried on July 14, 2009 (Crumbley 2009). No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking. This determination was communicated to the THPO on August 25, 2009, and the THPO concurred on September 11, 2009 (see Part 4).

3.9 Socioeconomics

Socioeconomic conditions include population, demographics, income, employment, and housing. These conditions can be analyzed and compared at various scales. This analysis focuses on the reservation, the four counties that overlap most of the Reservation and the state of North Dakota. The state population showed little change between the last two censuses (1990–2000), but there were notable changes locally, as shown in Table 3.9a. Populations in Dunn, McKenzie, McLean, and Mountrail counties declined 5 to 11%, while population on the Fort Berthold Reservation increased by almost 10%. These trends are expected to continue (Rathge *et al*. 2002). While American Indians are the predominant group on the reservation, they are a minority everywhere else in the state. More than two-thirds (3,986) of the Reservation population are tribal members.

Table 3.9a: Population and Demographics

County or Reservation	Population in 2000	% of State Population	% Change 1990-2000	Predominant Group	Predominant Minority
Dunn County	3,600	0.56%	- 10.1%	White	American Indian (12%)
McKenzie County	5,737	0.89%	- 10.1%	White	American Indian (21%)
McLean County	9,311	1.45%	- 11.0%	White	American Indian (6%)
Mountrail County	6,631	1.03%	- 5.6%	White	American Indian (30%)
Fort Berthold Reservation	5,915	0.92%	+ 9.8%	American Indian	White (27%)
Statewide	642,200	100%	+ 0.005%	White	American Indian (5%)

Source: U.S. Census Bureau 2007.

In addition to the ranching and farming that are employment mainstays in western North Dakota, employment on the reservation largely consists of ranching, farming, tribal government, tribal enterprises, schools, and federal agencies. The MHA Nation's Four Bears Casino and Lodge, near New Town, employs over 320 people, 90% of which are tribal members (Three Affiliated Tribes 2008).

As shown in Table 3.9b, counties overlapping the Reservation tend to have per capita incomes, median household incomes, and employment rates that are lower than North Dakota statewide averages. Reservation

residents have lower average incomes and higher unemployment rates compared to the encompassing counties. MHA Nation members are in turn disadvantaged relative to overall Reservation incomes and unemployment rates that average in non-Indian data. The most recent census found that per capita income for residents of the Reservation is $10,291 (less than ⅓ the state average). Overcrowded housing skews the median reservation household income upward to $26,274 (about ⅓ the state average). A BIA report in 2003 found that 33% of *employed* MHA Nation members were living below federal poverty levels. The unemployment rate for tribal members is 22 %, compared to 11.1% for the reservation as a whole and 4.6% statewide.

Table 3.9b: Income and Unemployment

Unit of Analysis	Per Capita Income	Median Household Income	Unemployment Rate (2007)	Employed but Below Poverty Level	Percent of All People in Poverty
MHA Nation members	--	--	22 %	33 %	Unknown
Fort Berthold Reservation	$ 10,291	$ 26,274	11.1 %	--	Unknown
Mountrail County	$ 29,071	$ 34,541	5.8 %	--	15.4%
Dunn County	$ 27,528	$ 35,107	3.4 %	--	13%
McKenzie County	$ 27,477	$ 35,348	3.1 %	--	15.8 %
McLean County	$ 32,387	$ 37,652	4.7 %	--	12.8%
North Dakota	$ 31,871	$ 40,818	3.2 %	--	11.2 %

Source: U.S. Department of Agriculture Economic Research Data 2008 and BIA 2003.

Availability and affordability of housing could impact oil and gas development and operations. Housing information is summarized in Table 3.9c. The tribal Housing Authority manages a majority of the housing units within the reservation. Housing typically consists of mutual help homes built through various government programs, low-rent housing units, and scattered-site homes. Private purchase and rental housing are available in New Town. New housing construction has recently increased within much of the analysis area, but availability remains low.

Table 3.9c: Housing Units – 2000 (U.S. Census Bureau 2007 and 2008).

Housing Development	Fort Berthold Reservation	Dunn County	McKenzie County	McLean County	Mountrail County
Existing Housing					
Owner-Occupied Units	1,122	1,570	2,009	4,332	2,495
Renter-Occupied Units	786	395	710	932	941
Total	1,908	1,965	2,719	5,264	3,436
New Private Housing Building Permits 2000-2005	--	18	4	135	113
Housing Development Statistics					
State rank in housing starts	--	51 of 53	15 of 53	21 of 53	17 of 53
National rank in housing starts	--	3112 / 3141	2498 / 3141	2691 / 3141	2559 / 3141

The proposed project is not expected to have measurable impacts on population trends, local unemployment rates or housing starts. Relatively high-paying construction jobs would result from exploration and development of oil and gas reserves on the reservation, but most of these opportunities are expected to be short-term. The proposed action would require temporary employees during the well construction cycle and one to two full-time employees for the long-term production cycle. Short-term construction employment would provide some economic benefit. Long-term commercial operations would provide significant royalty income and indirect economic benefits.

3.10 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, was signed by President Clinton in 1994. The Order requires agencies to advance

environmental justice (EJ) by pursuing fair treatment and meaningful involvement of minority and low-income populations. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions or operations. Meaningful involvement means federal officials actively promote opportunities for public participation and federal decisions can be materially affected by participating groups and individuals.

The U.S. Environmental Protection Agency (EPA) headed the interagency workgroup established by the 1994 Order and is responsible for related legal action. Working criteria for designation of targeted populations are provided in *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (EPA 1998). This guidance uses a statistical approach to consider various geographic areas and scales of analysis to define a particular population's status under the Order.

Environmental Justice is an evolving concept with potential for disagreement over the scope of analysis and the implications for federal responsiveness. It is nevertheless clear that tribal members on the Great Plains qualify for EJ consideration as both a minority and low-income population. The population of the Dakotas is predominantly Caucasian. While some 70% of Reservation residents are tribal members, Indians comprise only 5% of North Dakota residents and 12% of the population of Dunn County. Even in a state with relatively low per capita and household income, Indian individuals and households are distinctly disadvantaged.

There are, however, some unusual EJ considerations when proposed federal actions are meant to benefit tribal members. Determination of fair treatment necessarily considers the distribution of both benefits and negative impacts, due to variation in the interests of various tribal groups and individuals. There is also potential for major differences in impacts to resident tribal members and those enrolled or living elsewhere. A general benefit to MHA Nation government and infrastructure has already resulted from tribal leasing, fees and taxes. Oil and gas leasing has also already brought much-needed income to MHA Nation members who hold mineral interests, some of whom might eventually benefit further from royalties on commercial production. Profitable production rates at proposed locations might lead to exploration and development on additional tracts owned by currently non-benefitting allottees. The absence of lease and royalty income does not, moreover, preclude other benefits. Exploration and development would provide many relatively high-paying jobs, with oversight from the Tribal Employment Rights Office.

The owners of allotted surface within the project areas may not hold mineral rights. In such cases, surface owners do not receive oil and gas lease or royalty income and their only related income would be compensatory for productive acreage lost to road and well pad construction. Tribal members without either surface or mineral rights would not receive any direct benefits whatsoever. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is significantly reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there will be no historic properties affected. Nothing is known to be present, furthermore, that qualifies for protection under the *American Indian Religious Freedom Act*. Potential for disproportionate impacts is further mitigated by requirements for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultations will take place during any such work stoppage, affording an opportunity for all affected parties to assert their interests and contribute to an appropriate resolution, regardless of their home location or tribal affiliation.

The proposed project has not been found to pose significant impacts to any other critical element—air, public health and safety, water, wetlands, wildlife, soils or vegetation—within the human environment. Avoiding or minimizing such impacts also makes unlikely disproportionate impacts to low-income or minority populations. The proposed action offers many positive consequences for tribal members, while recognizing Environmental

Justice concerns. Procedures summarized in this document and in the APD are binding and sufficient. No laws, regulations or other requirements have been waived; no compensatory mitigation measures are required.

3.11 Mitigation and Monitoring

Many protective measures and procedures are described in this document and in the APD. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. Monitoring of cultural resource impacts by qualified personnel is recommended during all ground-disturbing activities.

3.12 Irreversible and Irretrievable Commitment of Resources

Removal and consumption of oil and/or gas from the Bakken Formation would be an irreversible and irretrievable commitment of resources. Other potential resource commitments include acreage devoted to disposal of cuttings, soil lost through wind and water erosion, cultural resources inadvertently destroyed, wildlife killed during earthmoving or in collisions with vehicles, and energy expended during construction and operation.

3.13 Short-Term Use Versus Long-Term Productivity

Short-term activities would not detract significantly from the long-term productivity of the project area. The small areas dedicated to the access road and well pad would be unavailable for livestock grazing, wildlife habitat and other uses. Allottees with surface rights would be compensated for loss of productive acreage and the project footprint would shrink considerably once the well were drilled and non-working areas were reclaimed and reseeded. Successful and ongoing reclamation of the landscape would quickly support wildlife and livestock grazing, stabilize the soil, and reduce the potential for erosion and sedimentation. The major long-term resource loss corresponds with the project purpose: extraction of hydrocarbons from the Bakken Formation.

3.14 Cumulative Impacts

Environmental impacts may accumulate either over time or in combination with similar events in the area. Unrelated and dissimilar activities may also have negative impacts on critical elements, thereby contributing to the cumulative degradation of the environment. Past and current disturbances in the vicinity of the project area include farming, grazing, roads, and other oil and gas wells. Reasonably foreseeable future impacts must also be considered. Should development of this well prove productive, it is likely that Red Willow and possibly other operators would pursue additional development in the area. Current farming and ranching is expected to continue with little change because virtually all available acreage is already organized into range units to use surface resources for economic benefit. Undivided interests in the land surface, range permits, and agricultural leases are often held by different tribal members than those holding mineral rights; oil and gas development is not expected to have more than a minor effect on land use patterns.

Figure 3.14 shows active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the project area. When this EA support document was prepared, approximately 260 oil and gas wells had been staked within the Reservation (D. Turcotte, Natural Resources Officer, personal communication with Josh Ruffo, SWCA, July 13, 2009). Table 3.14a summarizes the number of confidential, active, and dry wells within a radius of 1, 5, 10, and 20 miles of the project area.

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs would constrain proposed impacts. No significant negative impacts would be expected to any critical element of the human environment; impacts would generally be low and mostly temporary. Should this well prove productive, the proposed project may share its access road with other actual or proposed wells.

Red Willow has committed to conducting interim reclamation of the road and well pad immediately following construction and completion as allowed by regulations on reclamation and construction. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

Commercial success at the proposed site may result in additional oil and gas exploration proposals, but such developments remain speculative at this time. Additional cumulative impact analyses and BIA approvals would be required before the surface is disturbed at any other location. No significant cumulative impacts are reasonably foreseen from existing and proposed activities, other than increasingly positive impacts to the Reservation economy.

Reasonably foreseeable oil and gas development can be difficult to accurately track as new proposals are being submitted to the BIA on a regular basis.

Table 3.14a. Confidential, active, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the project area.

	1-mile		5-mile		10-mile		20-mile	
Reservation (On/Off)	On	Off	On	Off	On	Off	On	Off
Active Wells	**0**	**-**	**0**	**-**	**2**	**0**	**15**	**2**
Proposed Wells	**0**	**-**	**0**	**-**	**0**	**0**	**3**	**0**
Confidential	**0**	**-**	**1**	**-**	**1**	**0**	**17**	**3**

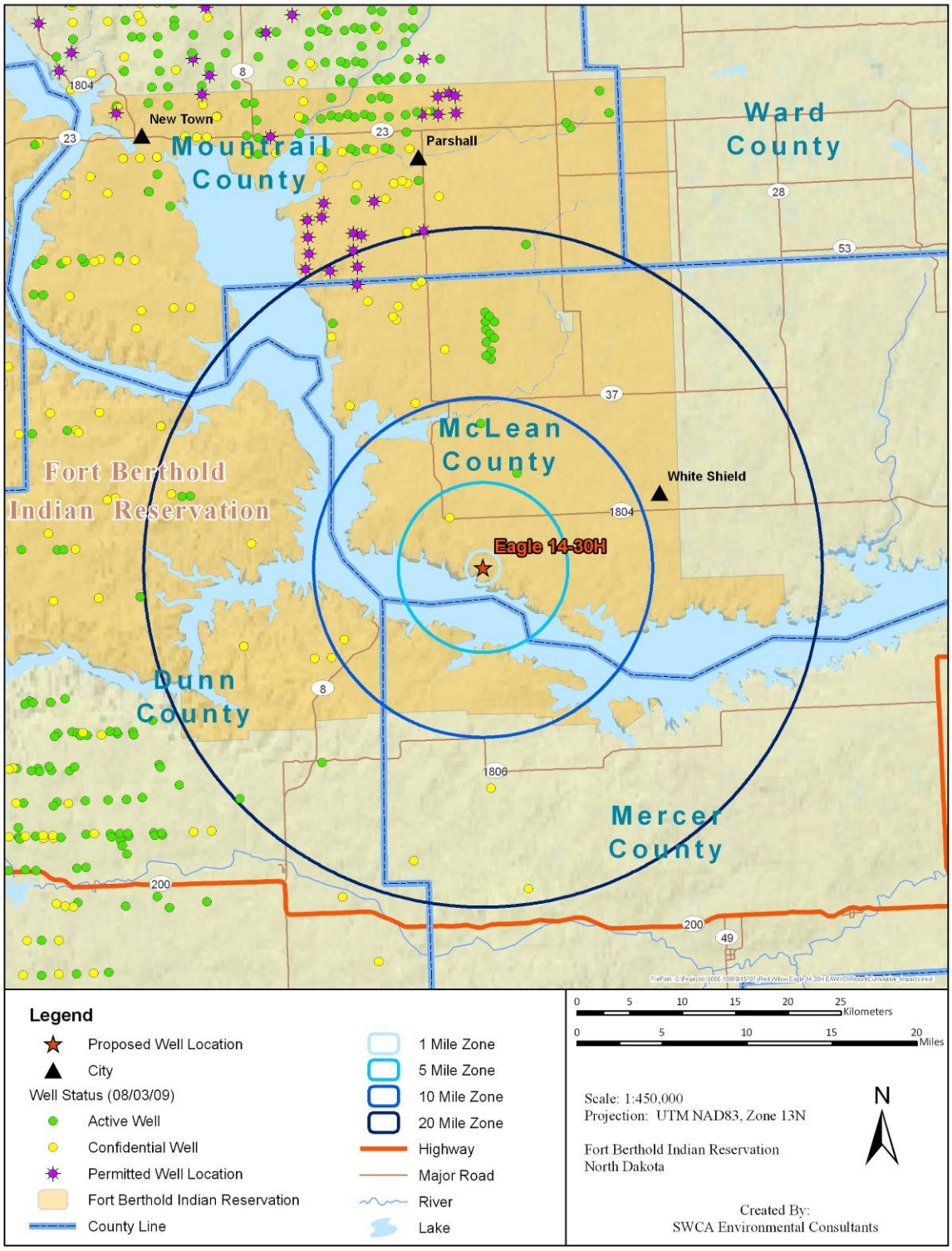

Figure 3.14. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the project location.

The Proposed Action, when combined with other oil and gas projects, may contribute to the depletion of oil and gas resources in the area if the well proves to be productive. In addition, construction of the well pad and access road for the Proposed Action combined with the disturbances from future oil and gas projects, road building, and construction of agricultural projects would incrementally alter the topographic character of the area. However, reclamation efforts would include recontouring and reseeding disturbed areas to minimize topographic disturbance.

It is anticipated that the pace and level of resource development within this region of the state will continue at the current rate over the next few years and contribute to cumulative air quality impacts. The Proposed Action would cumulatively contribute to emissions occurring within the region. In general, however, the increase in emissions associated with the Proposed Action—most of which would occur during well construction—would be localized, largely temporary, and limited in comparison with regional emissions. Therefore, it is unlikely that the project would significantly impact the cumulative air quality of the region.

No surface discharge of water would occur under the Proposed Action, nor would any surface water or groundwater be used during project development. The Proposed Action, when combined with other actions (cattle grazing, other oil and gas development, and agriculture) that are likely to occur in and near the project area in the future, would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and continue during production. Thus, the Proposed Action could incrementally add to existing and future sources of water quality degradation in the Good Bear Bay sub-watershed, but increases in degradation would be reduced by Red Willow's commitment to minimizing disturbance, using erosion control measures as necessary, and implementing BMPs designed to reduce impacts.

Unlike well pads, active roadways are not typically reclaimed, at the surface owner's request. Therefore, sediment yield from roads can continue above background rates indefinitely. The Proposed Action would create additional lengths of unpaved roadway in the project area. Thus, the Proposed Action would incrementally add to existing and future impacts to soil resources in the general area during production. However, Red Willow is committed to using BMPs to mitigate these effects. BMPs would include implementing erosion and sedimentation control measures, such as installing culverts with energy dissipating devices at culvert outlets to avoid sedimentation in ditches, constructing water bars along side slopes, planting cover crops to stabilize soil following construction and before permanent seeding takes place, and placing straw bales around the well pad.

Vegetation resources across the project area could be affected by various activities, including additional energy development and surface disturbance of quality native prairie areas that have been largely undisturbed by development activities, grazing, and agriculture. Indirect impacts to native vegetation also could be a possibility if soil loss and compaction and the increased encroachment of invasive weed species are not managed. Continued oil and gas development within the Reservation could result in the loss, and further fragmentation, of native mixed-grass prairie habitat. Past, present, and reasonably foreseeable future activities within the general area have reduced, and would likely continue to reduce, the amount of available habitat for listed species.

Significant archaeological resources are irreplaceable and often unique; any destruction or damage of such resources can be expected to diminish the archaeological record as a whole. However, no such damage or destruction of significant archaeological resources would be anticipated as a result of the Proposed Action, as these resources would be avoided, negating the cumulative impacts to the archaeological record.

The Proposed Action would incrementally add to existing and future socioeconomic impacts in the general area. The Proposed Action includes one well, which would be an additional source of revenue for some residents of the Reservation. Increases in employment would be temporary during the construction, drilling, and completion phases of the proposed project. Therefore, little change in employment would be expected over the long term.

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs would limit potential impacts. No significant negative impacts would be expected to affect any critical element of the human environment; impacts would generally be low and mostly temporary. Red Willow has committed to implementing interim reclamation of the road and well pad immediately following construction and completion as allowed by regulations on reclamation and construction. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

4. Consultation and Coordination

The Bureau of Indian Affairs has completed many Environmental Assessments (EAs) for the oil and gas projects at Fort Berthold since 2007. For the first 18 of these projects, prior notice was sent to about 60 tribes, government agencies, non-profit organizations and individuals. BIA consulted directly and repeatedly with the U.S. Fish and Wildlife Service to identify issues and incorporate best management practices for wildlife protection. BIA also routinely cooperated on every project with the Bureau of Land Management regarding operational standards and reclamation procedures.

Responses to previous notifications quickly became repetitious, usually consisting of form letters advising BIA that the respondent had no concerns or that the same general concerns applied to every project proposal. BIA has therefore discontinued mailing of individual notices for Fort Berthold oil and gas environmental review, except where proposals include unusual components not previously considered with other interested parties. There are no such components to the proposal analyzed in this EA. BIA is satisfied that the proper scope of analysis for such projects is known.

This justified simplification of NEPA procedures does not impact in any way BIA practices regarding cultural resource regulations and standard practices under the National Historic Preservation Act. Correspondence with the Tribal Historic Preservation Officer is reproduced below.

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Great Plains Regional Office
115 Fourth Avenue S.E.
Aberdeen, South Dakota 57401

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

AUG 2 5 2009

Perry 'No Tears' Brady, THPO
Mandan, Hidatsa and Arikara Nation
404 Frontage Road
New Town, North Dakota 58763

Dear Mr. Brady:

We have considered the potential effects on cultural resources of an oil well pad and access road in McLean County, North Dakota. Approximately 12.96 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking. Catalogued as **BIA Case Number AAO-1658/FB/09,** the proposed undertaking, location, and project dimensions are described in the following report:

Crumbley, Norma
(2009) A Class III Cultural Resource Inventory of the Red Willow Eagle 14-30H Well Pad and Access Road on the Fort Berthold Indian Reservation, McLean County, North Dakota. SWCA Environmental Consultants for Red Willow Great Plains LLC, Ignacio, Colorado.

If your office concurs with this determination, consultation will be completed under the National Historic Preservation Act and its implementing regulations. The Standard Conditions of Compliance will be adhered to.

If you have any questions, please contact Dr. Carson N. Murdy, Regional Archaeologist, at (605) 226-7656.

Sincerely,

ACTING Regional Director

Enclosure

cc: Chairman, Three Affiliated Tribes
Superintendent, Fort Berthold Agency
Chief, Division of Energy and Environment

TRIBAL HISTORIC PRESERVATION
Mandan Hidatsa Arikara
Perry 'No Tears' Brady, Director.
404 Frontage Road,
New Town, North Dakota 58763
Ph/701-862-2474 fax/701-862-2490
pbrady@mhanation.com

Three Affiliated Tribes
MANDAN * HIDATSA * ARIKARA

September 11, 2009

Carson Murdy
Regional Archeologist
Bureau of Indian Affairs
Great Plains Regional Office
115 Fourth Avenue SE
Aberdeen, SD, 57401

RE: Project # AAO-1658/FB/09
Red Willow Eagle 14-30H well pad and access road

Dr. Murdy:

After review of the documentation provided, the Mandan Hidatsa Arikara Nations Tribal Historic Preservation Office concurs with the determination of 'No Adverse Affect'/No Historic Properties Affected' to any pre and post-historic relics, artifacts or sacred and cultural resources in the proposed Project area.

We respectfully request to be notified should any NAGPRA issue or others arise as the Project progresses.

Sincerely,

Perry Brady pc

Perry 'No Tears' Brady,
Tribal Historic Preservation Officer,
Mandan Hidatsa Arikara Nations.

THPO concurrence letter

5. List of Preparers

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations. Portions of the documents were drafted by SWCA Environmental Consultants under contract to Red Willow Great Plains, LLC under the direction of BIA. Preparers, reviewers, consultants and federal officials include the following:

- Sarah Ruffo, Environmental Specialist, SWCA Environmental Consultants
  Prepared Environmental Assessment
- Joshua Ruffo, Project Manager/Environmental Specialist, SWCA Environmental Consultants
  Conducted natural resource surveys for well pads and access roads
- Michael Cook, Project Manager/Environmental Specialist, SWCA Environmental Consultants
  Completed Resource Report
- Jonathan Markman, Archaeologist/Field Coordinator, SWCA Environmental Consultants
  Conducted cultural resource surveys for well pads and access roads
- Richard Wadleigh, Senior NEPA Planner, SWCA Environmental Consultants
  Reviewed Environmental Assessment
- Stephanie Lechert, Archaeologist, SWCA Environmental Consultants
  Conducted cultural resource surveys for well pads and access roads
- Amarina Wuenschel, GIS Specialist, SWCA Environmental Consultants
  Created maps and spatially derived data
- Brent Sobotka, Hydrologist, SWCA Environmental Consultants
  Completed Water Resources section
- Norma Crumbley, Archaeologist, SWCA Environmental Consultants
  Completed Cultural Resource reports
- Division of Environment Safety and Cultural Resources, BIA

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7. Acronyms

AAQM	Ambient Air Quality Monitoring (site)
AIRFA	American Indian Religious Freedom Act
APD	Application for Permit to Drill
APE	Area of Potential Affect
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
GPRO	Great Plains Regional Office
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa and Arikira Nation
NAGPRA	Native American Graves Protection and Repatriation Act
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIC	North Dakota Industrial Commission
NDNH	North Dakota Natural Heritage
ND SWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPAL	Northern Plains Agroecosystems Laboratory
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTL	Notice to Lessees
SHPO	State Historic Preservation Officer
TCP	Traditional Cultural Property
TERO	Tribal Employment Rights Office
THPO	Tribal Historic Preservation Officer
TVD	Total Vertical Depth
USC	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey