United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Great Plains Regional Office
115 Fourth Avenue S.E., Suite 400
Aberdeen, South Dakota 57401

TAKE PRIDE IN AMERICA

JUN 03 2011

IN REPLY REFER TO:
DESCRM
MC-208

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 13 proposed oil wells atop four pads by EOG Resources 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 are copies 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 (40 C.F.R. Part 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: Tex Hall, Chairman, Three Affiliated Tribes (with attachment)
Elgin Crows Breast, THPO (with attachment)
Derek Enderud, BLM, Dickenson, ND (with attachment)
John Shelman, US Army Corps of Engineers
Jeffrey Hunt, Fort Berthold Agency

Finding of No Significant Impact

EOG Resources, Inc.

13 Horizontal Oil Wells From Four Pads

Fort Berthold Indian Reservation
McKenzie County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal to drill 13 oil and gas wells from four pads on the Fort Berthold Reservation in McKenzie County, North Dakota. 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 Environmental Assessment (EA), as required by the National Environmental Policy Act. Based on the recently completed EA, I have determined that the proposed projects 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

Date 6/2/11

Notice of Availability and Appeal Rights

EOG: Hawkeye and Riverview

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to installation of 13 oil and gas wells from four pads as shown on the attached map. Construction by EOG is expected to begin 2011.

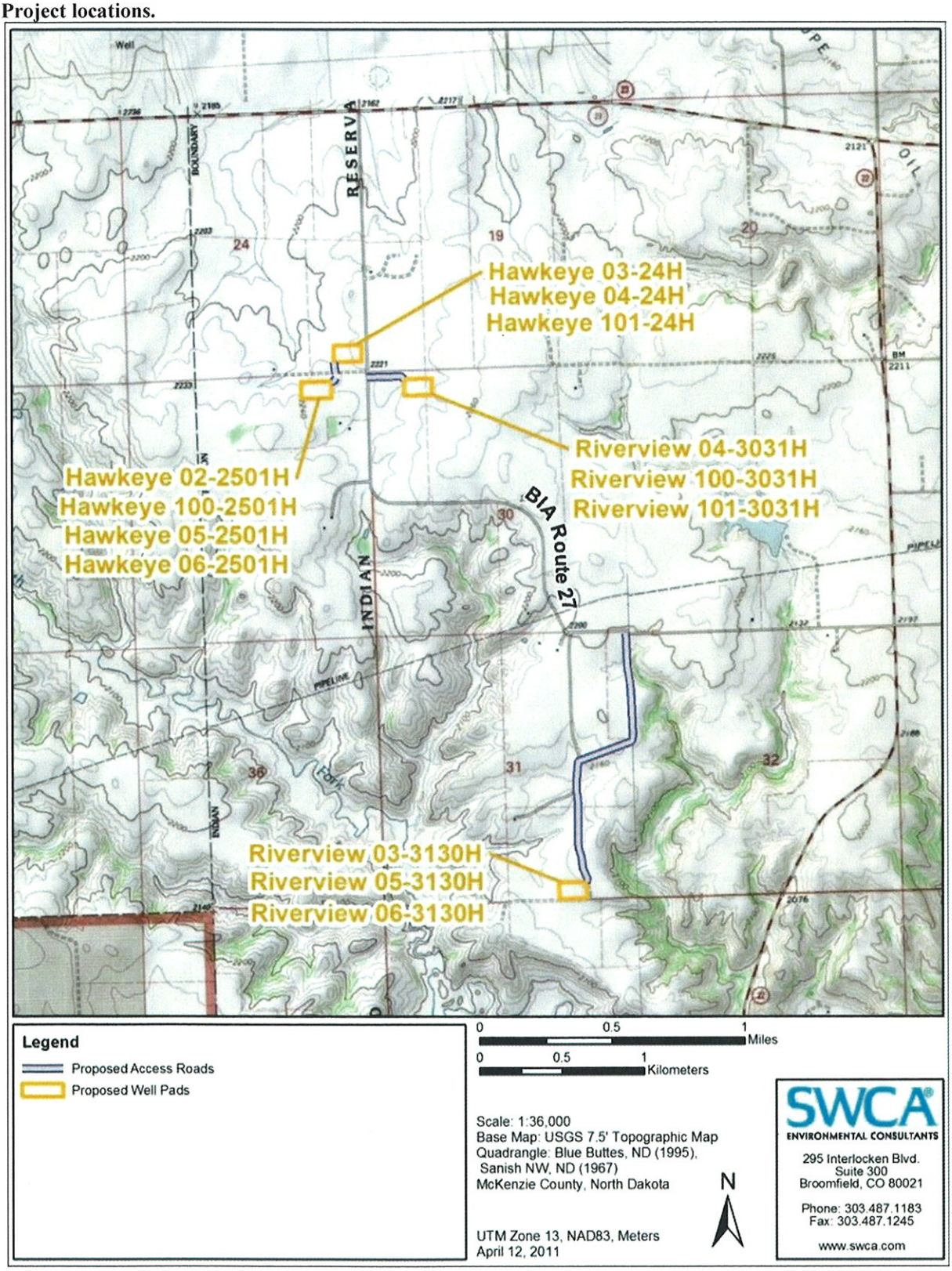
An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No 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 July 2, 2011, 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.



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

EOG Resources, Inc.

Hawkeye and Riverview Oil Wells

Fort Berthold Indian Reservation

May 2011

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

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF FIGURES

TABLE OF CONTENTS (continued)

LIST OF TABLES

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

EOG Resources, Inc. (EOG) proposes to drill and complete up to 13 horizontal oil wells on four pads to explore for and develop productive subsurface formations underlying oil and gas leases owned by EOG within the Fort Berthold Indian Reservation (Reservation). If oil is produced in paying quantities, EOG would install production facilities at each location and transport commercial quantities of oil to nearby markets via trucks or pipelines. These developments have been proposed on lands held in trust by the United States in McKenzie County, North Dakota (Figure 1). The Bureau of Indian Affairs (BIA) is the surface management agency for the potentially affected tribal lands and individual allotments. The BIA manages surface lands held in title by the tribe and tribal members and subsurface mineral rights associated with the surface ownership. Developments have been proposed in locations that target specific areas of known oil reserves located in the Bakken or Three Forks formations.

Initially, nine wells would be drilled, and are discussed in detail throughout this environmental assessment (EA). However, four additional wells may be drilled from the four well pads depending on results of the initial wells. The additional wells would be drilled within the proposed well pad disturbance. The proposed surface locations for the well pads are provided in Table 1; the four additional wells are shown in italics.

Table 1. Proposed Well Locations.

Well Pad Name	Well Pad Surface Location	Wells
Hawkeye Section 25	NE¼NE¼ Section 25, Township (T) 152 North (N), Range (R) 95 West (W)	Hawkeye #02-2501H Hawkeye #100-2501H *Hawkeye #05-2501H* *Hawkeye #06-2501H*
Hawkeye Section 24	SE¼SE¼ Section 24, T152N, R95W	Hawkeye #03-24H Hawkeye #04-24H Hawkeye #101-24H
Riverview Section 30	NW¼NW¼ Section 30, T152N, R94W	Riverview #04-3031H Riverview #100-3031H Riverview #101-3031H
Riverview Section 31	SE¼SE¼ Section 31, T152N, R94W	Riverview #03-3130H *Riverview #05-3130H* *Riverview #06-3130H*

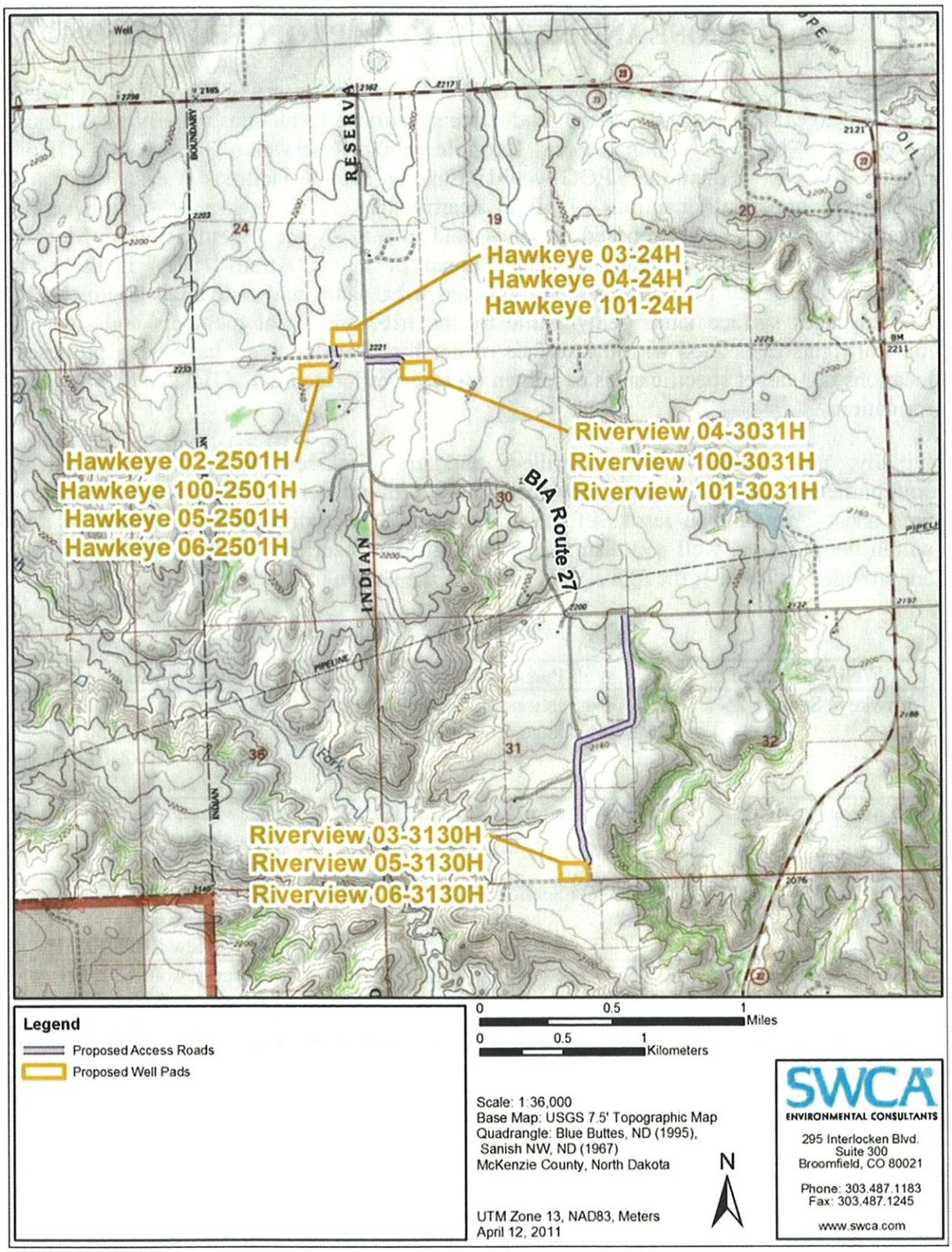


Figure 1. Proposed well pad locations.

The BIA's general mission is to represent the interests, including the Trust Resources, belonging to members of the Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara (MHA) Nation, as well as individual tribal members. All members of the MHA Nation and individual tribal members would benefit substantially from the development of oil and gas resources on the Reservation. Oil and gas exploration and development is 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).

The BLM is responsible for the final approval of all Applications for Permit to Drill (APDs) after receiving a recommendation 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 should arise as a result of any of the aforementioned actions.

Compliance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) regulations (Title 40 Code of Federal Regulations [CFR] 1500–1508) is required due to the project's location on federal land. APDs have been submitted by EOG to describe proposed procedures (i.e., development, reclamation) and technical practices. This EA will either result in a Finding of No Significant Impact (FONSI) or result in the preparation of an environmental impact statement (EIS).

The Proposed Action includes various components associated with the construction and subsequent operation of each of the proposed well sites. Well pads would be constructed to accommodate drilling activities. Access roads would be constructed to access each proposed well pad. Cuttings pits would be constructed on well pads for drilled cuttings and would be reclaimed once drilling has been completed. Assuming production is established from the wells, production facilities would be constructed on the well pad. After final plugging and abandonment of a well, all components (i.e., roads, well pads, supporting facilities) would be reclaimed unless formally transferred, with federal approval, to either the BIA or the landowner.

This EA only addresses the potential effect associated with the installation and possible long-term operation of the above-listed well pads and directly related infrastructure and facilities. Further oil and gas exploration and development resulting in additional surface disturbance would require additional NEPA analysis and federal actions. If authorized, this project must 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 ALTERNATIVES

2.1 NO ACTION ALTERNATIVE

A No Action Alternative is the only alternative to the Proposed Action considered in this EA. The U.S. Department of the Interior's (USDI's) authority to implement a "no action" alternative is limited. An oil and gas lease grants the lessee the "right and privilege to drill for, extract, remove, and dispose of all oil and gas deposits" in the lease lands, "subject to the terms and conditions incorporated in the lease." If the No Action Alternative is approved, the BIA would not approve APDs or grant ROWs for one or more of the proposed locations, and land would remain in its current state.

2.2 PROPOSED ACTION

This EA analyzes the potential impacts of 13 horizontal oil wells on four well pads and their associated facilities and infrastructure located on individual allotted surface lands administered in trust by the BIA. The Proposed Action would require constructing well pads, as well as constructing and maintaining access road, pipeline, and powerline ROWs. The proposed project sites have been chosen by the proponent in consultation with the tribal and BIA resource managers to assist in defining further potential production. All well pads would be on tribal surface. The line of production of the horizontal wells would pass through fee simple, individual allotted, and tribal subsurface. Table 2 presents the surface and bottom hole locations and lease numbers of the nine proposed wells that will be developed initially. Surface and bottom hole locations are not available for all the additional wells at this time.

The specific pad locations, access road routes, and pipeline routes were determined after pre-construction on-site inspections by the proponent, the civil surveyor, the environmental consultant, the BIA environmental specialist, and the Tribal Historic Preservation Office (THPO) oilfield monitor on 1 November 2010. Resource surveys were conducted at the time of pre-construction on-site inspections to determine potential impacts to cultural and natural (i.e., biological and physical) resources. The locations were inspected in consideration of topography, location of topsoil/subsoil stockpiles, natural drainage and erosion control, flora, fauna, habitat, historical and cultural resources, and other surface issues. The final locations were determined in consideration of these issues. Avoidance measures and other protective measures were incorporated into the final project design to minimize impacts to evaluated resources, as appropriate (see Section 2.11). During the on-site inspections, the BIA gathered information needed to develop site-specific mitigation measures that would be incorporated into the final APD.

Table 2. Proposed Well Leases.

Well	Surface Location	Bottom Hole Location	BIA Lease Number
Hawkeye #02-2501H	NE¼ NE¼ Section 25, T152N, R95W; 290 feet FNL, 900 feet FEL	SW¼ SE¼ Section 1, T151N, R95W; 290 feet FSL, 2,000 feet FEL	1420A049975
Hawkeye #100-2501H	NE¼ NE¼ Section 25, T152N, R95W; 290 feet FNL, 950 feet FEL	SE¼ SE¼ Section 1, T151N, R95W; 200 feet FSL, 500 feet FEL	1420A049975
Hawkeye #03-24H	SE¼ SE¼ Section 24, T152N, R95W; 420 feet FSL, 280 feet FEL	NE¼ NE¼ Section 24, T152N, R95W; 200 feet FNL, 1,320 feet FEL	1420A049916
Hawkeye #04-24H	SE¼ SE¼ Section 24, T152N, R95W; 420 feet FSL, 380 feet FEL	NW¼ NW¼ Section 24, T152N, R95W; 1,320 feet FNL, 500 feet FWL	1420A041040
Hawkeye #101-24H	SE¼ SE¼ Section 24, T152N, R95W; 420 feet FSL, 330 feet FEL	NW¼ NW¼ Section 24, T152N, R95W; 200 feet FNL, 1,320 feet FWL	1420A049912
Riverview #04-3031H	NW¼ NW¼ Section 30, T152N, R94W; 290 feet FNL, 1,050 feet FWL	SW¼ SW¼ Section 31, T152N, R94W; 200 feet FSL, 1,100 feet FWL	1420A048497
Riverview #100-3031H	NW¼ NW¼ Section 30, T152N, R94W; 290 feet FNL, 1,100 feet FWL	SW¼ SE¼ Section 31, T152N, R94W; 200 feet FSL, 2,100 feet FEL	1420A048496
Riverview #101-3031H	NW¼ NW¼ Section 30, T152N, R94W; 290 feet FNL, 1,000 feet FWL	SW¼ SW¼ Section 31, T152N, R94W; 200 feet FSL, 500 feet FWL	1420A048496
Riverview #03-3130H	SE¼ SE¼ Section 31, T152N, R94W; 170 feet FSL, 1,240 feet FEL	NW¼ NE¼ Section 30, T152N, R94W; 200 feet FNL, 1,500 feet FEL	1420A048496

FEL = from the east line; FNL = from the north line; FSL = from the south line; FWL = from the west line

The APD, EA, lease stipulations, and any special actions required by the BIA or BLM would be followed during construction. The proponent would secure all required permits, easements, and approvals following procedures established by the MHA Nation, the BIA, the North Dakota Industrial Commission (NDIC), and the BLM, as appropriate, prior to construction and drilling. The proponent would adhere to all applicable federal, state, county, and tribal regulations while performing all operations associated with the Proposed Action. Surface-disturbing activities would be constructed and maintained to the standards detailed in *Surface Operating Standards for Oil and Gas Exploration and Development, 4th Edition* (Gold Book) (USDI and U.S. Department of Agriculture [USDA] 2007), BLM Manual Section 9113, and according to BIA/tribal specifications. Operations would be in full compliance with applicable laws and regulations, including Title 43 CFR 3100; Onshore Oil and Gas Order Nos. 1, 2, 6, and 7; approved operation plans; and Notices to Lessees (NTLs). The proponent would maintain any production facilities for the lives of the wells, which is estimated to be 30 to 50 years.

This EA assumes that details of construction, drilling, completion, and reclamation provided in the APDs, Surface Use Plans (SUPs), drilling plan, and EOG's Safe Practices Manual (2007) are indicative of procedures that would be followed by the proponent and are incorporated by reference. Additional details of construction, drilling, and completion procedures can be found in the APDs for each well.

2.3 ACCESS ROADS, PIPELINES, AND UTILITY LINES

Each well would require construction of an all-weather, 24-foot-wide running surface, double-lane access road with a 40-foot subgrade. The 24-foot road width is necessary to ensure safe passage of oil tanker trucks. A 125-foot ROW is requested to accommodate access roads, underground oil, gas, and water gathering pipelines, waterlines, fiber optic lines, and utility lines. The 125-foot width is necessary to build ditches appropriate to handle large volumes of snow and runoff and is consistent with county and township roads in North Dakota. Approximately 1.3 miles of new ROW would be required to access the proposed well locations (see Table 4 in Section 2.12). Total surface disturbance for all ROWs would be approximately 20 acres. The ROWs are located on tribal lands.

A minimum of 6 inches of topsoil would be stripped from each access road footprint to provide access to the subsoil, which is better suited for shaping and compaction. The topsoil would be temporarily stored along the sides of a road and subsequently spread on the back slopes in preparation for seeding during interim reclamation. Maximum grade of each new access road would be less than 4%. Native or commercially obtained materials would be used to surface the well pad and access road. Access roads would be crowned and ditched with water turnouts to ensure proper drainage. Water control features would be constructed as necessary to control erosion. All access roads crossing drainages would be constructed as low water crossings. Culverts, consisting of corrugated metal pipes, would be installed along the access roads, as determined during the on-site inspections and shown on the plats that accompany each APD. As directed by the Authorized Officer (AO), EOG would install cattle guards where an access road would cross an existing fence line to maintain control of livestock.

Access roads would be surfaced with native or commercially obtained materials. Each access road would be maintained to prevent soil erosion and ensure safe conditions during the life of a well. Construction would follow road design standards outlined in the BLM Gold Book (USDI and USDA 2007), and details of road construction will be addressed in each APD. A typical cross section is shown in Figure 2. EOG would be responsible for road maintenance and upkeep for the life of the wells, unless a formal road maintenance agreement is in place designating another entity for maintenance. All oil well access roads would be fully reclaimed (see Section 2.10) once the wells are depleted and abandoned, unless the BIA or surface owners assume responsibility for the roads through a formal agreement.

In addition to roads, utility lines, natural gas, oil, and water gathering lines from these wells may also be installed in the 125-foot ROW. Gathering lines would be connected to trunk lines approved under other NEPA documents.

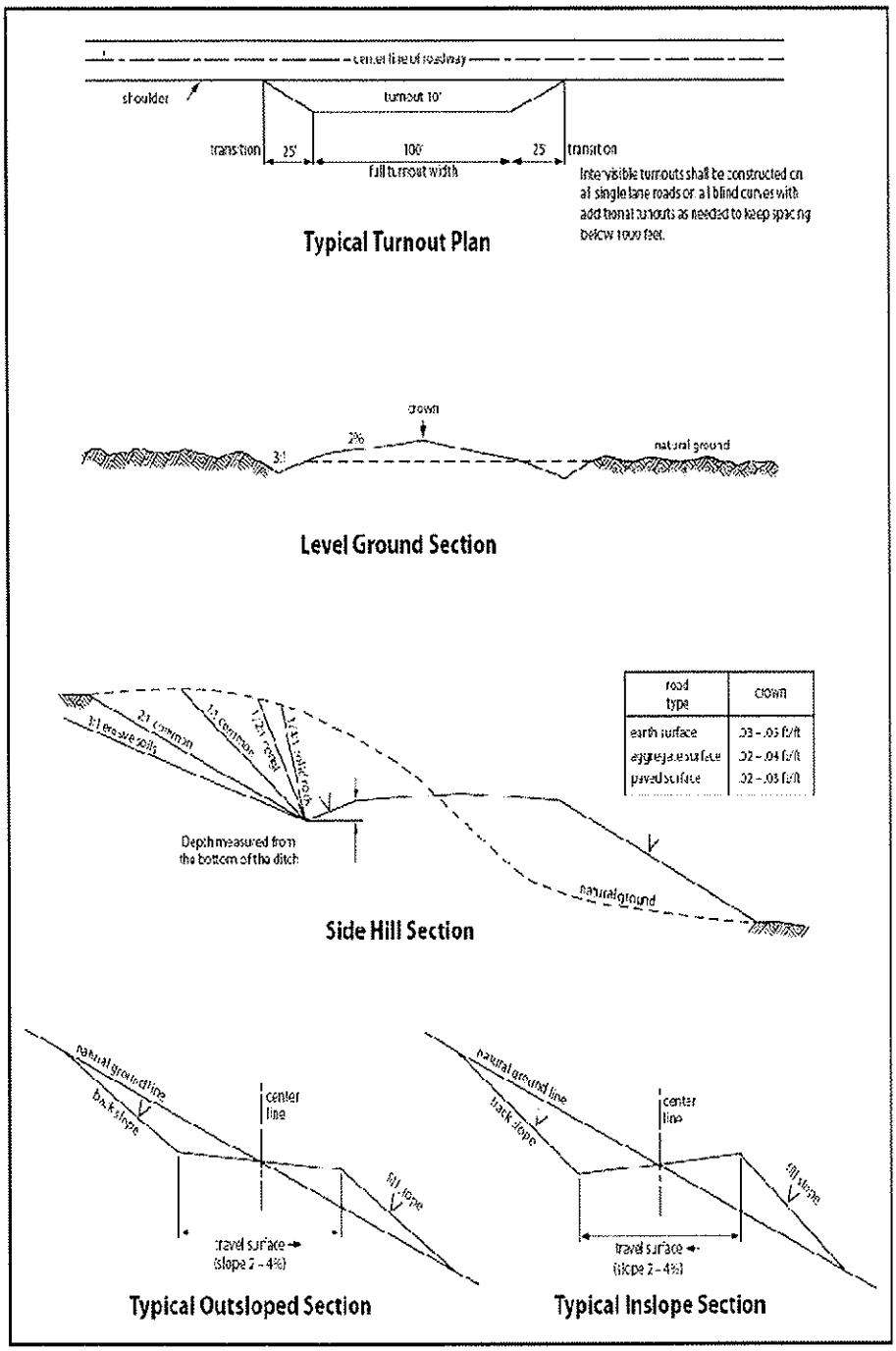


Figure 2. Typical road cross sections (USDI and USDA 2007).

2.4 WELL PADS

Wells would be drilled on pads typically measuring approximately 400 by 550 feet, resulting in a surface disturbance of approximately 6 acres each when including the area for fill slopes, stockpiles, and cuttings pit. See Section 2.9 and Table 4 in Section 2.12 for well-specific surface disturbance. Well pads have been designed to accommodate drilling multiple wells

within the initial area of disturbance. The four pads could accommodate up to 13 horizontal oil wells (Table 1).

Locations would be leveled by balancing cut and fill areas. Subsoil and the rock remaining from the cuttings pit cut would be used to construct the location. Topsoil would be stored in a stockpile for use during reclamation. Diversion ditches or berms would be constructed, as needed, along a perimeter of a well pad to prevent runoff from flowing across a well pad.

A temporary pit for drill cuttings would be constructed within the cut portion of each well pad; no drilling liquids would be stored in the pit. Each pit would be constructed so as not to leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit. A pit liner would have permeability less than 10^{-7} centimeters per second and burst strength greater than or equal to 300 pounds per square inch (psi) or puncture strength greater than or equal to 160 psi and grab tensile strength greater than or equal to 150 psi. A liner would be resistant to deterioration by hydrocarbons and would not be installed directly on a rock surface. Where necessary, bedding materials, such as sand or geotextile fiber liner, would be installed to prevent contact with exposed rock.

Prior to drilling, each well pad would be fenced to prevent ingress by livestock or wildlife, and a cattle guard would be installed at the entrance to well pads at the fence line, as determined at pre-construction on-site meetings.

2.5 DRILLING

For each well, drilling operations would consist of drilling the surface hole, running and cementing surface casing, drilling the production hole, and running and cementing production casing. The proposed wells would be drilled from individual well pads vertically to the Bakken or Three Forks formations at an approximate depth of 11,000 feet below the surface. Then a wellbore (i.e., lateral leg) would be drilled horizontally until total depth is reached. Appropriately sized pressure control equipment would be used for drilling activities. Water would be hauled by truck to each location from a commercial source, using approximately 1,200 barrels of fresh water to drill each well. Drilling operations would use both freshwater-based mud and oil-based drilling mud. For each well, approximately 1,500 barrels of drilling mud would be recycled for subsequent wells.

The wells would be drilled using a semi-closed-loop mud system and a pit for drill cuttings would be installed on the well pad. Drilling liquids would be temporarily stored in tanks on the well pad; no liquids would be stored in open pits. Each cuttings pit would be fenced on three sides during drilling and completion operations. The fourth side of the pit would be fenced as soon as the completion rig is moved off a location to prevent ingress by livestock or wildlife. The pits would generally be closed within 10 days of completing drilling operations.

Unintended 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.

No chemicals subject to reporting under Superfund Amendments and Reauthorization Act (SARA) Title III (hazardous materials) in an amount greater than 10,000 pounds would be used, produced, stored, transported, or disposed of in association with the drilling of these wells. 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 drilling operations.

2.6 CASING AND CEMENTING

After drilling, steel production casing would be run and cemented in place in accordance with the well design, as specified in the APD and Conditions of Approval. Evaluation logs may be run subsequent to setting and cementing production casing. The casing and cementing program would be designed to isolate and protect the shallower formations encountered in the well bore and to prohibit pressure communication or fluid migration between zones. Casing and cementing operations would be conducted in full compliance with Onshore Oil and Gas Order No. 2 (43 CFR 3160) and NDIC regulations.

2.7 COMPLETION AND EVALUATION

Completion operations would consist of perforating the production casing, stimulating the formation(s) using hydraulic fracturing techniques, flow back of fracturing fluids, flow testing to determine post-fracture productivity, and installation of production equipment. After production casing is perforated, stimulation would consist of hydraulically fracturing the producing formation. A water/sand slurry would be used with non-toxic chemical additives to ensure the quality of the fracture fluid. Fluid would be pumped down the wellbore through perforations in the casing and into the formation. Pumping pressures would be increased to the point at which fractures radiate outward from the perforations into the formation and the slurry flows rapidly into the fractures. The resulting fractures are propped open by the sand after the pressure drops, thereby allowing reservoir fluids to move more readily into the well. Hydraulic fracturing is a well understood and commonly employed technology used on potentially productive reservoirs at depths below usable aquifers. Approximately 25,000 barrels of fresh water would be used for hydraulic fracturing operations for each well.

2.8 COMMERCIAL PRODUCTION

2.8.1 Production Facilities

Production facilities at each well pad would include well heads and pump jacks, a flare pit, a heater-treater, a recirculating pump, and a tank battery. Production facilities would be installed on the disturbed portion of each well pad, a minimum of 25 feet from the toe of the back slope, where practical.

Production fluids would be stored on each well pad in tanks. Multiple 400-barrel oil tanks and water tanks would be located inside of a berm, which would be constructed completely around production facilities that contain fluids (i.e., production tanks, produced water tanks, and/or heater-treater). A berm would consist of impervious compacted subsoil and would hold 110% of the capacity of the largest tank plus one day's production. The proponent would

develop and maintain site-specific Spill Prevention, Control, and Countermeasure Plans (SPCCPs) for each production facility.

2.8.2 Production Traffic

Produced water and oil would initially be transported from the tanks on each location by trucks unless or until the well can be connected to gathering pipelines. Table 3 presents estimates of truck traffic anticipated to be necessary to initially haul fluids from each well. Trucks for normal production operations would use the existing and proposed access roads. Produced water would be transported to the Rink 1 disposal site (located in Section 21, T150N, R96W, McKenzie County, North Dakota) or other approved disposal facility. The proposed wells typically would be visited daily by a pumper. All truck drivers would be required to follow posted load limits, speed limits, and all other traffic laws in accordance with EOG's Safe Practices Manual (2007).

Table 3. Estimated Tanker Truck Traffic.

Time Period	Average Daily Tanker Truck Roundtrips Per Well
Production Days 1–30	5
Production Days 31–60	2
Production Days 61–ongoing	1

Note: Estimates based on projected production volumes for exploratory wells and are subject to change based on actual production volumes. Estimates assume all fluids transported via truck from each well.

Initially, natural gas produced in association with the liquid hydrocarbons would be flared, unless gas gathering lines are in place at initial production. A flare pit would be located a minimum of 150 feet from a well head to ensure safe operations. The proponent may construct natural gas-gathering pipelines within the ROW approved under this EA. The timing of installation of gas gathering pipelines would be dependent on the ability to tie-in to a larger gas system (trunk lines). Flaring operations would be conducted in compliance with applicable regulations and would be in accordance with NTLs 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).

All permanent (on-site six months or longer) aboveground structures constructed or installed, including pumping units, would be painted Shale Green color, as determined at the on-site inspection. The proponent would control noxious weeds within the exterior boundaries of access roads, well sites, or other applicable facilities by spraying or mechanical removal. Weed control would be conducted in accordance with procedures established by BIA, BLM, state, and county guidelines. Drainage ditches and/or culverts would be maintained for the life of the well to ensure free-flowing conditions.

2.9 CONSTRUCTION DETAILS AT INDIVIDUAL SITES

2.9.1 Hawkeye Section 25 Well Pad

This proposed Hawkeye well pad would be located approximately 20 miles north of the town of Mandaree in Section 25, T152N, R95W (Figures 3 and 4). The proposed 300- by 600-foot well pad, sized to accommodate drilling up to four wells, would disturb approximately 6.24 acres including fill slopes, stockpiles, and cuttings pit. A new access road, approximately 176 feet (0.03 mile) long, would be constructed to connect the proposed well site with BIA Route 27 (Figures 4 and 5). The new road would be within a 125-foot-wide ROW which would disturb approximately 0.51 acre. Total new disturbance including the well pad, road, and buried pipelines would be 6.75 acres (see Table 4 in Section 2.12).

The spacing unit consists of 1,920 acres (+/-) with the bottom holes located south of the surface hole location in Section 1, T151N, R95W (Figure 4). Specific information on the location of the drilling targets and leases are described in Table 2. Specific information is not available for two of the wells that would be located on this well pad. A setback of at least 200 feet from the north and south section lines of the spacing unit would be maintained.

Figure 3. Hawkeye Section 25 well pad area, facing west.

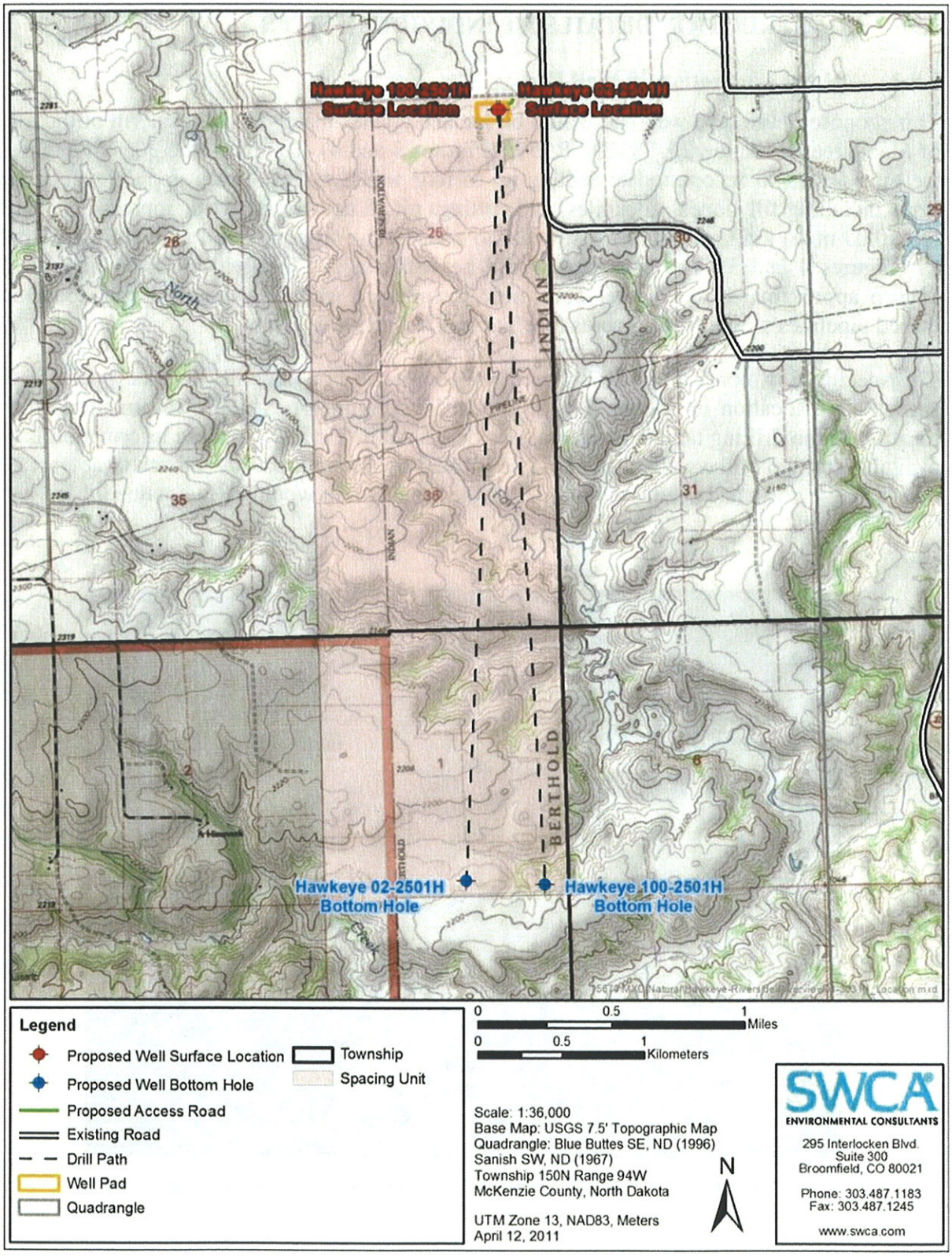


Figure 4. Hawkeye Section 25 proposed surface and bottom hole locations.

Figure 5. Hawkeye Section 25 access road, facing north.

2.9.2 Hawkeye Section 24 Well Pad

This proposed Hawkeye well pad would be located approximately 20 miles north of the town of Mandaree in Section 24, T152N, R95W (Figures 6 and 7). The proposed 400- by 550-foot well pad, sized to drill up to three wells, would disturb approximately 5.41 acres, including fill slopes, stockpiles, and cuttings pit. A new access road approximately 272 feet (0.05 mile) long would be constructed to connect the well site with BIA Route 27 (Figures 6 and 8). The new road would be within a 125-foot ROW which would disturb approximately 0.78 acre. Total new disturbance including the well pad, road, and buried pipelines would be 6.19 acres (see Table 4 in Section 2.12).

The spacing unit consists of 640 acres (+/-) with the bottom holes located north of the surface hole location within Section 24 (Figure 6). Specific information on the location of the drilling targets and leases are described in Table 2. A setback of at least 200 feet from the north and south section lines of the spacing unit would be maintained.

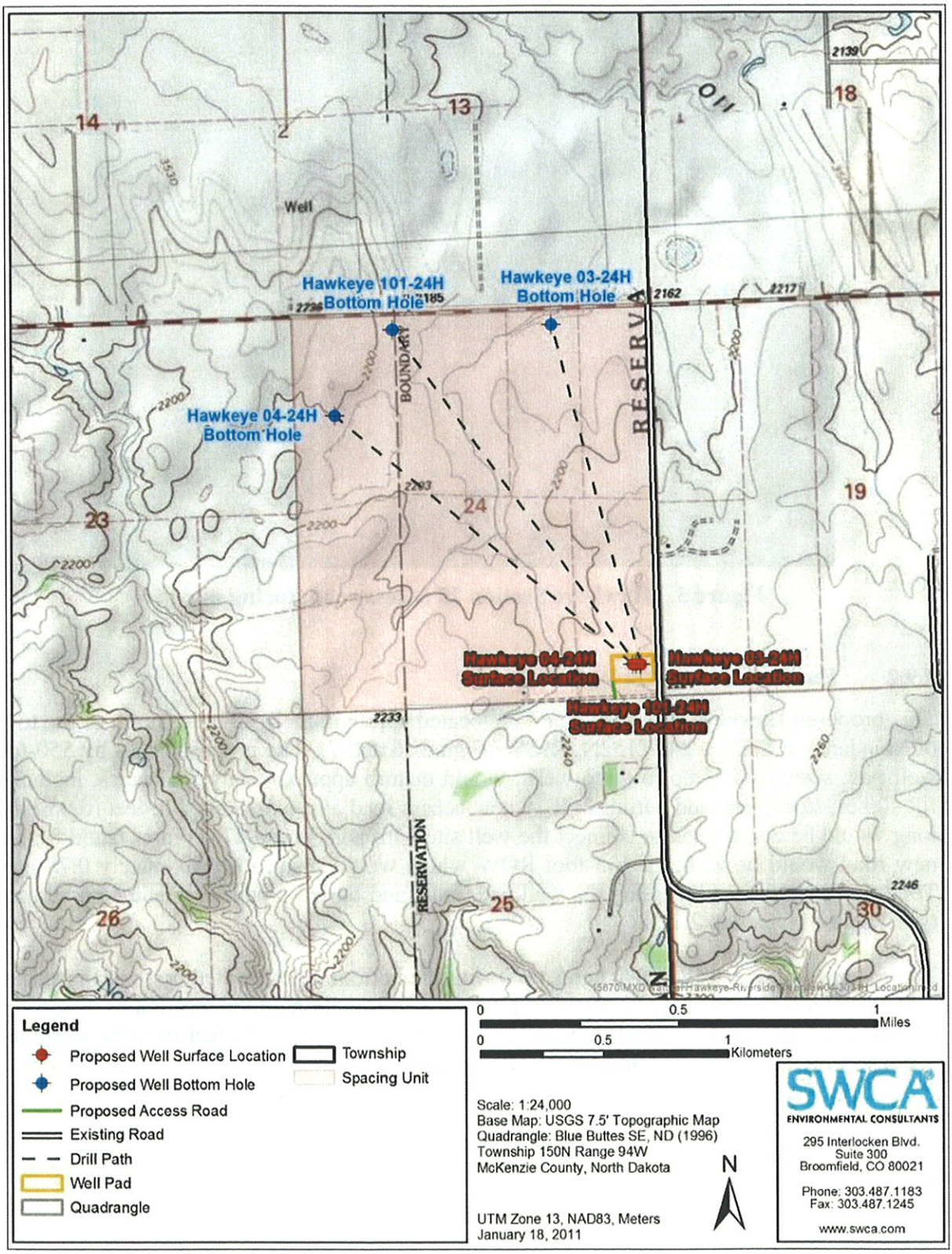


Figure 6. Hawkeye Section 24 proposed surface and bottom hole locations.

Figure 7. Hawkeye Section 24 well pad area, facing south.

Figure 8. Hawkeye Section 24 access road area, facing east.

2.9.3 Riverview Section 30 Well Pad

This proposed Riverview well site would be located approximately 20 miles north of the town of Mandaree in Section 30, T152N, R94W (Figures 9 and 10). The proposed 400- by 550-foot well pad, sized to accommodate drilling up to three wells, would disturb approximately 5.83 acres, including fill slopes, stockpiles, and cuttings pit. A new access road approximately 761 feet (0.14 mile) long would be constructed to connect the well site with BIA Route 27 (Figures 10 and 11). The road would be constructed within a 125-foot wide ROW and would disturb approximately 2.18 acres. Total new disturbance including the well pad, road, and buried pipelines would be approximately 8.01 acres (see Table 4 in Section 2.12).

The spacing unit consists of 1,280 acres (+/-) with the bottom holes located south of the surface hole location in Section 31, T152N, R94W (Figure 10). Specific information on the location of the drilling targets and leases is described in Table 2. A setback of at least 200 feet from the north section line of the spacing unit would be maintained.

Figure 9. Riverview Section 30 well pad area, facing west.

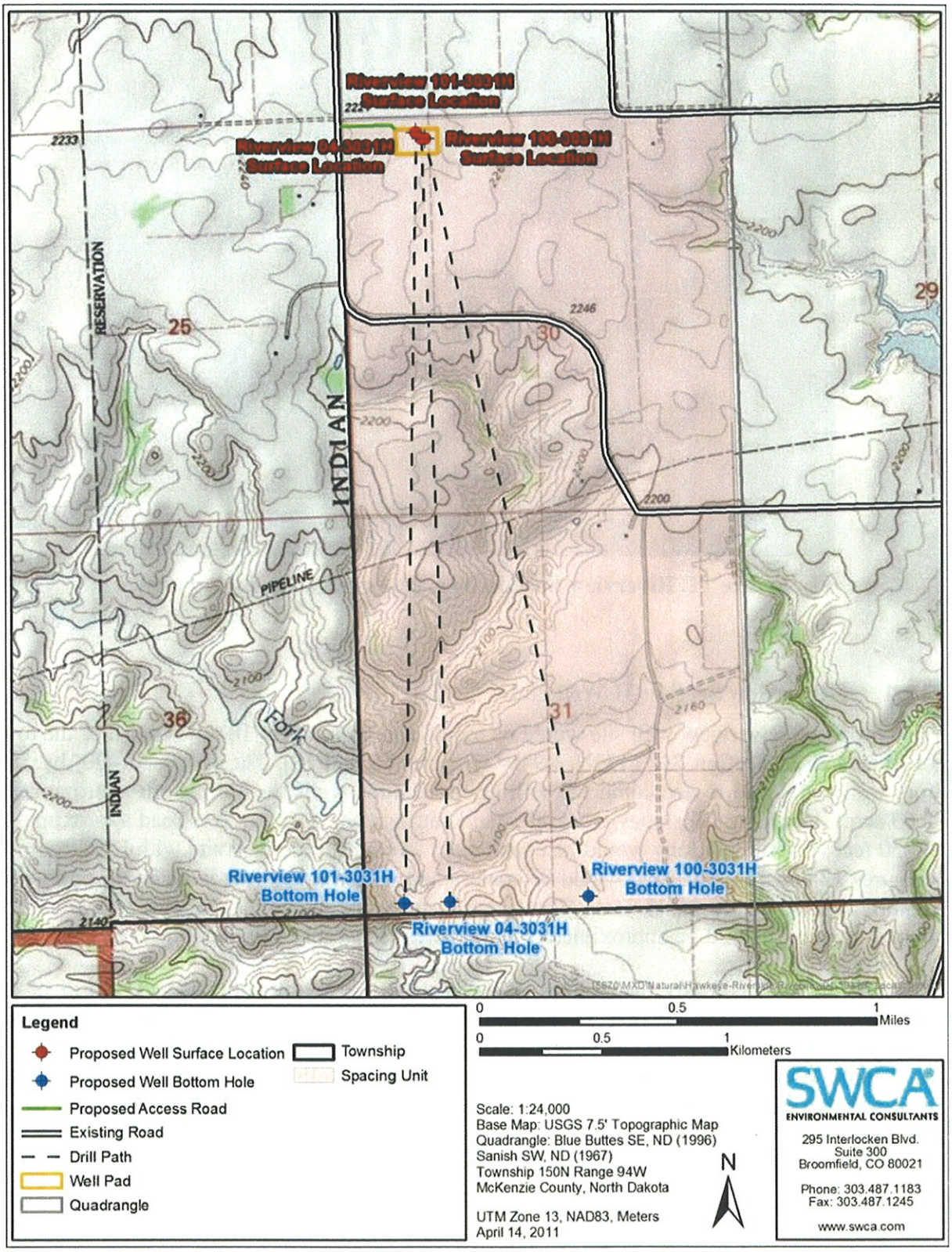


Figure 10. Riverview Section 30 proposed surface and bottom hole locations.

Figure 11. Riverview Section 30 access road area, facing west.

2.9.4 Riverview Section 31 Well Pad

This proposed Riverview well site would be located approximately 18 miles north of the town of Mandaree in Section 31, T152N, R94W (Figures 12 and 13). The proposed 400- by 550-foot well pad, sized to accommodate drilling up to three wells, would disturb approximately 5.63 acres, including fill slopes, stockpiles, and cuttings pit. A new access road approximately 5,750 feet (1.09 miles) long would be constructed to connect the well site with BIA Route 27 (Figures 12 and 14). The road would be constructed within a 125-foot wide ROW and would disturb approximately 16.46 acres. Total new disturbance including the well pad, road, and buried pipelines would be approximately 22.09 acres (see Table 4 in Section 2.12).

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located north of the surface hole location in Section 30, T152N, R94W (Figure 12). Specific information on the location of the drilling targets and leases is described in Table 2. Bottomhole information will be determined by the proponent at a later date for future wells that would be located on this well pad. A setback of at least 200 feet from the north section line of the spacing unit would be maintained.

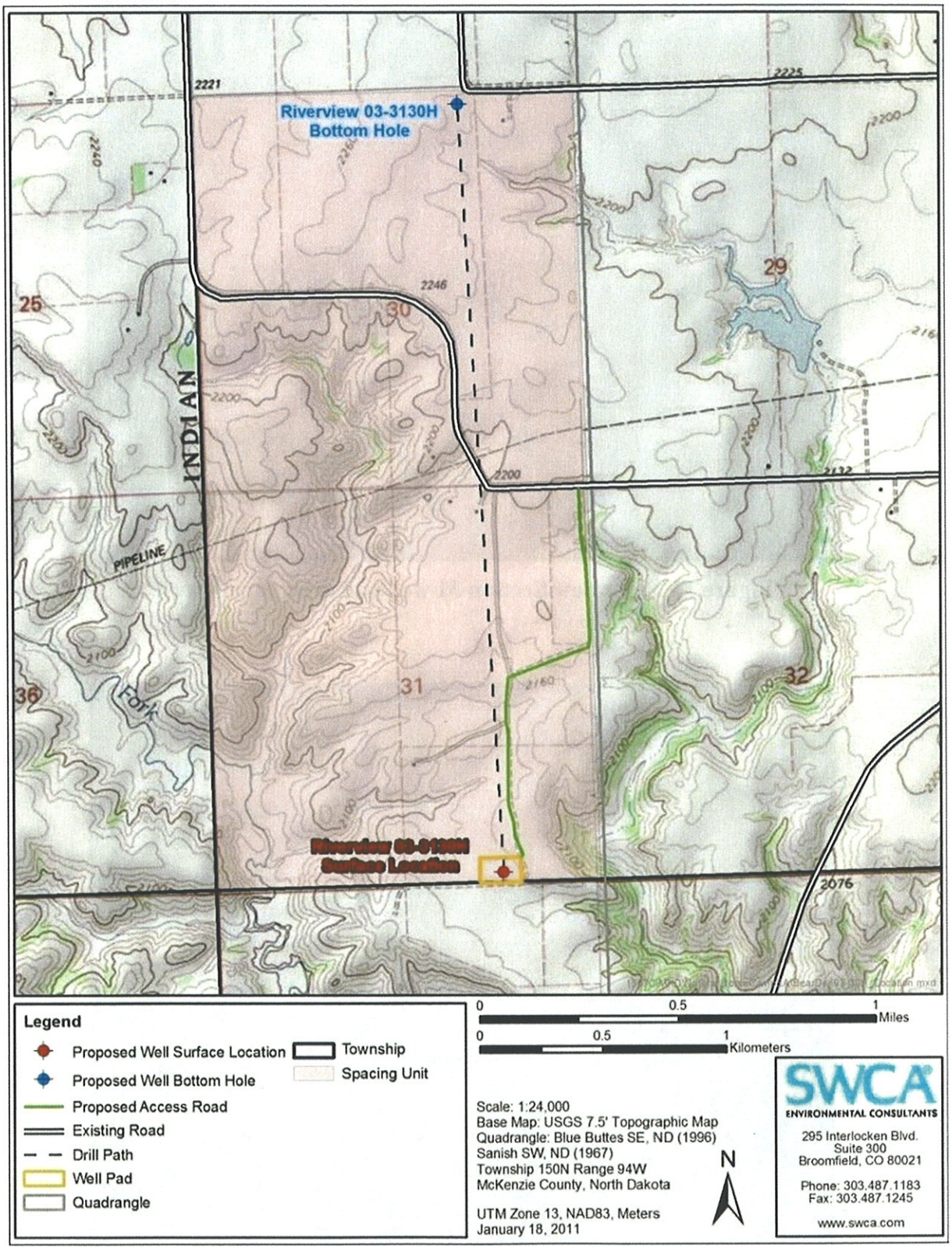


Figure 12. Riverview Section 31 proposed surface and bottom hole locations.

Figure 13. Riverview Section 31 well pad area, facing west.

Figure 14. Riverview Section 31 access road area, facing south.

2.10 RECLAMATION

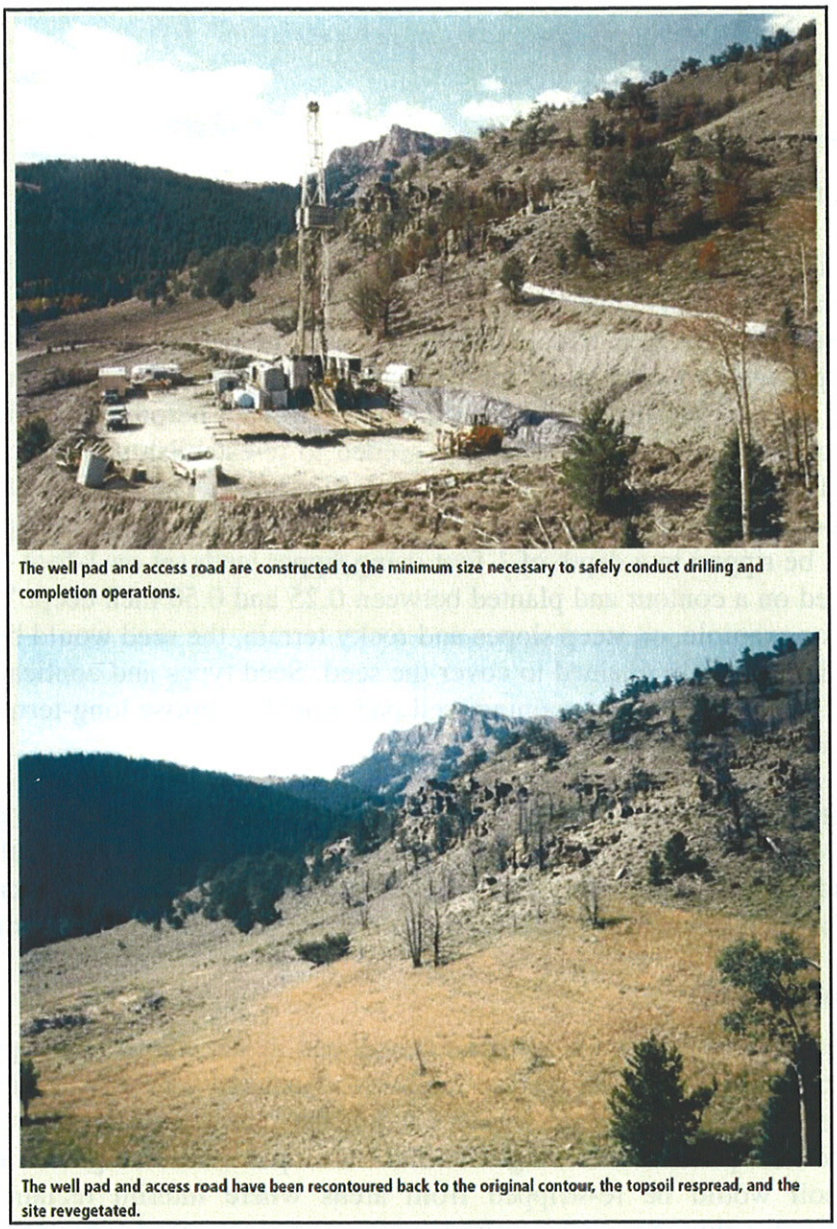
2.10.1 Interim Reclamation

Interim reclamation would consist of reclaiming all areas not needed for production operations for the life of a well. Rat and mouse holes would be filled and compacted from bottom to top immediately after release of the drilling rig. Immediately after well completion, all equipment and materials unnecessary for production operations would be removed from a location and surrounding area. The cuttings pit would be netted until final reclamation and closure of the pit, which would occur approximately 10 days following drilling of all wells on a pad. The pit liner, if plastic, would be torn and perforated before the cuttings pit is filled. The surface above the cuttings pit would be seeded to re-establish native/desired vegetation. Topsoil would be spread along a road's cut and fill slopes. The portion of a well pad not needed for production would be recontoured and covered with 6 inches of topsoil. Areas on a contour would be ripped to a depth of 1 foot using ripper teeth set on 1-foot centers. All seed would be drilled on a contour and planted between 0.25 and 0.50 inch deep. Where drilling is not possible, for example, on steep slopes and rocky terrain, the seed would be broadcast, and the area would be raked or chained to cover the seed. Seed types and application rates would be determined by the AO. The remaining well pad would comprise long-term disturbance for the life of the well.

The proponent would control noxious weeds within the exterior boundaries of access roads, well sites, or other applicable facilities by spraying or mechanical removal. Weed control would be conducted in accordance with procedures established by all applicable authorities. Drainage ditches and/or culverts would be maintained to free-flowing conditions.

2.10.2 Final Reclamation

A depleted well bore would be plugged and abandoned in accordance with applicable state or federal regulations. Typically, all surface facilities associated with a well would be removed during final reclamation. Disturbed surfaces would be returned to the approximate original contours of the land prior to reseeding. Cut and fill slopes would be graded to a 3:1 ratio or less. All topsoil would be re-stripped from areas where interim reclamation had been performed and redistributed over the entire location and access road. The entire disturbed area would be scarified to a depth of 12 inches on 8-inch intervals. Best management practices (BMPs) such as water bars, straw wattles (fiber rolls), or matting would be constructed according to BLM Gold Book standards (USDI and USDA 2007). The entire disturbed area, including the former access road and well pad, would be reseeded with the specified seed mixture. Figure 15 shows an example of appropriate reclamation.



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 15. Example of reclamation from the BLM Gold Book (USDI and USDA 2007).

2.11 RESOURCE PROTECTION MEASURES AND COMMITMENTS

The proponent would implement the following general applicant-committed measures during construction, operation, and reclamation of proposed facilities.

1. Construction materials would not be removed from federally administered or tribal lands without approval from the AO.
2. Construction operations would not occur using frozen or saturated soils or during periods when watershed damage would be likely to occur.

3. When conditions warrant, water would be applied to EOG's existing and proposed access roads and well pads during construction operations to minimize soil loss from wind transport.
4. Each well would be drilled as soon as possible after approval of the federal and state APD.
5. EOG has incorporated all safety measures in the design, construction, operation, and maintenance procedures for the proposed wells and their facilities. A designated EOG representative would be present on location during all construction operations. Accidents to persons or property would be reported immediately to the AO.
6. EOG is committed to working with the BIA and tribes in future transportation planning efforts. EOG would cooperate with landowner, tribal, and BIA requests for road alignments and sharing of roads. EOG would cooperate with nearby operators on siting and use of shared roads, if known at the time of permitting. Where EOG would share an access road with another operator(s), EOG would cooperate with the other operator(s) to develop a mutually agreed-upon road maintenance plan, which would incorporate tribal, BIA, and BLM standards.
7. EOG would drill the wells as semi-closed-loop mud systems; drilling liquids would not be stored in reserve pits. EOG would fence each cuttings pit in accordance with BIA specifications, specific APDs, and directions specified at pre-construction on-site inspections.
8. EOG would fence all well pads and install a cattle guard or panel gate in the access road at the entrance of the well pad, where necessary.
9. EOG would dike tanks with a minimum 4-foot berm and install a catch trench on the down-sloping side of each well pad to contain any waste/fluids from the well pad. In the case of a spill, fluids that accumulate would be pumped out and disposed of properly. Where needed, topsoil and erosion control devices would be placed to divert surface water flow away from the well pad locations to limit potential of surface contamination from sediment transport.
10. Covers would be installed under drip buckets and spigots.
11. EOG would cease construction or other activity if there is a confirmed sighting of a whooping crane within 1 mile of the project area and notify the U.S. Fish and Wildlife Service (USFWS). EOG personnel who have been trained in a formal program sponsored by EOG on the field identification of whooping crane can make a confirmed sighting.
12. EOG would mow (and/or clear) migratory bird habitat to deter nesting within the project area if construction would occur during nesting season. Mowing would occur outside of the February 1 to July 15 nesting season.
13. Where potential nesting habitat exists, EOG would have a biologist survey the project area for bald or golden eagle nests early in the nesting season from March 1 to May 15 prior to leaf out. If nests are discovered, the BIA and USFWS would be notified. A minimum 0.5-mile buffer would be maintained from any previously documented or surveyed active eagle nest during the nesting season. For newly constructed or

undocumented active nests within the 0.5-mile buffer of a project location, EOG would move facilities where possible or request the option to have a biologist monitor active eagle nests during the nesting season to resume activity once the birds fledge.

14. EOG would comply with all Tribal Employment Rights Office requirements.

15. Any utility/electrical lines would be installed below ground.

BMPs would be installed at the toe of the fill, within roadside ditches, and along large areas of slopes at all well locations. The following well-specific resource protection measures have been applied based on feedback during BIA and BLM on-site visits.

Hawkeye Section 25 Well Pad: BMPs as needed.

Hawkeye Section 24 Well Pad: Install a berm around the southwest corner of the well pad and install straw wattles along east side of access road to protect the adjacent wetland.

Riverview Section 30 Well Pad: BMPs as needed.

Riverview Section 31 Well Pad: Avoid low lying swale on the northwest corner of well pad. Mow location or conduct migratory bird surveys if construction is to occur between February 1 and July 15. The well pad and access road have been adjusted to avoid archaeological sites, however an archaeological monitor would still be needed during construction and fencing will be installed along the east side of the well pad and along a portion the ROW.

2.12 TOTAL SURFACE DISTURBANCE

In total, approximately 23.11 acres would be disturbed for well pad construction and 19.93 acres for construction of 1.32 miles of access roads. All surface disturbance would be on tribal lands. Table 4 summarizes the surface disturbance estimates for each proposed well.

Table 4. Surface Disturbance Details.

Wells	Access Road and Pipeline ROW			Well Pad			Total Disturbance (acres)
	Length (feet)	ROW width (feet)	ROW Disturbance (acres)	Length (feet)	Width (feet)	Well Pad Disturbance[1] (acres)	
Hawkeye Section 25	175.87	125	0.51	550	400	6.24	6.75
Hawkeye Section 24	272.36	125	0.78	550	400	5.41	6.19
Riverview Section 30	760.98	125	2.18	550	400	5.83	8.01
Riverview Section 31	5,734.06	125	16.46	550	400	5.63	22.09
Total	**6,943.27**	**-**	**19.93**	**-**	**-**	**23.11**	**43.04**

[1] Area of maximum disturbance including well pad, fill slopes, stockpiles, and cuttings pits.

2.13 PERSONNEL REQUIREMENTS AND SCHEDULING

The quantification of personnel and vehicles presented in Table 5 are typical average values. Actual personnel and vehicles on location at any particular time may vary.

Table 5. Personnel Requirements and Scheduling.

Activity	Duration of Activity (average days per well)	Daily Personnel (average number per well)	Daily Passenger Vehicle Trips (per well)
Construction	5	6	2
Drilling	30	15	18
Completion/Installation of Facilities	20	10	15
Production	ongoing – life of well	2	2

Two to three pieces of heavy equipment, such as bulldozers and motor graders, would be used to perform the earth-moving operations during construction operations. Duration of drilling operations would likely vary depending on depth and conditions encountered while drilling. The time required for drilling operations includes the time needed to rig up and rig down. EOG anticipates drilling each well sequentially, or as the timing of APD approval allows.

2.14 BIA-PREFERRED ALTERNATIVE

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

3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

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

The proposed 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 wells would target the Bakken and Three Forks formations, known oil reserves. Although earlier oil and gas exploration activity within the Reservation was limited and commercially unproductive, recent economic changes and technological advances now make accessing oil in the Bakken and Three Forks formations 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).

The proposed well sites are in a rural area consisting of mostly grassland, shrubland, and cropland that is currently farmed, idle, or used to graze livestock. The landscape has been previously disturbed by dirt trails and gravel and paved roadways. Based on aerial imagery, nine houses are located less than 1 mile away from the proposed well sites (Table 6). Note that some houses are within 1 mile of more than one proposed well.

Table 6. Distance and Direction from Proposed Wells to Nearest House.

Proposed Well	Houses within 1 mile	Feet to Nearest House	Direction to Nearest House
Hawkeye Section 25	4	1,000	northwest
Hawkeye Section 24	4	1,200	southwest
Riverview Section 30	5	1,400	southwest
Riverview Section 31	3	2,200	northwest

The broad definition of the human and natural environment under NEPA leads to the consideration of the following elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. Potential impacts to these elements are analyzed for the Proposed Action in the following sections. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. This EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts.

Under the No Action Alternative, the proposed project would not be constructed, drilled, installed, or operated. Existing conditions would not be impacted for the critical elements listed above. There would be no project-related ground disturbance, use of hazardous materials, or trucking of product to collection areas. Surface disturbance, trucking, and other traffic would not change from present levels. Under the No Action Alternative, the MHA Nation, tribal members, and allottees would not have the opportunity to realize potential financial gains resulting from the discovery of resources at these well locations.

3.1 AIR QUALITY

The federal Clean Air Act (CAA) (USC § 7401–7671, as amended in 1990) established national ambient air quality standards (NAAQS) 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. NAAQS have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead (U.S. Environmental Protection Agency [EPA] 2010a). The primary NAAQS are 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.'

The CAA mandates prevention of significant air quality deterioration in certain designated attainment areas and has designated more stringent air quality standards, known as Secondary Standards, for these 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 (Ross 1990). The Class I regulations (40 CFR 51.307) attempt to protect visibility through a review of major new and modified sources of pollutants, and requiring strict air quality emission standards if they will have an adverse impact on visibility within the Class I area (National Park Service 2010).

The nearest designated attainment area to the project area is the Theodore Roosevelt National Park (TRNP), a Class I area that covers about 110 square miles in three units within the Little Missouri National Grassland. The TRNP is located approximately 16 miles south of Watford City, North Dakota, and approximately 40 miles west of the proposed well sites. Two air quality monitoring stations are located within the TRNP, with the North Unit monitoring most criteria pollutants (National Park Service 2010; North Dakota Department of Health [NDDH] 2010). All other parts of the state, including the Reservation, are classified as Class II attainment areas, affording them protections through the Primary NAAQS (NDDH 2010).

Some states have adopted more stringent standards for criteria pollutants, or have chosen to adopt new standards for other pollutants. For instance, the NDDH has established a standard for hydrogen sulfide (H_2S) (NDDH 2010).

3.1.1 Air Quality Standards for Criteria Pollutants

Criteria pollutants and their health effects include the following.

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 (EPA 2010a).

Inhalable Particulate Matter (PM_{10} and $PM_{2.5}$) is a class of compounds that can lodge deep in the lungs, causing adverse health problems, depending on their size, concentration, and content. Based on extensive health studies, particulate matter is regulated under two classes: PM_{10} is the fraction of total particulate matter 10 microns or smaller, and $PM_{2.5}$ is two and a half microns or smaller. Inhalable 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 (EPA 2010a).

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 (EPA 2010a).

Ozone (O_3) 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. Health effects from O_3 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. O_3 can persist for many days after formation and travel several hundred miles (EPA 2010a).

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 (EPA 2010a).

The Primary and Secondary NAAQS for criteria pollutants are shown in Table 7. NEPA assessments require analysis of both near-field and far-field as part of the cumulative effects of proposals on air quality. Therefore, the North Dakota Ambient Air Quality Standards (AAQS) are shown as well as federal standards.

Table 7. NAAQS and Other Air Quality Standards.

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (National Parks)	North Dakota AAQS
SO_2 in parts per million of air (ppm)	3-hour	-	0.5	0.273 (1-hour)
	24-hour	0.14	-	0.099
	Annual Mean	0.03	-	0.023
PM_{10} in micrograms per cubic meter of air ($\mu g/m^3$)	24-hour	150		150
	Expected Annual Mean	50		50
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	35	35
	Weighted Annual Mean	15	15	15
NO_2 (ppm)	Annual Mean	0.053	0.053	0.053
CO (ppm)	8-hour	9	-	9
	1-hour	35	-	35
O_3 (ppm)	8-hour	0.075	0.075	-
	1-hour	-	-	0.12
Lead ($\mu g/m^3$)	3-month Arithmetic Mean within a 3-year period	0.15	0.15	1.5 (quarterly mean)
Hydrogen Sulfide (H_2S) (ppm)	Instantaneous	-	-	10
	1-hour	-	-	0.20
	24-hour	-	-	0.10
	3-month	-	-	0.02

Source: EPA 2010a and NDDH 2010.

North Dakota has separate state standards for SO_2 and H_2S that are different from the federal criteria standards. All other state criteria pollutant standards are the same as federal. North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008.

In addition, the EPA averages data from monitoring stations within each county to determine the Air Quality Index (AQI), a general measure of air quality for residents of the county. An AQI greater than 100 is indicative of unhealthy air quality conditions for the county residents, although residents may experience greater or lesser risks depending on their proximity to the sources of pollutants (EPA 2010a).

3.1.2 Greenhouse Gas Emissions and Responses to the Threat of Climate Change

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). Some GHGs such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The EPA (2010b) identifies the principal GHGs that enter the atmosphere because of human activities as the following.

> Carbon Dioxide (CO_2): CO_2 enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
>
> Methane (CH_4): CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
>
> Nitrous Oxide (N_2O): N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
>
> Fluorinated Gases: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are typically emitted in small quantities, but are potent GHGs thought to contribute significantly to global warming processes (EPA 2010b).

CO_2 is the primary 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]) (EPA 2010b). 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 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. N_2O has a CO_2e value of 310. Thus, control strategies often focus on the gases with the highest CO_2e value.

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 (Intergovernmental Panel on Climate Change [IPCC] 2007).

Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases. The IPCC Working Group I Fourth Assessment compiles and analyzes global data on climate change, and reports that warming of the climate system is evident from global observations of

increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level (IPCC 2007). Globally, 11 out of 12 years between 1995 and 2007 ranked among the 12 warmest years in the instrumental record of global surface temperature since 1850 (IPCC 2007). The National Oceanic and Atmospheric Agency (NOAA) monitored data indicate that 21 of the previous 30 years (1979–2009) have had above average temperatures in the contiguous United States, with departures from average temperatures occurring with increasing frequency (NOAA 2010).

Many physical and biological effects have been observed to correlate with trends in global warming. Sea levels are rising worldwide and along much of the United States coast (EPA 2010b). Tide gauge measurements and satellite altimetry suggest that the sea level has risen worldwide approximately 4.8 to 8.8 inches (12–22 centimeters) during the last century (IPCC 2007). A significant amount of sea level rise has likely resulted from the observed warming of the atmosphere and the oceans. Hydrological systems, ice pack, and permafrost are also affected by higher oceanic and atmospheric temperatures, affecting biological systems and agriculture (IPCC 2007).

IPCC experts concluded that most of the observed increase in globally averaged temperature since the mid-twentieth century is very likely due to the observed increase in anthropogenic GHG concentrations (IPCC 2007). Therefore, the EPA collects data on and encourages limiting or reducing emissions of anthropogenic sources of GHGs to the earth's atmosphere (EPA 2010c). Many U.S. states have adopted goals and actions to reduce GHGs. 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 (EPA 2010c).

On May 13, 2010, EPA issued a final rule that establishes thresholds for GHG emissions that define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and title V Operating Permit programs are required for new and existing industrial facilities (EPA 2010c). This final rule "tailors" the requirements of these CAA permitting programs to limit which facilities will be required to obtain PSD and title V permits. Facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities. Emissions from small farms, restaurants, and all but the very largest commercial facilities will not be covered by these programs at this time. However, the EPA recently initiated additional hearings to help determine the types of industries to be held to new standards under these federal permits (EPA 2010c).

Energy production and supply was estimated to emit up to 25.9% of GHGs world-wide in 2004 (Pew Center 2009). Methane gas (CH_4), with a high radiative forcing CO_2e ratio, is a common fugitive gas emission in oil and gas fields (EPA 2010b). Oil and gas production, however, is highly variable in potential GHG emissions. Oil and gas producers in the United States are not considered large GHG emitters by the EPA, and are not the subject of any current federal proposals that would regulate GHG emissions.

3.1.3 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 effects. 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 2010). 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 NDDH typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. 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 one in one hundred thousand.

3.1.4 Existing Air Quality in the Project Area

Federal air quality standards apply in the project area, which is designated as a Class II attainment area. Although the state of North Dakota does not have jurisdiction over air quality matters on the Reservation and no air quality monitoring stations occur within the boundaries of the Reservation, monitoring efforts are 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 and available from EPA and NDDH (NDDH 2010).

Monitoring stations providing complete data near the project site include Theodore Roosevelt National Park North Unit (TRNP-NU) (Air Quality Station #380530002) in McKenzie County, and Dunn Center (Air Quality Station #38025003) in Dunn County. These stations are located west and southeast of the proposed well sites, respectively. Bear Paw Energy and Amerada Hess operate site-specific monitoring stations in the region. However, these stations do not provide complete data that would be applicable to this analysis (NDDH 2010).

Criteria pollutants measured at the two monitoring stations include SO_2, PM_{10}, NO_2, and ozone. Lead and CO are not monitored by any of the stations. Table 8 summarizes the NAAQS and the maximum levels of criteria pollutants. The highest value at either of the two monitoring locations is shown for each year from 2007 through 2009.

Table 8. Maximum Levels of Monitored Pollutants, 2007–2009, as Measured at Dunn Center and Theodore Roosevelt National Park North Unit Monitoring Stations.

Criteria Pollutant	Averaging Period	Primary Standard (NAAQS)	Maximum Reported Level from Dunn Center and TRNP-NU Monitoring Stations		
			2009	2008	2007
SO_2 (parts per million [ppm])	24-hour	0.14	0.006	0.004	0.004
	Annual Mean	0.03	0.0005	0.0004	0.0011
PM_{10} (micrograms per cubic meter [$\mu g/m^3$])	24-hour	150	54	108	57.4
	Expected Annual Mean	50	11.3	14.2	13.2
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	15	35.7	22.2
	Weighted Annual Mean	15	3.4	3.7	3.6
NO_2 (ppm)	Annual Mean	0.053	0.0015	0.0018	0.0015
O_3 (ppm)	8-hour	0.08	0.057	0.0063	0.0071

Source: NDDH 2010.

All monitored criteria pollutants are well below federal and state standards in the project area for all years in the study period from 2007 through 2009. In addition to the low levels of monitored criteria pollutants, the EPA reports that Dunn County and McKenzie County had zero days in which the air quality index exceeded 100 in 2007 and 2008, indicating that general air quality does not pose an unhealthy condition for residents of these counties (EPA 2010d). The AQI was not available for 2009, but is also likely to be zero for these counties.

3.1.5 Typical Air Emissions from Oil Field Development

According to EPA Emission Inventory Improvement documents (EPA 1999), oil field emissions encompass three primary areas: combustion, fugitive, and vented. Typical processes that occur during exploration and production include the following.

- 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 of fugitive emissions include mechanical leaks from well field equipment such as valves, flanges, and connectors that may occur in heater/treaters, separators, pipelines, wellheads, and pump stations. Pneumatic devices such as gas actuated pumps and pressure/level controllers also result in fugitive emissions. Other sources include evaporation ponds and pits, condensate tanks, storage tanks, and wind-blown 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.

3.1.6 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.

3.1.7 Potential Air Quality Impacts

Based on the existing air quality of the region, the effects of typical air emissions from similar oil field projects, and implementation of BMPs identified in Section 3.1.6, the Proposed Action would not produce significant increases in criteria pollutants, GHGs, or HAPs.

3.2 PUBLIC HEALTH AND SAFETY

Health and safety concerns include naturally occurring toxic gases, hazardous materials used or generated during installation or production, and hazards posed by heavy truck traffic associated with drilling, completion, and production activities.

H_2S is extremely toxic in concentrations above 500 parts per million, but it has not been found in measurable quantities in the Bakken or Three Forks formations. 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.

As listed in Table 6, satellite imagery identified one house, outside of the town of Mandaree, within 1 mile of the well sites. This house is not located in the principle downwind direction (northwest), according to 2008 data from the AAQM site at the Dunn Center monitoring site (NDDH 2010). Release of H_2S at dangerous concentration levels is very unlikely, and no direct impacts from H_2S are anticipated with implementation of standard mitigation measures.

Other potential negative impacts from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about 55 days during construction, drilling, and well completion, and then diminish sharply during commercial operations. For each of the proposed well sites, it is estimated that two passenger vehicle trips would be needed during construction and 15 to 18 trips during drilling and well completion. Any wells that prove productive would require that one pumper truck visit the pad once a day to check the pump. Typical Bakken wells drilled in the project vicinity produce both oil and water at a high rate initially. Gas would be flared initially, while oil and produced water would be stored on each well pad in tanks and hauled out by tankers until the well could be connected to gathering pipelines. Up to eight 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. The proponent would develop and maintain site-specific SPCCPs for each production facility.

Tanker trips would depend on production, but an estimate of trips per well pad is presented in Table 3. Trucks for normal production operations must use the existing and proposed access

roads. Produced water would be transported to the Rink 1 disposal site or other approved disposal facility. 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 pit for drill cuttings would be constructed within the disturbed area of each well pad and constructed to not leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit. A pit liner would have permeability less than 10^{-7} centimeters per second; a burst strength greater than or equal to 300 psi or puncture strength greater than or equal to 160 psi; and grab tensile strength greater than or equal to 150 psi.

Unintended 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.

3.3 WATER RESOURCES

3.3.1 Surface Water

According to the NDDH Division of Water Quality, the well pads and associated access roads are located within the Antelope Creek, Clarks Creek, and North Fork Clarks Creek watersheds which are part of the Missouri River Basin. Figure 16 shows the general direction of surface runoff near each well and the direction of concentrated surface flow through the localized draws. Sheet flow and concentrated runoff near the proposed well areas would flow through nearby draws towards Antelope and Clarks creeks, which subsequently flow into Lake Sakakawea. Antelope Creek flows in a general northeasterly direction towards Lake Sakakawea, approximately 6 miles (15.6 river miles) from the project area (Table 9). Clarks Creek flows in a general easterly direction towards Hunts Along Bay within Lake Sakakawea, approximately 3 miles (5.7 river miles) from the project area.

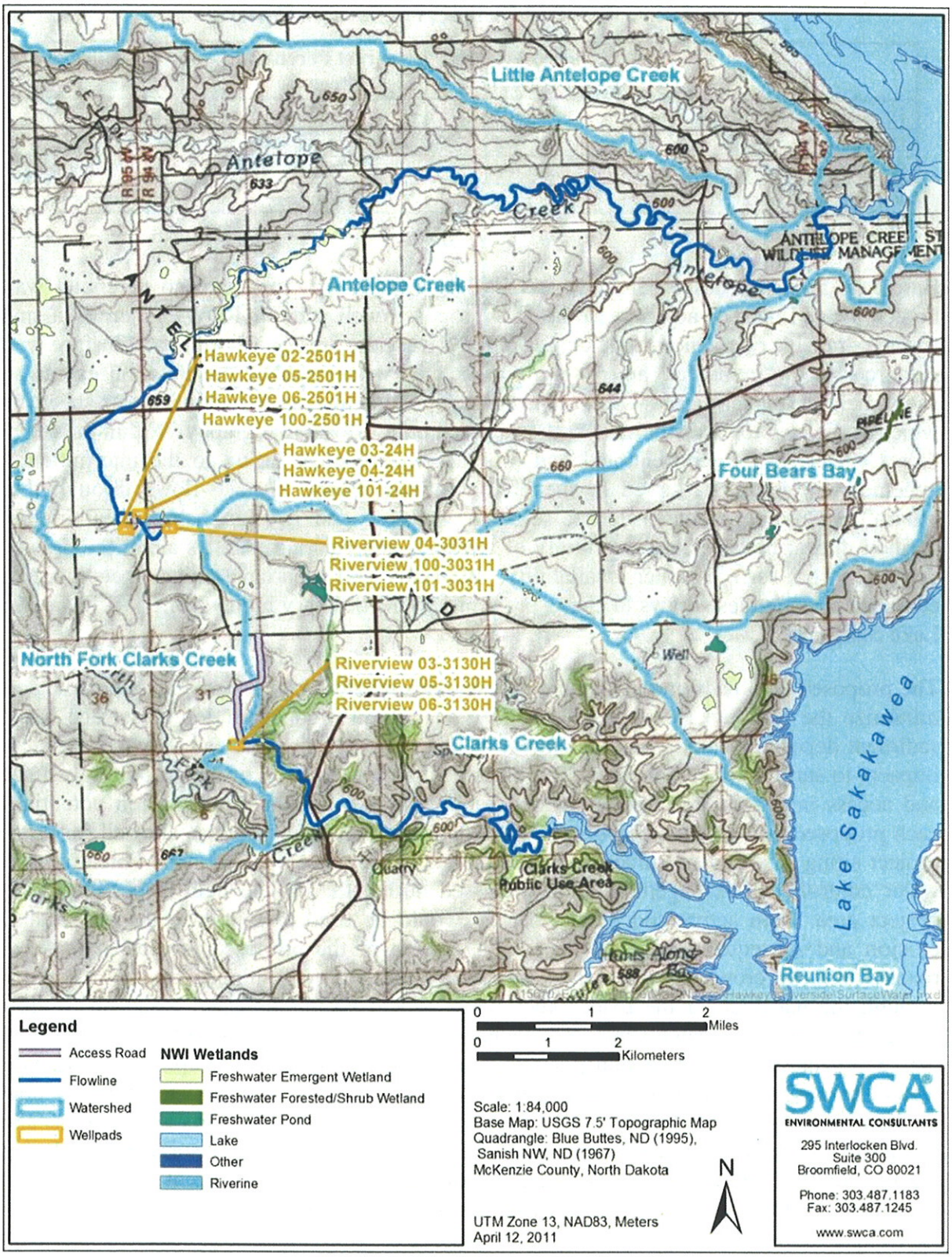


Figure 16. Watersheds, surface runoff direction, and wetlands near proposed wells.

Table 9. Well Pad Distances to Surface Waters.

Well Pad	Nearest Wetland (NWI)	Nearest Perennial Stream	River Miles to Lake Sakakawea
Hawkeye Section 25	331 feet	1.1 miles	15.1 miles
Hawkeye Section 24	60 feet	1.3 miles	15.1 miles
Riverview Section 30	286 feet	1.4 miles	15.6 miles
Riverview Section 31	0 feet	0.4 mile	5.7 miles

Based on an aerial desktop review and in-field verification, there are no perennial water bodies located near or adjacent to the four proposed well pads or ROWs. There is a small surface drainage on the northwest corner of the Riverview Section 31 well pad. Surface water resources in the immediate are primarily associated with localized precipitation events and snow melt during spring thaw. Runoff from precipitation and snow melt occurs as sheet flow which is directed towards the steeper draws based on localized topography. Within the steeper draws, sheet flow is concentrated and provides hydrological influx to the intermittent or ephemeral drainages observed in the bottom of the draws. Surface flows through these intermittent drainages may support seasonal wetlands and riparian habitats within these defined draws; however, the continuity of wetlands and riparian habitats along the draws is dependent on surface water availability. Wetlands and riparian habitats become more continuous along these draws in closer proximity to the ordinary high water pool elevation of Lake Sakakawea.

The proposed well pads and associated access roads would be engineered and constructed to minimize the potential for suspended solid (i.e., turbidity) concentration of surface runoff, sediment deposition in adjacent ephemeral or intermittent drainages, and to avoid any direct impacts to surface water resources. The placement and orientation of the proposed well pads and access infrastructure considered topography, natural drainage, and erosion potential at each proposed well pad and access road location. On-site field inspections allowed for further project siting based on resources discovered along the proposed project area. Potential storm water controls and management were discussed during the on-site field inspections of the project area. Both active and passive BMPs would be used to minimize the potential for erosion and subsequent sediment deposition outside of the proposed project area. Access roads would be crowned and ditched with water turnouts to minimize concentrated flows through the bar ditch of the road. Other BMPs would be implemented based on localized topography, potential catchments and drainage size, soil texture and particle cohesiveness, native vegetation, and restoration potential. Any access roads crossing ephemeral drainages would be designed as either a low water crossing or culvert crossing to maintain down gradient water quality and flow continuity. Corrugated metal pipe culverts would be installed along the access roads to help distribute and minimize any concentrated surface flow through the bar ditch of the roads. Access roads would be maintained to prevent erosion, off site deposition, and to ensure yearlong safe conditions during the life of a well.

No surface water within the project area would be used for well drilling and completion activities. Water required for drilling and completion operations would be obtained from commercially approved sources and would be trucked by tanker to the project area. Produced

water resulting from operations would be initially stored on each well pad in a designed tank battery before being transported from the tanks via tanker trucks to the permitted Rink 1 produced water disposal site or other approved disposal facility. Any chemicals or potentially hazardous materials would be handled in accordance with the operator's SPCCP. Provisions established under this plan, addressing accidental spills and releases, would help minimize both potential direct and indirect impacts to receiving waters outside of the proposed project area.

3.3.2 Groundwater

Aquifers in the project vicinity include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 10). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in the area. According to North Dakota State Water Commission (NDSWC), the Fox Hills aquifer is located approximately 5 miles west of the proposed project area (Table 11, Figure 17).

Table 10. Common Aquifers in the Proposed Project Area and Surrounding Region.

Period	Formation		Depth (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.

Sources: Croft 1985 and Klausing 1979.
gal/min = gallons per minute

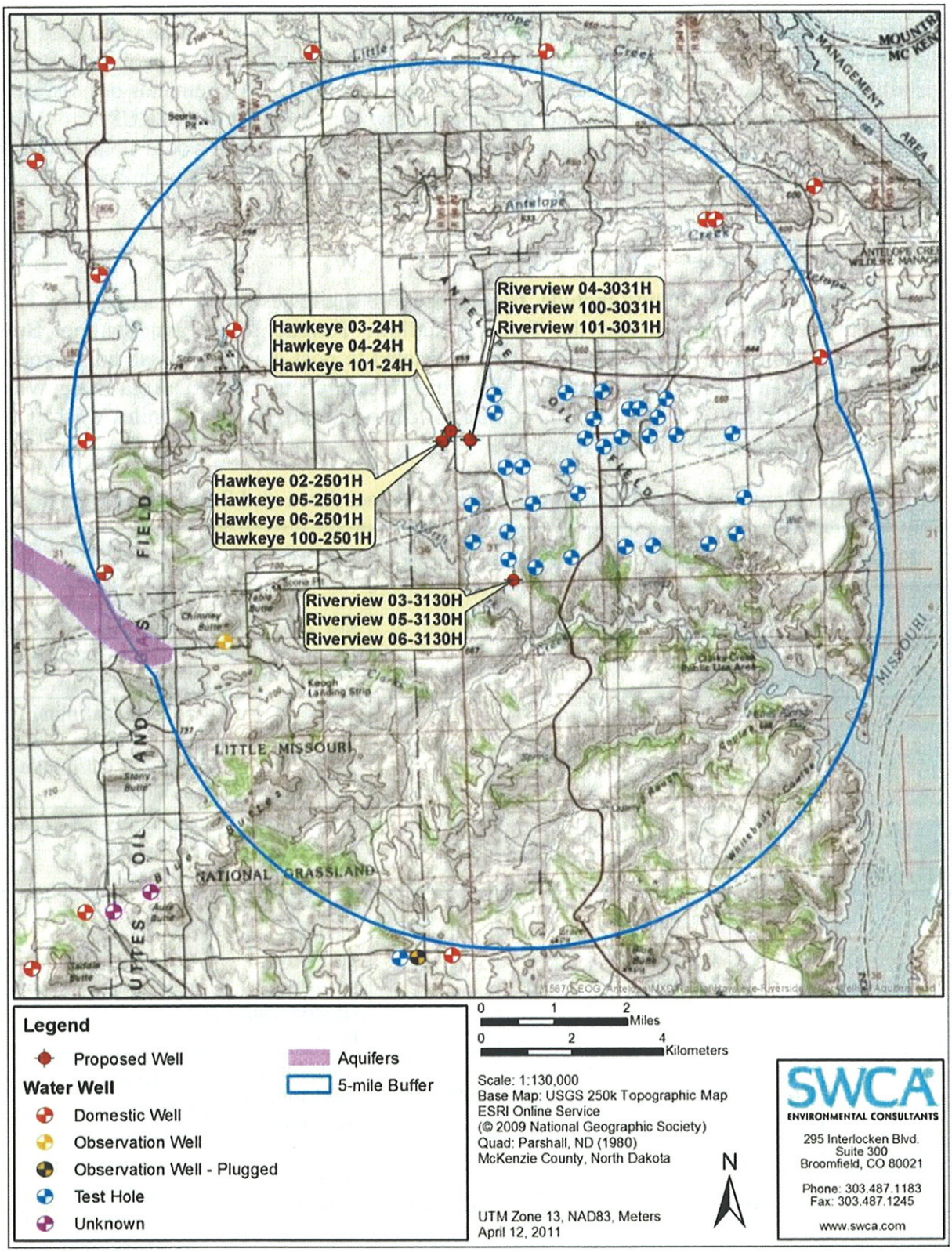


Figure 17. Water wells and aquifers near proposed wells.

Table 11. Well Pad Distances to Aquifers.

Well Pad Name	Distance to Aquifer
Hawkeye Section 25	4.6 miles
Hawkeye Section 24	4.8 miles
Riverview Section 30	5.0 miles
Riverview Section 31	4.7 miles

Review of electronic records of the NDSWC (2010) revealed 40 permitted water wells within an approximate 5-mile boundary of the proposed project areas (Table 12; Figure 17). Water wells within 5 miles of the subject area receive water from the Hells Creek, Fox Hills, and Tongue River-Ludlow aquifers. Out of the 40 permitted wells, one well is permitted for domestic use, four wells are either plugged or active observation wells, three are for unknown uses (likely agricultural), and 32 are test holes bored in the early 1950s by the U.S. Geological Survey (USGS 2010). A test hole by definition is an uncased or temporarily cased well drilled for water, geologic, or hydrogeologic testing (USGS 2010). Water quality would be protected by implementing proper BMPs and construction practices. Drilling would proceed in compliance with Onshore Oil and Gas Order No. 2, Drilling Operations (43 CFR 3160).

Fresh water use for the proposed wells would include approximately 1,200 barrels per well for drilling and 25,000 barrels per well for hydraulic fracturing. The fresh water used to drill and complete the wells would be obtained from a permitted commercial source and would be hauled by small tanker truck to each location. A pit would be used for the storage of cuttings and tanks would be used to temporarily store produced fluids at the well site.

Implementation of proper hazardous materials management and using appropriate casing and cementing during well completion, in addition to the distance to known aquifers, would prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells are test holes and are not in service. The other water wells are over a mile from project wells and likely have minimal hydrologic connections.

Table 12. Existing Water Wells within 5 Miles of the Project Area.

Well Index	Well ID	Type	Date Drilled	Owner	Section	Township/Range	Closest Proposed Well	Aquifer
26157	15209410ABD	Domestic	7/13/1976	B. Skarda	10	152N/94W	Riverview Sec. 30	Undefined
7823	15209516ADD	Observation	11/21/1981	NDSWC	16	152/95W	Hawkeye Sec. 25	Tongue River-Ludlow
7766	15109504DBD2	Observation	5/26/1983	NDSWC	4	151N/95W	Riverview Sec. 31	Fox Hills
7765	15109504DBD1	Observation - Plugged	6/29/1981	NDSWC	4	151N/95W	Riverview Sec. 31	Hell Creek
7821	15209424BBB	Observation - Plugged	12/2/1981	NDSWC	24	152N/94W	Riverview Sec. 30	Tongue River-Ludlow
25828	15209532CBC	Test Hole	5/5/1981	NDSWC	32	152/95W	Hawkeye Sec. 25	Unknown
26169	15209427DDD	Test Hole	11/7/1951	USGS	27	152N/94W	Riverview Sec. 31	Unknown
26175	15209429CCC	Test Hole	11/8/1951	USGS	29	152N/94W	Riverview Sec. 31	Unknown
26176	15209429DCA	Test Hole	11/8/1951	USGS	29	152N/94W	Riverview Sec. 31	Unknown
26180	15209431ACA	Test Hole	11/8/1951	USGS	31	152N/94W	Riverview Sec. 31	Unknown
26181	15209431BCD	Test Hole	1/7/1952	USGS	31	152N/94W	Riverview Sec. 31	Unknown
26182	15209431DBD	Test Hole	11/6/1951	USGS	31	152N/94W	Riverview Sec. 31	Unknown
26183	15209432CCB	Test Hole	11/7/1951	USGS	32	152N/94W	Riverview Sec. 31	Unknown
26184	15209432DBC	Test Hole	11/7/1951	USGS	32	152N/94W	Riverview Sec. 31	Unknown
26185	15209433CAB	Test Hole	11/6/1951	USGS	33	152N/94W	Riverview Sec. 31	Unknown
26186	15209433DBA	Test Hole	11/6/1951	USGS	33	152N/94W	Riverview Sec. 31	Unknown
26187	15209434ADC	Test Hole	11/7/1951	USGS	34	152N/94W	Riverview Sec. 31	Unknown
26188	15209434CAA	Test Hole	11/6/1951	USGS	34	152N/94W	Riverview Sec. 31	Unknown
26179	15209430CCD	Test Hole	11/8/1951	USGS	30	152N/94W	Riverview Sec. 30	Unknown
26158	15209419ACC	Test Hole	12/10/1951	USGS	19	152N/94W	Riverview Sec. 30	Unknown
26159	15209419DBC	Test Hole	12/11/1951	USGS	19	152N/94W	Riverview Sec. 30	Unknown
26160	15209420ACC	Test Hole	11/8/1951	USGS	20	152N/94W	Riverview Sec. 30	Unknown
26161	15209420DDA	Test Hole	11/6/1951	USGS	20	152N/94W	Riverview Sec. 30	Unknown
26162	15209421BCC	Test Hole	11/5/1951	USGS	21	152N/94W	Riverview Sec. 30	Unknown
26163	15209421CAD	Test Hole	12/12/1952	USGS	21	152N/94W	Riverview Sec. 30	Unknown
26164	15209421DAA	Test Hole	11/12/1951	USGS	21	152N/94W	Riverview Sec. 30	Unknown
26165	15209421DBC	Test Hole	12/13/1951	USGS	21	152N/94W	Riverview Sec. 30	Unknown

Well Index	Well ID	Type	Date Drilled	Owner	Section	Township/Range	Closest Proposed Well	Aquifer
26166	15209421DDB	Test Hole	12/12/1951	USGS	21	152N/94W	Riverview Sec. 30	Unknown
26167	15209427AAB	Test Hole	10/30/1951	USGS	27	152N/94W	Riverview Sec. 30	Unknown
26168	15209427BBB	Test Hole	10/30/1951	USGS	27	152N/94W	Riverview Sec. 30	Unknown
26170	15209428ABA	Test Hole	1/7/1952	USGS	28	152N/94W	Riverview Sec. 30	Unknown
26171	15209428BAB	Test Hole	10/31/1951	USGS	28	152N/94W	Riverview Sec. 30	Unknown
26172	15209428BBC	Test Hole	12/11/1951	USGS	28	152N/94W	Riverview Sec. 30	Unknown
26173	15209429AAB	Test Hole	12/11/1951	USGS	29	152N/94W	Riverview Sec. 30	Unknown
26174	15209429ACC	Test Hole	11/12/1951	USGS	29	152N/94W	Riverview Sec. 30	Unknown
26177	15209430ACD	Test Hole	11/12/1951	USGS	30	152N/94W	Riverview Sec. 30	Unknown
26178	15209430ADD	Test Hole	11/12/1951	USGS	30	152N/94W	Riverview Sec. 30	Unknown
26190	15209519DD1	Unknown	8/21/1975	Amerada	19	152/95W	Hawkeye Sec. 25	Undefined
26191	15209519DD2	Unknown	8/27/1975	Amerada	19	152/95W	Hawkeye Sec. 25	Undefined
26156	15209410ABC	Unknown	12/2/1972	B. Skarda	10	152N/94W	Riverview Sec. 30	Undefined

Source: NDSWC 2010.

3.4 WETLANDS

National Wetland Inventory (NWI) maps and a digital inventory maintained by the USFWS identify several wetlands areas in the vicinity of the Proposed Action. Based on the USFWS inventory database, several palustrine emergent freshwater wetlands and freshwater ponds are located within 1 mile of the proposed well pads and access road ROWs. Table 13 presents the distance and cardinal direction from each well site to the nearest wetland or water body. NWI wetlands are shown on Figure 16 in the Surface Water subsection.

Table 13. Distance and Direction from Proposed Well Pads to the Nearest Wetland.

Well Pad	Distance to Nearest Wetland	Direction to Nearest Wetland	Wetland Type
Hawkeye Section 25	331 feet	Northeast	Freshwater emergent
Hawkeye Section 24	60 feet	South	Freshwater emergent
Riverview Section 30	286 feet	North-Northwest	Freshwater emergent
Riverview Section 31	0 feet	Northwest corner of well pad	Freshwater emergent

Source: USFWS 2009a.

A wetland assessment of the project by SWCA Environmental Consultants (SWCA) in November 2010 noted a low lying drainage swale near the northwest corner of the Riverview Section 31 well pad and a small wetland area near the southwest corner of the Hawkeye Section 24 well pad. These areas would be avoided during construction of the well pads. Indirect impacts such as down-gradient sediment and decreased water quality to receiving waters would be expected to be minimal with proper implementation of appropriate BMPs for sediment and erosion. In addition, the operator's SPCCPs for each production facility on the well pad will address project storm water management. Permitting with the U.S. Army Corps of Engineers (USACE) for the discharge of fill material into potential waters of the U.S., including wetlands, is not anticipated at this time. However, if it is determined that the discharge of fill material in any potential jurisdictional surface water would be required due to changes in the project design or layout, the proponent would coordinate any permitting with the BIA, the USACE, and appropriate state and federal agencies. The proponent would comply with all conditions of permits and authorizations during construction.

3.5 WILDLIFE

The habitat at most of the well pads and access roads is cultivated fields, pasture, and mixed prairie grassland used for grazing. These habitats can support grassland birds, ungulates, and small mammals. Little wildlife was observed during field visits to the proposed project areas during site assessments in November 2010.

The primary impacts to wildlife species in the project areas and vicinity would be as a result of the construction of new access roads and well pads, drilling activity, potential commercial production, and the associated vehicular traffic. Ground clearing might impact habitat for wildlife species, including small birds and small mammals. Some individual animals would be affected by temporary disturbances (noise, traffic, dust, human presence, etc.) during

construction and drilling, but no long-term impacts would be anticipated to the persistence of wildlife species in the project area. Oil present in reserve pit fluids can entrap and kill birds and other wildlife (USFWS 2009b). However, EOG proposes to use a semi-closed-loop drilling system so that fluids are not stored in open pits. Drill cuttings would be stored in cuttings pits on the well pads; no fluids, other than rainwater, would be present in cuttings pits.

Several measures designed to mitigate the impacts to wildlife are described in Section 2.11 of this EA. The proponent would also comply with any measures indicated in the APDs, SUPs, and EOG's Safe Practices Manual (2007) that may limit or reduce the possible impact to wildlife species in the vicinity of the Proposed Action. These measures would include, but not be limited to, fencing of well pads, dust suppression, noxious weed control, and the use of trash cages for refuse storage. Interim and final reclamation would begin without delay if a well is determined to be unproductive or upon completion of commercial production.

3.5.1 Migratory Birds

No raptor nests or other bird nests were observed in the project area during surveys, but it is anticipated that raptors and other migratory birds would use the habitat within the project area intermittently for hunting, foraging, and potentially nesting. The Bald and Golden Eagle Protection Act (16 USC 668–668d, 54 Sta. 250) and the Migratory Bird Treaty Act of 1918 (916 USC 703–711) protect nesting migratory bird species.

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are species of special concern to the BIA, BLM, and the USFWS. Suitable nesting or foraging habitat for bald eagles includes old growth trees relatively close (usually less than 1.24 miles [Hagen et al. 2005]) to perennial water bodies. Bald eagles primarily feed on fish, but will also feed on other small animals and carrion. In winter, the bald eagles congregate roost in tall trees near open water. The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Golden eagles usually occupy open areas such as grasslands and shrub habitat where their preferred prey (e.g., small mammals) can be found. They also eat carrion, birds, and reptiles. Usually, golden eagles can be found in proximity to cliffs and bluffs that provide nesting habitat.

According to a North Dakota Game and Fish database (Johnson 2010), no golden eagle nests have been recorded within 1 mile of the project area. The closest known eagle nest is approximately 2.5 miles south of the proposed wells. Potential habitat for eagles or other raptors was observed near the Riverview Section 31 well pad during the on-site. However, a line-of-site survey was conducted at the location in November and no raptor nests were seen. For newly constructed or undocumented active eagle nests discovered within the 0.5-mile buffer of a project location, EOG would move facilities where possible or request the option to have a biologist monitor active eagle nests during the nesting season to resume activity once the birds fledge.

Grassland birds have experienced widespread population declines over the last 25 years due to habitat loss and landscape changes from agriculture, livestock grazing, fire suppression, and development (Herkert 1994; Samson and Knopf 1994; Vickery et al. 2000). Fragmentation of

native prairie habitat can detrimentally affect migratory grassland species. The proposed well pads and access roads would impact approximately 39 acres, primarily within agricultural fields. Proposed project activities may affect raptor and migratory bird species through direct mortality, habitat degradation, and/or displacement of individual birds. Such impacts are prohibited by the Migratory Bird Treaty Act and would be avoided or minimized by protective measures described in Section 2.11, including mowing habitat prior to nesting season in order to deter birds from the project area.

3.5.2 Special Status Wildlife

Several wildlife species that may exist in McKenzie County are listed as threatened or endangered under the Endangered Species Act (ESA) (16 USC 1531 et seq.). Listed species in the county are black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), interior least tern (*Sterna anillarum*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), and pallid sturgeon (*Scaphirhynchus albus*). In addition, the Dakota skipper (*Hesperia dacotae*) and Sprague's pipit (*Anthus spragueii*) are candidates for listing. No listed species were observed within the project area during surveys. Prairie habitat that could potentially be used by whooping crane, pipit, and Dakota skipper is present in the area. Special-status species are described below.

The North Dakota Parks and Recreation Department conducted a review of the North Dakota Natural Heritage biological conservation database for known occurrences of species of concern within a 1-mile radius of the project areas (see attached scoping comments). One record of the tawny crescent (*Phyciodes batesii*) was noted approximately 1.3 miles east of the Riverview Section 31 well pad. Although suitable habitat for this rare butterfly may occur in the project vicinity, there is no suitable habitat within the project area. There were no other known occurrences of special-status species within or adjacent to the project area, although this may be due to a lack of survey data for the area. The USFWS was consulted on December 3, 2010, for input on the following affects determinations. On April 11, 2011, USFWS concurred with the determinations based on the mitigation measures provided in this EA.

Effects of the project on listed species could result from human disturbance and increases in vehicular traffic during drilling and commercial production, as well as indirectly from habitat degradation, sedimentation, or accidental release of drilling fluids or hazardous materials from the drilling, construction, or operation of the wells. Considering the lack of suitable habitat, it is unlikely that listed species occur regularly within the proposed project areas. Based on the analysis below and applicant-committed mitigation measures described in Section 2.11, no impacts on special status wildlife are anticipated.

Black-footed Ferret (*Mustela nigripes*)
Status: Endangered
Affects Determination: No Effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs (USFWS 2010a). Ferrets inhabit extensive prairie dog complexes of the Great Plains,

typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Prairie dog towns of this size are not found in the project area. In addition, this species has not been observed in the wild for more than 20 years. Therefore, the proposed project would have no effect on this species.

Gray Wolf (*Canis lupus*)
Status: Endangered
Affects Determination: No Effect

The gray wolf was believed extirpated from North Dakota in the 1920s and 1930s with only sporadic reports from the 1930s to present (Licht and Huffman 1996). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings that have occurred within North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountains region in north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 17.4 miles from the northeast corner of North Dakota, over 248 miles from the project area.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2010b). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation, in particular road construction as a result of oil and gas development, may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed project would have no effect on the gray wolf.

Interior Least Tern (*Sterna antillarum*)
Status: Endangered
Affects Determination: May Affect, but is Not Likely to Adversely Affect

The interior population of the least tern is listed as endangered by the USFWS (1985a). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2010c). The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2010c).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and on the Missouri and Yellowstone rivers upstream of Lake Sakakawea (USFWS 1990a, 2010c). Approximately 100 pairs breed in North Dakota (USFWS 2010c). Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande river systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990a). Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2010c).

Suitable shoreline habitat for breeding and nesting terns does not occur in the project area, and Lake Sakakawea is 3 to 6 miles (5.7 to 15.6 river miles) away from the proposed well pads and access roads. It is unlikely that terns would visit the upland habitats present in the project area. Therefore, the proposed project may affect, but is not likely to adversely affect endangered least terns.

Piping Plover (*Charadrius melodus*) and its Designated Critical Habitat
Status: Threatened
Affects Determination for Species: May Affect, but is Not Likely to Adversely Affect
Affects Determination for Critical Habitat: No Effect

The piping plover is a small shorebird which breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plover populations were federally listed as threatened and endangered in 1985, with the Northern Great Plains and Atlantic Coast populations listed as threatened, and the Great Lakes population listed as endangered (USFWS 1985b).

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems (USFWS 2002, 2010d). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988b). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2010d). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988b, 2010d).

Suitable shoreline habitats for breeding and nesting plovers occur along Lake Sakakawea, which is 3 to 6 miles (5.7 to 15.6 river miles) away from the proposed well pads and access

roads. It is unlikely that migrating plovers would visit the project areas during their migration. Therefore, the proposed project may affect, but is not likely to adversely affect piping plovers.

In addition, the USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat, including areas near the proposed project, along the shoreline of Lake Sakakawea (USFWS 2002). Since the project would not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or any of its tributary streams in any way, no effect to designated critical habitat of the piping plover would occur.

Whooping Crane (*Grus americana*)
Status: Endangered
Affects Determination: May Affect, but is Not Likely to Adversely Affect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species includes habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 cranes (USFWS 2010e). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010e). Dunn and McKenzie counties, including the project area, are within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 1 kilometer of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed near the project area. Project precautionary measures would be implemented if a whooping crane is sighted in or near the project area. EOG would cease construction or other activity if there is a confirmed sighting of a whooping crane within 1 mile of the project area and notify the USFWS. EOG personnel or subcontractors who have been trained in a formal program sponsored by EOG on the field identification of whooping crane can make a confirmed

sighting. Additionally, any new utility lines would be buried to reduce potential impacts. As a result, the proposed project may affect, but is not likely to adversely affect the whooping crane.

Pallid Sturgeon (*Scaphirhynchus albus*)
Status: Threatened
Affects Determination: May Affect, but is Not Likely to Adversely Affect

The pallid sturgeon was listed as endangered in 1990 due to population declines resulting from the alteration of habitat through river channelization, creation of impoundments, and alteration of flow regimes (USFWS 1990b). These alterations within the Missouri River have blocked movements to spawning, feeding, and rearing areas, destroyed spawning habitat, altered flow conditions which can delay spawning cues, and reduced food sources by lowering productivity (USFWS 2007a). The fundamental elements of pallid sturgeon habitat are defined as the bottom of swift waters of large, turbid, free-flowing rivers with braided channels, dynamic flow patterns, flooding of terrestrial habitats, and extensive microhabitat diversity (USFWS 1990b).

A pallid sturgeon population of approximately 136 wild adults is found near the project area from the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and the lower Yellowstone River up the confluence of the Tongue River, Montana (USFWS 2007a). Hatchery reared sturgeon have also been stocked since 1998. The pallid sturgeon has been found to use the 25 kilometers of riverine habitat that would be inundated by Lake Sakakawea at full pool (Bramblett 1996 per USFWS 2007a). Larval pallid sturgeons have also been found to drift into Lake Sakakawea. While the majority of pallid sturgeons are found in the headwaters of Lake Sakakawea, North Dakota Game and Fish have caught and released pallid sturgeon in nets set in 80 to 90 feet of water between the New Town and Van Hook area. Based on this information, pallid sturgeon could be found throughout Lake Sakakawea (personal communication, email from Steve Krentz, Pallid Sturgeon Project Lead, U.S. Fish and Wildlife Service, to Mike Cook, Aquatic Ecologist, SWCA Environmental Consultants, September 3, 2010).

Suitable habitat for pallid sturgeon does not occur in the project area, and Lake Sakakawea is 5.7 to 15.6 river miles from the proposed well pads and access roads. However, Clarks and Antelope creeks, which drain the project area, are perennial tributaries to the Missouri River in Lake Sakakawea. Potential pollution and sedimentation occurring within the project area are concerns for downstream populations of endangered pallid sturgeon. Activities associated with the construction, production, or reclamation of the proposed project area are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Therefore, the proposed project may affect, but is not likely to adversely affect pallid sturgeon.

Dakota Skipper (*Hesperia dacotae*)
Status: Candidate

The Dakota skipper is a small butterfly with a 1-inch wingspan and is found primarily in undisturbed native tall grass and upland dry mixed grass prairie areas with a high diversity of wildflowers and grasses (Committee on the Status of Endangered Wildlife in Canada 2003). The Dakota skipper appears to require a range of precipitation-evaporation ratios between 60

and 105 and a soil pH between 7.2 and 7.9 (McCabe 1981). Larvae feed on grasses, favoring little bluestem. Adults commonly feed on nectar of flowering native forbs such as harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower (*Echinacea purpurea*). The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding (USFWS 2005). The proposed project would primarily impact agricultural lands and would have minor impacts on this species and its habitat. The use of BMPs and conservation guidelines (USFWS 2007b) during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

Sprague's Pipit (*Anthus spragueii*)
Status: Candidate

The Sprague's pipit, a small passerine bird that is native to the North American grasslands, was added to the candidate species list in September 2010. The pipit is a ground nester that breeds and winters on open grasslands and feeds mostly on insects and spiders and some seeds. The Sprague's pipit is closely tied with native prairie habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota, and South Dakota as well as south-central Canada (USFWS 2010f). Wintering occurs in the southern states of Arizona, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and New Mexico.

In North Dakota, Sprague's pipit has been found in areas of moderate grazing. Sprague's pipits are sensitive to patch size and avoid edges between grasslands and other habitat features (USFWS 2010f). They may avoid non-grassland features including roads, trails, oil wells, croplands, woody vegetation, and wetlands. The Sprague's pipit is reported to stay up to 350 meters away from anthropogenic features such as roads, oil wells, and wind turbines. The USFWS has estimated that each new oil well and associated road in North Dakota results in potential impacts to approximately 51 acres of pipit habitat due to avoidance and habitat fragmentation (USFWS 2010f). While there is native prairie grassland in the project vicinity, the proposed wells are located in disturbed agricultural lands. The proposed project is unlikely to directly affect habitat due to lack of adequate patch sizes required by the Sprague's pipit for breeding grounds in the immediate project area, but may indirectly contribute to reduced use of any nearby suitable grassland habitat patches within 350 meters of the proposed new facilities.

3.6 SOILS

Soils in the project areas vary depending on the topography, slope orientation, and parent material from which the soil is derived. The proposed project areas are located toward the center of the Williston Basin. The Greenhorn Formation is the primary geological feature in the project area. This formation consists of thin limestone and dark gray to black organic-rich shale and is found at the surface to a depth of approximately 4,000 feet. Soils found near the surface in the project area are derived from the parent material of the Greenhorn Formation and subsequent geological sequences. 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 geological Sequences.

3.6.1 Natural Resources Conservation Service Soil Data

The Natural Resources Conservation Service (NRCS) has mapped soils in the proposed project area. Soils complexes identified by the NRCS and derived from different soils series that are present on the well pads and access roads, and their respective acreages, are summarized in Table 14. The acreage shown is based on the spatial extent of soil series combinations derived from NRCS data; therefore, the acreage is approximate and used as a best estimate of soil series distribution at each of the proposed project areas. The Proposed Action would impact various types of soils due to surface disturbance for well pad and road construction. Figures 18 and 19 illustrate the soils composition that surrounds each proposed well pad and associated access road.

The erosion factor for each soil complex is shown in Table 14 as the K factor. The K factor indicates the soil erodibility of soil particles less than 2 millimeters in size to sheet and rill erosion by water forces. The K value can range from 0.02 (lowest erosion potential) to 0.69 (greatest erosion potential). The K value in the project area ranges from 0.24 to 0.37, indicating a moderate erosion potential (NRCS 2010).

As presented in Table 14, several different soil complexes are found along each well pad and access road alignment. The Williams-Bowbell loam and William-Zahl loam soil types are prevalent in the proposed well pads and access roads. These soils are largely used for rangeland, pasture, and other agricultural purposes. According to the NRCS, the Williams-Bowbell loam and William-Zahl loams are similar in composition and characteristics with the William series. These soils associations consists of well-drained soils formed in glacial alluvium on hills, summits, shoulders, swales, and other slopes varying between 3% and 9%. These soils have a low to medium runoff potential, depending on slope, with a moderate permeability. The mean annual precipitation found throughout this soil complex is approximately 14 to 17 inches with a mean annual air temperature ranging between 37°F and 45°F. This soil complex is largely used for cultivation of crops as well as range and pasture land. Dominant native vegetation types found on this soil complex within the proposed project area include green needlegrass (*Nassella viridula*), little bluestem (*Schizachyrium scoparium*), fringed sage (*Artemisia frigida*), coneflower (*Echinacea* sp.), western snowberry (*Symphoricarpos occidentalalis*), and western wheatgrass (*Pascopyrum smithii*). Individual soil series can vary in value as a source for topsoil salvage and reclamation utilization. One soil series in a soil complex or association may have greater reclamation potential than other soil series in the complex. The Williams soil series, the dominant series found within the project area, has sufficient depth and is considered a "good" viable topsoil source with high reclamation potential.

Table 14. Soil Types in the Project Area.

Project Area	Map Key	Soil Series	K factor	Acres
Hawkeye Section 24 Access Road	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	0.64
Hawkeye Section 24 Well Pad	42C	Williams loam, 6–9 percent slopes	0.28	2.84
	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	1.33
Hawkeye Section 25 Access Road	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	0.43
Hawkeye Section 25 Well Pad	42C	Williams loam, 6–9 percent slopes	0.28	2.15
	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	2.39
Riverview Section 30 Access Road	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	0.74
	33	Belfield-Grail silty clay loams, 0–2 percent slopes	0.37	0.77
	43C	Williams-Zahl loams, 6–9 percent slopes	0.28–0.37	0.24
Riverview Section 30 Well Pad	43C	Williams-Zahl loams, 6–9 percent slopes	0.28–0.37	0.35
	33	Belfield-Grail silty clay loams, 0–2 percent slopes	0.37	3.80
Riverview Section 31 Access Road	33	Belfield-Grail silty clay loams, 0–2 percent slopes	0.37	1.03
	42C	Williams loam, 6–9 percent slopes	0.28	2.02
	41	Williams-Bowbells loams, 0–3 percent slopes	0.24–0.28	2.10
	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	2.03
	43C	Williams-Zahl loams, 6–9 percent slopes	0.28–0.37	1.36
	145F	Zahl-Cabba-Arikara complex, 9–70 percent slopes	0.28	1.22
	44E	Zahl-Williams loams, 15–25 percent slopes	0.28–0.37	2.32
	44D	Zahl-Williams loams, 9–15 percent slopes	0.28	1.06
Riverview Section 31 Well Pad	44D	Zahl-Williams loams, 9–15 percent slopes	0.28	0.01
	42C	Williams loam, 6–9 percent slopes	0.28	0.10
	41B	Williams-Bowbells loams, 3–6 percent slopes	0.24–0.28	4.06

Source: NRCS 2010

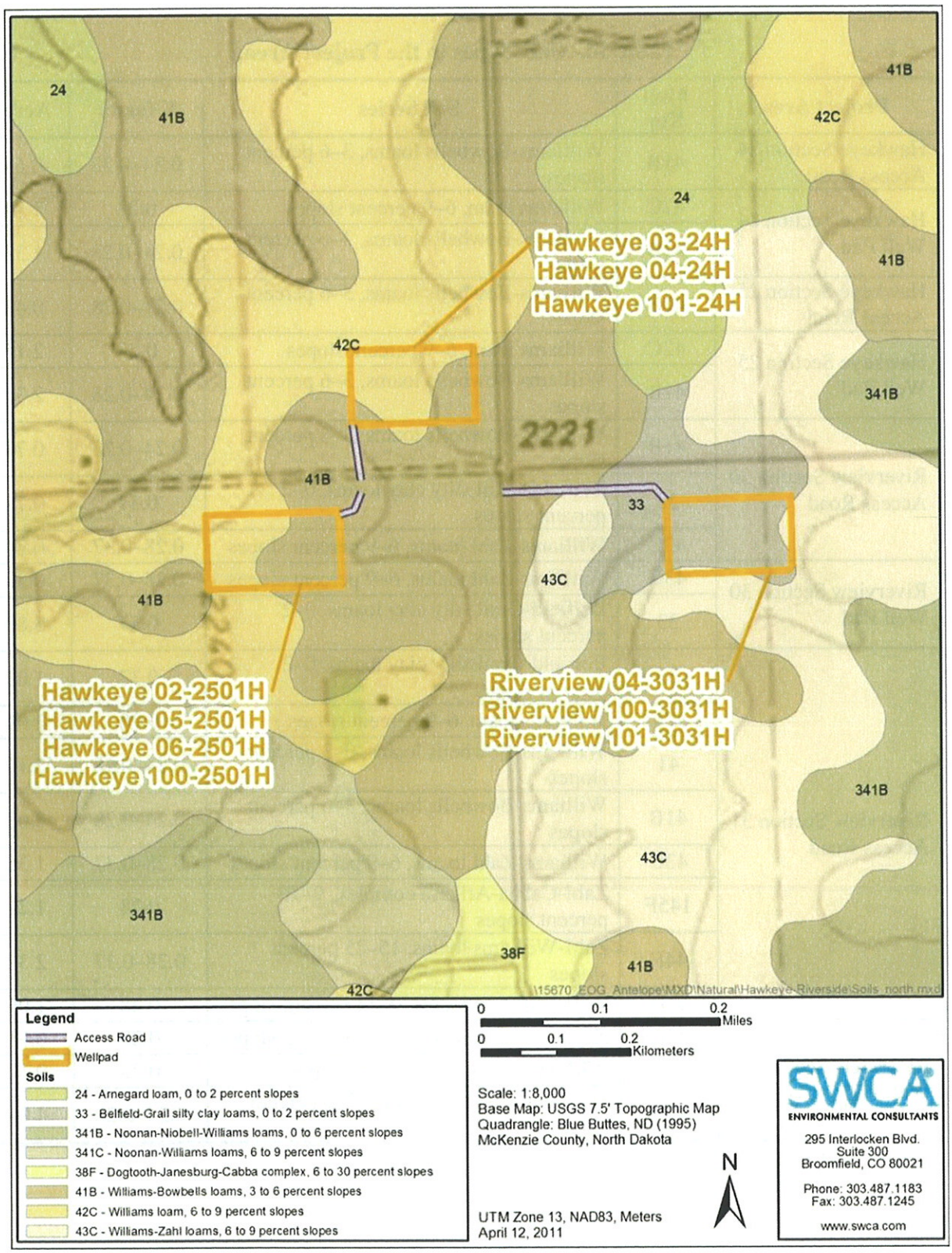


Figure 18. Soil types within Hawkeye Section 24, Hawkeye Section 25, and Riverview Section 30.

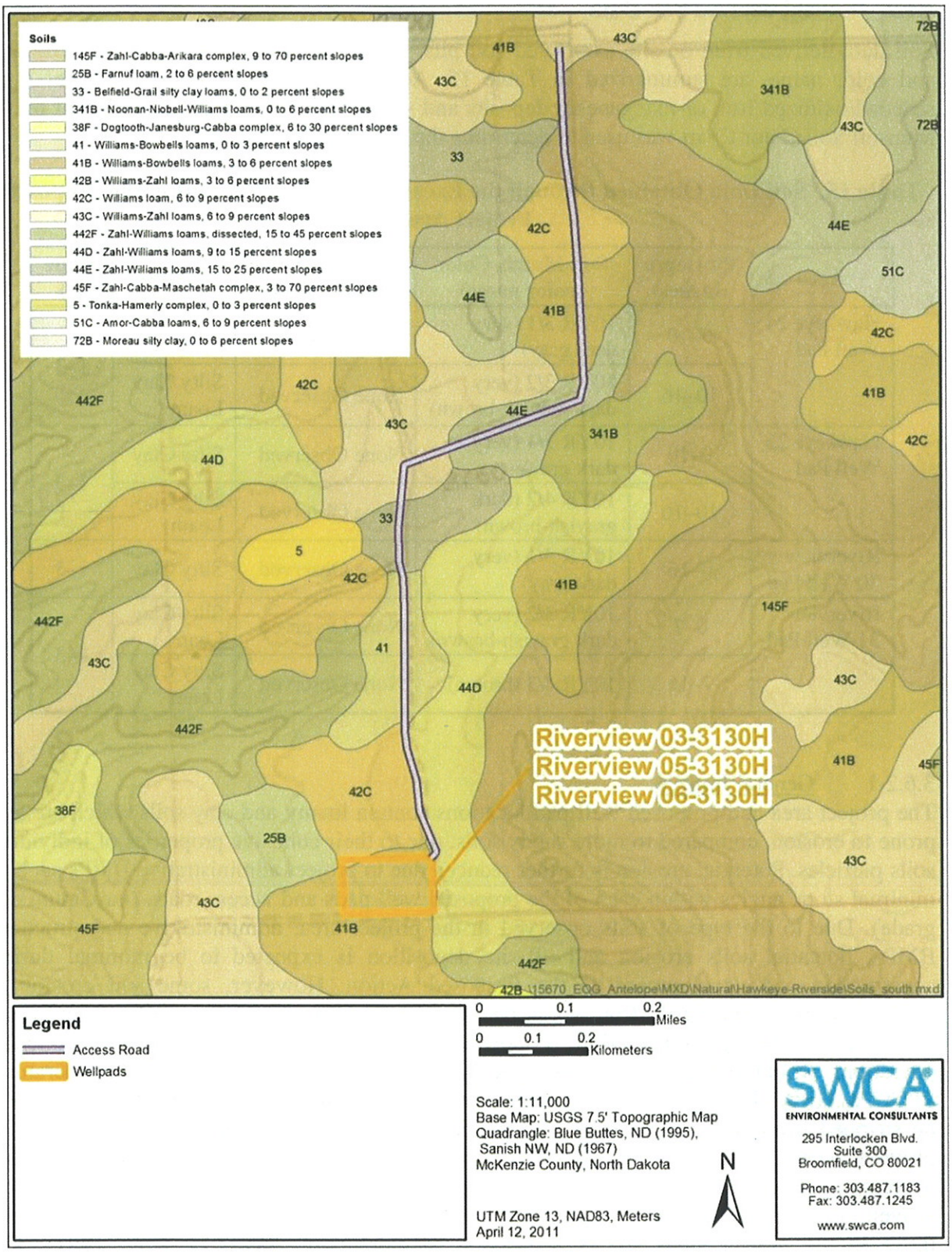


Figure 19. Soil types within Riverview Section 31.

3.6.2 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 15. 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 soil samples.

Table 15. Soil Data Obtained through the Excavation of Soil Pits within the Proposed Project Area.

Area	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (°)
Hawkeye 24 Well Pad	0–10	10YR 3/1 (very dark gray)	None Observed	Silty Clay	1–3
	10–16	10YR 3/2 (very dark grayish-brown)	None Observed	Silty Clay Loam	
Hawkeye 25 Well Pad	0–10	10YR 3/1 (very dark gray)	None Observed	Silty Clay	1–3
	10–16	10YR 4/2 (dark grayish-brown)	None Observed	Silty Clay Loam	
Riverview 30 Well Pad	0–16	10YR 3/1 (very dark gray)	None Observed	Silty Clay	1–3
Riverview 31 Well Pad	0–7	10YR 3/2 (very dark grayish-brown)	None Observed	Silty Clay Loam	1–3
	7–16	10YR 4/3 (brown)	None Observed	Silty Clay Loam	

3.6.2.1 General Impacts

The project area and proposed well pad locations contain loamy and clay soils which are less prone to erosion, compared to more sandy soils, due to their cohesive properties of individual soils particles. Potential erosion is further reduced due to project administrative BMPs such as minimal slope angles within each of the proposed well pads and access roads (maximum 4% grade). Due to the type of soils observed in the project area, administrative and structural BMPs, potential soils erosion and off-site deposition is expected to be minimal during construction and development of the Proposed Action. However, some soil erosion is expected to occur, primarily from wind, due to exposed soils on the proposed well pads and access roads during construction. Following construction, reclamation and production operations would minimize long-term erosions by the implementation of the operator's SPCCPs. For well pad and access road construction, a minimum of 6 inches of topsoil would be stripped from each access road, and temporarily stored along the sides of the road, to provide access to the subsoil, which is better suited for shaping and compaction. This movement of soil may lead to some soil erosion due to wind and water forces. However, proven practices are known to significantly reduce erosion of various types of soil, including those in the project areas (BLM Instruction Memorandum 2004-124; Grah 1997). The implementation of administrative and structural BMPs by the operator is expected to minimize the potential for erosion and loss of soils.

Reclamation potential for the soil complexes varies by soil series. Some soils may require soil amendments to achieve successful reclamation within a reasonable timeframe. During interim reclamation, the stripped 6 inches of topsoil would be spread on the back slopes in preparation for seeding. Any areas stripped of vegetation during construction would be reseeded once construction activities have ceased. All seed would be drilled on slope contours, as feasible, and planted between 0.25 and 0.50 inch deep. Where drilling is not possible, for example, on steep slopes and rocky terrain greater than 8% to 10% slopes, the seed would be broadcast, and the area would be raked or chained to cover the seed. Seed types and application rates would be determined by the AO.

Once production ceases, final reclamation would begin with all topsoil re-stripped from areas where interim reclamation had been performed and redistributed over the entire location and access road. The entire disturbed area would be scarified to a depth of 12 inches on 8-inch intervals. Water bars would be installed to minimize concentrated surface flows on finish grades of less than 8%. The entire disturbed area, including the former access road and well pad, would be reseeded with the specified seed mixture. Exceptions to these reclamation measures might occur if the BIA approves assignment of an access road either to the BIA roads inventory or to concurring surface allottees. The proponent would implement BMPs related to the reclamation effort and conduct all surface activities, including reclamation activities, in accordance with the BLM Gold Book (USDI and USDA 2007).

3.7 VEGETATION AND INVASIVE SPECIES

The proposed project area occurs 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*), sideoats 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*).

"Invasive species" is a general term used to describe plants 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 occupied by native species. "Noxious weeds" are invasive plants that have the potential to detrimentally affect public health, ecological stability, and agricultural practices. 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. North Dakota Century Code (Chapter 63-01.1) recognizes 11 plant species in the state as noxious; McKenzie County lists five additional weeds as noxious (Table 16).

During on-site assessments conducted in November 2010, biologists evaluated dominant vegetation at each proposed well site and associated access road and noted if any noxious weeds were present. All locations and proposed roads are located in agricultural fields vegetated with crops. Vegetation noted in the field included wheat (*Triticum vulgare*), barley

(*Hordeum vulgare*), alfalfa (*Medicago sativa*), green needlegrass, and brome (*Bromus* sp.). No noxious weeds were noted in the project area.

Removal of existing vegetation and disturbing soils for well pad and road construction could facilitate the spread of invasive species. The APD and this EA require the operator to control noxious weeds throughout project areas. Surface disturbance and vehicular traffic must not take place outside approved ROWs or the well pad. 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.

Table 16. Occupied Area for Recognized Noxious Weeds in McKenzie County, North Dakota.

Common Name	Scientific Name	McKenzie County (acres)
North Dakota Noxious Weeds		
absinth wormwood	*Artemisia absinthium*	15
Canada thistle	*Cirsium arvense*	33,600
diffuse knapweed	*Centaurea diffusa*	1
leafy spurge	*Euphorbia esula*	26,200
musk thistle	*Carduus nutans*	0
purple loosestrife	*Lythrum salicaria*	0
Russian knapweed	*Acroptilon repens*	0
spotted knapweed	*Centaurea stoebe*	5
yellow toadflax	*Linaria vulgaris*	0
Dalmatian toadflax	*Linaria dalmatica*	1
salt cedar	*Tamarix ramosissima*	2,400
McKenzie County Noxious Weeds		
black henbane	*Hyoscyamus niger*	0
common burdock	*Arctium minus*	0
houndstongue	*Cynoglossum officinale*	0
halogeton	*Halogeton glomeratus*	0
baby's breath	*Gypsophila muralis*	0
	Total	**62,222**

Source: North Dakota Department of Agriculture 2007

3.8 CULTURAL RESOURCES

Historic properties, or cultural resources, on federal or tribal lands are protected by many laws, regulations, and agreements. The National Historic Preservation Act of 1966 (16 USC 470 et seq.) at Section 106 requires, for any federal, federally assisted, or federally licensed undertaking, that the federal agency take into account the effect of that undertaking on any district, site, building, structure, or object that is included in the National Register of Historic Places (National Register) before the expenditure of any federal funds or the issuance of any

federal license. 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 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 Hawkeye 02-2501H / Hawkeye 100-2501H / Hawkeye 05-2501H / Hawkeye 06-2501H (formerly Hawkeye 02-2536H / Hawkeye 100-2536H) project approximately 10.59 acres were inventoried (Eisenhauer 2010b) and for the Hawkeye 03-24H / Hawkeye 04-24H / Hawkeye 100-24H project approximately 11.04 acres were inventoried (Eisenhauer 2010a) on November 9, 2010. No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for these undertakings. This determination was communicated to the THPO on December 27, 2010; however, the THPO did not respond within the allotted 30 day comment period. For the Riverview 04-3031H / Riverview 100-3031H (and Riverview 101-3031H) project approximately 13.42 acres were inventoried on November 1, 2010 (Eisenhauer 2010c). No historic properties were located and on the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking. This determination was communicated to the THPO on January 7, 2011; however, the THPO did not respond within the allotted 30 day comment period. For the Riverview 03-3130H (and Riverview 05-3130H / Riverview 06-3130H) project approximately 38.53 acres were inventoried on November 1,

2010 (Eisenhauer 2011). No historic properties were located and on the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking. This determination was communicated to the THPO on February 16, 2011; however, the THPO did not respond within the allotted 30 day comment period.

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 their proximity to the proposed well locations and overlap with the Reservation could result in socioeconomic impacts. 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 Population and Demographic Trends

Historic and current population counts for the Analysis Area, compared to the state, are provided below in Table 17. The state population showed little change between the previous two census counts (1990–2000), however in 2010 the state population increased by 4.7% to 672,594 (U.S. Census Bureau 2011a). Populations in McKenzie and Mountrail counties have increased slightly from 2000 to 2009 while McLean and Dunn counties had a rate of decline of -10.8% and -6.5%, respectively (U.S. Census Bureau 2011b). 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% from 2000 to 2005 (BIA 2005). 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 17, population growth on the Reservation (13.3%) exceeds the overall growth in the state of North Dakota (4.7%) 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 17. Population and Demographics.

County or Reservation	Population in 2009	% of State Population	% Change Between 1990–2000	% Change Between 2000–2009	Predominant Group in 2009 (%)	Predominant Minority in 2009 (Percent of Total Minority Population)
Dunn	3,365	0.5	-10.1	-6.5	Caucasian (85.3%)	American Indian (13.6%)
McKenzie	5,799	0.9	-10.1	1.1	Caucasian (76.7%)	American Indian (21.5%)
McLean	8,310	1.3	-11.0	-10.8	Caucasian (91.2%)	American Indian (7.1%)
Mountrail	6,791	1.0	-5.6	2.4	Caucasian (62.7%)	American Indian (35.1%)
On or Near Fort Berthold Indian Reservation[1]	11,897	1.8	178.0[2]	+13.3[3]	American Indian	Caucasian (~27%)
Statewide	672,594[4]	100	0.5	4.7[4]	Caucasian (91.1)	American Indian (5.6%)

Source: U.S. Census Bureau 2011b.
[1] BIA 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] BIA 2001. Reflects percent change between 1991 and 2001.
[3] Reflects percent change between 2001 and 2005.
[4]Refelects population levels in 2010 (U.S. Census Bureau 2011a).

3.9.3 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, 2010 economic data indicate that the major employers in North Dakota include government and government enterprises, which employed 16.6%; health care and social assistance, which employed 11.9%; and retail trade, which employed at 10.8% of the state's labor force (U.S. Bureau of Economic Analysis 2011a). Energy development and extraction, power generation, and services related to these activities have become increasingly important over the last several years and many service sector jobs are directly and indirectly associated with oil and gas development.

In 2010, total employment in the state of North Dakota was approximately 355,000 (Table 18). The average weekly wage for all employees on private nonfarm payrolls was $697 in North Dakota. All counties in the Analysis Area, and the entire state of North Dakota showed average weekly wages that were higher than the state and national average in 2010 (Table 18).

In 2010, the statewide unemployment rate was 3.8% of the workforce (Table 18). This is the lowest unemployment rate in the nation (Bureau of Labor Statistics 2011a). While some counties in the Analysis Area experienced a slight increase in unemployment, others were unchanged or experienced a decreased unemployment since 2005 (Table 18).

Table 18. 2010 Total Employment, Average Weekly Wages, and Unemployment Rates.

Location	Total Employment	Average Weekly Wage	Unemployment Rate	Change in Unemployment Rate (2005–2010)
United States	139,909,000	$781	9.4%	**+4.3%**
North Dakota	355,000	$697	3.8%	**+0.4%**
Dunn County	1,684	$829	3.3%	**-0.1%**
McKenzie County	2,625	$1,006	2.6%	**-1.1%**
McLean County	2,674	$820	3.8%	**-1.2%**
Mountrail County	4,713	$947	2.4%	**-3.6%**
On or Near Fort Berthold Indian Reservation*	1,287	N/A	71%	**N/A**

Sources: Bureau of Labor Statistics 2011a, 2011b; U.S. Department of Agriculture 2010; Bureau of Indian Affairs 2005.
* Represents 2005 data only.

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).

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.

3.9.4 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. Per capita income, median household income, and poverty rates for the Analysis Area and North Dakota are presented in Table 19.

Table 19. Income and Poverty in Analysis Area, 2008.

Unit of Analysis	Per Capita Income (2000)	Per Capita Income[1] (2008)	Median Household Income[2] (2009)	Percent of all People in Poverty[3] (2009)
Dunn County	$21,031	$29,558	$44,681	11.2%
McKenzie County	$22,269	$36,862	$49,465	12.8%
McLean County	$23,125	$42,466	$49,212	10.3%
Mountrail County	$23,045	$34,590	$49,884	12.4%
Fort Berthold Indian Reservation[4]	$8,855	$10,291[4]	$26,977[4]	N/A
North Dakota	$25,624	$39,874	$47,898	11.7%

[1] U.S. Bureau of Economic Analysis 2011a, 2011b
[2] U.S. Department of Agriculture 2010
[3] U.S. Department of Agriculture 2009
[4] BIA 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.

From 2000 to 2008, per capita include increased by 28.8% for Dunn County, 39.6% for McKenzie County, 45.5% for McLean County, and 33.4% for Mountrail County. These figures compare to a 35.7% increase for the State of North Dakota per capital personal income (U.S. Bureau of Economic Analysis 2009).

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). The median household income on the Reservation was $26, 977, compared to $41,994 in the U.S.

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 18, unemployment rates in all counties, including the Reservation, were equal to or above the state average of 3.8%. 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.

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, with 2009 updates (U.S. Census Bureau 2011c). 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 20 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 20. Housing Development Data for the Reservation and Encompassing Counties.

Region	Total Housing Units						% Change 2000–2009
	Occupied	Owner Occupied	Renter Occupied	Vacant	Total	Total	
	2000	2000	2000	2000	2000	2009	
Dunn	1,378	1,102	276	587	1,965	1,985	+1.0
McKenzie	2,151	1,589	562	568	2,719	2,801	+2.9
McLean	3,815	3,135	680	1,449	5,264	5,461	+3.6
Mountrail	2,560	1,859	701	878	3,438	3,607	+4.7
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	316,435	+8.5

Source: U.S. Census Bureau 2011c.

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

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 21.

Table 21. 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 2009a, 2009b.

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 22, 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, EOG 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 EOG 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.

Table 22. 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

Although some counties within the Analysis Area have experienced a recent decline in population between 2000 and 2009 (as shown in Table 17), the population on the Reservation itself has increased. This has not led to significant housing shortages. The historic housing

vacancy rate (Table 20) indicates that housing has remained available despite the growth of the population on the Reservation. The levels of available housing are therefore anticipated to be 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.

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 23 summarizes relevant data regarding minority populations for the Analysis Area.

Table 23. Minority Population Data by North Dakota County and Race, 2000–2009.

Race	Dunn		McKenzie		McLean		Mountrail		North Dakota	
	2000	2009	2000	2009	2000	2009	2000	2009	2000	2009
Total Population	3,600	3,365	5,737	5,799	9,311	8,310	6,629	6,791	642,204	646,844
Non-Hispanic	3,573	3,330	5,679	5,696	9,230	8,199	6,542	6,589	634,418	632,126
Hispanic or Latino[1]	27	35	58	103	81	111	87	202	7,786	14,718
Races										
Caucasian	3,123	2,827	4,457	4,450	8,632	7,577	4,546	4,259	596,722	589,112
African American	1	4	4	12	2	15	7	31	4,157	7,813
American Indians and Alaska Natives	448	459	1,216	1,249	568	587	1,988	2,385	31,440	36,258
Asian / Pacific Islanders	8	3	4	8	12	19	17	17	3,912	5,646
Two or More Races	25	30	39	80	97	112	71	99	5,973	8,015
All Minorities	477	538	1,280	1,349	679	733	2,083	2,532	45,482	57,732
% Minority Population	13.2	15.9	22.3	23.2	7.3	8.8	31.4	37.2	7.1	8.9
Change in Minority Population (2000–2009)	+12.8%		+5.3%		+7.9%		+21.5%		+26.9%	

[1] Hispanic or Latino may be of any race.

[2] U.S. Census Bureau estimates of population demographics were made in July 2009.
Source: U.S. Census Bureau 2011d.

In July 2009, the U.S. Census Bureau estimated that North Dakota's total minority population comprised approximately 57,732 persons, or 8.9% of the state's total population (i.e., 646,844 residents). This represents an increase of 26.9% over the 2000 minority population of the state. Within the Analysis Area, the number of Caucasian residents decreased, while minorities in nearly all categories increased, producing a strong increase in the percentage of minority population in each of the counties in the Analysis Area during the period from 2000 until 2009 (Table 23) (U.S. Census Bureau 2010a). The four counties of the Analysis Area showed an increase of 5.3% to 21.5% in minority population, compared with the statewide increase of 26.9%.

In 2009, the counties in the Analysis Area had a higher percentage of American Indian and Alaska Natives, ranging from 7.1% in McLean County to nearly 35.1% in Mountrail County, compared with the state as a whole which had approximately 5.6% in this category (U.S.

Census Bureau 2011d). The North Dakota Indian Affairs Commission (NDIAC) reports that American Indian population (race alone or in combination) in North Dakota has increased 12% from 35,228 in 2000 to 35,666 in 2008 (NDIAC 2011), with estimates for the future American Indian population (one race only) of 47,000 in 2015 and 59,000 in 2025 in North Dakota (NDIAC 2011). The Reservation had a total population of 5,915 in the 2000 census, with 67.4 % American Indian, mostly with tribal affiliations with MHA Nation (NDIAC 2010).

Poverty rate data for the counties in the Analysis Area are summarized in Table 24. The data show that poverty rates have decreased in the Analysis Area during the period from 2000 to 2009 (USDA 2009). McKenzie and Mountrail counties continue to have poverty rates that exceed the statewide poverty rate of 11.7%. All counties within the Analysis Area have lower median household incomes that the statewide household income of $47,898.

Table 24. Poverty Rates and Median Household Income for the Analysis Area.

Location	2000	2009	2009 Median Household Income
Dunn County	13.3%	11.2%	$44,681
McKenzie County	15.7%	12.8%	$49,465
McLean County	12.3%	10.3%	$49,212
Mountrail County	15.7%	12.4%	$49,884
North Dakota	10.4%	11.7%	$47,898

Source: U.S. Department of Agriculture 2009.

3.10.1 Potential Impacts to Environmental Justice

The Analysis Area, having larger and increasing minority populations, compared with statewide numbers, could result in disproportionately beneficial impacts from the proposed oilfield development. These would derive from direct and indirect economic opportunities for tribal members. 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. Poverty rates in the Analysis Area

have already begun to decrease since oil and gas development began after 2000, as shown in Table 24. There is potential for adverse economic impacts to tribal members who do not reside within the Reservation and therefore do not share in direct or indirect benefits.

Potential adverse impacts could occur to tribes and tribal members, as well, such as the potential disturbance of any traditional cultural properties and cultural resources. These potential impacts are reduced through surveys of proposed well locations and access road routes, mitigation measures required by the BIA, and thorough reviews and determinations by the BIA that there would be no effect to historic properties. 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 APDs. Applicant-committed measures are listed in Section 2.11. 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, the 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 that documents the results of monitoring in order to adapt the projects to eliminate any adverse impact on the environment.

3.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Extraction and consumption of oil and gas from the Bakken and Three Forks formations would be an irreversible and irretrievable commitment of resources. Other potential resource commitments include land area devoted to the disposal of cuttings, 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 activities would not detract significantly from long-term productivity of the project area. The development of access roads and well pad areas would eliminate any forage or habitat use by wildlife and/or livestock. Any allottees would be properly compensated for land disturbance. The initial disturbance area would decrease considerably once the wells are drilled and non-necessary areas have been reclaimed. Access roads and work areas would be leveled or backfilled as necessary, scarified, recontoured and reseeded. Rapid reclamation of the project area would facilitate revived wildlife and livestock usage, stabilize the soil, and reduce the potential for erosion and sedimentation. Exceptions to these reclamation measures might occur if the BIA approves assignment of an access road either to the BIA roads inventory or to concurring surface allottees. The foremost resource loss associated with long-term activities is the extraction of hydrocarbons from the Bakken and Three Forks formations targeted by this project.

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 EOG and possibly other operators would pursue additional development in the area. Current farming and ranching is expected to continue with little change because virtually all available acreage is already organized into range units. Undivided interests in the land surface, range permits, and agricultural leases are often held by different tribal members than those holding mineral rights; at this time, oil and gas development is not expected to have more than a minor effect on land use patterns.

The major foreseeable activity with potential to impact critical elements of the human environment is oil field development. Over the past several years, exploration and development of the Bakken and Three Forks formations has accelerated. Most of this exploration has occurred outside the Reservation boundary on fee land, but for purposes of cumulative impact analyses, land ownership and the Reservation boundary are immaterial. Current impacts from existing activity in the area, such as other road development and oil and gas-related activities are still fairly dispersed.

Figure 20 and Table 25 show the active, confidential, and permitted oil and gas wells currently existing within 1, 5, 10, and 20 miles of the proposed wells. There are no active wells within 1 mile of the proposed wells, although one permitted EOG well is within 1 mile. There are currently 543 active wells within 20 miles of the proposed wells.

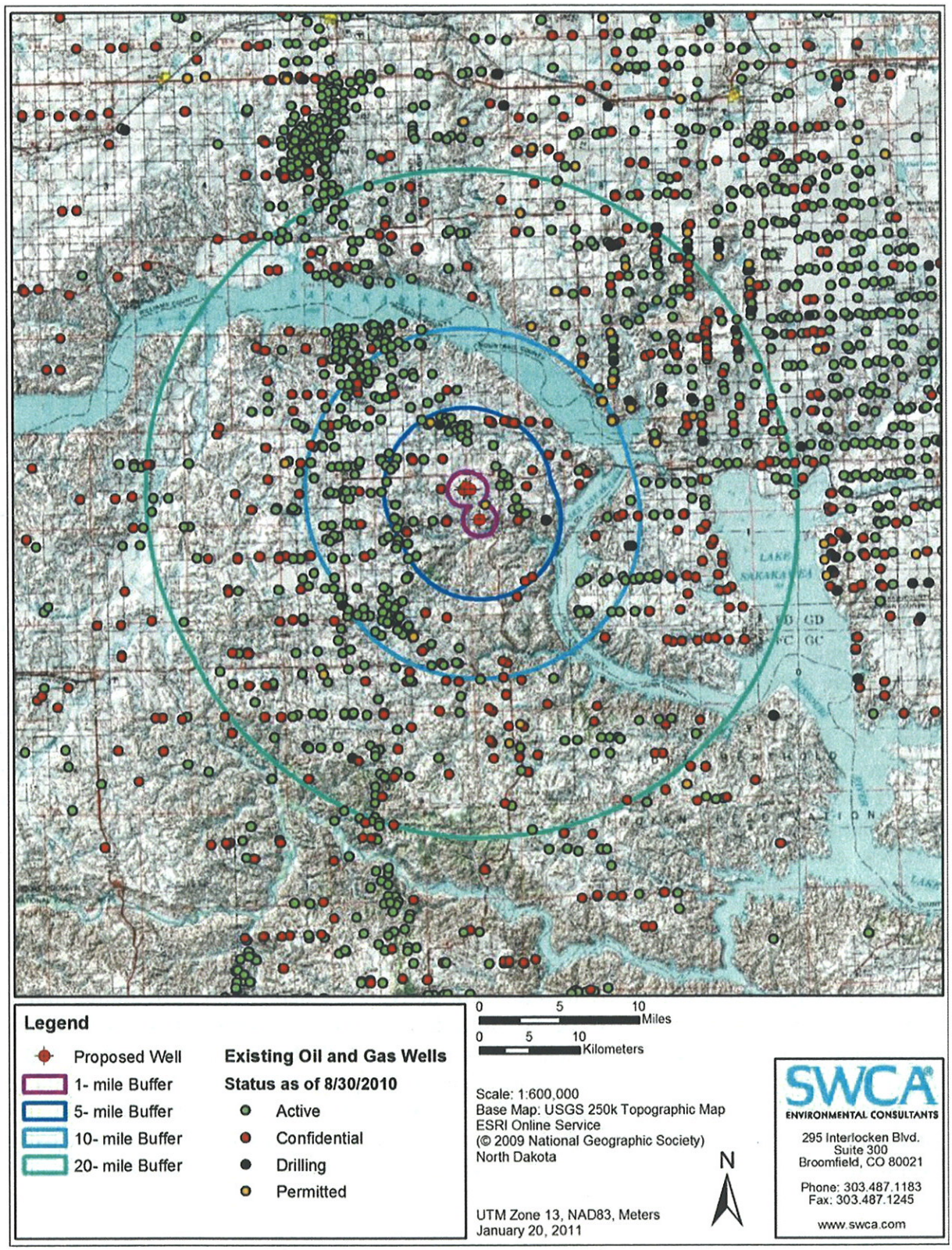


Figure 20. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

Table 25. Wells within 1, 5, 10, and 20 Miles of the Proposed Well Pads.

Radius	Active	Confidential	Drilling	Permitted	Total
0–1 mile	0	0	0	1	1
1–5 miles	46	14	3	1	64
5–10 miles	155	33	3	4	195
10–20 miles	342	184	21	16	563
Total	**543**	**231**	**27**	**22**	**823**

Potential cumulative impacts of the proposed project plus existing and other foreseeable future oil and gas development on the Reservation could include habitat fragmentation from construction of other well pads and roads, with potential effects on migratory grassland birds and other wildlife. The Proposed Action would create new long-term disturbance of 39.1 acres for roads and well pads. All locations and proposed roads are located in agricultural fields vegetated with crops. Thus, the project is replacing one non-native habitat with another. Similar levels of surface disturbance have occurred at 823 existing oil and gas wells within a 20-mile radius of the project area (Table 26). This level of development is estimated to have disturbed approximately 8,230 acres (assuming 10 acres per well) within the 20-mile radius. The cumulative disturbance due to surface disturbance from the existing and these proposed wells is estimated to be 0.95% of the land in a 20-mile radius.

Unlike well pads, active roadways are not typically reclaimed, thus sediment yield from roads can continue at an increased rate over the background rate during the life of the project or indefinitely if the roads are formally transferred to either the BIA or landowner. The Proposed Action would create approximately 1.3 miles of new unpaved roadway in the project area. As such, the Proposed Action would incrementally add to existing and future impacts to soil resources in the general area. EOG 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 slopes, and planting cover crops to stabilize soil following construction and before permanent seeding takes place.

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 invasive weed species. However, the APD for this project would require EOG to control invasive weed species throughout the project area. 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.

Surface disturbance and wildlife habitat fragmentation have existed in varying degrees within and surrounding the project area, and have increased over time with continuing oil and gas exploration, development, and production activities. Additional disturbance would likely

cause new behavioral adaptations, movement, and/or temporary avoidance of activity areas. The cumulative effects to all wildlife species in general would come from further habitat fragmentation due to road and well site construction, increased traffic and associated noise, and increased human activity across the landscape. As roads are developed within and adjacent to the project area, habitat is fragmented and roads serve as barriers to some animal movement. As wildlife avoid dust, noise, and vehicular activity associated with roads, wildlife in adjacent habitats may also be impacted. Grassland-obligate species would be affected by the cumulative removal of habitat (reduction or fragmentation of patch size and/or vertical habitat structure) throughout the area.

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. No cultural resource sites were newly recorded in the APE of the proposed wells. As such, no damage or destruction of archaeological resources is anticipated as a result of the Proposed Action.

It is anticipated that the pace and level of oil and natural 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—most of which would occur during the short-term construction and drilling phase (i.e., wells and roads)—would be localized, largely temporary, and limited in comparison with regional emissions. Therefore, it is unlikely that the Proposed Action would noticeably impact the cumulative air quality of the region.

No surface discharge of water would occur under the Proposed Action, nor would any surface water or groundwater be used during project development, as all water would be hauled in by truck from a commercial source. However, the Proposed Action, when combined with other actions (e.g., cattle grazing, other oil and gas development, and agriculture) likely to occur in and near the project area in the future, would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and continue during the life of the project or indefinitely if the roads are formally transferred to either the BIA or landowner. The Proposed Action could incrementally add to existing and future sources of water quality degradation in the Antelope Creek, Clarks Creek, and North Fork Clarks Creek watersheds. However, increases in water quality degradation would be reduced by EOG's commitment to minimizing surface disturbance, using erosion control measures as necessary, and implementing BMPs designed to reduce impacts.

The Proposed Action would incrementally add to existing and future socioeconomic impacts in the general area. The proposed wells, if successful, would be an additional source of revenue for some residents of the Reservation. These wells would also provide additional revenue to McKenzie County and the State of North Dakota, subject to relevant royalties and taxes. Increases in employment would be temporary during the construction, drilling, and completion phases of the Proposed Action. Although, short-term, additional tax revenue, such as sales and lodging taxes, would also be generated for the area, and would add to the current tax base from existing oil and gas operations.

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs and commitments contained in the APD 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. EOG has committed to implementing interim reclamation of the well pads immediately following construction and completion. Roads would also be reclaimed after the life of the project, unless formally transferred to the BIA or landowner. 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. For the purpose of this EA, a stakeholder is considered any agency, municipality, or individual person which the Proposed Action may affect either directly or indirectly in the form of public health, environmental, or socioeconomic issues. Scoping letters declaring the location of the proposed project areas and explaining the actions proposed at each site were sent in advance of this EA to allow stakeholders ample time to submit comments or requests for additional information. The scoping letter describing the four well pads and associated access roads was mailed on November 24, 2010. The scoping comments received for both announcements are summarized in Table 26 and copies are provided as an attachment. A copy of this EA will be submitted to all federal agencies with interests either in, near, or potentially affected by the Proposed Action.

List of Preparers

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations. This document was drafted by SWCA under the direction of the BIA. Information was compiled from various sources and resource specialists within SWCA.

EOG Resources, Inc.

- Heather Smith, NEPA Coordinator
- LB Myers, Environmental Specialist

SWCA Environmental Consultants

- Chad Baker, Project Manager/Environmental Specialist

Prepared the EA

- Kara Altvater, Biologist/Environmental Specialist

Prepared the EA

- Joshua Ruffo, Wildlife Biologist

Conducted natural resource surveys, reviewed and edited the EA

- Judy Cooper, Archaeologist/Principal Investigator

Supervised cultural resource surveys, prepared the technical report

- Jolene Schleicher, Archaeologist

Conducted cultural resources surveys

- Stephanie Lechert, Archaeologist

Conducted historical research, prepared site forms

- Nancy Eisenhauer, Archaeologist

Conducted cultural resource literature review, prepared technical reports and the cultural resources section of the EA

- Alex Wesson, Archaeologist/Project Coordinator

Coordinated preparation of technical reports and the cultural resources section of the EA

- Jacob Weber, GIS Specialist

Created maps and spatially derived data

Table 26. Public 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	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	No Comment	
Brugh, V. Judy	Three Affiliated Tribes	No Comment	
Bryan, Kelley	Zenergy Operating Company	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Chevance, Nick	National Park Service, Midwest Region	No Comment	
Christenson, Ray	Southwest Water Authority	No Comment	
Cimarosti, Daniel	U.S. Army Corps of Engineers	Provided information on Nationwide Permit 12 and 14.	Noted.
Danks, Marvin	Fort Berthold Rural Water Director	No Comment	
Davis, Scott	Indian Affairs Commission	No Comment	
Desjarlais, Lyndon	Fort Berthold Agency	No Comment	
Dhieux, Joyce	U.S. Environmental Protection Agency	No Comment	
Dixon, Doug	Montana Dakota Utilities	No Comment	
Dressler, Patricia	Federal Aviation Administration	No Comment	
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Ferris, Kade	Turtle Mountain Band of Chippewa	No Comment	
Fox, Fred	Three Affiliated Tribes	No Comment	
Garrison Project Office	U.S. Army Corps of Engineers	No Comment	
Glatt, David	North Dakota Department of Health	The department believed that environmental impacts from the proposed construction would be minor and could be controlled by proper construction methods.	Noted.
Hanson, Jesse	North Dakota Parks and Recreation	Reviewed the North Dakota Natural Heritage biological conservation database for occurrences of species of concern within 1 mile of the project areas.	Information included in the wildlife section of this EA.
Hauck, Reinhard	Dunn County	No Comment	
Hefferman, Dan	U.S. Environmental Protection Agency	No Comment	
Hoffman, Warren	Killdeer, Weydahl Field	No Comment	

Name	Organization	Comment	Response to Comment
Hudson-Schenfisch, Julie	McLean County Board of Commissioners	No Comment	
Hynek, David	Chair, Mountrail Board of County Commissioners	No Comment	
Jarski, Tim	Reservation Telephone Coop.	There are copper cables that could be affected by the proposed access roads.	Noted.
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadrmas, Ray	Dunn County	No Comment	
Kuehn, John	Parshall-Hankins Field Airport	No Comment	
Kyner, Dave	Federal Emergency Management Agency	Contact the local Floodplain Manager, Cliff Whitman, DES Director for the Reservation at 701-627-4805.	Noted.
Land Department	Northern Border Pipeline Company	No Comment	
Latimer, Tom	Red Willow Great Plains, LLC	No Comment	
Laux, Eric	U.S. Army Corps of Engineers	No Comment	
Levings, Marcus	Chairman, Three Affiliated Tribes	No Comment.	
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
Manager	Xcel Energy	No Comment	
Melhouse, Ronald	Bureau of Reclamation	There are waterlines in the vicinity of some of the proposed wells and their access roads. Request proponent coordinates construction with Lester Crows Heart, Fort Berthold Rural Water Director.	Noted. A scoping letter was sent to the Fort Berthold Rural Water Director.
Mercer County	Mercer County Board of Commissioners	No Comment	
Missile Engineer, Chief	Minot Air Force Base	No Comment	
Murphy, Charles	Chairman, Standing Rock Sioux Tribe	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	
Nelson, Richard	U.S. Bureau of Reclamation	No Comment	
Nordquist, Don	Petro-Hunt, LLC	No Comment	
Obenauer, Steve	Federal Aviation Administration	No Comment	
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merlan Jr.	State Historical Society	Requests that a copy of the cultural resources site forms and reports be sent to their office.	Noted.
Packineau, Mervin	Three Affiliated Tribes	No Comment	
Paulson, Gerald	Western Area Power Administration	No Comment	

Name	Organization	Comment	Response to 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	
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Schadewald, Paul	North Dakota Game and Fish Department	Concerned about habitat fragmentation. Recommend avoiding native prairie, wooded draws, riparian corridors, and wetland areas. Suggests botanical and aerial raptor nest surveys.	Noted.
Schelkoph, David	West Plains Electric Cooperative, Inc.	No Comment	
Selvage, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Short Bull, Marietta	Fort Berthold Agency	No Comment	
Sorenson, Charles	Army Corps of Engineers	Recommends building a catch trench for hazardous waste, closed loop drilling, using weed free fill, avoiding critical habitat for listed species, and discussing cumulative impacts.	Noted.
Strahs, Arnold	Three Affiliated Tribes	No Comment	
Svoboda, Larry	U.S. Environmental Protection Agency	No Comment	
Schaar, Jerome	U.S. Department of Agriculture, Natural Resources Conservation Service	Recommended avoiding wetland impacts or minimize using provided guidelines.	Noted.
Sellers, Randal	U.S. Army Corps of Engineers	Recommends coordination with ND State Water Commission, EPA, USFWS, and SHPO. A Section 404 permit would be required for any placement of dredged or fill material into waters of the U.S.	Noted.
Thorson, Gary	McKenzie Electric Cooperative	No Comment	
Towner, Jeffrey	U.S. Fish and Wildlife Service	Concurred with the affects determinations for ESA listed species. Stated that the applicant-committed protection measures demonstrate EOG's commitment to protect migratory birds.	Concurrence noted in the wildlife section of this EA.
White Calfe, Frank	Three Affiliated Tribes	No Comment	
Williams, Damon	Three Affiliated Tribes	No Comment	
Wolf, Malcolm	Three Affiliated Tribes	No Comment	

5.0 REFERENCES

Armbruster, M.J. 1990. Characterization of habitat used by whooping cranes during migration. Biological Rept. 90(4):1–16.

Bramblett, R.G. 1996. Habitats and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri Rivers, Montana and North Dakota. Doctoral dissertation. Montana State University, Bozeman.

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 online at http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/index.htm. Accessed June 2008.

Bureau of Indian Affairs. 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 Labor Statistics. 2011a. Local Area Unemployment Statistics. Available online at http://www.bls.gov/lau/tables.htm. Accessed January 26, 2011.

———. 2011b. Labor force data by county, not seasonally adjusted, October 2009 – November 2010. Available online at http://www.bls.gov/lau/laucntycur14.txt. Accessed January 26, 2011.

Bureau of Land Management (BLM). 2010. 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 February 2010.

Canadian Wildlife Service and U.S. Fish and Wildlife Service. 2007. International recovery plan for the whooping crane. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW), and U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Committee on the Status of Endangered Wildlife in Canada. 2003. COSEWIC Assessment and Status Report on the Dakota Skipper *Hesperia dacotae* in Canada. Ottawa: Committee on the Status of Endangered Wildlife in Canada.

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

Eisenhauer, N. 2010a. A Class I and Class III Cultural Resource Inventory of the EOG Hawkeye #02-2536H and #100-2536H Well Pad and Access Road, Fort Berthold

Indian Reservation, McKenzie County, North Dakota. Prepared by SWCA Environmental Consultants for EOG Resources, Inc., Denver.

———. 2010b. A Class I and Class III Cultural Resource Inventory of the EOG Hawkeye #03-24H, #04-24H, and #100-24H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota. Prepared by SWCA Environmental Consultants for EOG Resources, Inc., Denver.

———. 2010c. A Class I and Class III Cultural Resource Inventory of the EOG Riverview #04-3031H and #100-3031H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota. Prepared by SWCA Environmental Consultants for EOG Resources, Inc., Denver.

———. 2011. A Class I and Class III Cultural Resource Inventory of the EOG Riverview #03-3130H Well Pad and Linear Right-of-Way, Fort Berthold Indian Reservation, McKenzie County, North Dakota. Prepared by SWCA Environmental Consultants for EOG Resources, Inc., Denver.

EOG Resources. 2007. EOG Safe Practices Manual - Spring 2007. 229 pp.

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.

Hagen, S.K., P.T. Isakson, and S.R. Dyke. 2005. North Dakota Comprehensive Wildlife Conservation Strategy. North Dakota Game and Fish Department. Bismarck, ND.

Herkert, J.R. 1994. The influence of habitat fragmentation on Midwestern grassland bird communities. Ecological Applications 4:461–471.

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

Howe, M.A. 1987. Habitat use by migrating whooping cranes in the Aransas-Wood Buffalo corridor. Pages 303–311, in J.C. Lewis and J.W. Ziewitz, eds. Proc. 1985 Crane Workshop. Platte River Whooping Crane Habitat Maintenance Trust and USFWS, Grand Island, Nebraska.

———. 1989. Migration of radio-marked whooping cranes from the Aransas-Wood Buffalo population: Patterns of habitat use, behavior, and survival. USFWS Technical Report.

Intergovernmental Panel on Climate Change (IPCC). 2007. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Core Writing Team, Pachauri, R.K., and Reisinger, A. (Eds.), Geneva, Switzerland. Available online at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed October 25, 2010.

Johnson, S. 2010. Personal communication between Sandy Johnson, North Dakota Game and Fish Department, and Mike Cook, SWCA, regarding the University of North Dakota Eagle Project database. September 20, 2010.

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

Kotliar, N.B., B.W. Baker, A.D. Whicker, and G. Plumb. 1999. A critical review of assumptions about the prairie dog as a keystone species. Environmental Management 24(2):177–192.

Licht, D.S., and S.H. Fritts. 1994. Gray wolf *(Canis lupus)* occurrences in the Dakotas. American Midland Naturalist 132:74–81.

Licht, D.S., and L.E. Huffman. 1996. Gray wolf status in North Dakota. The Prairie Naturalist 28(4):169–174.

McCabe, T.L. 1981. The Dakota skipper (*Hesperia dacotae* (Skinner): Range and biology, with special reference to North Dakota. Journal of the Lepidopterists' Society 35(3):179–193.

National Oceanic and Atmospheric Administration (NOAA) 2010. National Climatic Data Center, State of the Climate: National Overview for January 2010, published online February 2010. Available online at http://www.ncdc.noaa.gov/sotc/?report=national&year=2009&month=13. Accessed October 25, 2010.

National Park Service 2010. Visibility Protection. Available online at http://www.nature.nps.gov/air/regs/visibility.cfm. Accessed October 2010.

Natural Resources Conservation Service (NRCS). 2010. Web Soil Survey. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soils data were downloaded from the NRCS websoil survey site in February 2010. Available online at http://websoilsurvey.ncrs.usda.gov and http://soildatamart.ncrs.usda. Accessed February 2010.

North Dakota Department of Agriculture. 2007. 2006 Noxious Weed List Survey – Reported Acres. North Dakota Department of Agriculture. Bismarck, North Dakota. 2 pp. Available online at http://agdepartment.com/Programs/Plant/NoxiousWeeds.html. Accessed February 2010.

North Dakota Department of Health (NDDH). 2010. Air Quality: Ambient Monitoring Annual Reports. Available online at http://www.ndhealth.gov/AQ/AmbientMonitoring.htm. Accessed October 2010.

North Dakota Indian Affairs Commission (NDIAC). 2011. Statewide Data: Tribal population projections. Available online at http://www.nd.gov/indianaffairs/?id=37. Accessed February 7, 2011.

North Dakota State Water Commission (NDSWC). 2010. North Dakota State Water Commission Mapservice. Available online at http://mapservice.swc.state.nd.us/. Accessed November 2010.

Pew Center 2009. Climate Change 101: Understanding and Responding to Global Climate Change. Available online at http://www.pewclimate.org/docUploads/Climate101-Complete-Jan09.pdf. Accessed October 25, 2010.

Root, B.G., M.R. Ryan, and P.M. Mayer. 1992. Piping plover survival in the Great Plains. Journal of Field Ornithology 63(1):10–15.

Ross, M. 1990. The Clean Air Act. Chapter 4 in M. A. Mantell, ed. Managing National Park System Resources: A Handbook of Legal Duties, Opportunities, and Tools. The Conservation Foundation, Washington, D.C.

Samson, F., and F. Knopf. 1994. Prairie Conservation in North America. Bioscience 44:418–421.

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

———. 2011a. Regional Economic Accounts. Local Area Personal Income. Table CA25 – Total Employment by Industry. Available online at http://www.bea.gov/regional/reis/scb.cfm. Accessed January 24, 2011.

———. 2011b. Regional Economic Accounts. State Annual Personal Income. Table SA25N-Total full-time and part-time employement by NAICS Industry. http://www.bea.gov/regional/spi/action.cfm

U.S. Census Bureau. 2009a. Building Permits (County). Available online at http://www.census.gov/const/www/permitsindex.html. Accessed December 1, 2009.

———. 2009b. 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.

———. 2011a. Resident Population Data. Available online at http://2010.census.gov/2010census/data/apportionment-pop-text.php. Accessed January 24, 2011.

———. 2011b. State & County QuickFacts. Available online at http://quickfacts.census.gov/qfd/states/38000.html. Accessed January 24, 2011.

———.2011c. USA Counties. Available online at http://censtats.census.gov/cgi-bin/usac/usatable.pl. Accessed January 24, 2011.

———. 2011d. USA Counties. Available online at http://censtats.census.gov/usa/usa.shtml. Accessed January 26, 2011.

U.S. Department of Agriculture (USDA). 2009. 2009 County-level Poverty Rates for ND. Available online at http://www.ers.usda.gov/Data/PovertyRates/PovListpct.asp?ST=ND&view=Percent. Accessed January 26, 2011.

———. 2010. Economic Research Service. County-Level Unemployment and Median Household Income for North Dakota. Available online at http://www.ers.usda.gov/Data/Unemployment/RDList2.asp?ST=ND. Accessed January 26, 2011.

U.S. Department of the Interior and United States Department of Agriculture (USDI and USDA). 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. The Gold Book Fourth Edition—Revised 2007. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

U.S. 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.

———. 2010a. National Ambient Air Quality Standards (NAAQS). Available online at http://www.epa.gov/air/criteria.html. Accessed October 21, 2010.

———. 2010b. Climate Change-Science. Available online at http://www.epa.gov/climatechange/emissions/. Accessed October 25, 2010.

———. 2010c. Climate Change Initiatives. Available online at http://www.epa.gov/climatechange/initiatives/index.html. Accessed October 25, 2010.

———. 2010d. Air Quality Indices, by County. Available online at http://www.epa.gov/cgi-bin/broker?grtype=CGM&dbtype=TSV&rpp=25&reqtype=viewdata&_service=airdata&_program=progs.webprogs.msummary.scl&_debug=2&geotype=st&geocode=ND&geoname=North+Dakota&mpol=aqi_days&myear=2008. Accessed October 21, 2010.

U.S. Fish and Wildlife Service (USFWS). 1985a. Interior population of the least tern. Federal Register 50 FR 21784–21792. May 28, 1985.

———. 1985b. Endangered and Threatened Wildlife and Plants: Determination of Endangered and Threatened Status for the Piping Plover. Federal Register 50 (238):50726–50734.

———. 1988a. Black-footed Ferret Recovery Plan. U.S. Fish and Wildlife Service. Denver, Colorado. 154 pp.

———. 1988b. Great Lakes and Northern Great Plains Piping Plover Recovery Plan. U.S. Fish and Wildlife Service, Twin Cities, MN. 160 pp.

———. 1989. Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver and Albuquerque: U.S. Fish and Wildlife Service.

———. 1990a. Interior Population of the Least Tern Recovery Plan. U.S. Fish and Wildlife Service, Twin Cities, MN. 160 pp.

———. 1990b. Endangered and threatened wildlife and plants; Determination of endangered status for the pallid sturgeon. Federal Register 55(173):36641–36647.

———. 2002. Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover; Final Rule. Federal Register. September 11, 2002 (Volume 67, Number 176), Rules and Regulations, pp. 57637–57717.

———. 2005. Endangered and Threatened Wildlife and Plants; Review of Native Species that are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule. Federal Register 70(90):24870–24934.

———. 2007a. Pallid sturgeon (*Scaphirhynchus albus)* 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Pallid Sturgeon Recovery Coordinator. Billings, Montana.

———. 2007b. Dakota skipper conservation guidelines *Hesperia dacotae* (Skinner) (Lepidoptera: Hesperiidae). U.S. Fish and Wildlife Service, Twin Cities Field Office. Available online at http://www.fws.gov/midwest/endangered/insects/dask-cons-guid2007.pdf. Accessed September 3, 2010.

———. 2009a. National Wetlands Inventory: Wetlands Online Mapper. Available online at http://www.fws.gov/wetlands/Data/Mapper.html. Data downloaded November 2009.

———. 2009b. Reserve Pits: Mortality Risks to Birds. U.S. Fish and Wildlife Service. Wyoming Ecological Services, Environmental Contaminants Program. September 2009. Document available online at http://www.fws.gov/contaminants/Documents/ReservePitsBirdMortality.pdf. Accessed February 2011.

———. 2010a. Black-footed ferret. Available online at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A004. Accessed September 7, 2010.

———. 2010b. Gray wolf. Available online at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A00D. Accessed September 7, 2010.

———. 2010c. Least Tern (Interior population). Available online at http://www.fws.gov/southwest/es/oklahoma/lestern.htm. Accessed September 7, 2010.

———. 2010d Piping plover. Available online at http://www.fws.gov/mountain-prairie/species/birds/pipingplover. Accessed September 7, 2010.

———. 2010e. Whooping crane. Available online at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B003. Accessed September 2, 2010.

———. 2010f. 12-month Finding on a Petition to List the Sprague's Pipit as Endangered or Threatened Throughout its Range. Available online at http://www.fws.gov/mountain-prairie/species/birds/spraguespipit/75FR56028.pdf. Accessed November 9, 2010.

U.S. Geological Survey (USGS). 2010. Codes Used in Water-Quality. Available online at http://pubs.usgs.gov/of/2005/1081/pdf/QW-AppxA.pdf. Accessed November 1, 2010.

Vickery, P.D., J.R. Herkert, F.L. Knopf, J. Ruth, and C.E. Keller. 2000. Grassland birds: An overview of threats and recommended management strategies. In Strategies for Bird Conservation: The Partners in Flight Planning Process, edited by R. Bonney, D.N. Pashley, R.J. Cooper, and L. Niles. Proceedings RMRS-P-16. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

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.

6.0 ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AO	Authorized Officer
APD	Application for Permit to Drill
APE	area of potential effect
AQI	Air Quality Index
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
EOG	EOG Resources, Inc.
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
IPCC	Intergovernmental Panel on Climate Change
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAICS	North American Industry Classification System
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIAC	North Dakota Indian Affairs Commission
NDIC	North Dakota Industrial Commission
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NTL	Notice to Lessees
NWI	National Wetland Inventory
O_3	ozone
PM	particulate matter
PSD	Prevention of Significant Deterioration
psi	pounds per square inch

Reservation	Fort Berthold Indian Reservation
ROW	right-of-way
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SUP	Surface Use Plan
SWCA	SWCA Environmental Consultants
THPO	Tribal Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound