United States Department of the Interior

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

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IN REPLY REFER TO:
DESCRM
MC-208

SEP 09 2010

MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: Regional Director, Great Plains Region

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for the proposed Environmental Assessment to Authorize Land Use for drilling two horizontal oil and gas wells named Birdbear 6C-1 and Yellowbird 6A-1H on two pad locations on the Fort Berthold Reservation, an Environmental Assessment (EA) has been completed and a Finding of No Significant Impact (FONSI) has been issued.

All the necessary requirements of the National Environmental Policy Act have been completed. Attached for your files is a copy of the EA, FONSI and Notice of Availability. The Council on Environmental Quality (CEQ) regulations require that there be a public notice of availability of the FONSI (1506.6(b)). Please post the attached notice of availability at the agency and tribal buildings for 30 days.

If you have any questions, please call Marilyn Bercier, Regional Environmental Scientist, Division of Environment, Safety and Cultural Resources Management, at (605) 226-7656.

Attachment

cc: Marcus Levings, Chairman, Three Affiliated Tribes (with attachment)
Perry "No Tears" Brady, THPO (with attachment)
Roy Swalling, BLM, Dickenson, ND (with attachment)
John Shelman, US Army Corps of Engineers
Jeff Hunt, Virtual One Stop Shop
Jeffrey Towner, Field Supervisor, U.S. Fish and Wildlife Service

Finding of No Significant Impact

Enerplus Resources (USA) Corporation

Environmental Assessment for Two Bakken Exploratory Oil Wells: Birdbear 6C-1H Yellowbird 6A-1H

Fort Berthold Indian Reservation Dunn County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal to authorize the land use by Enerpus for the drilling of two horizontal oil and gas wells on two pad locations located in SE¼ SW¼ of Section 6, Township (T) 149 North (N), Range (R) 93 West (W), Dunn County and NW¼ NE¼ of Section 6, T149N, R93W, Dunn County, North Dakota. The proposed gathering pipelines would transport oil, gas, and produced water from productive wells to markets and disposal facilities on the Fort Berthold Indian Reservation. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

Potential of the proposed actions to impact the human environment is analyzed in the attached addendum to an existing Environmental Assessment (EA), as required by the National Environmental Policy Act. Based on the recently completed addendum to the 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. This guidance includes the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) (MBTA), the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.) (NEPA), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) (BGEPA), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", and the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA).

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

9/9/10
Date

Notice of Availability and Appeal Rights

Enerplus: Birdbear 6C-1H and Yellowbird 6A-1H

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to an Environmental Assessment to Authorize Land Use for the Birdbear 6C-1H and Yellowbird 6A-1H as shown on the attached map. Construction by Enerplus is expected to begin in the Summer/Fall of 2010.

An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No Significant Impact (FONSI).

The FONSI is only a finding on environmental impacts – it is not a decision to proceed with an action and *cannot* be appealed. BIA's decision to proceed with administrative actions *can* be appealed until October 9, 2010, by contacting:

United States Department of the Interior
Office of Hearings and Appeals
Interior Board of Indian Appeals
801 N. Quincy Street, Suite 300, Arlington, Va 22203.

Procedural details are available from the BIA Fort Berthold Agency at 701-627-4707.

Project locations

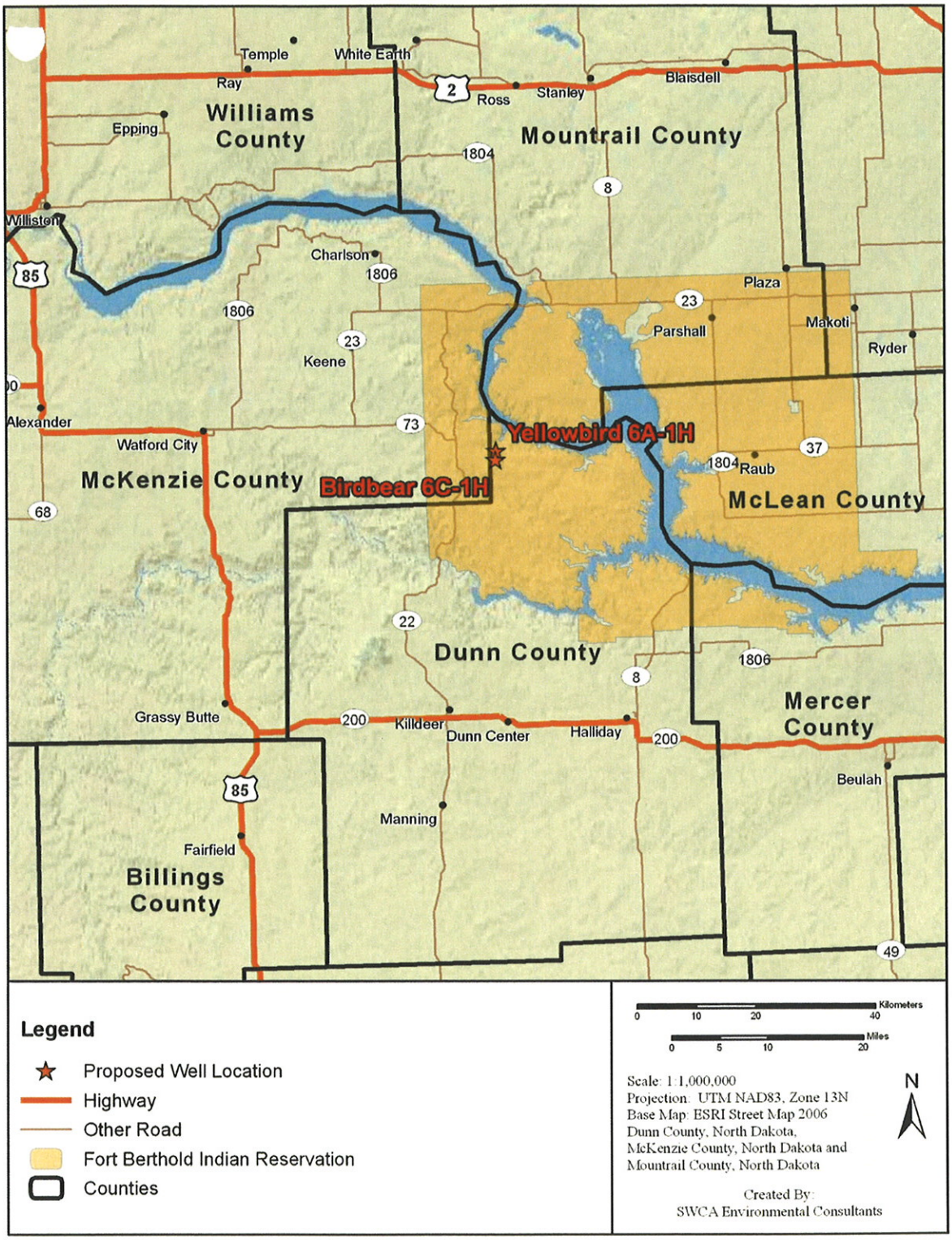

Figure 1. Birdbear 6C-1H and Yellowbird 6A-1H.

ENVIRONMENTAL ASSESSMENT

United States Department of the Interior
Bureau of Indian Affairs

Great Plains Regional Office
Aberdeen, South Dakota

Cooperating Agency:

Bureau of Land Management

North Dakota State Office
Dickinson, North Dakota

Enerplus Resources (USA) Corporation

Two Bakken Exploratory Oil Wells:

Birdbear 6C-1H
Yellowbird 6A-1H

Fort Berthold Indian Reservation

September 2010

For information contact:
Bureau of Indian Affairs, Great Plains Regional Office
Division of Environment, Safety and Cultural Resources Management
115 4th Avenue SE, Aberdeen, South Dakota 57401 (605) 226-7656

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

Enerplus Resources (USA) Corporation (Enerplus) has acquired the leases and is proposing to drill two horizontal oil and gas wells on two pad locations on the Fort Berthold Indian Reservation (Reservation) to evaluate, and possibly develop, the commercial potential of natural resources. Developments have been proposed on lands held in trust by the United States in Dunn County, North Dakota. The 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. Development has been proposed in locations that target specific areas in the Middle Bakken member of the Bakken Formation, a known oil reserve. The following proposed well sites, shown in Figure 1.1 and Figure 1.2, would be located within the Reservation in which the majority of the external boundaries are located above the Bakken Formation.

- **Birdbear 6C-1H**: SE¼ SW¼ of Section 6, Township (T) 149 North (N), Range (R) 93 West (W), Dunn County
- **Yellowbird 6A-1H:** NW¼ NE¼ of Section 6, T149N, R93W, Dunn County

New access roads would be constructed in order to facilitate the construction and operation of each proposed well. Well pads would be constructed to accommodate drilling activities and well operations. Pits constructed for drilled cuttings would be used during drilling operations and reclaimed once operations have ceased. Should any of the proposed well sites result in long-term commercial production, supporting facilities may be constructed on site. All components (i.e., roads, well pads, supporting facilities) would be reclaimed upon final abandonment unless formally transferred, with federal approval, to either the BIA or the landowner. The proposed wells are exploratory; should they prove productive, further exploration of surrounding areas is possible.

This environmental assessment (EA) addresses the potential impacts associated with the construction, and possible long-term operation, of the above-listed wells and directly related infrastructure and facilities. Further oil and gas exploration and development would require additional National Environmental Policy Act of 1969 (NEPA) analysis and federal actions.

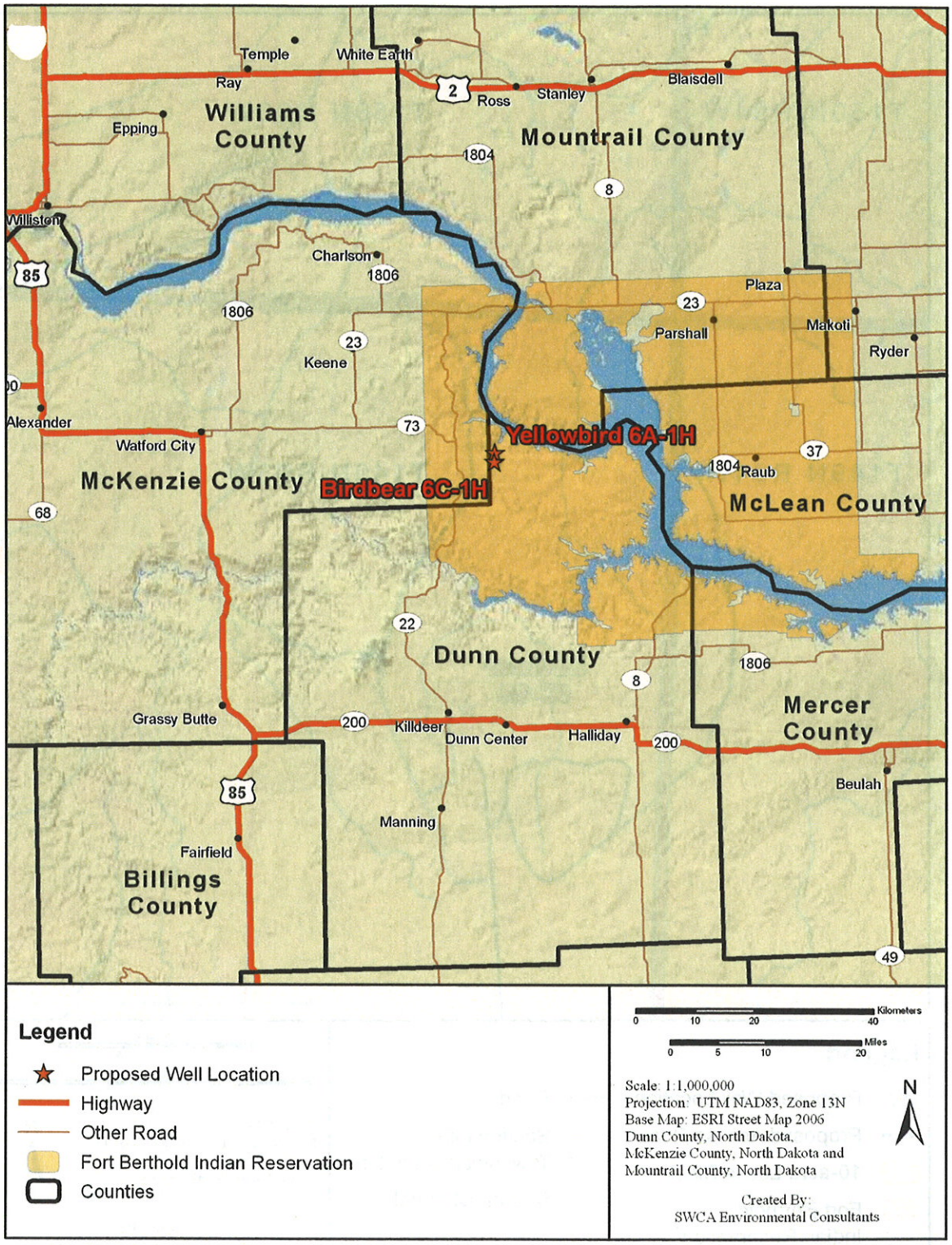

Figure 1.1. Project location.

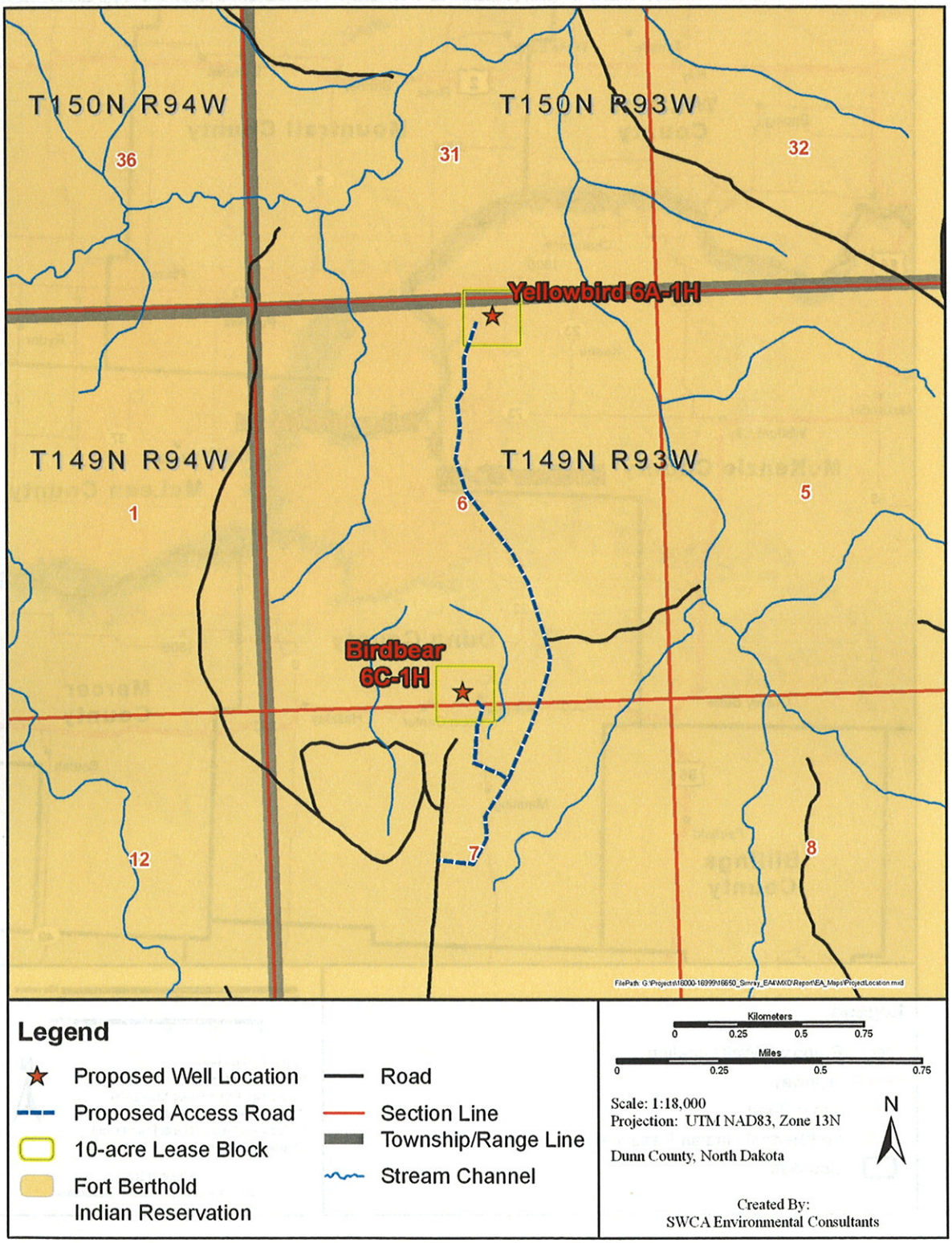

Figure 1.2. Proposed well locations.

1.2 FEDERAL AND OTHER RELEVANT REGULATIONS AND AUTHORITIES

The BIA's general mission is to represent the interests, including the trust resources, of members of the Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara (MHA) Nation, as well as those of individual tribal members. All members of the MHA Nation, including individual allotment owners, would benefit substantially from the development of oil and gas exploration on the Reservation. Oil and gas exploration and subsequent development are under the authority of the Energy Policy Act of 2005 (42 United States Code [USC] 15801, et seq.), the Federal Onshore Oil and Gas Royalty Management Act of 1982 (30 USC 1701, et seq.), the Indian Mineral Development Act of 1982 (25 USC 2101, et seq.), and the Indian Mineral Leasing Act of 1938 (25 USC 396a, et seq.). The BIA's role in the proposed project includes approving easements, leases, and rights-of-way (ROWs); determining effects on cultural resources; and making recommendations to the Bureau of Land Management (BLM).

Compliance with NEPA, the Council on Environmental Quality (CEQ) regulations (Title 40 Code of Federal Regulations [CFR] 1500–1508), 43 CFR 3100, and Onshore Oil and Gas Order Nos. 1, 2, 6, and 7 is required due to the project's location on federal lands. The BLM is responsible for the final approval of all Applications for Permit to Drill (APDs) after receiving recommendations for approval from the BIA. The BLM is also tasked with on-site monitoring of construction and production activities as well as resolution of any dispute that may arise as a result of any of the aforementioned actions.

The procedures and technical practices described in the APD supporting documents and in the EA would describe potential impacts to the project area. This EA analyzes potential impacts to elements in the natural and human environment for both the No Action Alternative (described in Section 2.1) and the Proposed Action. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. The EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts.

This EA would result in either a Finding of No Significant Impact (FONSI) or, should significant adverse impacts be identified as a result of the direct, indirect, or cumulative effects of the Proposed Action, then the NEPA requires the preparation of an environmental impact statement (EIS). In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* require preparation of an EIS.

Commercial viability of the proposed wells could result in additional exploration in the area. Should future oil/gas exploration activities be proposed wholly or partly on trust land, those proposals and associated federal actions would require additional NEPA analysis and BIA consideration prior to implementation and/or production activities.

Enerplus would comply with all applicable federal, state, and tribal laws, rules, policies, regulations, and agreements. No disturbance of any kind can begin until all required clearances, consultations, determinations, easements, leases, permits, and surveys are in place.

2.0 PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

The BIA, as directed by the NEPA, must "study, develop, and describe appropriate alternatives to the recommended course of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources..." (NEPA Sec 102[2][e]). Developing a range of alternatives allows for exploration of options designed to meet the purpose and need for the action. Along with the No Action Alternative, the BIA is considering the Proposed Action.

2.1 THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed project, including well pads, wells, and access roads, would not be constructed, drilled, installed, or operated. The BIA would not approve easements, leases, or ROWs for the proposed locations and the BLM would not approve the APD. No impacts would occur as a result of this alternative to 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, socioeconomic conditions, 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, and traffic levels 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 these well locations.

2.2 THE PROPOSED ACTION

This document analyzes the potential impacts of two exploratory oil and gas wells on two pad locations with varied surface and mineral estates located in the west-central portions of the Reservation in Dunn County. Sites were chosen by Enerplus in consultation with tribal and BIA resource managers to provide information for future development. Well site locations underwent a pre-clearance process that included surveys for cultural, archaeological, and natural (i.e., biological and physical) resources. The proposed wells would test the commercial potential of the Middle Bakken member of the Bakken Formation. The EA on-site meeting for both well site locations and proposed access roads was conducted June 10, 2010. The on-site meeting was attended by the surveyor, natural and cultural resource specialists, the Enerplus representative, the BIA representative, and the Tribal Historic Preservation Office (THPO) monitor. Surveys were conducted at that time to determine potential impacts to resources; topography, potential drainage issues, erosion control measures, and pad and related facility locations (topsoil/subsoil stockpiles, reserve pits, tanks, etc.) were also discussed at the on-site and the location was finalized. Three cultural resources were identified during survey. Two were historic in age and recommended not eligible for the National Register of Historic Places; no further work or recommendations are required for those resources. One prehistoric resource identified near the area of potential effect (APE) was found to be potentially eligible for the National Register of Historic Places. Adjacent the site, it is recommended that construction personnel avoid the temporary ROW. The construction corridor will be limited to the 30-foot-wide permanent ROW; all vehicle traffic and constructions activities will be limited to this corridor. The restricted area will be 200 feet

in total length and only applies to the eastern portion of the temporary ROW between the site and access road centerline. Fencing would be required around the culturally sensitive area and along the edge of the construction corridor adjacent the site boundary. Additionally, a qualified archaeological monitor would be required to be present during all ground-disturbing activities to ensure that inadvertent impacts to cultural resources are avoided.

2.2.1 Field Camps

A few personnel would be housed in self-contained trailers for a very short period of time. Long-term housing is not being proposed. Most personnel, both construction and drilling, would commute to the site. Human waste would be collected on site in portable toilets and trailers and it would be transported off site to a state-approved wastewater treatment facility. All other solid waste would be contained in enclosed containers and transported to, and disposed of at, state-approved facilities.

2.2.2 Access Roads and Utility Corridor

An existing driveway that extends north approximately 3,316 feet from BIA Road 12 would be used by Enerplus to provide access to the new roads that would be constructed to the two well locations. Up to 9,460.1 feet (i.e., 1.79 miles) of new access roads would be constructed. A maximum disturbed ROW width of 60 feet for each access road would result in up to 14.3 acres of new surface disturbance. Signed agreements would be in place allowing road construction across affected private and allotted land surfaces, and any applicable approach permits and/or easements would be obtained prior to any construction activity.

Construction would follow road design standards outlined in the BLM Gold Book (BLM and U.S. Forest Service [USFS] 2007). At a minimum, 6 inches of topsoil would be removed from the access road corridors. This stockpiled topsoil would then be placed on the outside slopes of the ditches following road construction. The ditches would be reseeded as quickly as possible using a seed mixture determined by the BIA. Care would be taken during road construction to avoid disturbing or disrupting any buried utilities that may exist, either along BIA Road 12 or in the vicinity of new road construction. The access roads would be surfaced with a minimum of 4 inches of aggregate prior to commencement of drilling operations and would remain in use for the life of the wells. Details of road construction are addressed in the APD. A diagram of typical road cross sections is shown in Figure 2.1.

Enerplus also proposes to construct and install oil, gas, and water gathering pipelines from BIA 12, along the existing driveway and the new access roads to both well locations. A buried electric line would be installed in the future. The utility corridor would be part of the proposed ROW and no additional disturbance is anticipated.

2.2.3 Well Pads

The proposed well pads would include a leveled area (pad) and a pit. The pad would be used for the drilling rig and equipment and the pit would be excavated, lined, and used for drilling cuttings. The pads would be stripped of topsoil and vegetation and then graded. The topsoil would be stockpiled and stabilized with a cover crop until it could be used to reclaim and revegetate the disturbed area. The subsoils would be used in the construction of the pad and the finished pads would be graded to ensure that water drains away from the pad. Erosion

control Best Management Practices (BMPs) would be implemented and could include surface drainage controls, soil surface protection methodologies, and sediment capture features.

The well pads average approximately 400 by 350 feet in size (3.13 acres per well pad). Cut-and-fill slopes, stockpiled topsoil, and reserve pit backfill placed on the edge of the pads would result in approximately 0.1 acre of additional surface disturbance per pad. Total surface disturbance would average approximately 3.2 acres per well pad and would total 6.4 acres. Details of pad construction and reclamation can be found in the APD.

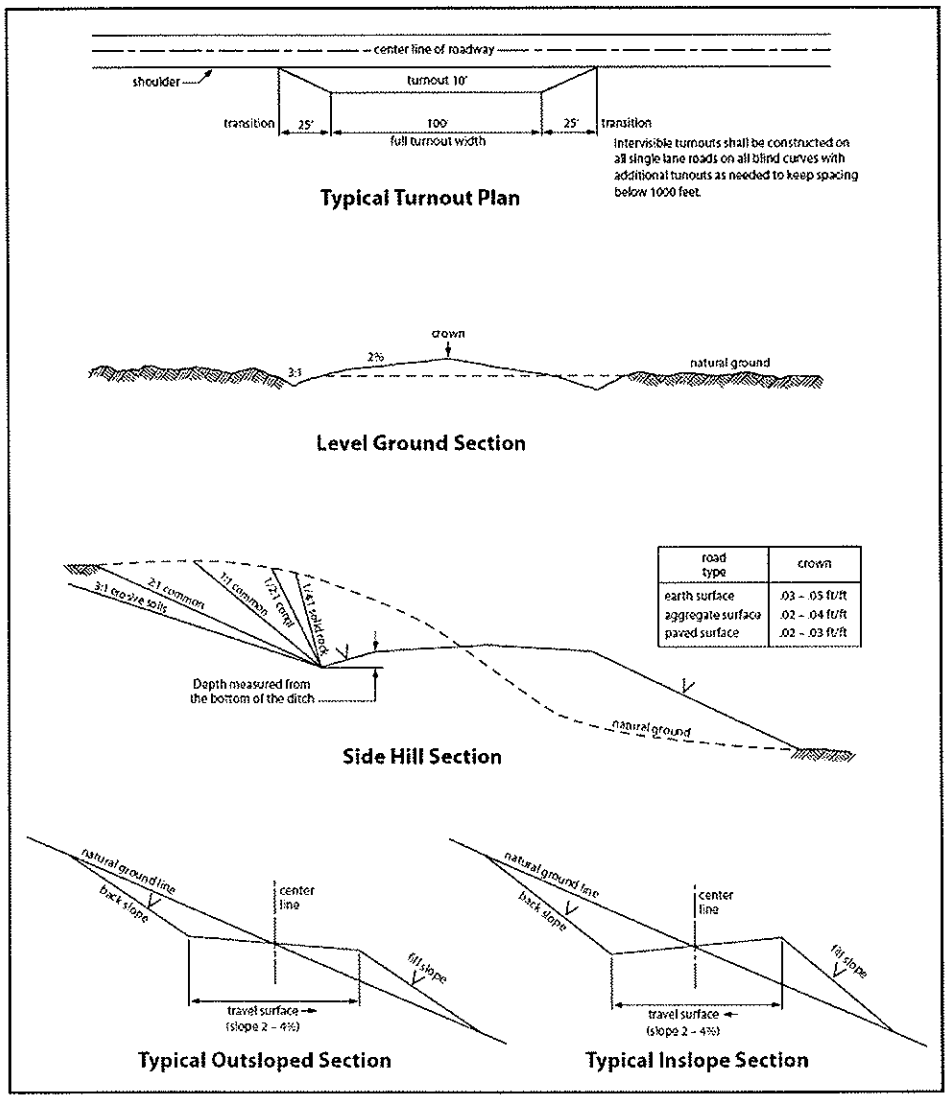

Figure 2.1. Typical road cross sections (BLM and USFS 2007).

2.2.4 Drilling

After securing mineral leases, Enerplus submitted the Notices of Staking to the BLM on June 25, 2010. The BIA's office in New Town, North Dakota, receives copies of the APD from the BLM North Dakota Field Office. Construction would begin only when the BIA completes the NEPA process and the APDs are subsequently approved by the BLM.

Enerplus uses a semi-closed loop drilling system. Rig transport and on-site assembly would take roughly seven days for each well; a typical drill rig is shown in Figure 2.2. Drilling would require approximately 35 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 15,100 feet. For the first 2,000 feet drilled, a freshwater-based mud system (1.26 gallons per foot of hole drilled) with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage.

After setting and cementing the near-surface casing, an oil-based mud system (80% to 85% diesel fuel and 15% to 20% water) would be used to drill to a 7-inch casing point at approximately 11,099 feet. Oil-based drilling fluids reduce the potential for hole sloughing while drilling through water-sensitive formations (shales/salts). Approximately 3,400 gallons of salt water and 13,400 gallons of diesel fuel per well would be used to complete vertical drilling. The lateral reach of the borehole would be drilled using approximately 63,000 gallons of salt water as mud and adding polymer sweeps as necessary to clean the hole.

Figure 2.2. Typical drilling rig.

2.2.5 Casing and Cementing

Surface casing would be set at an approximate depth of 1,930 feet and cemented back to the surface during drilling, isolating all near-surface freshwater aquifers in the project area. The Fox Hills Formation/Pierre Formation would be encountered at a depth of approximately 1,800 to 1,900 feet. Production casing would be cemented from approximately 11,109 feet deep to a depth of about 4,700 feet in order to isolate the hydrocarbon zone present in the Dakota Formation below at an average depth of 5,200 feet. Casing and cementing operations would be conducted in full compliance with Onshore Oil and Gas Order No. 2 (43 CFR 3160).

2.2.6 Completion and Evaluation

A completion rig unit would be moved on site following the conclusion of drilling and casing activities. Approximately 30 days are usually required, at the proposed well depths, 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. The typical procedure for fracturing a target formation to increase production includes pumping a mixture of sand and a carrier (e.g., water and/or nitrogen) downhole under extreme pressure. The resulting fractures are propped open by the sand, increasing the capture zone of the well and subsequently maximizing the efficient drainage of the field. After fracturing, the well is "flowed back" to the surface where fracture fluids are recovered and disposed of in accordance with North Dakota Industrial Commission (NDIC) rules and regulations.

2.2.7 Commercial Production

If drilling, testing, and production support commercial production from any of the two proposed locations, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, tanks (usually 400-barrel steel tanks), and a flare pit (Figure 2.3). An impervious dike sized to hold 110% of the capacity of the largest tank. Load out lines would be located inside the diked area and a heavy screen-covered drip barrel would be installed under the outlet. A metal access staircase would protect the dike and support flexible hoses used by tanker trucks. For all above-ground facilities not subject to safety requirements, the BIA would choose a paint color, recommended by the BLM or the Rocky Mountain Five-State Interagency Committee, which would blend with the natural color of the landscape. Commercial production would be discussed more fully in subsequent NEPA analyses.

Figure 2.3. Typical producing oil well pad (Sobotka 2008).

Oil would be collected in tanks installed on location 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 oil and produced water would depend upon volumes and rates of production. The duration of production operations cannot be reliably predicted, but some oil wells have pumped for more than 100 years. The operator estimates that each well would yield approximately 180 barrels of oil per day and 40 barrels of water during the first year of production. After the first year, the operator estimates production would decrease to approximately 40 to 60 barrels of oil per day and 10 to 15 barrels of water. Produced water is mostly recovered frac fluids and is expected to become minimal after two years.

Large volumes of gas are not expected from these locations. Small volumes would be flared in accordance with Notice to Lessees (NTL) 4A and adopted NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (North Dakota Century Code [NDCC] 38-08-06.4).

In the future, the operator may apply for ROWs for oil and water pipelines and for an electric line, all of which would likely be located within existing disturbance along access and arterial roads. For purposes of this EA, a survey corridor was sized to accommodate the full utility corridor, including the access road and future pipelines and electric line.

2.2.8 Construction Details at Individual Sites

2.2.8.1 Birdbear 6C-1H Well Pad

The proposed Birdbear 6C-1H well site, seen in Figure 2.4, is located approximately 2.4 miles northeast of Mandaree in the SE¼ SW¼ of Section 6, T149N, R93W in Dunn County, North Dakota. A new access road approximately 3,037 feet long would be constructed to connect to

the Yellowbird 6A-1H access road (see Figure 1.2) and to BIA Road 12 to the south (Figure 2.5). The new road would disturb approximately 4.60 acres; the proposed well pad would disturb approximately 3.15 acres, bringing the total anticipated new disturbance to 7.75 acres.

Figure 2.4. Birdbear 6C-1H well pad area, looking west.

Figure 2.5. Birdbear 6C-1H well site access road, looking east.

An additional site visit to revise the pad layout was conducted by the BIA and a company representative on June 23, 2010. Due to the tight configuration of the revised Birdbear 6C-1H well pad and the surrounding topography, the BIA will require the following.

- Two-foot berms must be constructed and silt barrier fencing must be installed on the west, north, and northeast sides of the well pad.
- Matting must be laid and/or hydroseeding must take place on the fill side of the pad.
- Trees and other woody material removed from the pad must be ground and added to the topsoil.

Please see Section 3.9 Mitigation and Monitoring for more information regarding BMPs and other protection measures.

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the NW¼ NW¼ of Section 6, T149N, R93W (Figure 2.6). Vertical drilling would be completed at approximately 10,264 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 10,837 feet. The drill string would total approximately 15,630 feet at the total measured depth (TMD), including approximately 4,466 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 550 feet from the north line and 550 feet from the west line, about 4,959 feet northwest of the surface hole location. A setback of at least 500 feet would be maintained.

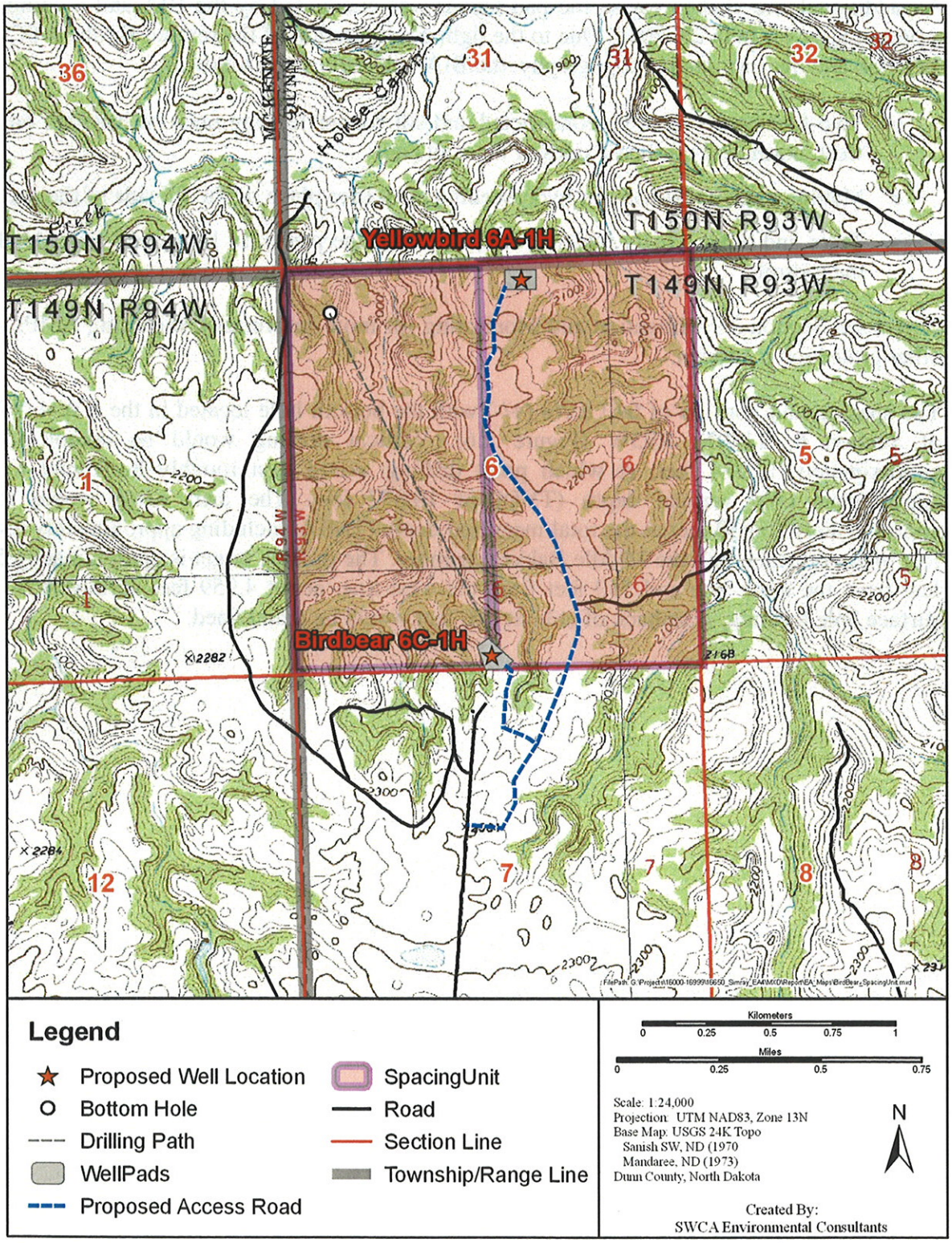

Figure 2.6. Birdbear 6C-1H proposed location showing spacing unit and drilling target.

2.2.8.2 Yellowbird 6A-1H Well Pad

The proposed Yellowbird 6A-1H well site, seen in Figure 2.7, is located approximately 3.0 miles west-southwest of Mandaree in the NW¼ NE¼ of Section 6, T149N, R93W in Dunn County, North Dakota. A new access road approximately 6,424 feet long would be constructed to connect to BIA Road 12 (Figure 2.8). The new road would disturb approximately 9.73 acres; the proposed well pad would disturb approximately 3.01 acres, bringing the total anticipated new disturbance to 12.7 acres.

Figure 2.7. Yellowbird 6A-1H well pad area, looking west.

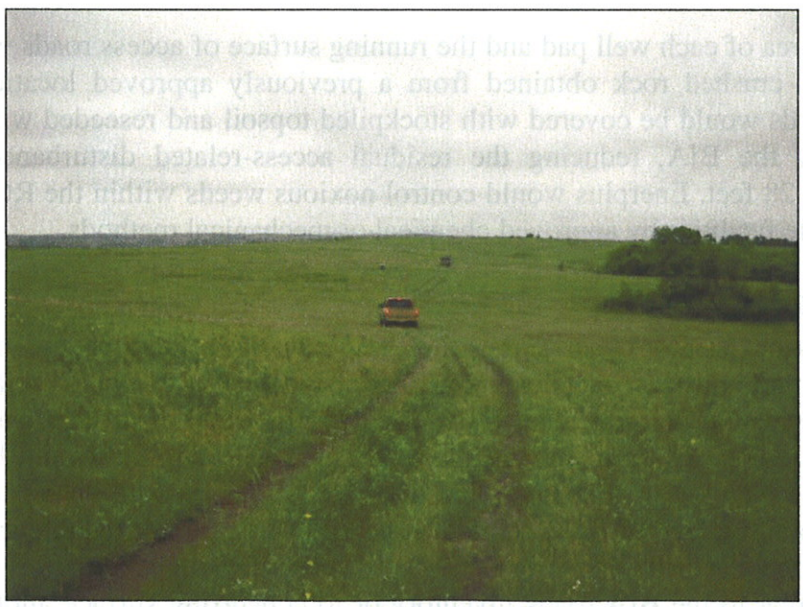

Figure 2.8. Yellowbird 6A-1H well site access road, looking northeast.

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SW¼ SE¼ of Section 6, T149N, R93W (Figure 2.9). Vertical drilling would be completed at approximately 10,350 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,827 feet. The drill string would total approximately 15,122 feet at the TMD, including approximately 4,022 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 550 feet from the south line and 2,090 feet from the east line, about 4,505 feet south of the surface hole location. A setback of at least 500 feet would be maintained.

2.2.9 Reclamation

2.2.9.1 Interim Reclamation

Interim reclamation would consist of reclaiming all areas not needed for production operations for the life of a well. Immediately after well completion, all equipment and materials unnecessary for production operations would be removed from a location and surrounding area. The reserve pit drill cuttings would be treated, solidified, backfilled, and buried as soon as possible after well completion. Cuttings would be mixed with a non-toxic reagent resulting in an irreversible reaction to produce an inert, solid material. Any oil residue would be dispersed and captured, preventing coalescence and release to the environment at significant rates. The alkaline nature of the stabilized material also chemically stabilizes various metals that may be present, primarily by converting them into less soluble compounds. The treated material would then be buried in the reserve pit, and overlain by at least 4 feet of overburden as required by adopted NDIC regulations. The surface above the reserve pit would be seeded to re-establish native/desired vegetation. Topsoil would be spread along the cut and fill slopes of a road.

If commercial production equipment is installed, the well pad would be reduced in size to approximately 300 by 200 feet; the portion of the well pad not needed for production would be recontoured, covered with 6 inches of topsoil, and reseeded using methods and seed mixtures determined by the BIA.

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. The outslope portions of roads would be covered with stockpiled topsoil and reseeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to a width of approximately 28 feet. Enerplus would control noxious weeds within the ROW, well pads, or other applicable facilities by approved chemical or mechanical methods.

2.2.9.2 Final Reclamation

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, recontoured, and reseeded. 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. Figure 2.10 shows an example of reclamation (BLM and USFS 2007).

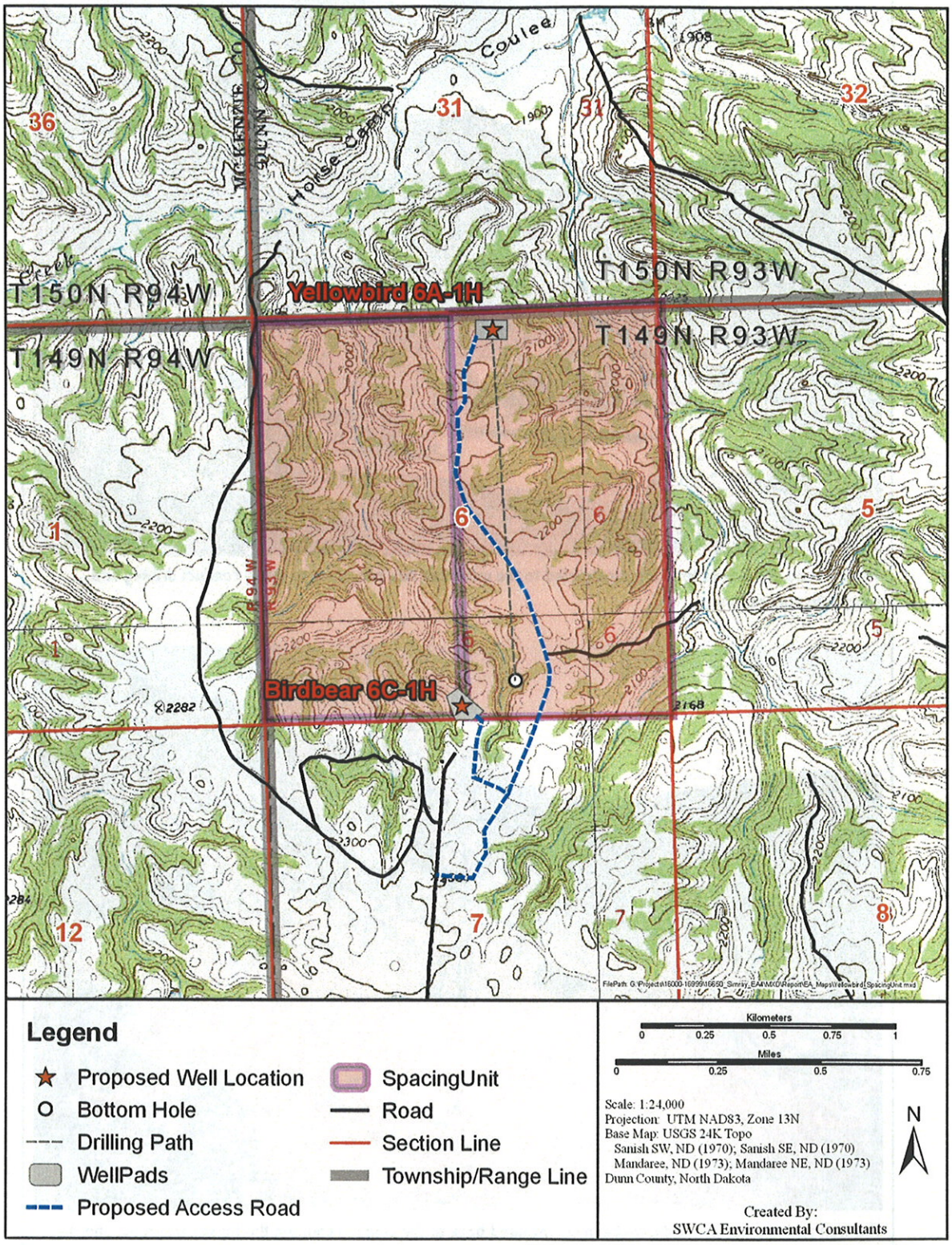

Figure 2.9. Yellowbird 6A-1H proposed location showing spacing unit and drilling target.

The well pad and access road are constructed to the minimum size necessary to safely conduct drilling and completion operations.

The well pad and access road have been recontoured back to the original contour, the topsoil respread, and the site revegetated.

Figure 2.10. Example of reclamation from the BLM Gold Book (BLM and USFS 2007).

2.3 BIA-PREFERRED ALTERNATIVE

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

3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

The broad definition of the NEPA leads to the consideration of the following elements of the human and natural environment: 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.

3.1 PHYSICAL SETTING

The proposed well sites and spacing units are in a rural area located on the Fort Berthold Indian Reservation in west-central North Dakota. The Birdbear 6C-1H location is currently being used by the landowner as a scrap metal dump and storage yard. The Yellowbird 6A-1H location is active pasture that is currently over-grazed; dense vegetation was absent during the onsite. A single residential structure lies within 1 mile of the Project Area. The Fort Berthold Indian Reservation is the home of the Three Affiliated Tribes of the MHA Nation. The Reservation encompasses more than one million acres, of which almost half, including the Project Area, are held in trust by the United States for either the MHA Nation or individual allottees. The proposed wells and access roads are 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 (not flooded); 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 glaciated, gently rolling landscape range 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 degrees Fahrenheit (°F) in January and between 55°F and 83°F in July, with 95 to 130 frost-free days each year (Bryce et al. 1998; High Plains Regional Climate Center 2008).

3.2 AIR QUALITY

3.2.1 Air Quality Standards and Criteria Pollutants

The federal Clean Air Act (CAA), as amended in 1990, established national ambient air quality standards for criteria pollutants to protect public health and welfare. It also set standards for other compounds that can cause cancer, regulated emissions that cause acid rain, and required federal permits for large sources. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These standards were set for pervasive compounds that are generally emitted by industry or motor

vehicles. Standards for each pollutant meet specific public health and welfare criteria; thus, they are called the 'criteria pollutants.' Some states have adopted more stringent standards for criteria pollutants, or have chosen to adopt new standards for other pollutants. For instance, North Dakota has a standard for hydrogen sulfide that the U.S. Environmental Protection Agency (EPA) does not. The following discussion characterizes the criteria pollutants and their health effects.

Ozone is a colorless gas with a pungent, irritating odor and creates a widespread air quality problem in most of the world's industrialized areas. Ozone smog is not emitted directly into the atmosphere but is primarily formed through the reaction of hydrocarbons and nitrogen oxides (NO_x) in the presence of sunlight. Ozone's health effects can include reduced lung function, aggravated respiratory illness, and irritated eyes, nose, and throat. Chronic exposure can cause permanent damage to the alveoli of the lungs. Ozone can persist for many days after formation and travel several hundred miles.

Respirable Particulate Matter (PM) is a class of compounds that can lodge deep in the lungs causing health problems. Based on extensive health studies, particulate matter is regulated under two classes. PM10 is the fraction of total particulate matter 10 microns or smaller, and PM2.5 is two and a half microns or smaller. Respirable particulate matter can range from inorganic wind-blown soil to organic and toxic compounds found in diesel exhaust. Toxic compounds such as benzene often find a route into the body via inhalation of fine particulate matter.

Nitrogen dioxide (NO_2) is a reddish-brown gas with an irritating odor. Primary sources include motor vehicles, industrial facilities, and power plants. In the summer months, NO_2 is a major component of photochemical smog. NO_2 is an irritating gas that may constrict airways, especially of asthmatics, and increase the susceptibility to infection in the general population. NO_2 is also involved in ozone smog production.

Carbon monoxide (CO) is a colorless, odorless gas that is a byproduct of incomplete combustion. CO concentrations typically peak nearest a source, such as roadways or areas with high fireplace use, and decrease rapidly as distance from the source increases. Ambient levels are typically found during periods of stagnant weather, such as on still winter evenings with a strong temperature inversion. CO is readily absorbed into the body from the air. It decreases the capacity of the blood to transport oxygen, leading to health risks for unborn children and people suffering from heart and lung disease. The symptoms of excessive exposure are headaches, fatigue, slow reflexes, and dizziness.

Sulfur dioxide (SO_2) is a colorless gas with a strong, suffocating odor. SO_2 is produced by burning coal, fuel oil, and diesel fuel, and can trigger constriction of the airways, causing particular difficulties for asthmatics. Long-term exposure is associated with increased risk of mortality from respiratory or cardiovascular disease. SO_2 emissions are also a primary cause of acid rain and plant damage.

3.2.2 Greenhouse Gas Emissions and Climate Change

Carbon dioxide (CO_2) is the primary greenhouse gas (GHG), responsible for approximately 90 percent of radiative forcing (the rate of energy change as measured at the top of the

atmosphere; can be positive [warmer] or negative [cooler]). To simplify discussion of the various GHGs, the term 'Equivalent CO_2 or CO_2e' has been developed. CO_2e is the amount of CO_2 that would cause the same level of radiative forcing as a unit of one of the other GHGs. For example, one ton of methane (CH_4) has a CO_2e of 22 tons; therefore, 22 tons of CO_2 would cause the same level of radiative forcing as one ton of CH_4. Nitrous oxide (N_2O) has a CO_2e value of 310. Thus, control strategies often focus on the gases with the highest CO_2e value. CH_4 is a common fugitive gas emission in oil and gas fields and is emitted at many phases of exploration and production.

According to the Pew Center, "Over the past 50 years, the (worldwide) data on extreme temperatures have shown similar trends of rising temperatures: cold days, cold nights, and frosts occurred less frequently over time, while hot days, hot nights, and heat waves occurred more frequently" (Pew Center 2009). Generally, the earth's temperature has increased about one degree Celsius since 1850 but some areas have seen an increase of four degrees. Sea levels are also rising, mountain glaciers are disappearing, and ocean currents, such as the Gulf Stream, are slowing. According to the Intergovernmental Panel on Climate Change, sea levels could rise by 2.5 feet to over 6.6 feet depending on the rate of melt in the Polar Regions. Much of the increase is due to thermal expansion. Changes of this magnitude will affect rainfall patterns worldwide.

According to the Center for Integrative Environmental Research at the University of Maryland (2008), climate change will affect North Dakota's climate significantly over time. North Dakota will experience an increase in the unpredictability of droughts, floods, and pests making it harder for farmers to remain economically viable in the agricultural industry. This damage to the agricultural community will subsequently be a detriment to the livestock industry. Additionally, due to reductions in the amount of available wildlife habitat, including receding water levels, North Dakota's hunting, fishing, and tourism industries will be damaged.

3.2.3 Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are a class of compounds known to cause cancer, mutation, or other serious health problems. HAPs are usually a localized problem near the emission source. HAPs are regulated separately from criteria air pollutants. There are several hundred HAPs recognized by the EPA and State of North Dakota. Health effects of HAPs may occur at exceptionally low levels; for many HAPs it is not possible to identify exposure levels that do *not* produce adverse health affects. Major sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), wood smoke, and motor vehicle exhaust. Unlike regulations for criteria pollutants, there are no ambient air quality standards for HAPs. Examples of HAPs found in gases released by oil field development and operation include benzene, toluene, xylene, and formaldehyde (BLM 2009). HAP emissions receive evaluation based on the degree of exposure that can cause risk of premature mortality, usually from cancer.

Risk assessments express premature mortality in terms of the number of deaths expected per one million persons. The North Dakota Department of Health (NDDH) typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state

engineers to do the work. The state requires that maximum individual cancer risks be calculated using its adopted protocol (the Determination of Compliance in the state's Air Toxics Policy). For new sources emitting HAPs with known negative health effects, an applicant must demonstrate that the combined impact of new HAP emission does not result in a maximum individual cancer risk greater than 1×10^{-5} (one in one hundred thousand).

3.2.4 Air Monitoring

Although the state of North Dakota does not have jurisdiction over air quality matters on the Reservation, it is helpful to note the monitoring efforts being made by the state and industry in the area. The NDDH operates a network of monitoring stations around the state that continuously measure pollution levels. Industry also operates monitoring stations as required by the state. The data from all these stations are subject to quality assurance, and when approved, it is published on the World Wide Web (available from EPA and other sources). Monitoring stations near the project site include 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 sites, respectively. Criteria pollutants measured include SO_2, PM_{10}, NO_2, and ozone. Lead and CO are not monitored by any of the three stations. Table 3.1 summarizes federal air quality standards and available air quality data from the three-county study area. The highest value at any of the three monitoring locations is shown for each year.

The federal and state governments have set standards based on set criteria for various air pollutants caused by human activity. Table 3.1 summarizes the standards for these criteria pollutants, and baseline data from the Project Area. All monitored criteria pollutants are well below federal and state standards in the Project Area, as of 2008. However, the trend has been increasing for PM_{10}.

Table 3.1. Air Quality Standards and Monitored Data.

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$) or (*ppm*)	Year		
			2006	2007	2008
SO_2 (in ppm)	24-hour	*0.14*	0.011	0.011	0.009
	Annual Mean	*0.03*	0.002	0.002	0.002
PM_{10} (in $\mu g/m^3$)	24-hour	150	50	57	108
$PM_{2.5}$ (in $\mu g/m^3$)	24-hour	35	18.9	13.5	16.4
	Weighted Annual Mean	15	6.3	6.6	6.7
NO_2 (in ppm)	Annual Mean	*0.053*	0.003	0.003	0.003
O_3 (in ppm)	1-hour	*0.12*	0.076	0.076	0.069
	8-hour	*0.08*	0.067	0.065	0.063

Source: EPA 2009. $\mu g/m^3$ = micrograms per cubic meter. ppm = parts per million
Note: for $PM_{2.5}$ the 4th highest 24-hour value is reported per EPA attainment evaluation protocol.

Note that North Dakota has separate state standards for several pollutants that are different from the federal criteria standards. These are:

- SO_2 (parts per million [ppm]) – 0.023 annual arithmetic mean, 0.099 24-hour concentration, and 0.273 one-hour concentration.
- Hydrogen sulfide (H_2S) (ppm) – 10 instantaneous, 0.20 one-hour, 0.10 24-hour, and 0.02 3-month arithmetic mean.

All other state criteria pollutant standards are the same as federal (shown in Table 3.1). North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008.

The CAA mandates prevention of significant deterioration in the designated attainment areas. Class I attainment areas have national significance and include national parks greater than 6,000 acres, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres that were designated prior to 1977. Theodore Roosevelt National Park, a Class I area that covers about 110 square miles in three units within the Little Missouri National Grassland, lies between Medora and Watford City and is roughly 30 to 40 miles west of the proposed well sites. All other parts of the state, including the Reservation, are classified Class II, affording them a lower level of protection from significant deterioration.

3.2.5 Response to the Threat of Climate Change

The EPA has proposed an endangerment finding that would allow regulation of GHGs under the CAA. The first step is a regulation that requires sources emitting 25,000 tons or more CO_2e to report their emissions. The EPA and the National Highway Traffic Safety Administration have increased corporate fuel economy standards to promote national energy security and reduce GHGs. Standards will equal 35 miles per gallon by 2020, with an estimated savings to drivers of $100 billion annually. Many U.S. states and foreign nations have adopted goals and actions to reduce GHGs to levels scientists forecast will allow the earth's climate to stabilize at one to two degrees Celsius above the current level. Additional regulation is currently being developed by the U.S. Congress to roll back emissions to levels recommended by atmospheric scientists.

3.2.6 Typical Project Emissions from Oilfield Development

Oilfield emissions encompass three primary areas: combustion, fugitive, and vented.

- Combustion emissions include SO_2, ozone precursors called volatile organic compounds (VOCs), GHGs, and HAPs. Sources include engine exhaust, dehydrators, and flaring.
- Fugitive emissions include criteria pollutants, H_2S, VOCs, HAPs, and GHGs. Sources include equipment leaks, evaporation ponds and pits, condensate tanks, storage tanks, and windblown dust (from truck and construction activity).
- Vented emissions include GHGs, VOCs, and HAPs. Primary sources are emergency pressure relief valves and dehydrator vents.

Pad and road construction, drilling activities, and tanker traffic would generate emissions of criteria pollutants and HAPs. Primary emissions sources during drilling are diesel exhaust, wind-blown dust from disturbed areas and travel on dirt roads, evaporation from pits and sumps, and gas venting. Diesel emissions are being progressively controlled by the EPA in a

nationwide program. This program takes a two-pronged approach. First, fuels are improving to the ultra-low sulfur standard, and secondly manufacturers must produce progressively lower engine emissions.

3.2.7 Air Quality Best Management Practices

Under the CAA, federal land management agencies have an affirmative responsibility to protect air quality. Tribes, federal land managers, and private entities can make emission controls part of a lease agreement. BMPs can be adopted for various portions of an oil/gas well's lifecycle. BMPs fall into the following six general categories.

- Transportation BMPs to reduce the amount of fugitive dust and vehicle emissions
    - Use directional drilling to drill multiple wells from a single well pad;
    - use centralized water storage and delivery, well fracturing, gathering systems;
    - use telemetry to remotely monitor and control production;
    - use water or dust suppressants to control fugitive dust on roads;
    - control road speeds; and
    - use van or carpooling.
- Drilling BMPs to reduce rig emissions
    - Use cleaner diesel (Tier 2, 3, and 4) engines;
    - use natural gas-powered engines; and
    - use "green" completions to recapture product that otherwise would have been vented or flared.
- Unplanned or emergency releases
    - Use high-temperature flaring if gas is not recoverable.
- Vapor recovery
    - Use enclosed tanks instead of open pits to reduce fugitive VOC emissions; and
    - use vapor recovery units on storage tanks.
- Inspection and maintenance
    - Use and maintain proper hatches, seals, and valves;
    - optimize glycol circulation and install a flash tank separator;
    - use selective catalytic reduction; and
    - replace high-bleed with low-bleed devices on pneumatic pumps.
- Monitoring and repair
    - Use directed inspection and maintenance methods to identify and cost-effectively fix fugitive gas leaks; and
    - install an air quality monitoring station.

3.2.8 Potential Air Quality Impacts

Based on the existing air quality of the region and the typical air emissions of similar oilfield projects, and implementation of best management practices identified in Section 3.2.8, the Proposed Action would not produce significant increases in criteria pollutants, greenhouse gases, or hazardous air pollutants.

3.3 WATER RESOURCES

3.3.1 Surface Water

As shown in Figure 3.1, the proposed wells, Birdbear 6C-1H and Yellowbird 6A-1H, and their access roads, are located near Lake Sakakawea, which is classified by the U.S. Geological Survey (USGS) as perennial. Given the topography of the individual sites over the project area, runoff occurs largely as sheet-flow. Runoff that concentrates near the proposed project well area will flow into Boggy Creek and Drags Wolf Bay, and subsequently into Lake Sakakawea.

The proposed Birdbear 6C-1H is located in the Boggy Creek subwatershed (Hydrologic Unit Code [HUC] 101101012101) of the Independence Point Watershed (Figure 3.1). The Boggy Creek subwatershed is part of the Lake Sakakawea sub-basin, the Lake Sakakawea basin, the Little Missouri River and subregion, and Missouri region. Runoff from the well pad would flow to the north into an unnamed intermittent waterway (HUC 10110101001129), then into Boggy Creek (HUC 10110101001122) and travel approximately 1.08 miles until reaching perennial waters in Lake Sakakawea (Figure 3.2).

The proposed Yellowbird 6A-1H is located in the Boggy Creek subwatershed (HUC 101101012101) of the Independence Point Watershed (Figure 3.1). The Boggy Creek subwatershed is part of the Lake Sakakawea sub-basin, the Lake Sakakawea basin, the Little Missouri River and subregion, and Missouri region. Runoff from the well pad would flow to the north into Boggy Creek (HUC 10110101001122) and travel approximately 0.11 mile until reaching perennial waters in Lake Sakakawea (Figure 3.2).

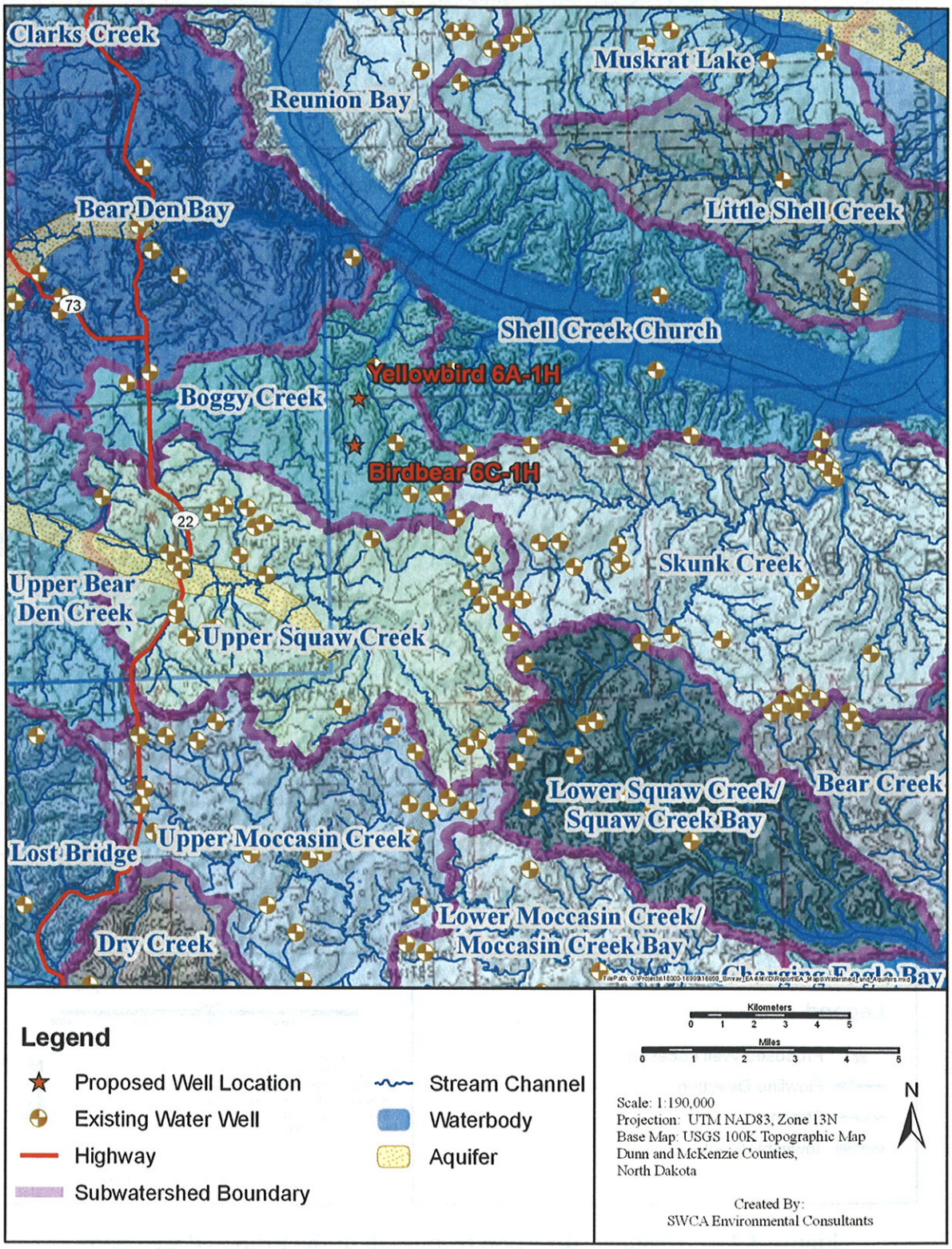

Figure 3.1. Watersheds, surface runoff direction, and aquifers near the project area.

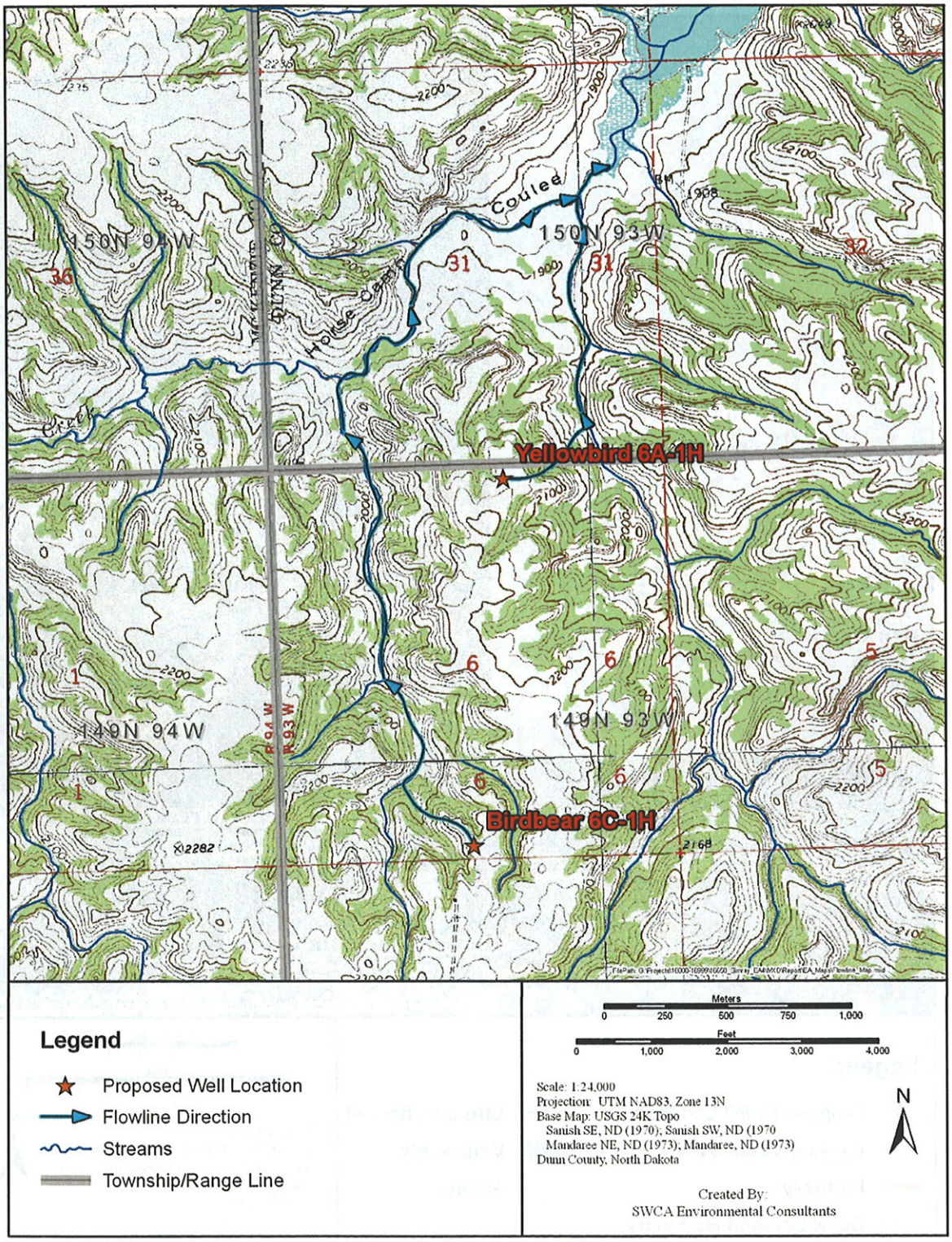

Figure 3.2. Drainage direction from each of the proposed well pads.

The proposed project would be engineered and constructed to minimize the suspended sediment (i.e., turbidity) concentration of surface runoff, avoid disruption of drainages, and avoid direct impacts to surface water. No surface water would be used for well drilling operations. Any chemicals or potentially hazardous materials would be handled in accordance with the operator's spill prevention, control, and countermeasure plan. Provisions established under this plan would minimize potential impacts to any surface waters associated with an accidental spill.

3.3.2 Groundwater

Aquifers in the project area include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 3.2). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in Dunn County. However, none are within the proposed project areas (Figure 3.1). The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn County and meets standards of the NDDH (Croft 1985). Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part III, 1976.

Review of electronic records of the North Dakota State Water Commission revealed 49 existing water wells within an approximate 5-mile boundary of the proposed project areas (Table 3.3). Two wells (149-093-05CDC and 150-093-31ADD) are within 1 mile of the project wells. Water quality would be protected by drilling with freshwater to a point below the base of the Fox Hills Formation, implementing proper hazardous materials management, and using appropriate casing and cementing. Drilling would proceed in compliance with Onshore Oil and Gas Order No. 2, Drilling Operations (43 CFR 3160).

Since none of the proposed project area lies within the boundaries of the post-glacial outwash aquifers, low porosity bedrock near the project wells would act as confining layers to prevent impacts to groundwater resources. Additionally, well completion methods would prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells may have minimal hydrologic connections due to their respective distance from the project wells.

Table 3.2. Common Aquifers in the Proposed Project Area and Surrounding Region.

Period	Formation		Depth Range (feet)	Thickness (feet)	Lithology	Water-Yielding Characteristics
Quaternary	Alluvium		0–40	40	Silt, sand, and gravel	Maximum yield of 50 gal/min to individual wells from sand and gravel deposits.
Tertiary	Fort Union Group	Sentinel Butte	0–670	0–670	Silty, clay, sand and lignite	5 to 100 gal/min in sandstone. 1 to 200 gal/min in lignite.
		Tongue River	140–750	350–490	Silty, clay, sand and lignite	Generally less than 100 gal/min in sandstone.
		Cannonball/ Ludlow	500–1,150	550–660	Fine- to medium-grained sandstone, siltstone, and lignite	Generally less than 50 gal/min in sandstone.
Cretaceous	Hell Creek		1,000–1,750	200–300	Claystone, sandstone, and mudstone	5 to 100 gal/min in sandstone.
	Fox Hills		1,100–2,000	200–300	Fine- to medium-grained sandstone and some shale	Generally less than 200 gal/min in sandstone. Some up to 400 gal/min.

Source: Croft (1985) and Klausing (1979).
gal/min = gallons per minute

Table 3.3. Existing Water Wells near the Project Area.

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-093-02ACB	C. Perkins	1962	02	149/093	Stock	647	Sentinel Butte	Yellowbird 6A-1H	4.01
149-093-05CDC		1961	05	149/093	Stock	84	Sentinel Butte	Birdbear 6C-1H	0.82
149-093-08DCC	M. Fox	1960	08	149/093	Domestic	500	Sentinel Butte	Birdbear 6C-1H	1.44
149-093-09ABD	Dale McGrady	1/1/1981	09	149/093	Stock	150	Unknown	Birdbear 6C-1H	2.23
149-093-09CCC	St. Anthonys	10/3/1988	09	149/093	Domestic	453	Unknown	Birdbear 6C-1H	1.86
149-093-09CCD	St. Anthonys	1952	09	149/093	Domestic	65	Sentinel Butte	Birdbear 6C-1H	1.96
149-093-10AAA	Tribal	1950	10	149/093	Unused	450	Unknown	Birdbear 6C-1H	3.43
149-093-14CCC	Tribal		14	149/093	Unused	450	Sentinel Butte	Birdbear 6C-1H	4.07
149-093-14CDD2	USGS	10/18/1994	14	149/093	Mon	35	Unknown	Birdbear 6C-1H	4.43
149-093-16BDD	Paul Rosario	8/15/1994	16	149/093	Domestic	460	Unknown	Birdbear 6C-1H	2.43
149-093-18DDB	Tribal		18	149/093	Unused	465	Sentinel Butte	Birdbear 6C-1H	1.84
149-093-21AAD	Gerald Fox	12/14/2000	21	149/093	Domestic	100	Unknown	Birdbear 6C-1H	3.28
149-093-21DCA	E. Wicker		21	149/093	Unused	35	Unknown	Birdbear 6C-1H	3.59
149-093-22CCD	Arla Muzzy	7/17/2002	22	149/093	Domestic	100	Unknown	Birdbear 6C-1H	4.04
149-093-23ACD			23	149/093	Unused	34	Sentinel Butte	Birdbear 6C-1H	4.88
149-093-27ABA	H. Youngbird		27	149/093	Domestic	65	Sentinel Butte	Birdbear 6C-1H	4.45
149-093-27ABA2	Patricia McKenzie	8/12/2004	27	149/093	Domestic	130	Unknown	Birdbear 6C-1H	4.42
149-093-27BAA	USGS	10/24/1994	27	149/093	Monitoring	62	Unknown	Birdbear 6C-1H	4.27
149-093-27CAD	USGS	10/11/1994	27	149/093	Monitoring	170	Unknown	Birdbear 6C-1H	4.72
149-093-28 AA	Ken Danks	10/16/2009	28	149/093	Industrial	1,680		Birdbear 6C-1H	3.96
149-094-08DCB	Randy Binger	6/1/1992	08	149/094	Domestic	195	Unknown	Birdbear 6C-1H	4.98
149-094-14-1	Mandaree School	3/21/1988	14	149/094	Monitoring	16	Unknown	Birdbear 6C-1H	2.49
149-094-14-2	BIA	1/30/2002	14	149/094	Monitoring	29	Unknown	Birdbear 6C-1H	2.50

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-094-14-3	BIA	1/30/2002	14	149/094	Monitoring	28	Unknown	Birdbear 6C-1H	2.48
149-094-14-4	BIA	4/11/2000	14	149/094	Monitoring	25	Unknown	Birdbear 6C-1H	2.49
149-094-14ACD	Mike Mason	5/25/1973	14	149/094	Domestic	66	Unknown	Birdbear 6C-1H	2.32
149-094-14BA	Mandaree 3	7/21/1970	14	149/094	Public	1,746	Fox Hills	Birdbear 6C-1H	2.39
149-094-15AAA	Sandy Youngbird	10/16/2006	15	149/094	Domestic	285	Unknown	Birdbear 6C-1H	2.76
149-094-15ABD	Tilly Lone Fight	11/7/2005	15	149/094	Domestic	335	Unknown	Birdbear 6C-1H	3.06
149-094-16DDC	Jimmy Stone	4/15/1981	16	149/094	Domestic	200	Unknown	Birdbear 6C-1H	4.17
149-094-21AAD	NDSWC 11352	9/9/1980	21	149/094	Unused	240	Unknown	Birdbear 6C-1H	4.16
149-094-22BBB	NDSWC 11351	9/9/1980	22	149/094	Com-mercial	140	Unknown	Birdbear 6C-1H	4.00
149-094-22BCB	NDSWC 11353	9/9/1980	22	149/094	Unused	80	Unknown	Birdbear 6C-1H	4.14
149-094-23ACD	USGS	10/26/1994	23	149/094	Monitoring	120	Unknown	Birdbear 6C-1H	3.06
149-094-23BBA	USGS	10/25/1994	23	149/094	Monitoring	69	Unknown	Birdbear 6C-1H	3.07
149-094-27	Margaret Wolf	3/5/1982	27	149/094	Domestic	64	Unknown	Birdbear 6C-1H	4.62
149-094-27ACD	George Wolf	5/19/1973	27	149/094	Domestic	36	Unknown	Birdbear 6C-1H	4.48
149-094-27CB	George Wolf	5/19/1973	27	149/094	Domestic	36	Unknown	Birdbear 6C-1H	4.97
149-094-28AAA2	Unknown	Unknown	28	149/094	Monitoring	120	Unknown	Birdbear 6C-1H	4.70
149-094-28AAD	USGS	6/10/1992	28	149/094	Monitoring	120	Unknown	Birdbear 6C-1H	4.77
149-094-28AAD	USGS	6/10/1992	28	149/094	Monitoring	320	Unknown	Birdbear 6C-1H	4.77
150-093-19ACB	Waterford City	10/7/1988	19	150/093	Municipal	95	Unknown	Yellowbird 6A-1H	2.74
150-093-31ADD	Unknown	1/1/1961	31	150/093	Unknown	336	Sentinel Butte	Yellowbird 6A-1H	0.68
150-093-33CCA	Unknown	1/1/1960	33	150/093	Unknown	388	Sentinel Butte	Yellowbird 6A-1H	1.93
150-094-15ABC	Fox, Nick	1962	15	150/094	Stock	414	Unknown	Yellowbird 6A-1H	4.89
150-094-21ABA	Youngwolf	1964	21	150/094	Stock	380	Unknown	Yellowbird 6A-1H	4.90
150-094-22CBA	Youngwolf	1964	22	150/094	Stock	327	Unknown	Yellowbird 6A-1H	4.18

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
150-094-33ACC	USGS	6/9/1992	33	150/094	Unknown	235	Unknown	Yellowbird 6A-1H	4.05
150-094-33CB	Occidental	12/20/1964	33	150/094	Unknown	11,630	Unknown	Yellowbird 6A-1H	4.46

Source: North Dakota State Water Commission (2010).

3.3.3 Potential Impacts to Surface Water and Groundwater Resources

No significant adverse impacts to surface water or groundwater resources are anticipated based on the location, design, and drilling methods of the Proposed Action.

3.4 WETLANDS, HABITAT, AND WILDLIFE

3.4.1 Wetlands

National Wetland Inventory maps maintained by the U.S. Fish and Wildlife Service (USFWS) do not identify any jurisdictional wetlands within the proposed well pads or access roads (USFWS 2008a). No wetlands were observed along any access road ROWs or at any of the well sites during surveys conducted in June 2010.

According to the USFWS National Wetland Inventory database, one palustrine emergent (PEM) wetland is located within 0.5 mile from the proposed project areas (Table 3.4), at a distance of 0.24 mile and a bearing of 200° from the Birdbear 6C-1H well pad area.

Lake Sakakawea is the closest wetland located at a distance of 0.91 mile and a bearing of 21° from the Yellowbird 6A-1H well pad area. Due to the location of these PEM wetlands no impacts are expected as a result of construction, drilling, or production activities associated with the proposed well pad areas and associated access roads. In order to prevent any downstream impact to Lake Sakakawea, Enerplus would employ standard BMPs to reduce the potential for adverse impact.

Table 3.4. Distance and Bearings from Well Pad Location to PEM Wetlands.

Well Pad	Distance (miles)	Bearings (degrees)
Birdbear 6C-1H	0.24	200
Yellowbird 6A-1H	0.91	21

3.4.2 Wildlife

Several wildlife species that may exist in Dunn County are listed as threatened or endangered under the Endangered Species Act (ESA). Listed species in Dunn County include the black-footed ferret, gray wolf, interior least tern, pallid sturgeon, piping plover, and whooping crane (USFWS 2008b). Although delisted in 2007, the bald eagle remains a species of special concern to the BIA and the Department of the Interior, and is effectively treated the same as listed species. 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. Species listed by the USFWS are described below.

ENDANGERED SPECIES

Black-footed Ferret (*Mustela nigripes*)
Status: Endangered
Likelihood of impact: No effect

Several isolated populations are known to exist within the United States. However, this species is presumed extirpated from North Dakota because it has not been observed in the wild for over 20 years.

Gray Wolf (*Canis lupus*)
Status: Endangered
Likelihood of impact: No effect

The project areas do not contain suitable habitat for occupation or colonization by gray wolves. Due to the distance of known gray wolf populations in Minnesota, Canada, Montana, and Wyoming, transient wolves are not expected to be present.

Interior Least Tern (*Sterna antillarum*)
Status: Endangered
Likelihood of impact: May affect, but is not likely to adversely affect

The proposed project areas would be located in upland areas which would not provide suitable nesting or foraging habitat for the interior least tern. Key habitat includes sparsely vegetated sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. Interior least tern nests are usually found along the shoreline and islands of Lake Sakakawea. Migrating or foraging interior least terns may transition through the project area; however, no adverse impact is expected as a result of construction, production, or reclamation activities.

Pallid Sturgeon (*Scaphirhynchus albus*)
Status: Threatened
Likelihood of impact: May affect, but is not likely to adversely affect

Activities associated with the construction, production, or reclamation of the project areas are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Pallid sturgeons prefer turbid, main stem river channels.

Whooping Crane (*Grus americana*)
Status: Endangered
Likelihood of impact: May affect, but is not likely to adversely affect

No viable habitat including PEM wetlands is located within the proposed project areas. The lack of suitable foraging and nesting habitat makes the proposed project areas unsuitable for whooping cranes.

THREATENED SPECIES

Piping Plover (*Charadrius melodus*)
Status: Threatened
Likelihood of impact: May affect, but is not likely to adversely affect

The entire shoreline of Lake Sakakawea has been designated critical habitat for piping plover. These birds nest on sparsely vegetated shoreline beaches, peninsulas, and islands composed of sand, gravel, or shale. The nearest critical habitat would be greater than or equal to 1.1 miles from the proposed project areas. Individual piping plovers may transition across or forage at the proposed project areas during construction, drilling, production, or reclamation activities.

MIGRATORY BIRD TREATY ACT / THE BALD AND GOLDEN EAGLE PROTECTION ACT

Bald Eagle (*Haliaeetus leucocephalus*)
Status: Delisted in 2007
Likelihood of impact: Not likely to adversely affect

Project areas are located between 1.1 and 2.0 miles from Lake Sakakawea and do not contain suitable nesting/perching habitat, concentrated feeding areas, or other necessary habitat. Though delisted, the bald eagle is afforded some protection under the Migratory Bird Treaty Act (916 USC 703–711) and the Bald and Golden Eagle Protection Act (16 USC 668–668c). Suitable habitat does occur within a half mile of the location. However, surveys for eagle nests were completed and no active eagle nests were found.

Golden Eagle (*Aquila chrysaetos*)
Status: Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Likelihood of impact: May affect, but is not likely to adversely affect

The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs which provide nesting habitat. Suitable habitat does occur within a half mile of the location. However, surveys for eagle nests were completed and no active eagle nests were found.

The wildlife species listed in Table 3.5 were observed during field visits to the proposed project areas. All species listed were visually observed by a biologist during the field survey (i.e., primary observation). Various secondary indicators, including scat, tracks, and animal carcasses, were not observed within the proposed project areas.

Table 3.5. Wildlife Observed during Field Surveys at the Proposed Project Areas.

Well Pad Area	Common Name	Scientific Name	Observation Type	Habitat
Birdbear 6C-1H	NA	NA	NA	NA
Yellowbird 6A-1H	White-tailed deer	*Odocoileus virginianus*	Direct	Wooded draws and open meadows

3.4.3 Potential Impacts to Wetlands, Habitat, and Wildlife

With the implementation of standard BMPs, no riparian or wetland habitats are anticipated to be directly or indirectly impacted by the proposed access roads or wells.

No impacts to listed species are anticipated because of the low likelihood of their occurrence within the proposed project areas, confirmed by on-site assessments conducted by SWCA Environmental Consultants biologists. If construction is planned during the critical season, a migratory bird survey would be conducted prior to commencement of construction. Additionally, Enerplus has committed to using a semi-closed loop drilling system, ensuring that the reserve pit would 1) be smaller than a typical pit and 2) would contain only dry cuttings, which would be solidified with fly ash and buried in place following completion of drilling operations. For additional information on general BMPs and other operator-committed measures, please see Sections 2.2.8, Construction Details at Individual Sites and 3.11, Mitigation and Monitoring.

Minor impacts to unlisted wildlife species and their habitats and could result from the construction of two well pads and new access roads, increased vehicular traffic density, drilling activities, and long-term disturbances during commercial production. Ground clearing may impact habitat for small birds, small mammals, and other wildlife species. Proposed project may affect raptor and migratory bird species through direct mortality, habitat degradation, and/or displacement of individual birds. These impacts are regulated in part through the Migratory Bird Treaty Act of 1918 (916 USC 703–711). Fragmentation of native prairie habitat can detrimentally affect grouse species; however, due to the ratio of each project area to the total landscape area, the overall disturbance would be negligible.

Several precautions that may limit or reduce the possible impact to all wildlife species include:

- locating well pads over areas with existing disturbances;
- netting the reserve pit between drilling and reclamation;
- removing any oil found in pits and ponds;
- installing covers under drip buckets and spigots; and
- conducting interim reclamation of at least half the disturbed area.

Reclamation would begin without delay if a well is determined to be unproductive, or upon completion of commercial production. Any wildlife species inhabiting the project area are likely to adapt to changing conditions, and continue to persist without adverse impact.

3.5 SOILS

3.5.1 Natural Resources Conservation Service Soil Data

The Project Area is located toward the center of the Williston Basin. The Greenhorn Formation, which consists of thin limestone and dark gray to black organic-rich shale, is found from the surface to a depth of approximately 4,000 feet. The Greenhorn is subdivided into lower and upper intervals of limestone and calcareous shale with a middle interval of shale. Near-surface sediment is of Recent, Pleistocene, or Tertiary age, and includes Sauk, Tippecanoe, Kaskaskia, Absaroka, Zuni, and Tejas Sequences.

The Natural Resources Conservation Service (NRCS 2009) soil series present on the well pads and access road areas, and their respective acreages, are listed in Table 3.6. The acreage shown in Table 3.6 is based on the spatial extent of soil series combinations derived from NRCS data (Figure 3.3); therefore, the acreage is approximate and used as a best estimate of soil series distribution at each of the proposed project areas.

Table 3.6. Percentage of the Project Area Comprised of Specific Soil Types.

Feature	Soil Series	Acres	% of Location
Birdbear 6C-1H			
Access Road	Zahl-Williams loams, 15 to 25 percent slopes	1.75	38
	Cabba loam, 15 to 45 percent slopes	0.09	2
	Zahl-Williams loams, 9 to 15 percent slopes	1.00	22
	Williams loam, 6 to 9 percent slopes	1.75	38
Well Pad	Zahl-Williams loams, 15 to 25 percent slopes	3.15	100
Yellowbird 6A-1H			
Access Road	Zahl-Williams loams, 15 to 25 percent slopes	2.34	24
	Zahl-Williams loams, 9 to 15 percent slopes	3.50	36
	Williams loam, 3 to 6 percent slopes	3.89	40
Well Pad	Zahl-Williams loams, 15 to 25 percent slopes	3.01	100

The following soil series descriptions represent individual soil series reported to exist within the proposed project area (NRCS 2009). Each individual soil series does not exist individually within the project areas but rather in combination with other soil types (Table 3.6).

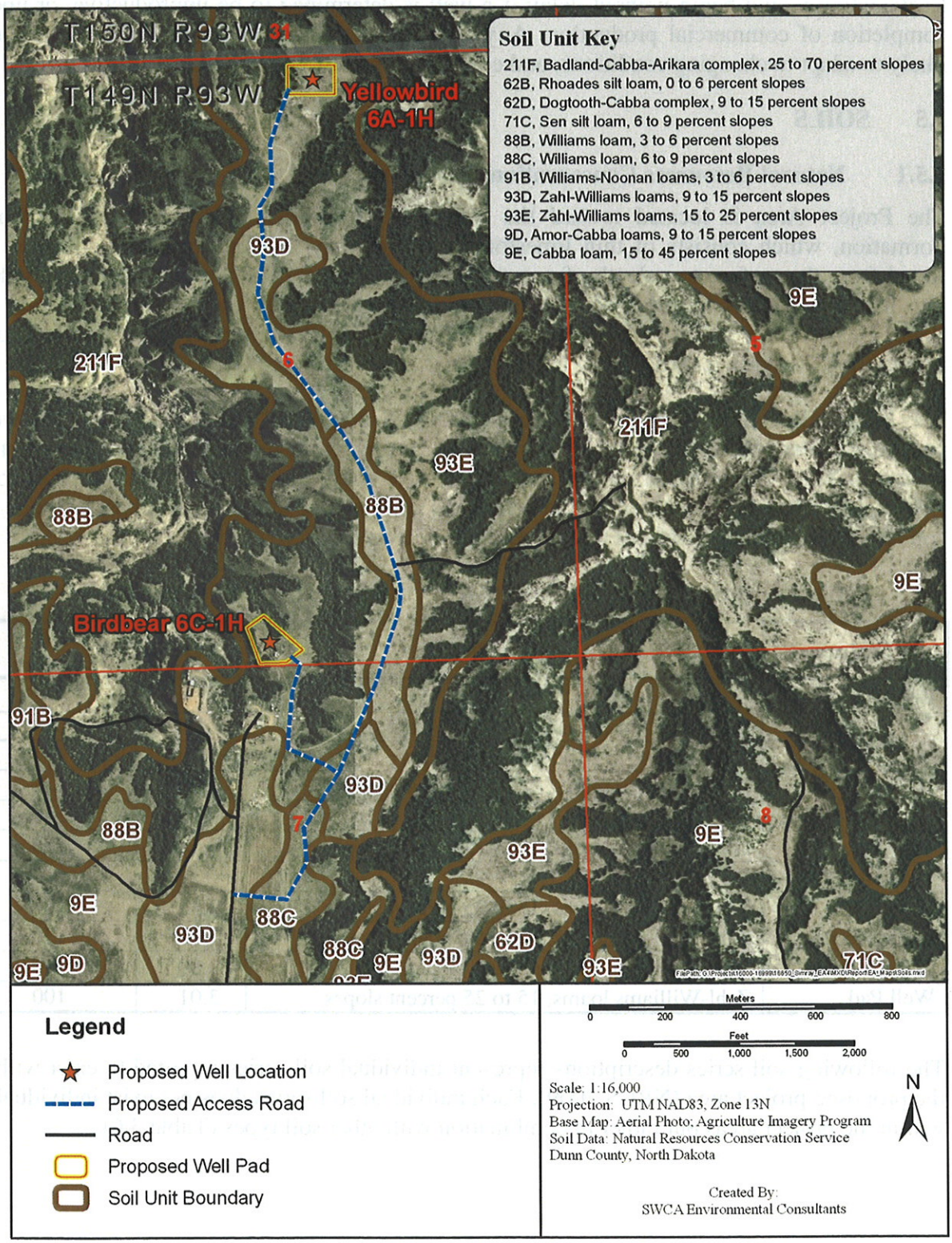

Figure 3.3. Approximate spatial extent of soil types within and around Birdbear 6C-1H and Yellowbird 6A-1H.

3.5.1.1 Amor

The Amor series consists of moderately deep, well-drained, moderately permeable soils found on sandstone bedrock uplands with slopes ranging from approximately 0 to 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for cultivation of small grains, flax, and corn. Native vegetation species common to this soil type include needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

3.5.1.2 Arikara

The Arikara series consists of very deep, well-drained soils found on wooded slopes. Permeability is moderate with slopes ranging from approximately 9 to 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 40°F. This soil type is used most often for woodland grazing. Native vegetation species common to this soil type include bur oak (*Quercus macrocarpa*), green ash (*Fraxinus pennsylvanica*), quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), and Rocky Mountain juniper (*Juniperus scopulorum*) (NRCS 2009).

3.5.1.3 Badland (Miscellaneous Area)

Miscellaneous areas have essentially no soil and support little or no vegetation. This can be a result of active erosion, washing by water, unfavorable soil conditions, or human activities. Some miscellaneous areas can be made productive but only after major reclamation efforts.

Badland is defined as moderately steep to very steep barren land dissected by many intermittent drainage channels. Ordinarily, the areas are not stony. Badland is most common in semiarid and arid regions where streams cut into soft geologic material. Local relief generally ranges between 10 and 200 meters. Potential runoff is very high, and erosion is active.

3.5.1.4 Cabba

The Cabba series consists of shallow, well-drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2 and 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are little bluestem (*Schizachyrium scoparium*), green needlegrass (*Stipa viridula*), and other various herbs, forbs, and shrub species (NRCS 2009).

3.5.1.5 Dogtooth

The Dogtooth series consists of moderately deep, well-drained, very slowly permeable soils found in uplands where the predominant slope is between 0 and 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. The most common vegetation species found on this soil type are range and pasture grasses including western wheatgrass and blue grama (NRCS 2009).

3.5.1.6 Noonan

The Noonan series consists of very deep, well-drained or moderately well-drained soils formed in till. Permeability is moderate on the surface and slow in the Btn horizons. These soils are on till plains and uplands and have slopes of 0 to 15 percent. Mean annual air temperature is 39°F, and mean annual precipitation is 14 inches. This soil type is used for spring seeded small grains and pasture. Native vegetation includes western wheatgrass and blue grama (NRCS 2009).

3.5.1.7 Rhoades

The Rhoades series consists of deep and very deep, well- to moderately well-drained, very slowly permeable soils found on swales and uplands with slopes ranging from approximately 0 to 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type includes western wheatgrass and blue grama (NRCS 2009).

3.5.1.8 Sen

The Sen series consists of well-drained, moderately permeable soils that formed in calcareous siltstone or shale. They are moderately deep to soft bedrock. These soils are on upland plains and have slope of 0 to 25 percent. Mean annual air temperature is 42°F, and mean annual precipitation is 15 inches. Soils are cropped to small grains in a crop-summer fallow rotation. Native vegetation is mid and short prairie grasses such as green needlegrass, needle and thread, western wheatgrass, blue grama, and a variety of forbs (NRCS 2009).

3.5.1.9 Williams

The Williams series consists of very deep, slowly permeable, well-drained soils found on glacial till plains and moraines with slopes at approximately 0 to 35 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for cultivation. Native vegetation species common to this soil type include western wheatgrass, needle and thread, blue grama, and green needlegrass (NRCS 2009).

3.5.1.10 Zahl

The Zahl series consists of very deep, slowly permeable, well drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1 to 60 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, little bluestem, and needle and thread (NRCS 2009).

3.5.2 Field-Derived Soil Data

Soil data derived from on-site excavated soil pits, including the matrix value, hue, chroma, and color name, are summarized in Table 3.7. Additionally, redoximorphic features (i.e., reduced/oxidized iron or manganese deposits) and soil texture were noted at each soil pit. A Munsell Soil Color Chart was used to determine the color of moist soil samples.

Table 3.7. Soil Data Obtained through the Excavation of Soil Pits within the Proposed Project Area.

Feature	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (°)	K Factor
Birdbear 6C-1H						
Well Pad/ Access Road	0–12	10YR 4/2 (grayish-yellow brown)	None Observed	Silty Clay	1–3	0.28
Well Pad/ Access Road	12–20	10YR 4/2 (grayish-yellow brown)	None Observed	Silty Clay	1–3	0.28
Yellowbird 6A-1H						
Well Pad/ Access Road	0–12	10YR 4/2 (grayish-yellow brown)	None Observed	Silty Clay	3–5	0.28
Well Pad/ Access Road	12–20	10YR 6/2 (grayish-yellow brown)	None Observed	Silty Clay	3–5	0.28

K Factor indicates the vulnerability of material less than 2 millimeters in size to sheet and rill erosion by water. Values can range from 0.02 (i.e., lowest erosion potential) to 0.69 (i.e., greatest erosion potential).

3.5.3 Potential Impacts from Soil Erosion

3.5.3.1 Birdbear 6C-1H

1. The Birdbear 6C-1H well pad is dominated by Zahl-Williams loam (100%), and the proposed new access road is dominated (60%) by Zahl-Williams loams and Williams loam (38%) (Table 3.7).
2. This soil type may have variable run-off depending on the slope, which ranges between 0 and 35 percent for the Williams, and 1 to 60 percent for the Zahl (NRCS 2009).
3. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
4. This location has a Soil Erodibility Factor (K) of 0.28. The Revised Universal Soil Loss Equation (RUSLE) calculation indicates a possible 4.19 tons/acre/year of soil loss from the site if it is not properly managed to prevent such loss. The site would be monitored during and after construction and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

3.5.3.2 Yellowbird 6A-1H

1. The Yellowbird 6A-1H well pad is dominated (100%) by Zahl-Williams loams (Table 3.6); the access road is also dominated by Zahl-Williams loams (60%) and also contains Williams loam (40%).
2. The Williams soil series is found on slopes typically ranging from 0 to 35 percent. The Zahl loams soil series is found on slopes ranging from 1 to 60 percent (NRCS 2009).
3. Both soil series are capable of supporting native short- and mid-grass prairie vegetative communities, which may substantially increase the probability for successful and permanent reclamation (NRCS 2009).
4. This location has a Soil Erodibility Factor (K) of 0.28. The RUSLE calculation indicates a possible 1.98 tons/acre/year of soil loss from the site if it is not properly managed to prevent such loss. The site would be monitored during and after construction and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

3.5.3.3 General

Due to the presence of steep slopes within the proposed Birdbear 6C-1H well pad, precautions should be taken during construction activities to prevent erosion. Specialized BMPs that are capable of stabilizing steep slopes would be used at this location. Proven BMPs are known to significantly reduce erosion of various types of soil, including those in the project area (BLM Instruction Memorandum 2004-124, www.blm.gov/bmp; BLM and USFS 2007; Grah 1997).

The soil types are not expected to create unmanageable erosion issues or interfere with reclamation of the area. Topsoil stripped from areas of new construction would be retained for use during reclamation. Any areas stripped of vegetation during construction would be reseeded once construction activities have ceased. The implementation of BMPs by the operator would reduce project effects and maintain negligible levels of erosion; therefore, no significant adverse impacts to soil resources are anticipated.

3.6 VEGETATION AND INVASIVE SPECIES

3.6.1 Vegetation Data

The proposed project areas occur in the Missouri Plateau Ecoregion (Missouri Slope) which is a western mixed-grass and short-grass prairie ecosystem (Bryce et al. 1998). Native grasses include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), side-oats grama (*Bouteloua curtipendula*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*). Common wetland vegetation includes various sedge species (*Carex* spp.), bulrush (*Scirpus* spp.), and cattails (*Typha* spp.). Common plant species found in woody draws, coulees, and drainages include chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*).

3.6.1.1 Birdbear 6C-1H

Vegetation noted at the Birdbear 6C-1H project area includes western snowberry, silver sagebrush (*Artemisia cana*), Kentucky bluegrass (*Poa pratensis*), silver buffaloberry, and Canada thistle (*Cirsium arvense*).

3.6.1.2 Yellowbird 6A-1H

Vegetation noted at the Yellowbird 6A-1H project area includes green needlegrass, western snowberry, silver buffaloberry, prairie sagewort (*Artemisia frigida*), and little bluestem.

3.6.2 Noxious Weeds

Noxious weeds have the potential to detrimentally affect public health, ecological stability, and agricultural practices. North Dakota Century Code (Chapter 63-01.1) recognizes 12 species as noxious. Five species are known to exist in Dunn County. Table 3.8 indicates total acreage for each noxious species. Additional information is available from the NRCS Plants Database for North Dakota at http://www.plants.usda.gov.

Table 3.8. Occupied Area for Recognized Noxious Weeds in Dunn County, North Dakota.

Common Name	Scientific Name	Dunn County (acres)
absinth wormwood	*Artemisia absinthium*	39,300
Canada thistle	*Cirsium arvense*	28,500
Dalmatian toadflax	*Linaria dalmatica*	--
diffuse knapweed	*Centaurea diffusa*	--
field bindweed	*Convolvulus arvensis*	--
leafy spurge	*Euphorbia esula*	18,300
musk thistle	*Carduus nutans*	--
purple loosestrife	*Lythrum salicaria*	--
Russian knapweed	*Acroptilon repens*	--
salt cedar	*Tamarix ramosissima*	--
spotted knapweed	*Centaurea stoebe*	--
yellow starthistle	*Centaurea solstitialis*	--
Total		**86,100**

Source: North Dakota Department of Agriculture 2009.

"Invasive" is a general term used to describe plant species that are not native to a given area, spread rapidly, and have adverse ecological and economic impacts. These species may have high reproduction rates and are usually adapted to occupy a diverse range of habitats otherwise occupied by native species. These species may subsequently out-compete native plant species for resources, causing a reduction in native plant populations and an increase in noxious weed populations.

Evaluation of the existing vegetation during on-site assessments conducted in June 2010 indicated that Canada thistle is present at the proposed Birdbear 6C-1H site. Efforts to reduce

the spread of noxious weeds would be made during the project construction and maintenance processes. The following guidelines would be followed during construction, reclamation, and maintenance stages of the project to control the spread of noxious weeds.

- Construction equipment, materials, and vehicles would be stored at construction sites or at specified construction yards.
- All personal vehicles, sanitary facilities, and staging areas would be confined to a limited number of specified locations to decrease chances of incidental disturbance and spread of weeds.
- In areas with existing noxious weed infestations, vegetation, soils, and trench spoil material would be stockpiled adjacent to the removal point and, following construction, would be returned to its original locations to prevent spreading.
- Prompt re-establishment of the desired vegetation in disturbed areas is required. Seeding would occur during the frost-free periods after construction. Certified "noxious weed-free" seed would be used on all areas to be seeded.

3.6.3 Potential Impacts on Vegetation and Noxious Weeds

The Proposed Action would result in minor loss of native grassland vegetation. The potential disturbance at the Birdbear 6C-1H location is approximately 3.15 acres at the well pad and 4.60 acres for the access road, for a total of 7.75 acres of disturbance. The potential disturbance at the Yellowbird 6A-1H location is approximately 3.0 acres at the well pad and 9.7 acres for the access road, for a total of 12.7 acres of disturbance.

In addition to the removal of typical native grasslands, removal of existing vegetation may facilitate the spread of invasive species. The APD and this EA require the operator to control noxious weeds throughout project areas. If a noxious weed community is found, it would be eradicated unless the community is too large, in which case it would be controlled or contained to prevent further growth. The services of a qualified weed control contractor would be utilized.

Surface disturbance and vehicular traffic must not take place outside approved ROWs for the well pads. Areas that are stripped of topsoil must be reseeded and reclaimed at the earliest opportunity. Additionally, certified weed-free straw and seed must be used for all construction, seeding, and reclamation efforts. Prompt and appropriate construction, operation, and reclamation are expected to maintain minimal levels of adverse impacts to vegetation and would reduce the potential establishment of invasive vegetation species.

With implementation of reclamation and the described methods of reducing the spread of noxious weeds, the proposed project would not result in significant adverse impacts to vegetation.

3.7 CULTURAL RESOURCES

Historic properties, or cultural resources, on federal or tribal lands are protected by many laws, regulations, and agreements. Section 106 of the National Historic Preservation Act of

1966 (16 USC 470 et seq.) 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. Cultural resources is a broad term encompassing sites, objects, or practices of archaeological, historical, cultural, and religious significance. 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). Thus, BIA consults and corresponds with the THPO regarding cultural resources on all projects proposed within the exterior boundaries of the Fort Berthold Reservation.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using an intensive pedestrian methodology. For the Birdbear 6C-1H (formerly Birdbear 1-06H) project approximately 17.49 acres were inventoried between June 3 and 10, 2010 (Lechert *et al.* 2010). For the Yellowbird 6A-1H (formerly Yellowbird 1-06) project approximately 24.79 acres were inventoried on June 10, 2010 (Hutchinson and Klitzka 2010). One archaeological site was located that may 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 these undertakings, as the archaeological site will be avoided. This determination was communicated to the THPO on July 14, 2010 and the THPO concurred on July 22, 2010.

3.7.1 Potential Impacts to Cultural Resources

No cultural resources are known to be present in the APE; therefore, there would be no adverse impacts to cultural resources as a result of the Proposed Action.

If cultural resources are discovered during construction or operation, the operator shall immediately stop work, secure the affected site, and notify the BIA and THPO. Unexpected or inadvertent discoveries of cultural resources or human remains trigger mandatory federal procedures that include work stoppage and BIA consultation with all appropriate parties. Following any such discovery, operations would not resume without written authorization from the BIA. Project personnel are prohibited from collecting any artifacts or disturbing cultural resources in the area under any circumstance. Individuals outside the ROW are trespassing. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. The presence of qualified cultural resource monitors during construction activities is encouraged.

3.8 PUBLIC HEALTH AND SAFETY

The Proposed Action would occur in a rural area with one residence located within 1 mile of the proposed well sites (Table 3.9).

Table 3.9. Distance and Direction from Proposed Wells to Nearest Home.

Proposed Well	Feet to Nearest Home	Direction to Nearest Home
Birdbear 6C-1H	717	South
Yellowbird 6A-1H	5,619	South

Health and safety concerns include sour gas that could be released as a result of drilling activities, hazards introduced by heavy truck traffic, and hazardous materials used or generated during construction, drilling, and/or production activities.

H_2S is extremely toxic in concentrations above 500 ppm, but it has not been found in measurable quantities in the Bakken Formation. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H_2S. Contingency plans submitted to the BLM comply fully with relevant portions of Onshore Oil and Gas Order No. 6 to minimize potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within 1 mile of a well; precautions include automated sampling and monitoring by drilling personnel stationed at each well site.

Standard mitigation measures would be applied, and because release of H_2S at dangerous concentration levels is very unlikely, no direct impacts from H_2S are anticipated with implementation of the project.

Tanker trips would depend on production, but Enerplus estimates approximately two trucks per day during the initial production period. Trucks for normal production operations would use the existing and proposed access roads. Produced water would be transported to an

approved disposal site. All traffic would be confined to approved routes and conform to established load restrictions and speed limits for state and BIA roadways and haul permits would be acquired as appropriate.

The EPA specifies chemical reporting requirements under Title III of the Superfund Amendments and Reauthorization Act (SARA), as amended. No chemicals subject to reporting under SARA Title III (hazardous materials) in an amount greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with the Proposed Action. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities would be used, produced, stored, transported, or disposed of in association with the Proposed Action. All operations, including flaring, would conform to instructions from BIA fire management staff.

A temporary, lined reserve pit would be constructed within the disturbed area of each well pad and constructed so as not to leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit.

Spills of oil, produced water, or other produced fluids would be cleaned up and disposed of in accordance with appropriate regulations. Sewage would be contained in a portable chemical toilet during drilling. All trash would be stored in a trash cage and hauled to an appropriate landfill during and after drilling and completion operations.

3.8.1 Potential Impacts to Public Health and Safety

With the implementation of the described reporting and management of hazardous materials, no adverse impacts to public health and safety are anticipated as a result of the proposed new wells. Other potential adverse impacts to any nearby residents from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about 60 days during construction, drilling, and well completion as equipment and vehicles move on and off the site, and then diminish sharply during production operations. If a well proved productive, one small pumper truck would visit the well once a day to check the pump. Bakken wells typically produce both oil and water at a high rate initially. Gas would be flared initially and intermittently, while oil and produced water would be stored on the well pad in tanks and then hauled out by tankers until the well could be connected to gathering pipelines. Up to four 400-barrel oil tanks and one 400-barrel water tank would be located on the pad inside a berm of impervious compacted subsoil. The berm would be designed to hold 110% of the capacity of the largest tank.

3.9 SOCIOECONOMICS

3.9.1 Socioeconomic Analysis Area

The scope of analysis for social and economic resources includes a discussion of current social and economic data relevant to the Analysis Area and surrounding communities of the Reservation and McKenzie, Dunn, McLean, and Mountrail counties, North Dakota. These counties were chosen for analysis because potential socioeconomic impacts would most likely

be realized due to their proximity to the proposed well locations and overlap of the Reservation. These communities are collectively referred to as the Analysis Area.

This section discusses community characteristics such as population, housing, demographics, employment, and economic trends within the Analysis Area. Also included are data relating to the State of North Dakota and the United States, which provide a comparative discussion when compared to the Analysis Area. Information in this section was obtained from various sources including, but not limited to, the U.S. Census Bureau, the U.S. Bureau of Economics, and the North Dakota State Government.

3.9.2 Employment

The economy in the state of North Dakota, including the Reservation and four counties in the Analysis Area, has historically depended on agriculture, including grazing and farming. However, energy development and extraction, power generation, and services related to these activities have increased over the last several years. Consequently, service and trade sectors have also become increasingly important; many of the service sector jobs are directly and indirectly associated with oil and gas development. In 2007, total employment in the state of North Dakota was approximately 487,337 (U.S. Bureau of Economic Analysis 2009a). Of this, the largest employers include government and government enterprises employing 16.6% of the labor force (81,218 jobs); health care and social assistance at 11.7% of the labor force (56,990 jobs); and retail trade at 11.3% of the labor force (55,478 jobs) (U.S. Bureau of Economic Analysis 2009a). Table 3.10 provides total employment opportunities for the Analysis Area between 2001 and 2007.

Table 3.10. Total Employment for the Analysis Area and State of North Dakota, 2001 and 2007.

Location	Total Employment (2001)	Total Employment (2007)	Percent Change (+)	Unemployment Rate (2007)
Dunn County	1,941	1,961	1.0	3.8%
McKenzie County	4,164	4,600	10.4	3.1%
McLean County	5,173	5,448	5.3	4.6%
Mountrail County	3,691	3,711	0.5	5.7%
On or Near Fort Berthold Indian Reservation	1,211	1,287*	6.2	71%
North Dakota	448,897	487,337	8.5	3.1%

Source: U.S. Bureau of Economic Analysis 2009a.
* Bureau of Indian Affairs 2005. Represents 2005 data.

Although detailed employment information for the Reservation is not provided by the U.S. Bureau of Economics or the State of North Dakota, residents of the Reservation are employed in similar ventures as those outside the Reservation. Typical employment includes ranching, farming, tribal government, tribal enterprises, schools, federal agencies, and recently, employment related to conventional energy development. The MHA Nation's Four Bears Casino and Lodge, located 4 miles west of New Town, employs approximately 320 people, of which 90% are tribal members (Fort Berthold Housing Authority 2008).

The Fort Berthold Community College, which is tribally chartered to meet the higher education needs of the people of the MHA Nation, had 11 full-time members and 25 adjunct members in academic year 2006–2007. Approximately 73% of the full-time faculty members are of American Indian/Alaska Native descent, approximately 88% of which are enrolled members of the MHA Nation. Additionally, 65% of the part-time faculty members are of American Indian/Alaska Native descent and all (100%) are tribal members.

The BIA publishes biannual reports documenting the Indian service and labor market for the nation. According to the 2005 American Indian Population and Labor Force Report, of the 8,773 tribal members that were eligible for BIA-funded services, 4,381 constituted the total available workforce. Approximately 29%, or 1,287 members, were employed in 2005, indicating a 71% unemployment rate (as a percent of the labor force) for members living on or near the Reservation; 55% of the employed members were living below poverty guidelines. Compared to the 2001 report, 2005 statistics reflect a 6.2% increase in the number of tribal members employed living on or near the Reservation, but unemployment (as a percent of the labor force) has stayed steady at 71% and the percentage of employed people living below the poverty guidelines has increased to 55% (BIA 2005).

3.9.3 Income

Per capita income is often used as a measure of economic performance, but it should be used with changes in earnings for a realistic picture of economic health. Since total personal income includes income from 401(k) plans as well as other non-labor income sources like transfer payments, dividends, and rent, it is possible for per capita income to rise even if the average wage per job declines over time.

The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. According to NAICS standards, per capita personal income for Dunn County was $20,634 in 2000 and $26,440 in 2007, an increase of approximately 28.1%; per capita personal income for McKenzie County was $21,637 in 2000 and $32,927 in 2007, an increase of approximately 52.1%; per capita personal income for McLean County was $23,001 in 2000 and $38,108 in 2007, an increase of approximately 65.6%; per capita personal income for Mountrail County was $23,363 in 2000 and $32,324 in 2007, an increase of approximately 38.3%. These figures compare with a State of North Dakota per capital personal income of $25,105 in 2000 and $36,082 in 2007, an increase of approximately 43.7% from 2000 (U.S. Bureau of Economic Analysis 2009b).

According to a 2008 report published by the Fort Berthold Housing Authority, the average per capita income for the Reservation was $8,855 in 1999, compared to $17,769 for the State and the U.S. average of $21,587 at that time (Fort Berthold Housing Authority 2008).

With the exception of McLean County, counties that overlap the Reservation tend to have per capita incomes and median household incomes below North Dakota statewide averages. As presented in Table 3.11, unemployment rates in all counties, including the Reservation, were equal to or above the state average of 3.1%. Subsequently, Reservation residents and MHA

Nation members tend to have per capita incomes and median household incomes below the averages of the encompassing counties, as well as statewide and higher unemployment. Per capita income for residents on or near the Reservation is approximately 28% lower than the statewide average. The median household income reported for the Reservation (i.e., $26,274) is approximately 40% lower than the state median of $43,936. According to the BIA, approximately 55% of tribal members living on or near the Reservation were employed, but living below federal poverty levels (BIA 2005).

Table 3.11. Income and Unemployment, 2007.

Unit of Analysis	Per Capita Income[1]	Median Household Income	Percent of all People in Poverty[2]
Dunn County	26,440	$37,632	13.5%
McKenzie County	32,927	$41,333	13.8%
McLean County	38,108	$44,421	10.4%
Mountrail County	32,324	$35,981	15.9%
Fort Berthold Indian Reservation[3]	10,291	$26,274	N/A
North Dakota	36,082	$43,936	11.8%

[1] U.S. Bureau of Economic Analysis 2009b
[2] United Stated Department of Agriculture (USDA) 2009
[3] North Dakota State Data Center 2009
N/A = Data not available.

3.9.4 Population

Historic and current population counts for the Analysis Area, compared to the state, are provided below in Table 3-12. The state population showed little change between the last two census counts (1990–2000), but there were notable changes at the local level. Populations in all four counties have steadily declined in the past. McLean and Dunn counties had a higher rate of population decline among the four counties at -10.5% and -7.8%, respectively. These declines can be attributed to more people moving to metropolitan areas, which are perceived as offering more opportunities for growth. However, population on or near the Reservation has increased approximately 13.3% since 2000. While Native Americans are the predominant group on the Reservation, they are considered the minority in all other areas of North Dakota.

As presented in

Table 3.12, population growth on the Reservation (13.3%) exceeds the overall growth in the state of North Dakota (-0.1%) and four counties in the Analysis Area. This trend in population growth for the Reservation is expected to continue in the next few years (Fort Berthold Housing Authority 2008).

Table 3.12. Population and Demographics.

County or Reservation	Population in 2008	% of State Population	% Change Between 1990–2000	% Change Between 2000–2008	Predominant Group (%)	Predominant Minority (Percent of Total Minority Population)
Dunn	3,318	0.5	-10.1	-7.8	Caucasian (84.9%)	American Indian (15.1%)
McKenzie	5,674	0.8	-10.1	-1.1	Caucasian (76.3%)	American Indian (23.7%)
McLean	8,337	1.3	-11.0	-10.5	Caucasian (91.3%)	American Indian (8.7%)
Mountrail	6,511	1.0	-5.6	-1.8	Caucasian (62.8%)	American Indian (37.2%)
On or Near Fort Berthold Indian Reservation[1]	11,897	1.8	178.0[2]	13.3[3]	American Indian	Caucasian (~27%)
Statewide	641,481	100	0.005	-0.1	Caucasian	American Indian (8.6%)

Source: U.S. Census Bureau 2009a.
[1] Bureau of Indian Affairs 2005. Population shown reflects the Total enrollment in the Tribe in 2005. 2008 data unavailable. All information related to the Fort Berthold Indian Reservation reflects 2005 data, including state population. 11,897 reflects tribal enrollment on or near the Reservation. According to the BIA, near the Reservation includes those areas or communities adjacent or contiguous to the Reservation.
[2] Bureau of Indian Affairs 2001. Reflects percent change between 1991 and 2001.
[3] Reflects percent change between 2001 and 2005.

3.9.5 Housing

Workforce-related housing can be a key issue associated with development. Historical information on housing in the four counties in the Analysis Area was obtained from the U.S. Census Bureau, 2000 census. Because the status of the housing market and housing availability changes often, current housing situations can be difficult to characterize quantitatively. Therefore, this section discusses the historical housing market. Table 3.13 provides housing unit supply estimates in the Analysis Area, including the Reservation and four overlapping counties.

The Fort Berthold 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. Housing for government employees is limited, with a few quarters in Mandaree and White Shield available to Indian Health Service employees in the Four Bears Community and to BIA employees. 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 3.13. Housing Development Data for the Reservation and Encompassing Counties.

Region	Total Housing Units						% Change 2000–2008
	Occupied	Owner Occupied	Renter Occupied	Vacant	Total	Total	
	2000	2000	2000	2000	2000	2008	
Dunn	1,378	1,102	276	587	1,965	1,968	0.1
McKenzie	2,151	1,589	562	568	2,719	2,781	2.2
McLean	3,815	3,135	680	1,449	5,264	5,420	2.9
Mountrail	2,560	1,859	701	878	3,438	3,528	2.6
Reservation	1,908	1,122	786	973	2,881	N/A	N/A
North Dakota	257,152	171,299	85,853	32,525	289,677	313,332	8.2

Source: U.S. Census Bureau n.d.

Availability and affordability of housing could impact oil and gas development and operations. The number of owner-occupied housing units (1,122) within the Reservation is approximately 58% lower than the average number of owner-occupied housing units found in the four overlapping counties (1,921).

In addition to the relatively low percent change of the total housing units compared to the state average, these four counties are ranked extremely low for both the state and national housing starts and have minimal new housing building permits, as presented in Table 3.14.

Table 3.14. Housing Development Data for the Encompassing Counties 2000–2008.

Housing Development	North Dakota County			
	Dunn	McKenzie	McLean	Mountrail
New Private Housing Building Permits 2003–2008	14	14	182	110
Housing Starts-State Rank	51 / 53	15 / 53	21 / 53	17 / 53
Housing Starts-National Rank	3,112 / 3,141	2,498 / 3,141	2,691 / 3,141	2,559 / 3,141

Source: U.S. Census Bureau 2009b, 2009c.

3.9.6 Potential Impacts to Area Socioeconomics

Impacts to socioeconomic resources of the Analysis Area would be minimal and therefore would not adversely impact the local area. Short-term impacts to socioeconomic resources would generally occur during the construction/drilling and completion phase of the proposed wells. Long-term effects would occur during the production phase, should the wells prove successful. Impacts would be significant if the affected communities and local government experienced an inability to cope with changes including substantial housing shortages, fiscal problems, or breakdown in social structures and quality of life.

As presented in Table 3.15, implementation of the proposed wells is anticipated to require between 14 and 28 workers per well in the short term. If the wells prove successful, Enerplus would install production facilities and begin long-term production. To ensure successful operations, production activities require between one and four full-time employees to staff operations. It is anticipated that a mixture of local and Enerplus employees would work in the project area. Therefore, any increase in workers would constitute a minor increase in population in the project area required for short-term operations and would not create a noticeable increase in demand for services or infrastructure on the Reservation or the communities near the project area. Because the communities likely impacted by the proposed project have experienced a recent decline in population between 2000 and 2008 (as shown in

Table 3.12), with the exception of the Reservation itself, and the historic housing vacancy rate (Table 3.13) indicates housing availability despite the growth of the population on the Reservation, these communities are able to absorb the projected slight increase in population related to this proposed project. As such, the proposed project would not have measurable impacts on housing availability or community infrastructure in the area. The proposed project also would not result in any identifiable impacts to social conditions and structures within the communities in the project area.

Table 3.15. Duration of Employment during Proposed Project Implementation.

Activity	Duration of Activity (Average Days per Well)	Daily Personnel (Average Number per Well)
Construction (access road and well pad)	5–8 days	3–5
Drilling	30–35 days	8–15
Completion/Installation of Facilities	Approx. 10 days	3–8
Production	Ongoing – life of well	1–4

Implementation of the proposed project would likely result in direct and indirect economic benefits associated with industrial and commercial activities in the area, including the Reservation, State of North Dakota, and potentially local communities near the Reservation. Direct impacts would include increased spending by contractors and workers for materials, supplies, food, and lodging in Dunn County and the surrounding areas, which would be subject to sales and lodging taxes. Other state, local, and Reservation tax payments and fees would be incurred as a result of the implementation of the proposed project, with a small percentage of these revenues distributed back to the local economies. Wages due to employment would also impact per capita income for those that were previously unemployed or underemployed. Indirect benefits would include increased spending from increased oil and gas production, as well as a slight increase in generated taxes from the short-term operations. Mineral severance and royalty taxes, as well as other relevant county and Reservation taxes on production would also grow directly and indirectly as a result of increased industrial activity in the oil and gas industry.

3.10 ENVIRONMENTAL JUSTICE

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

EJ is an evolving concept with potential for disagreement over the scope of analysis and the implications for federal responsiveness. Nevertheless, due to the population numbers, tribal members on the Great Plains qualify for EJ consideration as both a minority and low-income population. Table 3.16 summarizes relevant data regarding minority and low-income populations for the Analysis Area.

Table 3.16. Population Breakdown by Region and Race, 2002–2008.

Race	Dunn		McKenzie		McLean		Mountrail		North Dakota	
	2002	2008	2002	2008	2002	2008	2002	2008	2002	2008
Caucasian	3,067	2,818	4,493	4,329	8,313	7,610	4,480	4,086	587,085	586,272
African American	1	2	4	30	1	9	8	27	4,931	6,956
American Indians and Alaska Natives	469	467	1,175	1,230	558	587	1,949	2,277	31,104	35,666
Asian / Pacific Islanders	4	3	4	10	17	19	17	20	4,679	5,095
Two or More Races	1	28	32	75	118	112	68	101	6,311	7,492
All Minorities	475	500	1,215	1,345	694	727	2,042	2,425	47,025	55,209
Total Population	3,542	3,318	5,708	5,674	9,007	8,337	6,522	6,511	634,112	641,481

Source: Northwest Area Foundation 2009.

In 2008, North Dakota's total minority population comprised approximately 55,209, or 8.6% of the state's total population (i.e., 641,481). This is an increase of approximately 17.4% over the 2002 minority population numbers, compared with the 1.2% overall increase for the state's total population during the same time. Although 91.3% of the population in North Dakota is classified as Caucasian, this is a decrease of 1.3% from 2002. Conversely, as presented in Table 3.176, the minority population of the state has increased steadily since 2002. For example, the American Indian and Alaska Native population increased 0.6%, from 4.9% of the 2002 state population to 5.5% of the 2008 state population. Approximately 70% of Reservation residents are tribal members and 14% of the Dunn County population and 21.6% of the McKenzie County population comprises American Indians and Alaska Natives.

Poverty rate data for the counties in the Analysis Area are summarized in Table 3.17. The data show that poverty rates for Dunn County, Mountrail County, and the State of North Dakota increased from 2000 to 2007. Poverty rates have decreased for McKenzie and McLean counties.

Table 3.17. Poverty Rates for the Analysis Area.

Location	2000	2007
Dunn County	13.3%	13.5%
McKenzie County	15.7%	13.8%
McLean County	12.3%	10.4%
Mountrail County	15.7%	15.9%
Fort Berthold Reservation	N/A	N/A
North Dakota	10.4%	11.8%

Source: U.S. Census Bureau 2009d.

3.10.1 Potential Impacts to Environmental Justice

Generally, existing oil and gas leasing has already benefited the MHA Nation government and infrastructure from tribal leasing, fees, and taxes. Current oil and gas leasing on the Reservation has also already generated revenue to MHA Nation members who hold surface and/or mineral interests. However, owners of allotted surface within the Analysis Area may not necessarily 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 compensation for productive acreage lost to road and well pad construction. Those with mineral interests also may benefit from royalties on commercial production if the wells prove successful. Profitable production rates at proposed locations might lead to exploration and development of additional tracts owned by currently non-benefitting allottees. In addition to increased revenue for land and mineral holders, exploration and development would increase employment on the Reservation with oversight from the Tribal Employment Rights Office, which would help alleviate some of the poverty prevalent on or near the Reservation. Tribal members without either surface or mineral rights would not receive any direct benefits, except through potential employment, should they be hired. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Additional 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 reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there would be no effect to historic properties. Furthermore, nothing is known to be present that qualifies as a Traditional Cultural Property or for protection under the American Indian Religious Freedom Act.

The possibility of disproportionate impacts to tribes or tribal members is further reduced by the requirement for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultation would 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 a threat for significant impact to any other critical element, including air quality, public health and safety, water quality, wetlands,

wildlife, soils, or vegetation within the human environment. Through the avoidance of such impacts, no disproportionate impact is expected to low-income or minority populations. The Proposed Action offers many positive consequences for tribal members, while recognizing EJ 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. Each phase of construction and development through production would be monitored by the BLM, BIA, and representatives of the MHA Nation to ensure the protection of cultural, archaeological, and natural resources. In conjunction with 43 CFR 46.30, 46.145, 46.310, and 46.415, a report would be developed by the BLM and BIA which documents the results of monitoring in order to adapt the projects to eliminate any adverse impact on the environment.

Mitigation opportunities can be found in general and operator-committed BMPs and mitigation measures. BMPs are loosely defined as techniques used to lessen the visual and physical impacts of development. The BLM has created a catalog of BMPs that, when properly implemented, can assist industry in a project's design, scheduling, and construction techniques. Enerplus would implement, to the extent possible, the use of BMPs in an effort to mitigate environmental concerns in the planning phase allowing for smoother analysis, and possibly faster project approval. Many of these are required by the BLM when drilling federal or tribal leaseholds and can be found in the surface use plan in the APD.

3.11.1 General BMPs

Although largely project-specific, there are a number of BMPs that can, and should, be considered on development projects in general. The following are examples of general BMPs.

- Planning roads and facility sites to minimize visual impacts.
- Using existing roads to the extent possible, upgrading as needed.
- Reducing the size of facility sites and types of roads to minimize surface disturbance.
- Minimizing topsoil removal.
- Stockpiling stripped topsoil and protecting it from erosion until reclamation activities commence. At that time, the soil would be redistributed and reseeded on the disturbed areas. The reclaimed areas would be protected and maintained until the sites are fully stabilized.
- Avoiding removal of, and damage to, trees, shrubs, and groundcover where possible. Trees near construction areas would be marked clearly to ensure that they are not removed.

- Mowing, instead of clearing, a facility or well site to accommodate vehicles or equipment.
- Maintaining buffer strips or using other sediment control measures to avoid sediment migration to stream channels as a result of construction activities.
- Planning for erosion control.
- Proper storage of chemicals (including secondary containment).
- Keeping sites clean, including containing trash in a portable trash cage. The trash cage would be emptied at a state-approved sanitary landfill.
- Conducting snow removal activities in a manner that does not adversely impact reclaimed areas and areas adjacent to reclaimed areas.
- Avoiding or minimizing topographic alterations, activities on steep slopes, and disturbances within stream channels and floodplains to the extent possible.
- Maintaining buffers around work areas where there is a risk of fire as a result of construction activities.
- Keeping fire extinguishers in all vehicles.
- Planning transportation to reduce vehicle density.
- Posting speed limits on roads.
- Avoiding traveling during wet conditions that could result in excessive rutting.
- Painting facilities a color that would blend with the environment.
- Practicing dust abatement on roads.
- Recontouring disturbed areas to approximate the original contours of the landscape.
- Developing a final reclamation plan that allows disturbed areas to be quickly absorbed into the natural landscape.

Enerplus recognizes that there are several BMPs that can be used to mitigate environmental concerns specific to projects associated with below-ground linear alignments, such as those included in the proposed utility corridor. These include:

- following the contour (form and line) of the landscape;
- avoiding locating ROWs on steep slopes;
- sharing common ROWs;
- co-locating multiple lines in the same trench; and
- using natural (topography, vegetation) or artificial (berms) features to help screen facilities such as valves and metering stations.

Enerplus would implement these and/or other BMPs to the extent that they are technically feasible and would add strategic and measurable protection to the project area.

3.11.2 Mitigation and Safety Measures Committed to by Enerplus

3.11.2.1 Dust Control

During construction, a watering truck may be kept on site and the access roads would be watered as necessary, especially during periods of high winds and/or low precipitation.

3.11.2.2 Wildlife

As mentioned in Section 3.4.3, Potential Impacts to Wetlands, Habitat, and Wildlife, Enerplus has committed to using a semi-closed loop drilling system, ensuring that the reserve pit would 1) be smaller than a typical pit and 2) would contain only dry cuttings, which would be solidified with fly ash and buried in place following completion of drilling operations. Additional protections committed to by Enerplus include:

- If a whooping crane is sighted within one mile of the proposed project area, work will be stopped and the Fish and Wildlife Service will be notified.
- If construction is to take place outside the migratory bird breeding season (February 1 – July 15) Enerplus would have a biologist survey the project area five days before construction begins and contact the BIA and the USFWS if birds or nests are found.
- Two-foot berms would be constructed and silt barrier fencing would be installed on the west, north, and northeast sides of the Birdbear 6C-1H pad.
- Matting would be laid and/or hydroseeding would take place on the fill side of the Birdbear 6C-1H pad.
- Trees and other woody material removed from the Birdbear 6C-1H pad would be ground and added to the topsoil.

3.11.2.3 Fire Control

Enerplus would implement fire prevention and control measures including, but not limited to:

- requiring construction crews to carry fire extinguishers in their vehicles and/or equipment;
- training construction crews in the proper use of fire extinguishers; and
- contracting with the local fire district to provide fire protection.

3.11.2.4 Traffic

Construction personnel would stay primarily within the ROW or would follow designated access roads.

3.11.2.5 Cultural Resources

The following protocol will be adhered to by all construction personnel during construction and maintenance of the well pad or access road:

- One archaeological site identified near the APE was found to be potentially significant. Adjacent the site, construction personnel will not utilize the temporary

ROW. The construction corridor will be limited to the 30-foot-wide permanent ROW; all vehicle traffic and constructions activities will be contained within this corridor. The restricted area will be 200 feet in total length (100 feet on either side of the site) and only applies to the eastern portion of the temporary ROW between the site and access road centerline. Temporary fencing will be placed along the edge of the construction corridor adjacent the site boundary and a qualified archaeological monitor will be present during all ground-disturbing activities to ensure that inadvertent impacts to cultural resources are avoided.

- All project workers are prohibited from collecting artifacts or disturbing cultural resources in any area under any circumstances.

If cultural resources are discovered during construction or operation, work shall immediately be stopped, the affected site be secured, and BIA and THPO notified. In the event of a discovery, work shall not resume until written authorization to proceed has been received from the BIA.

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 land area devoted to the disposal of cutting, soil lost to erosion (i.e., wind and water), unintentionally destroyed or damaged cultural resources, wildlife killed as a result of collision with vehicles (i.e., construction machinery and work trucks), and energy expended during construction and operation.

3.13 SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Short-term development activities would not detract significantly from long-term productivity, and use, of the project areas. The construction of access roads and well pad areas would eliminate any forage or habitat use by wildlife and/or livestock. Any allottees to which compensation for land disturbance is owed would be properly compensated for the loss of land use. The initial disturbance area would decrease considerably once the wells are drilled and non-necessary areas have been reclaimed. Rapid reclamation of the project area would facilitate revived wildlife and livestock usage, stabilize the soil, and reduce the potential for erosion and sedimentation.

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 these wells prove productive, it is likely that Enerplus and possibly other operators would pursue additional development in the area. Current farming and ranching activities are 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. Over the past several years, exploration has accelerated over the Bakken Formation. Most of this exploration has taken place outside the Reservation boundary on fee land, but for purposes of cumulative impact analyses, land ownership and the Reservation boundary are immaterial. Although it is the dominant activity currently taking place in the area, oil and gas development is not expected to have more than a minor cumulative effect on land use patterns.

One active well was found within 1 mile of the project area (Table 3.18). There are 12, 76, and 434 oil and gas wells (active, confidential, and permitted) within 5, 10, and 20 miles, respectively, of the proposed project areas (Table 3.19 through Table 3.21; Figure 3.4).

Table 3.18. Confidential, Active, and Permitted Wells within a 1-mile Radius of the Project Area.

	Birdbear 6C-1H		Yellowbird 6A-1H	
Reservation (On/Off)	On	Off	On	Off
Confidential Wells	1	0	0	0
Active Wells	0	0	0	0
Permitted Wells	0	0	0	0

Table 3.19. Confidential, Active, and Permitted Wells within a 5-mile Radius of the Project Area.

	Birdbear 6C-1H		Yellowbird 6A-1H	
Reservation (On/Off)	On	Off	On	Off
Confidential Wells	11	0	11	0
Active Wells	8	0	8	0
Permitted Wells	2	0	2	0

Table 3.20. Confidential, Active, and Permitted Wells within a 10-mile Radius of the Project Area.

	Birdbear 6C-1H		Yellowbird 6A-1H	
Reservation (On/Off)	On	Off	On	Off
Confidential Wells	38	5	39	0
Active Wells	37	8	40	1
Permitted Wells	3	0	3	0

Table 3.21. Confidential, Active, and Permitted Wells within a 20-mile Radius of the Project Area.

	Birdbear 6C-1H	Yellowbird 6A-1H

Reservation (On/Off)	On	Off	On	Off
Confidential Wells	100	59	101	54
Active Wells	94	196	99	189
Permitted Wells	4	0	5	3

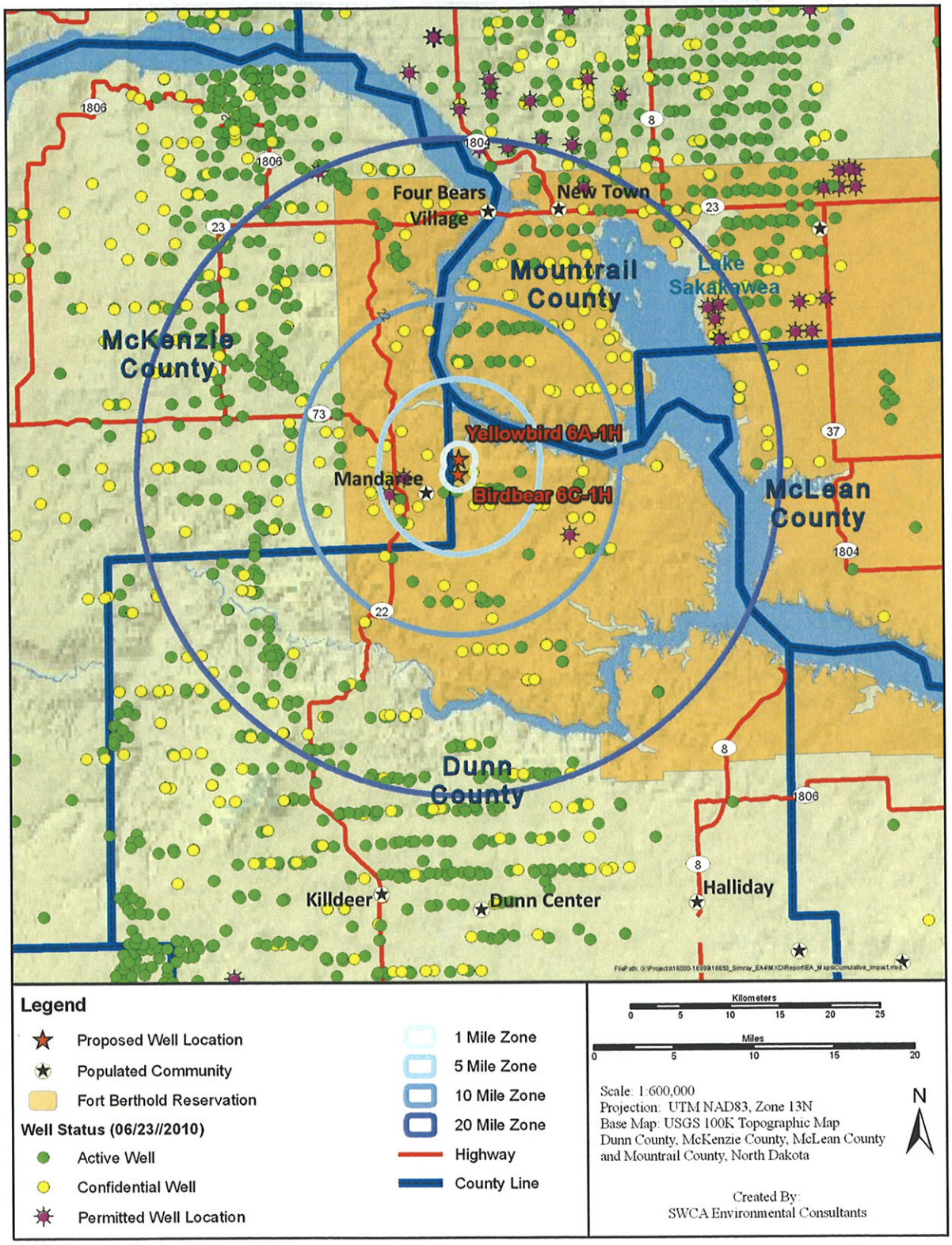

Figure 3.4. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

Within the Reservation and near the proposed project areas, development projects remain few and widely dispersed. None of the project areas proposed in this EA would share access roads with any other proposed wells, but this may change in the future. If successful commercial production is achieved, new exploratory wells may be proposed, though such developments are merely speculation until APDs are submitted to the BLM and BIA for approval. Enerplus has suggested, but not yet formally proposed, that potentially 74 more wells may eventually be drilled in the same general area as the proposed project, using many of the same main access roads and minimizing the disturbance as much as possible.

Potential cumulative impacts of the proposal plus other forseeable future oil and gas development on Fort Berthold could include habitat fragmentation from construction of other well pads and roads, with potential effects on migratory grassland birds. The Project would generate new long-term disturbance of approximately 11 acres of grassland habitat during the construction of roads and wellpads, out of a total 804,244 acres within a 20-mile radius of the project. Similar levels of disturbance have occurred at 434 existing wells within the 20-mile radius, as indicated above. This level of development is estimated to have disturbed approximately 4,340 acres (10 acres per well), or approximately 0.5% of the available surface area within the 20-mile radius. The project would result in an estimated relative incremental increase of 0.3% when added to the existing surface disturbance.

It is anticipated that the pace and level of oil and gas development within this region of the state would continue at the current rate over the next few years and contribute to cumulative air quality impacts. The Proposed Action would incrementally contribute to emissions occurring within the region. In general, however, the increase in emissions associated with the Proposed Action would occur predominantly during construction and drilling operations and would therefore be localized, largely temporary, and limited in comparison with regional emissions.

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 indefinitely. Thus, the Proposed Action could incrementally add to existing and future sources of water quality degradation in the Boggy Creek subwatershed, but increases in degradation would be reduced by Enerplus'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, thus sediment yield from roads can continue indefinitely at rates two to three times the background rate. 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. However, Enerplus 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. Additional information regarding BMPs can be found in Section 3.10 Mitigation and Monitoring.

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 may be possible due to soil loss, compaction, and increased encroachment of unmanaged invasive weed species. 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 is 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 two wells, 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 are expected to affect any critical element of the human environment; impacts would generally be low and mostly temporary. Enerplus has committed to implementing interim reclamation of the roads and well pads immediately following construction and completion. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

4.0 CONSULTATION AND COORDINATION

The BIA must continue to make efforts to solicit the opinions and concerns of all stakeholders (Table 4.1). For the purpose of this EA, a stakeholder is considered any agency, municipality, or individual person to which the proposed action may affect either directly or indirectly in the form of public health, environmental, or socioeconomic issues. A scoping letter declaring the location of the proposed project areas and explaining the actions proposed at each site was sent in advance of this EA to allow stakeholders ample time to submit comments or requests for additional information. Additionally, a copy of this EA would be submitted to all cooperating federal agencies and also to those agencies with interests in or near the proposed actions that could be affected by those actions.

Table 4.1. Scoping Comments.

Name	Organization	Comment	Response to Comment
Bagley, Lonny	Bureau of Land Management	No Comment	
Benson, Barry	Three Affiliated Tribes	No Comment	
Bercier, Marilyn	Bureau of Indian Affairs	No Comment	
Berg, George	NoDak Electric Cooperative, Inc.	No Comment	
Black, Mike	Bureau of Indian Affairs	No Comment	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	The well sites have been overseen by monitors; we have no questions at this time.	Thank you for your comment. See 3.6 Cultural Resources.
Brien, David	Chairman, Turtle Mountain Band of Chippewa	No Comment	
Brugh, V. Judy	Three Affiliated Tribes	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Christenson, Ray	Southwest Water Authority	No Comment	
Cimarosti, Dan	U.S. Army Corps of Engineers	Submit a Section 10 permit application if needed.	Section 10 permit not needed.
U.S. Army Corps of Engineers, Omaha District	Garrison Project Office	No Comment	
Danks, Marvin	Fort Berthold Rural Water Director	No Comment	
Dhieux, Joyce	U.S. Environmental Protection Agency	No Comment	
Director, Insurance & Hazard	Federal Emergency Management Agency	David Kyner: Major concern is whether or not project is located within a mapped Special Flood Hazard Area.	Project area is not in a flood hazard area. Please see section 3.2 Water Resources.
Dixon, Doug	Montana Dakota Utilities	No Comment	
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Flores, J.R.	U.S. Department of Agriculture	No Comment	
Fox, Fred	Three Affiliated Tribes	No Comment	
Glatt, David	North Dakota Department of Health	Impacts minor and can be controlled by using proper construction methods.	See Sections 2.2.8 Construction Details at Individual Sites and 3.9 Mitigation and Monitoring for site-specific details and BMPs.
Gorton, Candace	U.S. Army Corps of Engineers	No Comment	
Guzman, Frank	U.S. Forest Service	No Comment	
Hall, Todd	Three Affiliated Tribes	No Comment	

Name	Organization	Comment	Response to Comment
Hanson, Jesse	North Dakota Parks and Recreation	No historic plant or animal species are known to occur within one mile. During reclamation, we recommend that the area be revegetated with native species.	See Sections 2.2.9 Reclamation, 3.3 Wetlands, Habitat, and Wildlife, 3.5 Vegetation and Invasive Species, and 39 Mitigation and Monitoring for more information.
Hauck, Reinhard	Dunn County	No Comment	
His Horse Is Thunder, Ron	Chairman, Standing Rock Sioux Tribe	No Comment	
Hoffman, Warren	Killdeer, Weydahl Field	No Comment	
Hovda, Roger	Reservation Telephone Cooperative	No Comment	
Hudson-Schenfisch, Julie	McLean County Board of Commissioners	No Comment	
Hynek, David	Chair, Mountrail Board of County Commissioners	No Comment	
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadrmas, Ray	Dunn County	No Comment	
Kuehn, John	Parshall-Hankins Field Airport	No Comment	
Kulas, Cheryl	Indian Affairs Commission	No Comment	
Land Department	Northern Border Pipeline Company	No Comment	
Laux, Eric	U.S. Army Corps of Engineers	Brad Thompson: Coordinate with the EPA, USFWS, NDGF, SHPO. Consult the floodplain management office.	Necessary consultations have, or will be, made.
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
Manager	Xcel Energy	No Comment	
McKenna, Mike	North Dakota Game and Fish Department	Avoid construction to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.	See Affected Environment Section 3.3 Wildlife, Wetlands, and Vegetation.
Mercer County	Mercer County Board of Commissioners	No Comment	
Missile Engineer, Chief	Minot Air Force Base	No Comment	
NAGPRA Office	Three Affiliated Tribes	No Comment	
Nash, Mike	Bureau of Land Management	No Comment	
Natural Resources Department	Three Affiliated Tribes	No Comment	

Name	Organization	Comment	Response to Comment
Nelson, Richard	U.S. Bureau of Reclamation	Kelly McPhillips: Insufficient information to determine if project components would affect BOR facilities (rural water pipelines). Please review enclosed map for potential adverse effects and proper pipeline crossing, should that be necessary. Coordinate with the FBIR Rural Water director.	See 2.2.2 Access Roads. Enerplus would consult with the Rural Water Director if the project components should come into contact with any BOR rural water lines.
Dressler, Patricia	Federal Aviation Administration	No Objections	Thank you for your comment.
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merl	State Historical Society	Send copy of reports and forms to keep archives current. Consider putting TCP-related info in separate reports not sent to SHPO.	Reports will be sent to the required agencies. See 3.6 Cultural Resources.
Packineau, Mervin	Three Affiliated Tribes	No Comment	
Paulson, Gerald	Western Area Power Administration	No Comment	
Pearson, Myra	Spirit Lake Sioux Tribe	No Comment	
Peterson, Walter	North Dakota Department of Transportation	No Comment	
Poitra, Fred	Three Affiliated Tribes	No Comment	
Prchal, Doug	North Dakota Parks and Recreation Department	No Comment	
Representative, Mandaree Segment	Three Affiliated Tribes	No Comment	
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Schelkoph, David	West Plains Electric Cooperative, Inc.	No Comment	
Selvage, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Sorenson, Charles	U.S. Army Corps of Engineers	Due to the close proximity to the Missouri River/Lake Sakakawea, please consider constructing a catch trench on the down-sloping side of the pad to contain hazardous wastes. Please consider a closed-loop drilling system. Additional weed-free fill material should be obtained from a supplier. Do not allow surface occupancy within ½ mile of any known T&E species habitat.	See 2.2.8 Construction Details for information regarding berms. Enerplus uses the semi-closed loop system with a pit for cuttings only as a matter of practice. No additional fill material is required. NSO would be allowed within ½ mile of any known T&E habitat.
Svoboda, Larry	U.S. Environmental Protection Agency	No Comment	

Name	Organization	Comment	Response to Comment
Sweeney, Paul	Natural Resources Conservation Service	FPPA does not apply, no further action is needed. Avoid impacts to wetlands.	Thank you for your comment. See 3.3 Wetlands, Wildlife, and Habitat.
Thorson, Gary	McKenzie Electric Cooperative	No Comment	
Towner, Jeffrey	U.S. Fish and Wildlife Service	Service concurs with findings for plovers, terns, sturgeon, cranes, and migratory birds based on analysis provided and protection measures committed to by Enerplus. Service does not concur with statements regarding lack of suitable habitat for golden eagles and recommends that the EA be corrected before finalization. Service does not agree with statement regarding affects to grouse species and habitat fragmentation as covered in the cumulative impacts section.	Please see sections 3.4.2, 3.11.2.2, and 3.14.
Chevance, Nick	National Park Service, Midwest Region	No Comment	
Vodehnal, Dale	U.S. Environmental Protection Agency	No Comment	
Wells, Marcus	Chairman, Three Affiliated Tribes	No Comment	
Whitcalf, Frank	Three Affiliated Tribes	No Comment	
Williams, Damon	Three Affiliated Tribes	No Comment	
Wolf, Malcolm	Three Affiliated Tribes	No Comment	

5.0 LIST OF PREPARERS

An interdisciplinary team contributed to this document according to guidance provided in Part 1502.6 of CEQ regulations. This document was drafted by SWCA Environmental Consultants under the direction of the BIA. Information was compiled from various sources within SWCA Environmental Consultants.

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- Alan Hutchinson, Archaeologist
  Conducted cultural resource surveys and prepared cultural resource reports for well pads and access roads.
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- Stephanie Lechert, Archaeologist
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- Wade Epperson, GIS Specialist
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- Matt Spann, Environmental Specialist
  Completed water resources, soils, and vegetation sections.

6.0 REFERENCES

Bryce, S., J.M. Omernik, D.E. Pater, M. Ulmer, J. Schaar, J. Freeouf, R. Johnson, P. Kuck, and S.H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. Jamestown, North Dakota: Northern Prairie Wildlife Research Center Online, available at http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/index.htm. Accessed April 30, 2010.

Bureau of Indian Affairs (BIA). 2001. 2001 American Indian Population and Labor Force Report. Available online at http://www.indianaffairs.gov/WhatWeDo/Knowledge/Reports/index.htm. Accessed December 2009.

———. 2005. 2005 American Indian Population and Labor Force Report. Available online at http://www.indianaffairs.gov/WhatWeDo/Knowledge/Reports/index.htm. Accessed December 2009.

Bureau of Land Management (BLM). 2009. Air Resource BMPs – Best Management Practices for Fluid Minerals. Available online at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/technical_information.html. Accessed August 2009.

Bureau of Land Management (BLM) and U.S. Forest Service (USFS). 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

Center for Integrative Environmental Research at the University of Maryland. 2008. Economic Impacts of Climate Change on North Dakota. Available online at http://www.cier.umd.edu/climateadaptation/North%20Dakota%20Economic%20Impacts%20of%20Climate%20Change%20Full%20Report.pdf. Accessed November 16, 2009.

Croft, M.G. 1985. *Groundwater Resources of McKenzie County, North Dakota.* Bulletin 80 – Part III. North Dakota Geological Survey.

Fort Berthold Housing Authority. 2008. Mandan, Hidatsa, Arikara Website. Available online at http://www.mhanation.com/main/history_economic_social.html. Accessed November 2009.

Grah, O.J. 1997. *Soils, Water, and Vegetation Resources Technical Report.* Report prepared for the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Environmental Impact Statement. Prepared for the Casper District Office, Bureau of Land Management, and Gary Holsan Environmental Planning, Thayne, Wyoming, by ECOTONE Environmental Consulting, Inc. Logan, Utah. 101 pp.

High Plains Regional Climate Center. 2008. Historical Climate Data Summaries. Available online at http://www.hprcc.unl.edu/data/historicl. Accessed May 2008.

Hutchinson, Alan, and Nelson Klitzka. 2010. *A Class I and Class III Cultural Resource Inventory of the Enerplus Yellowbird #1-06H Well Location and Access Road on the Fort Berthold Indian Reservation, Dunn County, North Dakota.* Submitted to the Bureau of Indian Affairs-Great Plains Regional Office by SWCA Environmental Consultants, Bismarck, North Dakota.

Klausing, Robert L. 1979. Groundwater Resources of Dunn County, North Dakota. Bulletin 68 – Part III. North Dakota Geological Survey.

Lechert, Stephanie, Alan Hutchinson, and Nelson Klitzka. 2010. *A Class I and Class III Cultural Resource Inventory of the Enerplus Birdbear 6C-1H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota.* Submitted to the Bureau of Indian Affairs-Great Plains Regional Office by SWCA Environmental Consultants, Bismarck, North Dakota.

Natural Resources Conservation Service (NRCS). 2009. *Web Soil Survey.* Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soils data for portions of Sections 21, 22, and 27, Township 147 North, Range 91 West were downloaded from the NRCS websoil survey site in May 2009. Available online at http://websoilsurvey.ncrs.usda.gov and http://soildatamart.ncrs.usda.

North Dakota Department of Agriculture. 2009. 2009 Noxious Weed List Survey - Reported Acres. Available online at http://www.agdepartment.com/weedsurvey/report.asp. Accessed May 6, 2010.

North Dakota State Data Center. 2009. Profile of General Demographic Characteristics: 2000. Fort Berthold Indian Reservation. Available online at http://www.ndsu.nodak.edu/sdc/data/profiles/profilesDP1to4/reservations/fortberthold.pdf. Accessed December 2009.

North Dakota State Water Commission. 2009. North Dakota State Water Commission Mapservice. Available online at http://mapservice.swc.state.nd.us/. Accessed August 24, 2009.

Northwest Area Foundation. 2009. Indicators Website. Available at http://www.indicators.nwaf.org/AdvancedDownload.aspx. Accessed December 2009.

Ruffo, Joshua. 2009. Photograph of drilling rig in North Dakota. Personal photograph by Joshua Ruffo.

Sobotka, Brent. 2008. Photograph of well drilling operations in Wyoming. Personal photograph by Brent Sobotka.

United States Bureau of Economic Analysis. 2009a. Regional Economic Accounts. Local Area Personal Income. Table CA25 – Total Employment by Industry. Available online at http://www.bea.gov/. Accessed December 2009.

———. 2009b. Regional Economic Accounts. Local Area Personal Income. Table CA1-3 – Personal Income, Population, Per Capita Personal Income. Available online at http://www.bea.gov/. Accessed December 2009.

United States Census Bureau. 2009a. State and County Quick Facts. Available online at http://quickfacts.census.gov/qfd/states/38000.html. Accessed November 2009.

———. 2009b. Building Permits (County). Available online at http://www.census.gov/const/www/permitsindex.html. Accessed December 1, 2009.

———. 2009c. Profile of General Demographic Characteristics. Available online at http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=25000US1160&-qr_name=DEC_2000_SF1_U_DP1&-ds_name=DEC_2000_SF1_U&-_sse=on. Accessed December 1, 2009.

———. 2009d. Small Area Income and Poverty. Available online at http://www.census.gov/did/www/saipe/county.html. Accessed November 2009.

———. n.d. USA Counties. Available online at http://censtats.census.gov/usa/usa.shtml. Accessed December 2009.

United States Department of Agriculture (USDA). 2009. Economic Research Service. County-Level Unemployment and Median Household Income for North Dakota. Available at http://www.ers.usda.gov/Data/Unemployment/RDList2.asp?ST=ND. Accessed December 1, 2009.

United States Environmental Protection Agency (EPA). 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. Office of Federal Activities, U.S. Environmental Protection Agency. Washington, D.C. 70 pp. + appendices.

———. 2009. Query AQ Data Website. Available online at http://www.epa.gov/aqspubl1/. Accessed October 2009.

United States Fish and Wildlife Service (USFWS) 2010. *County Occurrence of Endangered, Threatened, and Candidate Species and Designated Critical Habitat in North Dakota.* Available online at http://www.fws.gov/northdakotafieldoffice/county_list.htm. Accessed May 14, 2010.

———. 2009. National Wetlands Inventory: Wetlands Online Mapper. Available online at http://westlandsfew.er.usgs.gov/wtlnds/launch.html. Accessed January 4, 2010.

United States Geological Survey (USGS). 2010. Ecoregions of North and South Dakota. Available online at http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/nodak.htm. Accessed April 30, 2010.

Williams, B.B., and M.E. Bluemle. 1978. Status of Mineral Resource Information for the Fort Berthold Indian Reservation, North Dakota. Administrative Report BIA-40. 35 pp.

7.0 ACRONYMS

°F	degrees Fahrenheit
APD	Application for Permit to Drill
APE	Area of Potential Effect
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
EA	environmental assessment
EIS	environmental impact statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
HAP	hazardous air pollutant
HUC	hydrologic unit code
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation
N_2O	nitrous oxide
NAGPRA	Native American Graves Protection and Repatriation Act
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIC	North Dakota Industrial Commission
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NTL	Notice to Lessees
PEM	palustrine emergent
ppm	parts per million
ROW	right-of-way
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
THPO	Tribal Historic Preservation Officer
TMD	total measured depth
TVD	total vertical depth
USC	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound