



# United States Department of the Interior

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




IN REPLY REFER TO:  
DESCRM  
MC-208

NOV 29 2010

## MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: Regional Director, Great Plains Region 

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for four proposed exploratory drilling wells by EOG Resources, Inc, on the Fort Berthold Reservation, an Environmental Assessment (EA) has been completed and a Finding of No Significant Impact (FONSI) has been issued.

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

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

Attachment

cc: Tex Hall, Chairman, Three Affiliated Tribes (with attachment)  
Elgin Crow Breast, THPO (with attachment)  
Derek Enderud, BLM, Dickenson, ND (with attachment)  
John Shelman, US Army Corps of Engineers  
Jeffrey Hunt, Virtual One Stop Shop



**Finding of No Significant Impact**  
**EOG Resources, Inc.**

**Ten Exploratory Oil Wells from four well pads:**  
**Horse Camp #02-11H, Horse Camp #03-16H, Bear Den #03-30H and Clarks Creek #02-17H**  
**Fort Berthold Indian Reservation**  
**McKenzie and Dunn Counties, North Dakota**

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for ten oil/gas wells, access roads and related infrastructure from four well pads on the Fort Berthold Indian Reservation to be located in NW¼ NW¼, Section 11, Township (T) 149 North (N), Range (R) 93 West (W), Dunn County, North Dakota, NW¼ NE¼, Section 16, T149N, R93W, Dunn County, North Dakota, NE¼ NE¼, Section 30, T150N, R94W, McKenzie County, North Dakota and NW¼ NW¼, Section 17, T151N, R94W, 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.

The 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

11-29-10  
\_\_\_\_\_  
Date



# **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.**

**Four Exploratory Oil Wells:**

**Horse Camp #02-11H, Horse Camp #03-16H, Bear Den #03-30H,  
and Clarks Creek #02-17H**

**Fort Berthold Indian Reservation**

**November 2010**

For information contact:  
Bureau of Indian Affairs, Great Plains Regional Office  
Division of Environment, Safety and Cultural Resources Management  
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## **1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION**

EOG Resources, Inc. (EOG) proposes to drill and complete up to 10 exploratory horizontal oil wells on four pads to explore and potentially develop productive subsurface formations underlying oil and gas leases owned by EOG within the Fort Berthold Indian Reservation (Reservation). If successful, EOG would install production facilities at each location and transport commercial quantities of oil to nearby markets. These developments have been proposed on lands held in trust by the United States in Dunn and McKenzie counties, North Dakota. 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. The following four wells have been initially identified and proposed at this time on four well pads, although each pad would accommodate future infill wells (Figure 1).

- **Horse Camp #02-11H:** NW¼ NW¼, Section 11, Township (T) 149 North (N), Range (R) 93 West (W), Dunn County, North Dakota
- **Horse Camp #03-16H:** NW¼ NE¼, Section 16, T149N, R93W, Dunn County, North Dakota
- **Bear Den #03-30H:** NE¼ NE¼, Section 30, T150N, R94W, McKenzie County, North Dakota
- **Clarks Creek #02-17H:** NW¼ NW¼, Section 17, T151N, R94W, McKenzie County, North Dakota

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.

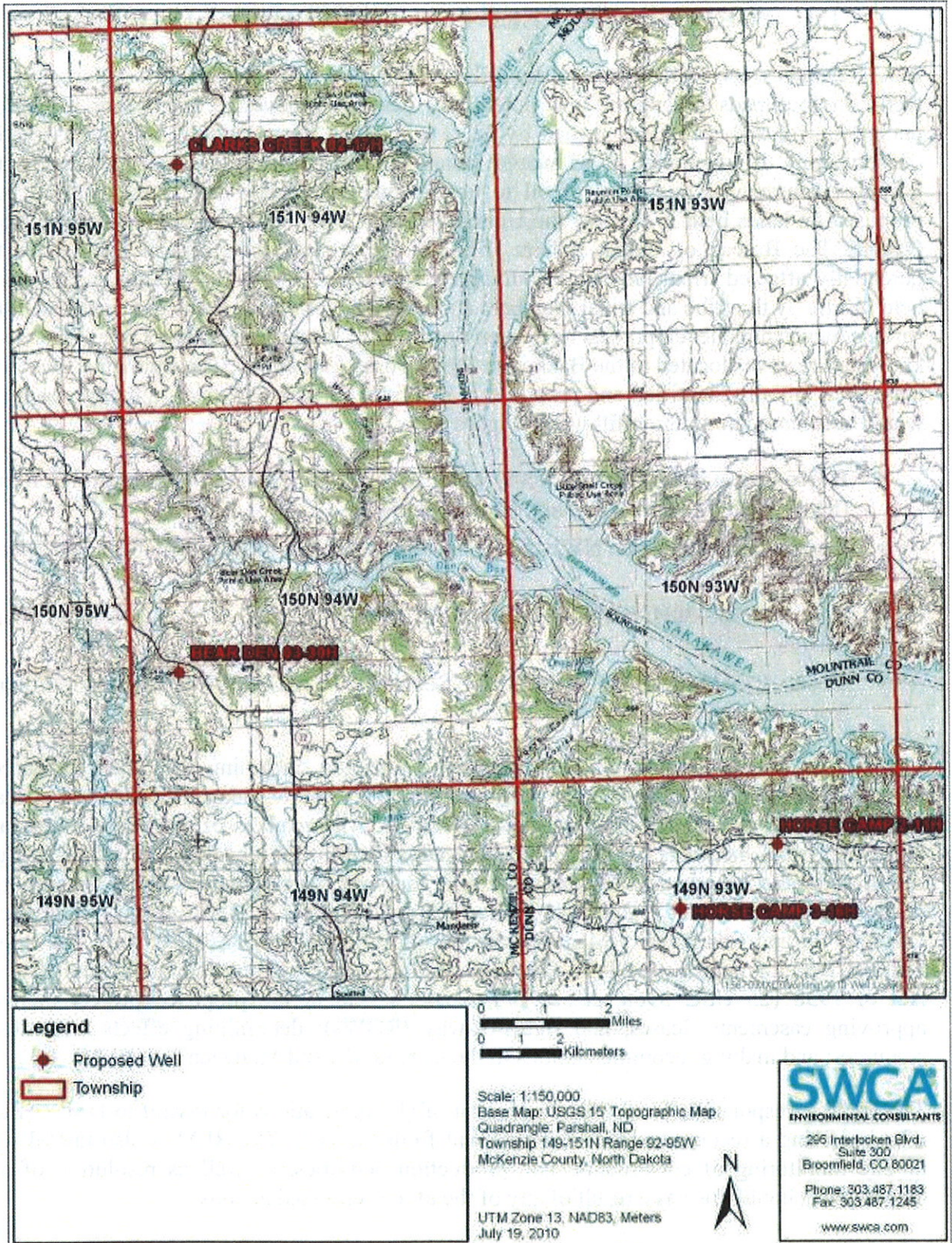


Figure 1. Proposed well locations.

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 requiring federal approval. APDs have been submitted by EOG to describe proposed procedures (i.e., development, reclamation) and technical practices. This environmental assessment (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. 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. Once this project is authorized, it 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 document analyzes the potential impacts of four exploratory horizontal oil wells and their associated facilities and infrastructure on individual allotted surface lands administered in trust by the BIA. 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.

The line of production of the horizontal wells passes through fee simple, individual allotted, and tribal subsurface. The Proposed Action would require constructing well pads, as well as constructing and maintaining access roads. Table 1 presents the surface and bottom hole locations and lease numbers of each well site. In addition to the initial well on each pad, future infill wells may be drilled from the surface pad locations in each drilling and spacing unit for a total of up to 10 wells on four pads.

**Table 1. Proposed Well Locations.**

Well	Surface Location	Bottom Hole Location	Lease Number
Horse Camp #02-11H	NW¼ NW¼ Sec 11, T149N, R93W; 495 feet FNL, 530 FWL	SW¼ SW¼ Sec 11, T149N, R93W; 200 feet FSL, 500 FWL	1420A41240 SHL and BHL
Horse Camp #03-16H	NW¼ NE¼ Sec 16, T149N, R93W; 400 feet FNL, 2,140 FEL	SE¼ SE¼ Sec 16, T149N, R93W; 234 feet FSL, 510 FEL	1420A49930 SHL and BHL
Bear Den #03-30H	NE¼ NE¼ Sec 30, T150N, R94W; 500 feet FNL, 1,134 FEL	NE¼ NW¼ Sec 19, T150N, R94W; 500 feet FNL, 1,500 FWL	1420A42269 SHL and 1420A42263 BHL
Clarks Creek #02-17H	NW¼ NW¼ Sec 17, T151N, R94W; 707 feet FNL, 155 FWL	SE¼ SW¼ Sec 17, T151N, R94W; 500 feet FSL, 2,140 FWL	1420A49645 SHL and BHL

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

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 in May 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 2.9). On-site inspections were conducted in June and September 2010. During the inspections, the BIA gathered information needed to develop site-specific mitigation measures that would be incorporated into the final APD.

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), 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 and SUPs 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 100-foot ROW is requested to accommodate access roads, underground oil, gas, and water gathering pipelines, waterlines, fiber optic lines, and utility lines. The 100-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 0.54 mile of new ROW would be required to access the proposed well locations (see Table 3 in Section 2.12). Total surface disturbance for all ROWs would be approximately 6.02 acres. All ROWs are 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 are addressed in the 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, natural gas, oil, and water gathering lines from these wells may also be installed in the 100 foot ROW. Gathering lines would be connected to trunk lines approved under other NEPA documents. Specific tie-ins, including any above-ground appurtenances at the trunk line tie-ins or regional powerlines would be addressed in separate NEPA documents, including conducting cultural and biological resource surveys and obtaining additional ROWs as needed.

## **2.4 WELL PADS**

Wells would be drilled on pads typically measuring approximately 400 by 450 feet, resulting in a surface disturbance of approximately 4.5 acres when including the area for fill slopes, stockpiles, and cuttings pit. See Section 2.9 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 10 exploratory horizontal oil wells.

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

A temporary cuttings pit for drill cuttings would be constructed within the cut portion of each well pad; no drilling fluids would be stored in pits. 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 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.

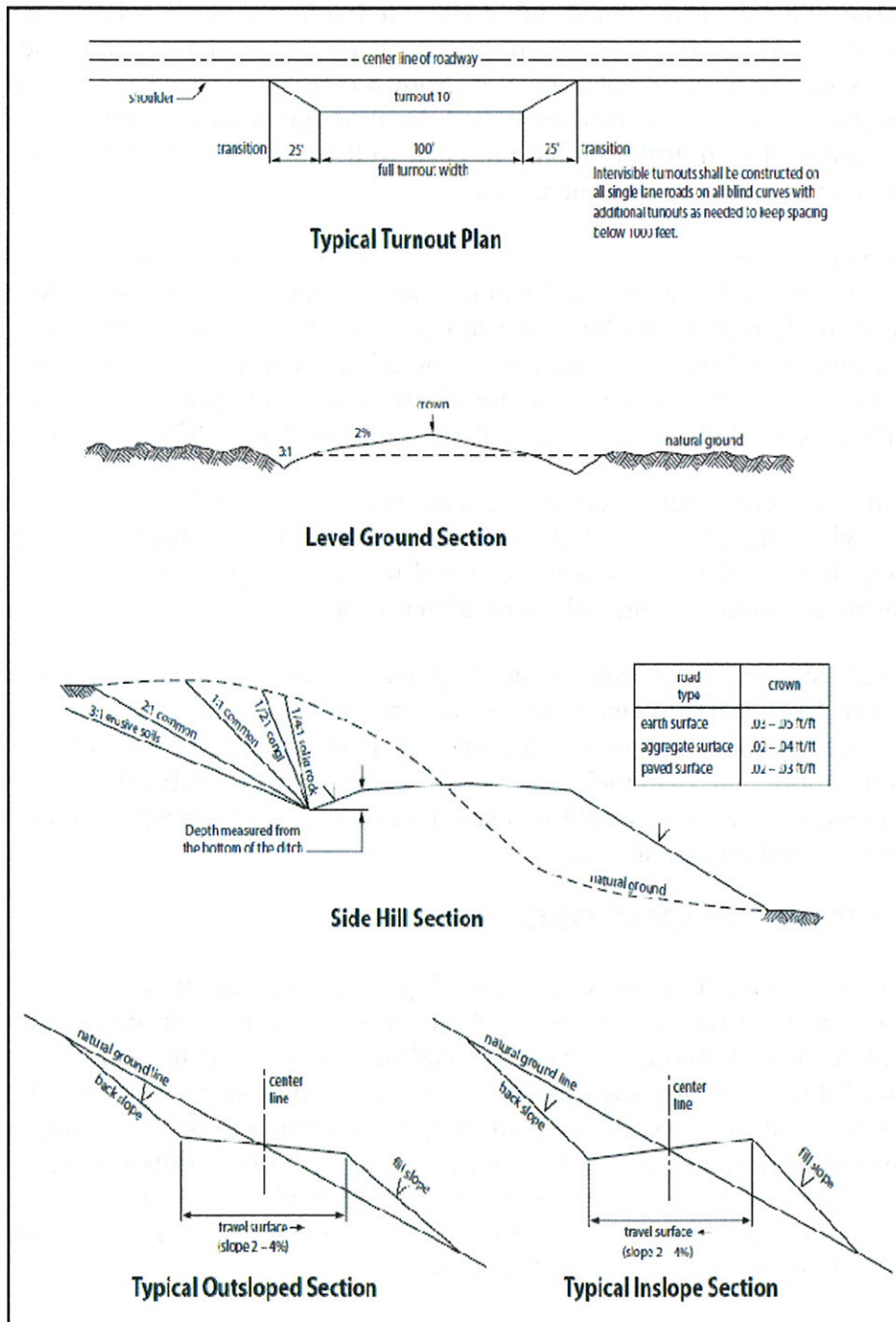


Figure 2. Typical road cross sections (USDI and USDA 2007).

## **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 be closed within 30 days of completing drilling operations.

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, downhole geophysical well logs may be run to evaluate the production potential of a well. If the evaluation concludes that sufficient hydrocarbons are present and recoverable, then 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 a well head and pump jack, 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. Up to eight 400-barrel oil tanks and one 400-barrel water tank 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. 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 be transported from the tanks on each location by trucks until the well can be connected to gathering pipelines. Table 2 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 Wayzetta 100-26 disposal site (located in Section 26, T153N, R90W, Mountrail County, North Dakota) or other approved disposal facility. The proposed wells typically would be visited daily by a pumper, but possibly less frequently. 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 2. Estimated Tanker Truck Traffic.<sup>1,2</sup>**

Time Period	Average Daily Tanker Truck Roundtrips Per Well	Average Daily Tanker Round Trips for Four Wells
Production Days 1–30	5	20
Production Days 31–60	2	8
Production Days 61–ongoing	1	4

<sup>1</sup> Estimates based on projected production volumes for exploratory wells and are subject to change based on actual production volumes.

<sup>2</sup> Estimates assume all fluids transported via truck from each well.

Initially, natural gas produced in association with the liquid hydrocarbons would be flared. A flare pit would be located a minimum of 150 feet from a well head to ensure safe operations. Because the proposed wells are exploratory, projections of the volumes of natural gas that may be produced are not possible at this time. 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 North Dakota Industrial Commission 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 a flat, non-reflective, earth-tone color, typically Shale Green or Carlsbad Canyon, as determined by the AO. 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 Horse Camp #02-11H**

The proposed Horse Camp #02-11H well pad would be located approximately 7 miles northeast of the town of Mandaree in the NW¼ NW¼ of Section 11, T149N, R93W (Figures 3 and 4). The proposed 400- by 450-foot well pad would disturb approximately 4.72 acres including fill slopes, stockpiles, and cuttings pit. A new access road, approximately 0.19 mile long, would be constructed to connect the well site to the BIA 10 road (Figures 3 and 5). The new road would be within a 100-foot-wide ROW which would disturb approximately 2.30 acres. Total new disturbance including the well pad, road, and buried pipelines would be 7.02 acres (see Table 3 in Section 2.12).

The spacing unit consists of 320 acres (+/-) with the bottom hole located approximately 4,581 feet south of the surface hole location in the SW¼ SW¼ of Section 11, T149N, R93W (Figure 3). Specific information on the location of the drilling target and lease is described in Table 1.

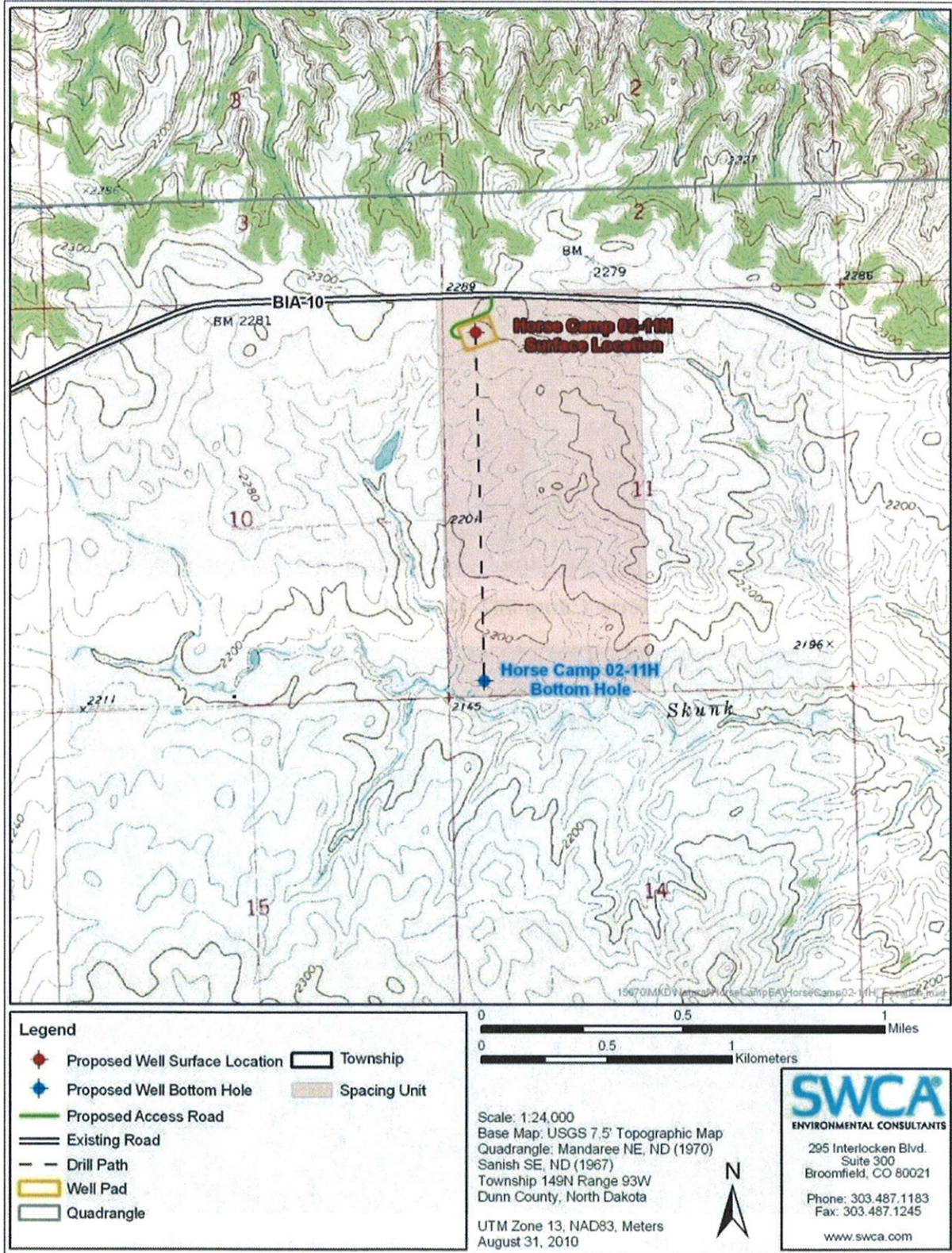


Figure 3. Horse Camp #02-11H proposed surface and bottom hole locations.



**Figure 4. Horse Camp #02-11H well pad area, facing west.**



**Figure 5. Horse Camp #02-11H access road, facing northeast.**

### 2.9.2 Horse Camp #03-16H

The proposed Horse Camp #03-16H well site would be located approximately 5 miles east of the town of Mandaree in the NW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 16, T149N, R93W (Figures 6 and 7). The proposed 400- by 450-foot well pad would disturb approximately 4.32 acres, including fill slopes, stockpiles, and cuttings pit. A new access road approximately 0.09 mile long would be constructed to connect the proposed well site with the existing BIA 10 road (Figures 7 and 8). The new road would be within a 100-foot ROW which would disturb approximately 1.09 acres. Total new disturbance including the well pad, road, and buried pipelines would be 5.41 acres (see Table 3 in Section 2.12).

The spacing unit consists of 320 acres (+/-) with the bottom hole located approximately 4,922 feet southeast of the surface hole location in the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 16, T149N, R93W (Figure 7). Specific information on the location of the drilling target and lease is described in Table 1.



**Figure 6. Horse Camp #03-16H well pad area, facing south.**

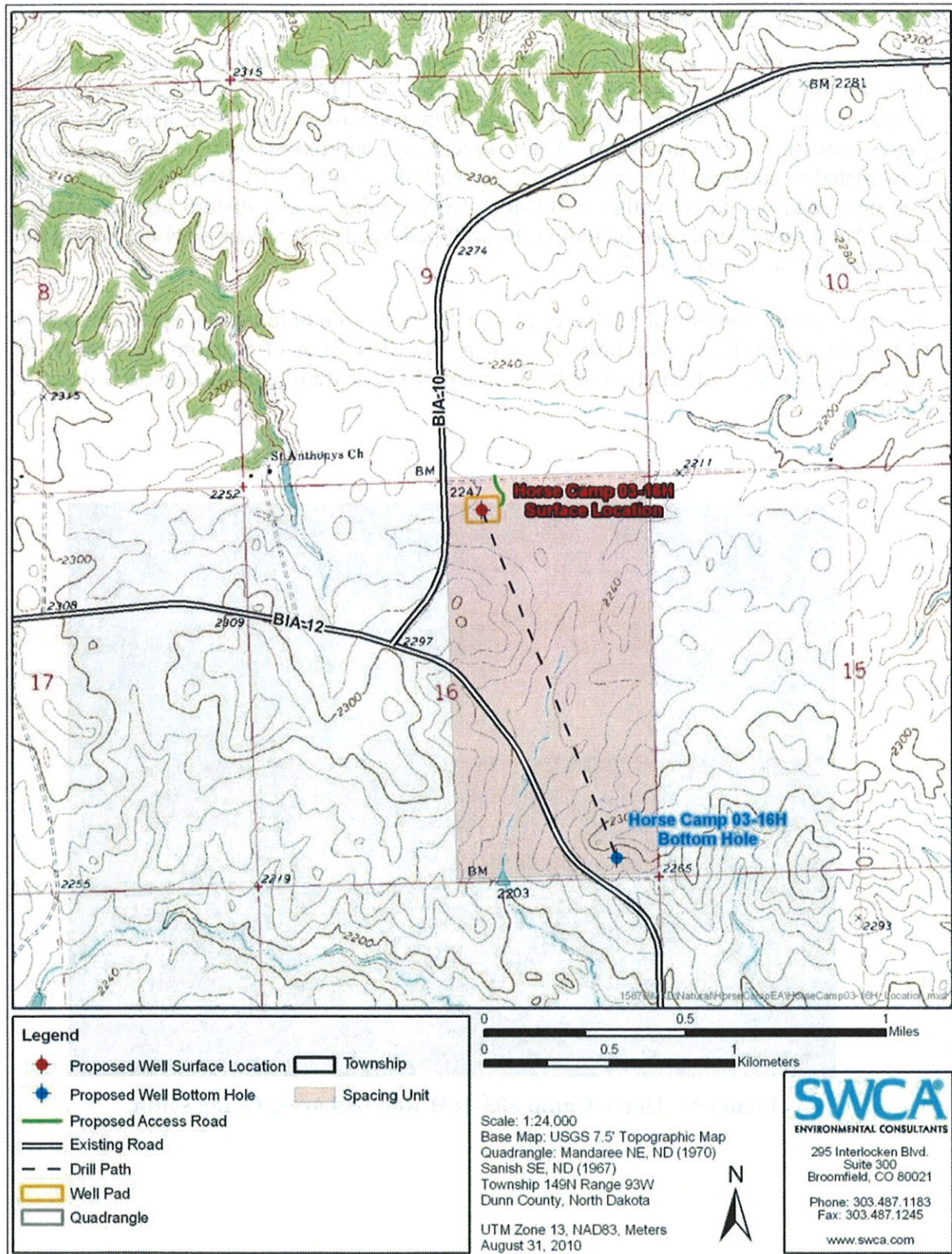


Figure 7. Horse Camp #03-16H proposed surface and bottom hole locations.



**Figure 8. Horse Camp #03-16H access road, facing west.**

### **2.9.3 Bear Den #03-30H**

The proposed Bear Den #03-30H well site would be located approximately 6 miles northwest of the town of Mandaree in the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 30, T150N, R94W (Figures 9 and 10). The proposed 400- by 450-foot well pad would disturb approximately 4.80 acres, including fill slopes, stockpiles, and cuttings pit. A new access road approximately 0.12 mile long would be constructed to connect the proposed well site with an existing access road (Figures 9 and 11). The road would be constructed within a 100-foot wide ROW and would disturb approximately 1.46 acres. Total new disturbance including the well pad, road, and buried pipelines would be approximately 6.26 acres (see Table 3 in Section 2.12).

The spacing unit consists of 640 acres (+/-) with the bottom hole located approximately 5,833 feet northwest of the surface hole location in the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 19, T150N, R94W (Figure 9). Specific information on the location of the drilling target and lease is described in Table 1. A setback of at least 500 feet from the section line would be maintained.

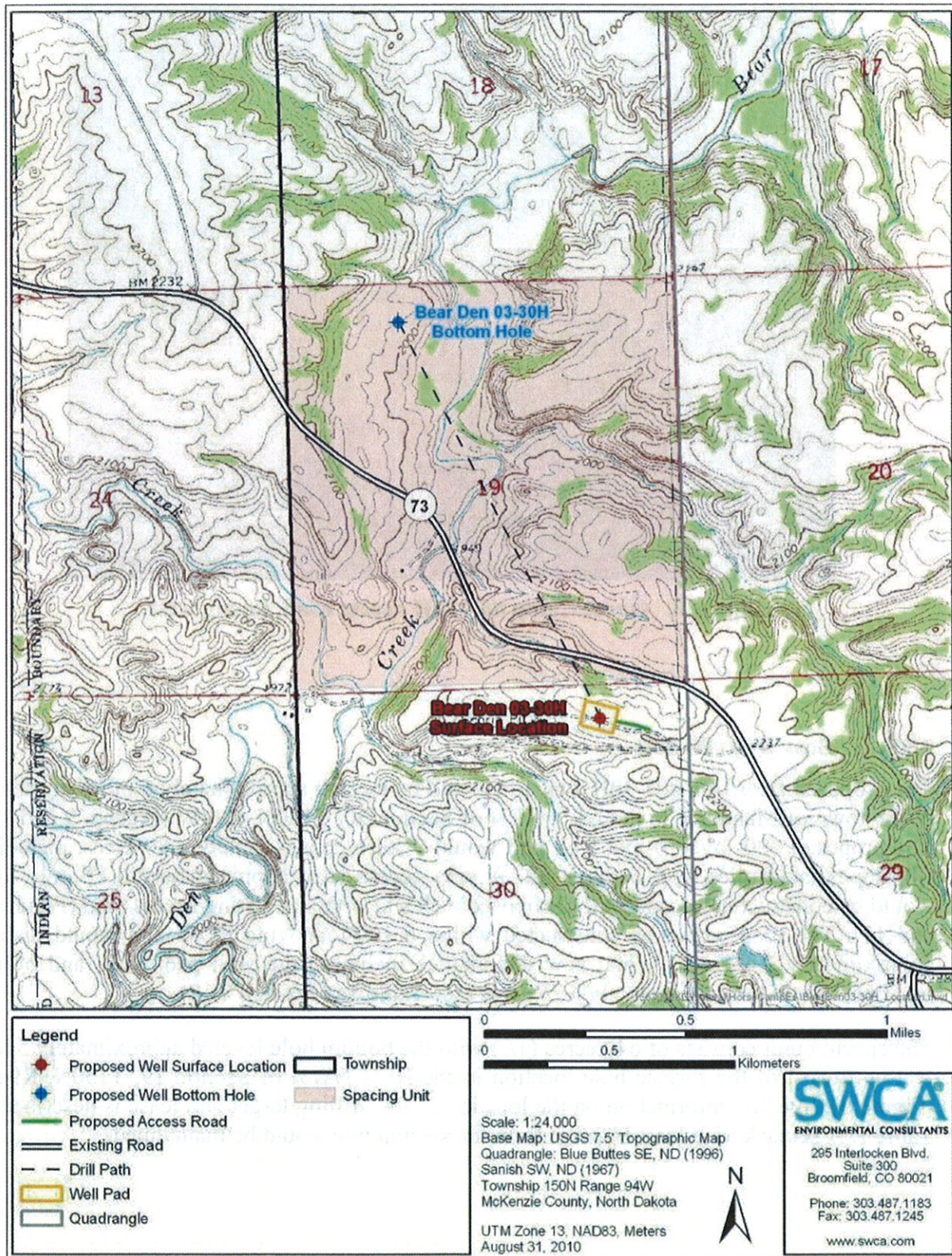
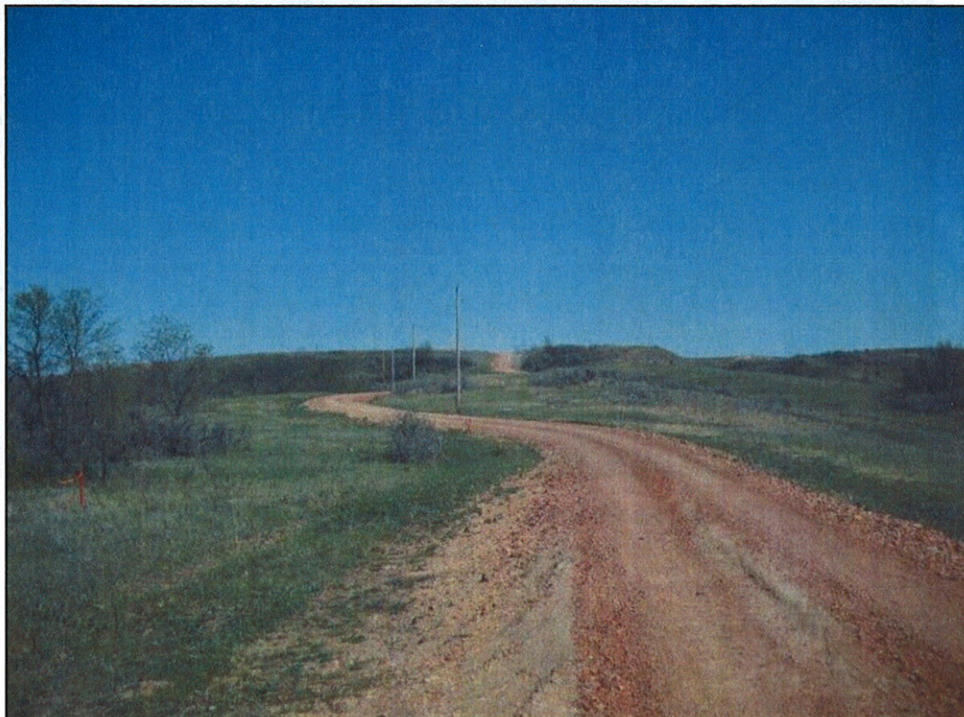


Figure 9. Bear Den #03-30H proposed surface and bottom hole locations.





**Figure 10. Bear Den #03-30H well pad area, facing north.**



**Figure 11. Bear Den #03-30H access road area, facing east.**

#### 2.9.4 Clarks Creek #02-17H

The proposed Clarks Creek #02-17H well site would be located approximately 12 miles north of the town of Mandaree in the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 17, T151N, R94W (Figures 12 and 13). The proposed 400- by 450-foot well pad would disturb approximately 4.17 acres, including fill slopes, stockpiles, and cuttings pit. A new access road approximately 0.14 mile long would be constructed to connect the proposed well site with an existing access road off of Highway 22 (Figures 13 and 14). The road would be constructed within a 100-foot wide ROW and would disturb approximately 1.70 acres. The total anticipated new disturbance for the well pad, road, and buried pipelines would be 5.87 acres (see Table 3 in Section 2.12).

The spacing unit consists of 320 acres (+/-) with the bottom hole located approximately 4,534 feet southeast of the surface hole location in the SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 17, T151N, R94W (Figure 13). Specific information on the location of the drilling target and lease is described in Table 1.



Figure 12. Clarks Creek #02-17H well pad area, facing north.

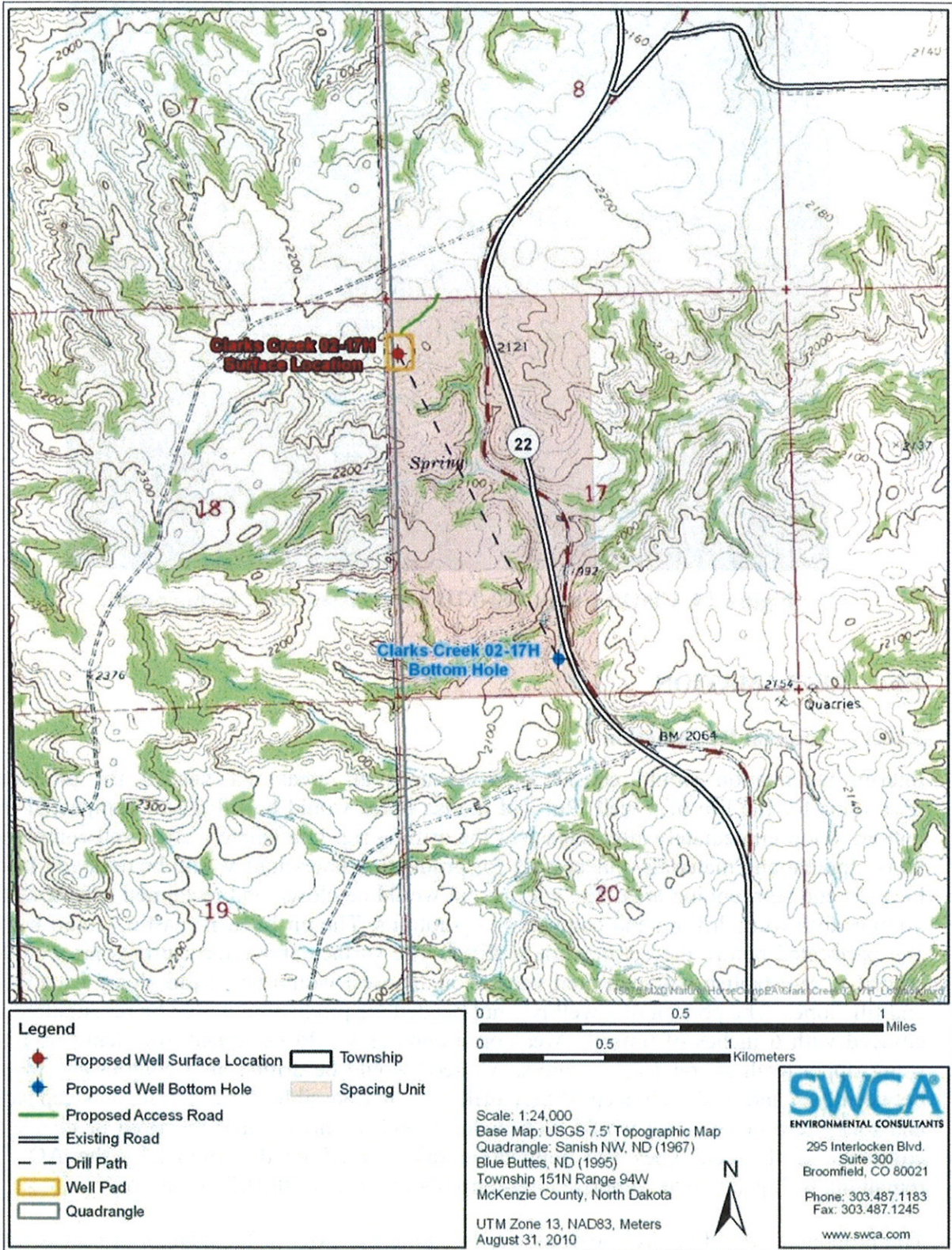


Figure 13. Clarks Creek #02-17H proposed surface and bottom hole locations.



**Figure 14. Clarks Creek #02-17H access road area, facing north.**

## **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 closed and reclaimed approximately 30 days following drilling and completion operations. 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 reseeded. 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. Water bars would be constructed according to BLM Gold Book standards. 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.

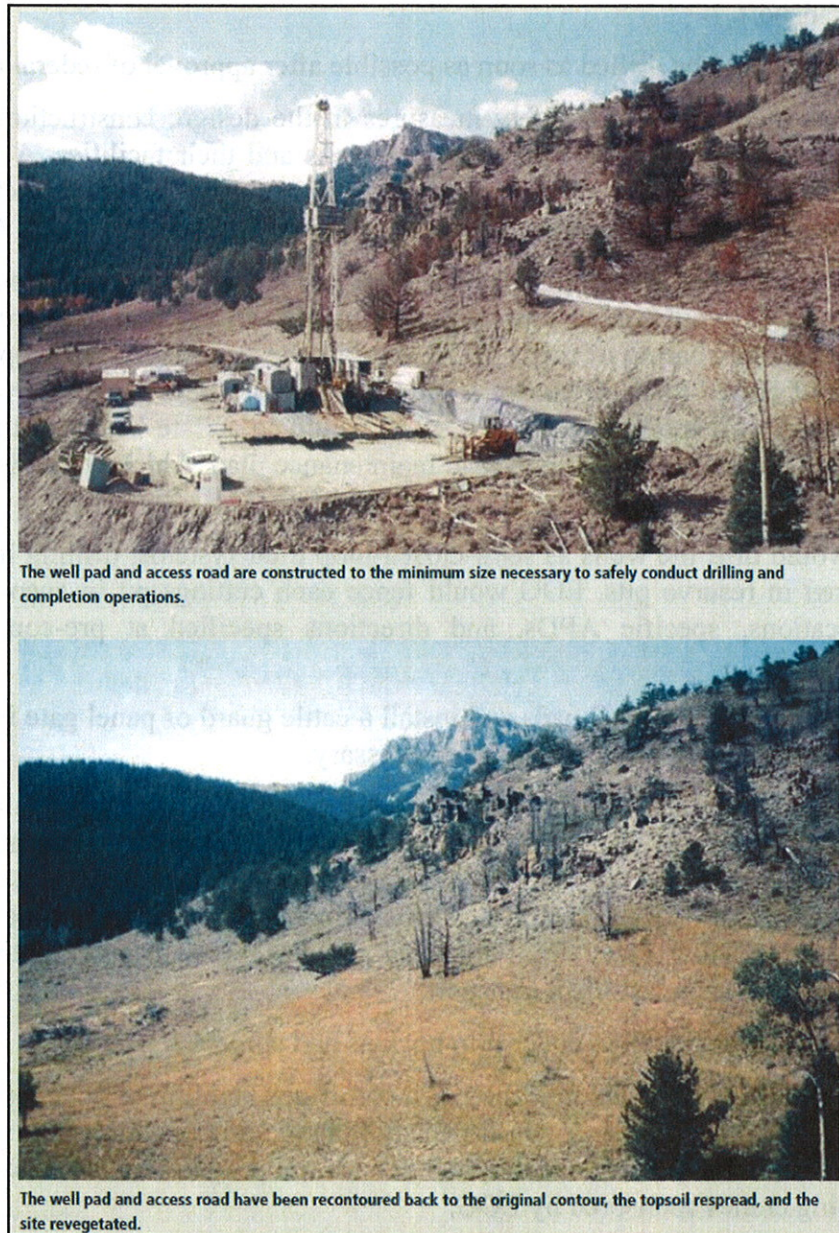


Figure 15. Example of reclamation from the BLM Gold Book (USDI and USDA 2007).

## **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 during construction operations to EOG's existing and proposed access roads and well pads to minimize soil loss from wind transport.
4. Each well would be drilled as soon as possible after approval of 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 hazardous wastes 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 will cease construction if there is a confirmed sighting of a whooping crane within 1 mile of the project area. A confirmed sighting includes sightings that are confirmed by EOG personnel who have been trained in a formal program on the field identification of whooping cranes sponsored by EOG.

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 15 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 during the nesting season at least five days before construction begins. If nests are discovered, the BIA and USFWS would be notified. If active eagle nests are present, a minimum 0.5-mile buffer would be maintained from any active eagle nest during the nesting season (February 15 to July 15). EOG would request the option to have a biologist monitor active eagle nests to resume activity prior to July 15 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.

Best management practices (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.

**Horse Camp #02-11H:** The access road would be placed on top of a low hill to allow better visibility for vehicular traffic. The pad and road were shifted to reduce the impact to large woody vegetation.

**Horse Camp #03-16H:** Prior to well pad construction in the spring or summer, the vegetation at the well site would be mowed to discourage nesting of migratory birds.

**Bear Den #03-30H:** Large woody vegetation removed during construction of the access road and well pad would be ground into mulch and mixed with topsoil to increase reclamation success. The southeast corner of the well pad was shifted to avoid potential cultural resources.

## 2.12 TOTAL SURFACE DISTURBANCE

In total, approximately 18 acres would be disturbed for well pad construction and 6 acres for construction of access roads. All surface disturbance would be on tribal lands. Table 3 summarizes the surface disturbance estimates for each proposed well.

**Table 3. Surface Disturbance Details.**

Well	Access Road and Pipeline ROW			Well Pad			Total Disturbance (acres)
	Length (miles)	ROW width (feet)	ROW Disturbance (acres)	Length (feet)	Width (feet)	Well Pad Disturbance <sup>1</sup> (acres)	
Horse Camp #02-11H	0.19	100	2.30	450	400	4.72	7.02
Horse Camp #03-16H	0.09	100	1.09	450	400	4.32	5.41

Well	Access Road and Pipeline ROW			Well Pad			Total Disturbance (acres)
	Length (miles)	ROW width (feet)	ROW Disturbance (acres)	Length (feet)	Width (feet)	Well Pad Disturbance <sup>1</sup> (acres)	
Bear Den #03-30H	0.12	100	1.46	450	400	4.80	6.26
Clarks Creek #02-17H	0.14	100	1.70	450	400	4.17	5.87
<b>Total</b>	<b>0.54</b>	<b>-</b>	<b>6.02</b>	<b>-</b>	<b>-</b>	<b>18.01</b>	<b>24.56</b>

<sup>1</sup> Area of maximum disturbance including well pad, fill slopes, stockpiles, and cuttings pit.

### 2.13 PERSONNEL REQUIREMENTS AND SCHEDULING

The quantification of personnel and vehicles presented in Table 4 are typical average values. Actual personnel and vehicles on location at any particular time may vary.

**Table 4. 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. Developments have been proposed that 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 ranges from a normal pool elevation of 1,838 feet at Lake Sakakawea to over 2,600 feet on Phaelan's Butte near Mandaree. Annual precipitation on the plateau averages between 15 and 17 inches. Mean temperatures fluctuate between -3 and 21 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. Three of the proposed well sites are located within 1 mile of residences (Table 5).

**Table 5. Distance and Direction from Proposed Wells to Nearest Home.**

Proposed Well	Feet to Nearest Home	Direction to Nearest Home
Horse Camp #02-11H	10,982	Southwest
Horse Camp #03-16H	1,550	South
Bear Den #03-30H	1,230	Northeast
Clarks Creek #02-17H	500	East

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), United States Code (USC § 7401-7671, as amended in 1990) established national ambient air quality standards for criteria pollutants to protect public health and welfare. It also set standards for other compounds that can cause cancer, regulated emissions that cause acid rain, and required federal permits for large sources. National ambient air quality standards (NAAQS) have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead (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 C.F.R. 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 (NPS 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. There are two air quality monitoring stations located there, with the North Unit monitoring most criteria pollutants (NPS 2010; 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, North Dakota Department of Health (NDDH) has established a standard for hydrogen sulfide (NDDH 2010).

### **3.1.1 Air Quality Standards for Criteria Pollutants**

Criteria pollutants and their health effects include the following:

Sulfur dioxide (SO<sub>2</sub>) is a colorless gas with a strong, suffocating odor. SO<sub>2</sub> 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<sub>2</sub> emissions are also a primary cause of acid rain and plant damage (EPA 2010a).

Inhalable Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>) 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<sub>10</sub> is the fraction of total particulate matter 10 microns or smaller, and PM<sub>2.5</sub> 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<sub>2</sub>) is a reddish-brown gas with an irritating odor. Primary sources include motor vehicles, industrial facilities, and power plants. In the summer months, NO<sub>2</sub> is a major component of photochemical smog. NO<sub>2</sub> is an irritating gas that may constrict airways, especially of asthmatics, and increase the susceptibility to infection in the general population. NO<sub>2</sub> is also involved in ozone smog production (EPA 2010a).

Ozone (O<sub>3</sub>) 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<sub>x</sub>) in the presence of sunlight. Ozone's health effects can include reduced lung function, aggravated respiratory illness, and irritated eyes, nose, and throat. Chronic exposure can cause permanent damage to the alveoli of the lungs. Ozone can persist for many days after formation and travel several hundred miles (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 National Ambient Air Quality Standards (NAAQS) standards for criteria pollutants are shown in Table 3.1. 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 federal standards.

**Table 6. NAAQS and Other Air Quality Standards.**

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (National Parks)	North Dakota AAQS
SO <sub>2</sub> 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 <sub>10</sub> in micrograms per cubic meter of air (µg/m <sup>3</sup> )	24-hour	150		150
	Expected Annual Mean	50		50
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	24-hour	35	35	35
	Weighted Annual Mean	15	15	15
NO <sub>2</sub> (ppm)	Annual Mean	0.053	0.053	0.053
CO (ppm)	8-hour	9	-	9
O <sub>3</sub> (ppm)	1-hour	35	-	35
	8-hour	0.075	0.075	-
	1-hour	-	-	0.12
Lead (µg/m <sup>3</sup> )	3-Month Arithmetic Mean within a 3-Year period	0.15	0.15	1.5 (quarterly mean)
Hydrogen Sulfide (H <sub>2</sub> S) (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<sub>2</sub> and H<sub>2</sub>S 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 index 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 greenhouse gases (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<sub>2</sub>):** Carbon dioxide 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). Carbon dioxide is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH<sub>4</sub>):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N<sub>2</sub>O):** Nitrous oxide 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 greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are typically emitted in small quantities, but are potent greenhouse gases thought to contribute significantly to global warming processes (EPA 2010b).

Carbon dioxide (CO<sub>2</sub>) 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<sub>2</sub>’ or ‘CO<sub>2</sub>e’ has been developed. CO<sub>2</sub>e is the amount of CO<sub>2</sub> that would cause the same level of radiative forcing as a unit of one of the other GHGs. For example, one ton of methane (CH<sub>4</sub>) has a CO<sub>2</sub>e of 22 tons; therefore, 22 tons of CO<sub>2</sub> would cause the same level of radiative forcing as one ton of CH<sub>4</sub>. Nitrous oxide (N<sub>2</sub>O) has a CO<sub>2</sub>e value of 310. Thus, control strategies often focus on the gases with the highest CO<sub>2</sub>e 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 (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 Intergovernmental Panel on Climate Change (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, eleven out of twelve years between 1995 and 2007 ranked among the twelve warmest years in the instrumental record of global surface temperature since 1850 (IPCC 2007).

The temperature increase is widespread over the globe and is greater at higher northern latitudes. Land regions have warmed faster than the oceans. The National Oceanic and Atmospheric Agency (NOAA) monitored data indicates 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 U.S. coast (EPA 2010b). Tide gauge measurements and satellite altimetry suggest that sea level has risen worldwide approximately 4.8-8.8 inches (12-22 cm) 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-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations (IPCC 2007). Therefore, the EPA collects data on and encourages limiting or reducing emissions of anthropogenic sources of greenhouse gases to 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).

According to the Center for Integrative Environmental Research at the University of Maryland (2008), climate change will affect North Dakota's climate significantly over time. North Dakota will experience an increase in the unpredictability of droughts, floods, and pests making it harder for farmers to remain economically viable in the agricultural industry. This

damage to the agricultural community will subsequently be a detriment to the livestock industry. Additionally, due to reductions in the amount of available wildlife habitat, including receding water levels, North Dakota's hunting, fishing, and tourism industries will be damaged.

Energy production and supply was estimated to emit up to 25.9% of GHGs world-wide in 2004 (Pew Center 2009). Methane gas (CH<sub>4</sub>), with a high radiative forcing CO<sub>2</sub>e 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 U.S. 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 North Dakota Department of Health (NDDH) typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. 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 there, 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.

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 that would be applicable to this analysis (NDDH 2010AQ).

Criteria pollutants measured at the two monitoring stations include SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub>, and ozone. Lead and CO are not monitored by any of the three stations. Table 3.2 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 7. 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
	<b>Year</b>		<b>2009</b>	<b>2008</b>	<b>2007</b>
SO <sub>2</sub> (ppm)	24-hour	0.14	0.006	0.004	0.004
	Annual Mean	0.03	0.0005	0.0004	0.0011
PM <sub>10</sub> (µg/m <sup>3</sup> )	24-hour	150	54	108	57.4
	Expected Annual Mean	50	11.3	14.2	13.2
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	24-hour	35	15	35.7	22.2
	Weighted Annual Mean	15	3.4	3.7	3.6
NO <sub>2</sub> (ppm)	Annual Mean	0.053	0.0015	0.0018	0.0015
O <sub>3</sub> (ppm)	8-hour	0.075	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 believed to be zero.

### 3.1.5 Typical Air Emissions from Oilfield Development

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

- Combustion emissions include SO<sub>2</sub>, ozone precursors called volatile organic compounds (VOCs), GHGs, and HAPs. Sources include engine exhaust, dehydrators, and flaring.



- Fugitive emissions include criteria pollutants, H<sub>2</sub>S, VOCs, HAPs, and GHGs. Sources include equipment leaks, evaporation ponds and pits, condensate tanks, storage tanks, and windblown dust (from truck and construction activity).
- Vented emissions include GHGs, VOCs, and HAPs. Primary sources are emergency pressure relief valves and dehydrator vents.

Pad and road construction, drilling activities, and tanker traffic would generate emissions of criteria pollutants and HAPs. Primary emissions sources during drilling are diesel exhaust, wind-blown dust from disturbed areas and travel on dirt roads, evaporation from pits and sumps, and gas venting. Diesel emissions are being progressively controlled by the EPA in a nationwide program. This program takes a two-pronged approach. First, fuels are improving to the ultra-low sulfur standard, and secondly manufacturers must produce progressively lower engine emissions.

### **3.1.6 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 oilfield projects, and implementation of best management practices identified in Section 3.2.8, the Proposed Action would not produce significant increases in criteria pollutants, greenhouse gases, or hazardous air pollutants.

## **3.2 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<sub>2</sub>S is extremely toxic in concentrations above 500 ppm, 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<sub>2</sub>S. 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 5, satellite imagery identified homes, outside of the town of Mandaree, within 1 mile of four of the well sites. None of the aforementioned nearby homes is 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<sub>2</sub>S at dangerous concentration levels is very unlikely, and no direct impacts from H<sub>2</sub>S 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 2. Trucks for normal production operations must use the existing and proposed access roads. Produced water would be transported to the Wayzetta 100-26 disposal site (located in Section 26, T153N, R90W, Mountrail County) 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 cuttings pit for drill cuttings would be constructed within the disturbed area of each well pad and constructed so as not to leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit. A pit liner would have permeability less than  $10^{-7}$  centimeters per second and 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**

The well pads and access roads are located within four watersheds of the Lake Sakakawea sub-basin (Figures 16 through 19). Table 7 lists the sub-basin and watershed in which each well pad and access road is located. The major surface water feature in the project vicinity is Lake Sakakawea in the Missouri River basin. Horse Camp #02-11H is approximately 2 miles south of Lake Sakakawea; the other wells are approximately 3 miles from the lake. No perennial water bodies are located near the proposed wells or access roads. Given the topography of the individual sites over the project area, runoff occurs largely as sheet flow. Figures 16 through 19 show the direction of surface runoff near each well. Runoff near the

proposed well areas would flow to Skunk Creek, Boggy Creek, Clarks Creek, or Bear Den Creek, which all subsequently flow into Lake Sakakawea.

**Table 8. Watersheds within the Project Areas.**

Sub-basin/Watershed/HUC	Project Area
Lake Sakakawea/Bear Den Bay/101101012004	Bear Den #03-30H well pad and access road
Lake Sakakawea/Skunk Creek/101101012102	Horse Camp #02-11H well pad and access road; Horse Camp #03-16H well pad and access road
Lake Sakakawea/Shell Creek Church/101101012103	Horse Camp #02-11H access road
Lake Sakakawea/Clarks Creek/101101011904	Clarks Creek #02-17H well pad and access road

HUC = Hydrologic Unit Code

The proposed project would be engineered and constructed to minimize the suspended solid (i.e., turbidity) concentration of surface runoff, avoid disruption of drainages, and avoid direct impacts to surface water. On-site inspections considered topography, natural drainage, and erosion control at each proposed location. Any stormwater drainage issues were addressed at that time. Proper BMPs would be used to avoid any erosion issues at this site as well as the other sites. 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 and corrugated metal pipe culverts would be installed along the access roads. Access roads would be maintained to prevent soil erosion and ensure safe conditions during the life of a well.

No surface water would be used for well drilling operations. Produced water would be transported from the tanks on each location by trucks to the Wayzetta 100-26 disposal site or another approved disposal facility. Any chemicals or potentially hazardous materials would be handled in accordance with the operator's SPCCP. Provisions established under this plan would minimize potential impacts to any surface waters associated with an accidental spill.

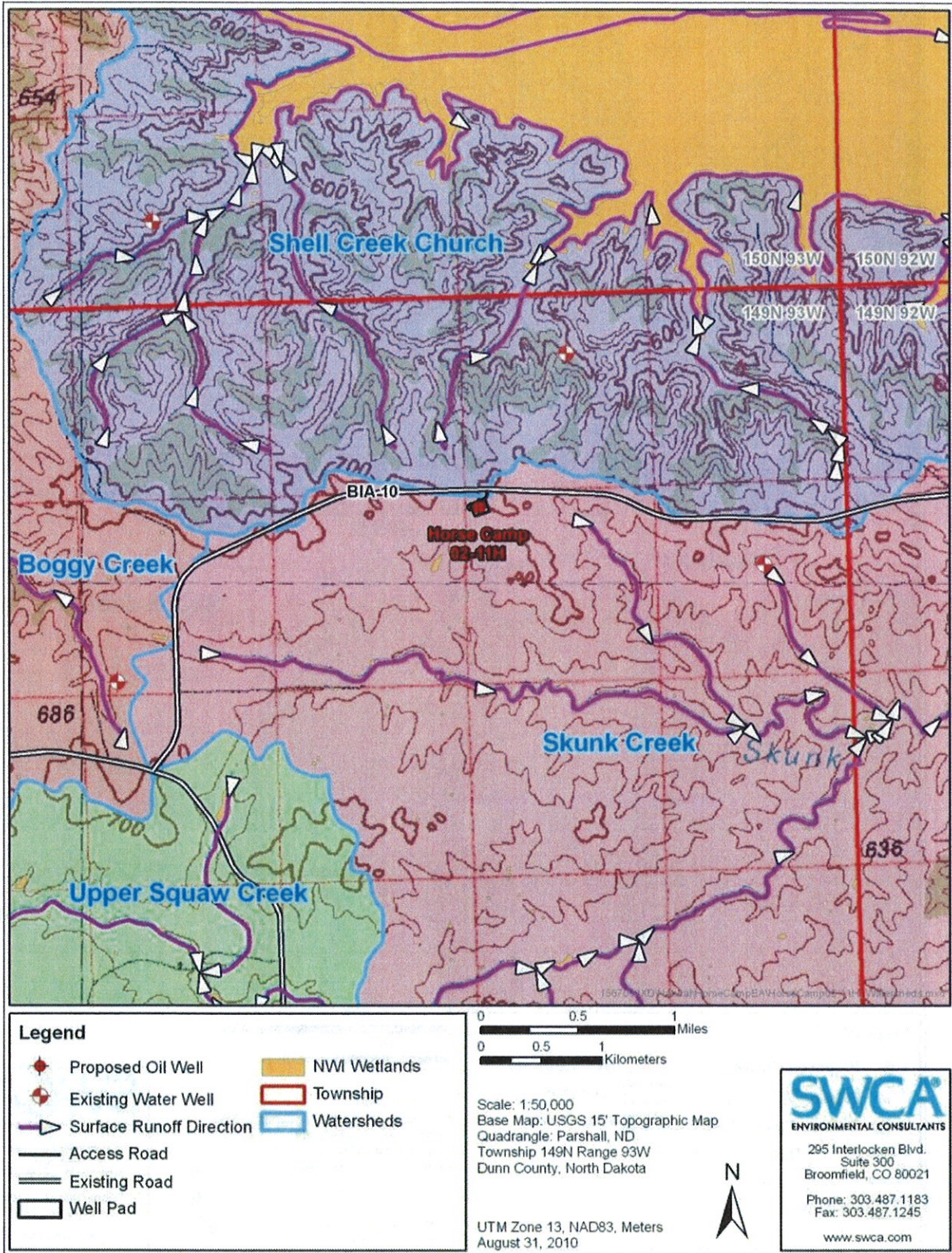


Figure 16. Watersheds, surface runoff direction, and wetlands near Horse Camp #02-11H.

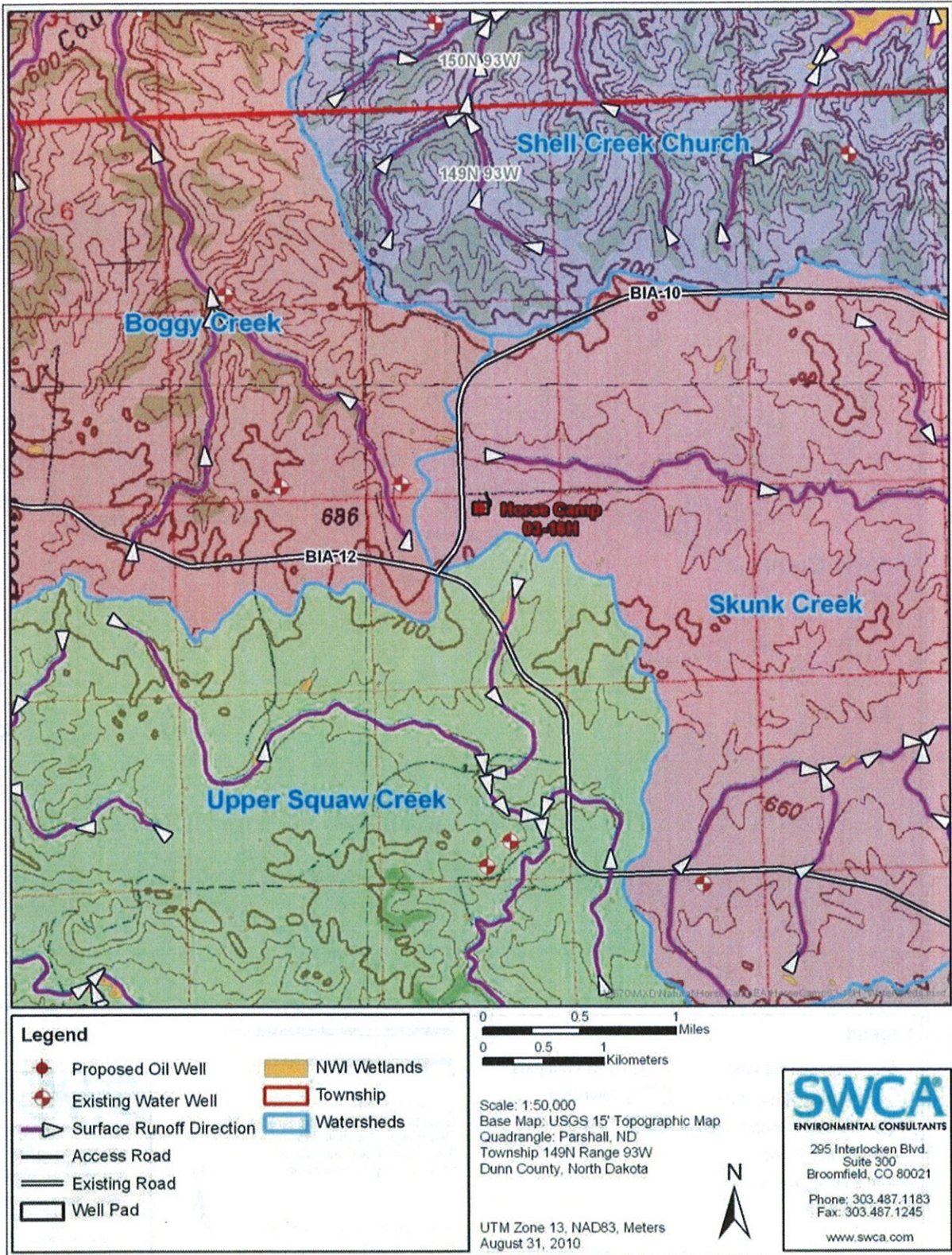


Figure 17. Watersheds, surface runoff direction, and wetlands near Horse Camp #03-16H.

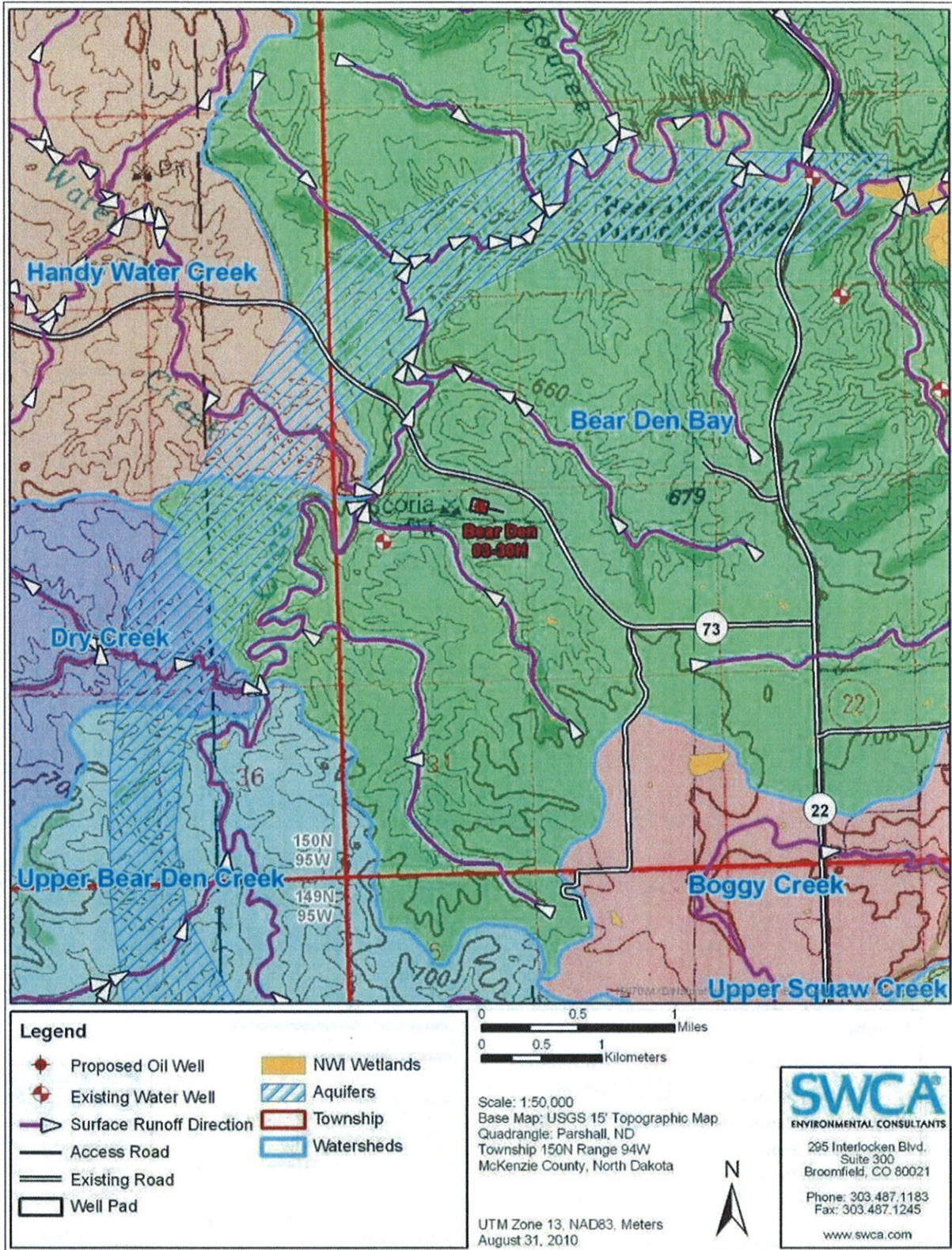


Figure 18. Watersheds, surface runoff direction, wetlands, and aquifers near Bear Den #03-30H.

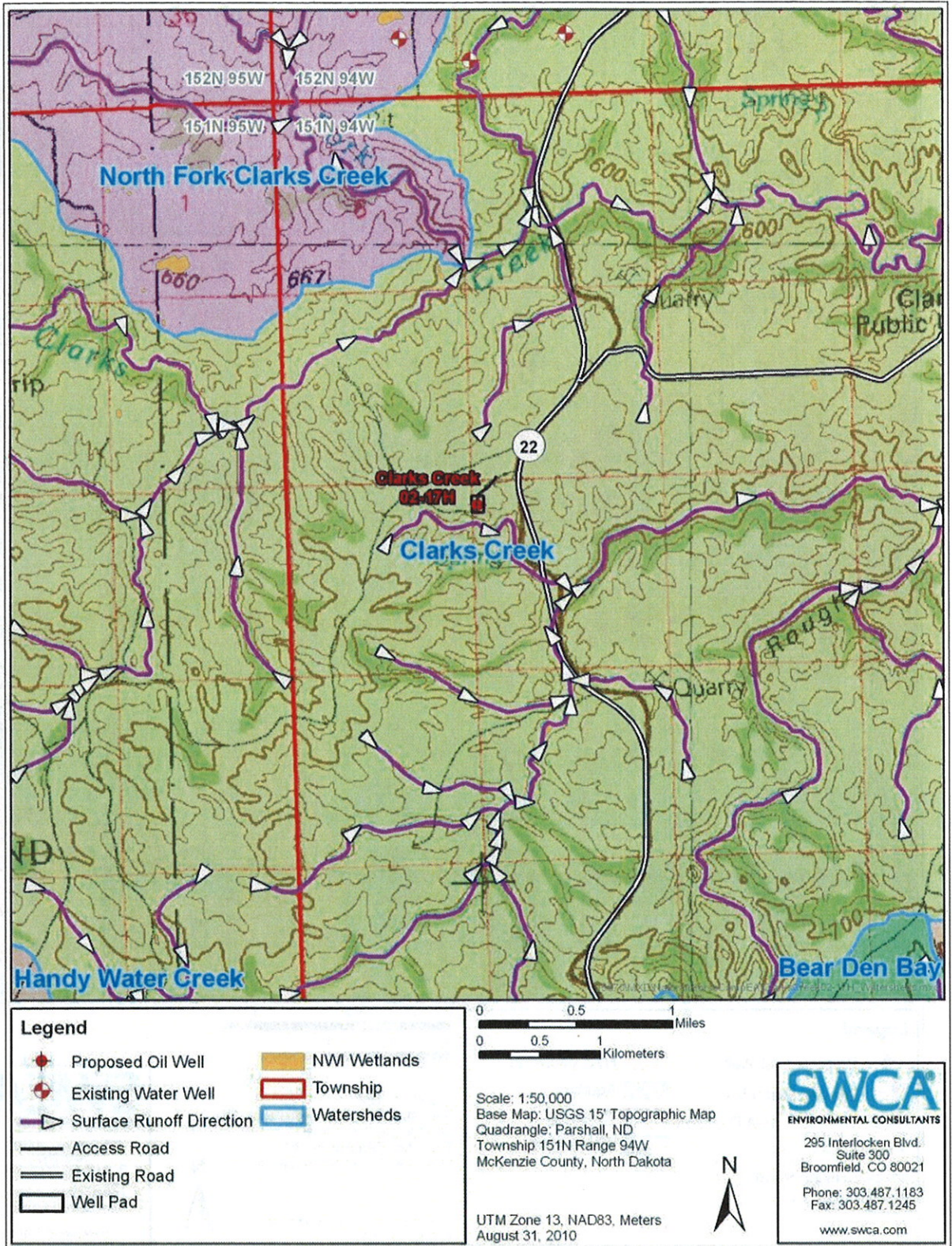


Figure 19. Watersheds, surface runoff direction, and wetlands near Clarks Creek #02-17H.



### 3.3.2 Groundwater

Aquifers in the project area include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 8). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in the area. None of these are within the proposed project areas, although the Bear Den #03-30H well is located approximately 1 mile east of the mapped boundary of the aquifer (Figure 18). The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn County and meets standards of the NDDH (Croft 1985). Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part III, 1976.

**Table 9. Common Aquifers in the Proposed Project Area and Surrounding Region.**

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

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

Review of electronic records of the North Dakota State Water Commission (NDSWC 2010) revealed 35 permitted water wells within an approximate 5-mile boundary of the proposed project areas (Table 9; Figures 16 through 18). Three wells are within 1 mile of proposed drilling; other water wells are over 1 mile from the proposed wells. The closest known water well is 0.43 mile from Horse Camp #03-16H. 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 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 would prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells likely have minimal hydrologic connections due to their respective distance from the project wells.

**Table 10. Existing Water Wells within 5 Miles of the Project Area.**

Water Well Index	Water Well ID	Aquifer	Date Drilled	Type	Owner	Section	Township/Range	Closest Proposed Well	Miles to Closest Well
5262	14909309CCD	Sentinel Butte-Tongue River	01/01/52	Unknown	St. Anthony's	9	149N/93W	Horse Camp #03-16H	0.43
22825	15009430B	Surface Water	00/00/00	Surface Water Sample Site	no data	30	150N/94W	Bear Den #03-30H	0.53
5259	14909302ACB	Sentinel Butte-Tongue River	01/01/62	Unknown	C. Perkins	2	149N/93W	Horse Camp #02-11H	0.92
5261	14909308DCC	Sentinel Butte-Tongue River	01/01/60	Unknown	M. Fox	8	149N/93W	Horse Camp #03-16H	1.04
5263	14909312ACC	Surface Water	00/00/00	Surface Water Sample Site	A. Horn	12	149N/93W	Horse Camp #02-11H	1.50
5260	14909305CDC	Sentinel Butte-Tongue River	01/01/61	Unknown	no data	5	149N/93W	Horse Camp #03-16H	1.72
5264	14909321DCA	Sentinel Butte-Tongue River	00/00/00	Unknown	E. Wicker	21	149N/93W	Horse Camp #03-16H	1.73
5265	14909321DCC	Surface Water	00/00/00	Surface Water Sample Site	R. Birdbear	21	149N/93W	Horse Camp #03-16H	1.85
5262	14909309CCD	Sentinel Butte-Tongue River	01/01/52	Unknown	St. Anthony's	9	149N/93W	Horse Camp #02-11H	2.08
7660	15009421ABA	Fort Union	01/01/64	Unknown	Youngwolf	21	150N/94W	Bear Den #03-30H	2.17
5268	15009333CAA	Sentinel Butte-Tongue River	01/01/60	Unknown	W. Face	4	150N/93W	Horse Camp #02-11H	2.25
5266	14909327ABA	Surface Water	00/00/00	Surface Water Sample Site	H Youngbird	27	149N/93W	Horse Camp #03-16H	2.26
7661	15009422CBA	Fort Union	01/01/64	Unknown	Youngwolf	22	150N/94W	Bear Den #03-30H	2.47
7663	15009514DCB	Fort Union	12/13/72	Unknown	C. Berwald	14	150N/95W	Bear Den #03-30H	2.48
5268	15009333CAA	Sentinel Butte-Tongue River	01/01/60	Unknown	W. Face	33	150N/93W	Horse Camp #03-16H	2.52
5259	14909302ACB	Sentinel Butte-Tongue River	01/01/62	Unknown	C. Perkins	2	149N/93W	Horse Camp #03-16H	2.65
5261	14909308DCC	Sentinel Butte-Tongue River	01/01/60	Unknown	M. Fox	8	149N/93W	Horse Camp #02-11H	2.66
5260	14909305CDC	Sentinel Butte-Tongue River	01/01/61	Unknown	no data	5	149N/93W	Horse Camp #02-11H	2.78

Water Well Index	Water Well ID	Aquifer	Date Drilled	Type	Owner	Section	Township/Range	Closest Proposed Well	Miles to Closest well
5266	14909327ABA	Surface Water	00/00/00	Surface Water Sample Site	H Youngbird	27	149N/93W	Horse Camp #02-11H	2.99
5263	14909312ACC	Surface Water	00/00/00	Surface Water Sample Site	A. Horn	12	149N/93W	Horse Camp #03-16H	3.03
5264	14909321DCA	Sentinel Butte-Tongue River	00/00/00	Unknown	E. Wicker	21	149N/93W	Horse Camp #02-11H	3.05
5267	15009331ADD	Sentinel Butte-Tongue River	01/01/61	Unknown	Three Affiliated Tribes	31	150N/93W	Horse Camp #03-16H	3.11
26120	15109536ABA	Undefined	05/22/73	Domestic Well	Jim Hall	36	151N/95W	Clarks Creek #02-17H	3.19
5265	14909321DCC	Surface Water	00/00/00	Surface Water Sample Site	R. Birdbear	21	149N/93W	Horse Camp #02-11H	3.22
7659	15009415ABC	Fort Union	01/01/62	Unknown	N. Fox	15	150N/94W	Bear Den #03-30H	3.37
7769	15109536BBA	Tongue River-Ludlow	05/28/82	Observation Well - Plugged	NDSWC	36	151N/95W	Clarks Creek #02-17H	3.41
5267	15009331ADD	Sentinel Butte-Tongue River	01/01/61	Unknown	Three Affiliated Tribes	33	150N/93W	Horse Camp #02-11H	3.56
5258	14909230CA	Surface Water	00/00/00	Surface Water Sample Site	T. Loneflight	30	149N/92W	Horse Camp #02-11H	4.20
7640	14909414BA	Fox Hills	07/21/70	Unknown	Mandaree well	14	149N/94W	Horse Camp #03-16H	4.21
7639	14909414B	Sentinel Butte-Tongue River	00/00/00	Unknown	Mandaree well	14	149N/94W	Horse Camp #03-16H	4.34
7765	15109504DBD1	Hell Creek	06/29/81	Observation Well - Plugged	NDSWC	4	151N/95W	Clarks Creek #02-17H	4.45
7766	15109504DBD2	Fox Hills	05/26/83	Observation Well	NDSWC	4	151N/95W	Clarks Creek #02-17H	4.45
5258	14909230CA	Surface Water	00/00/00	Surface Water Sample Site	T. Loneflight	2	149N/92W	Horse Camp #03-16H	4.55
21389	14809304CAB1	Tongue River	10/01/73	Observation Well	NDSWC	4	148N/93W	Horse Camp #03-16H	4.96
5217	14809304CAB2	Sentinel Butte-Tongue River	10/01/73	Observation Well	NDSWC	30	148N/93W	Horse Camp #03-16H	4.96

Source: NDSWC (2010).

### 3.4 WETLANDS

National Wetland Inventory (NWI) maps maintained by the USFWS identify several wetlands areas in the vicinity of the Proposed Action. According to the USFWS NWI database, several palustrine emergent freshwater wetlands and freshwater ponds are located near the ROW of the proposed access roads. The closest wetlands are 0.3 mile from the Horse Camp #03-16H. Table 10 presents the distance from each well site to the nearest wetland or water body. NWI wetlands are shown on Figures 16 through 19 in the Surface Water subsection.

**Table 11. Distance and Direction from Proposed Wells to the Nearest Wetland.**

Proposed Well	Feet to Nearest Wetland	Direction to Nearest Wetland	Wetland Type
Horse Camp 02-11H	1,637	Southwest	Freshwater Pond
Horse Camp 03-16H	1,588	North-northwest	Freshwater Emergent Wetland
Bear Den 03-30H	1,922	Northeast	Freshwater Pond
Clarks Creek 02-17H	5,521	Southeast	Freshwater Emergent Wetland

Source: USFWS 2009a.

A wetland assessment of the project by SWCA Environmental Consultants (SWCA) in June and September 2010 determined that no wetlands or potentially jurisdictional waters of the U.S. would be impacted by any access road ROWs or at any of the well sites. Therefore, no riparian or wetland habitats are anticipated to be directly or indirectly impacted by the proposed access roads or wells with implementation of appropriate BMPs for sediment and erosion control measures and the operator's SPCCPs for each production facility. 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 pasture and mixed prairie grassland used for grazing. This habitat supports grassland birds, ungulates, and small mammals. Little wildlife was observed during field visits to the proposed project areas during site assessments in June and September 2010. Well locations are in areas with sparse vegetation that would not provide suitable cover for most birds and small mammals.

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 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 stored in cuttings pits.

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 four well pads and access roads would impact approximately 24 acres within disturbed grasslands with sparse cover. 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. No raptor nests or other bird nests were observed in the project area during surveys, but it is anticipated that raptors and birds would use the habitat within the project area intermittently for hunting, foraging, and potentially nesting. EOG would have a biologist survey the project area for bald or golden eagle nests at least five days before construction begins during the nesting season (February 15 to July 15). If nests are discovered, the BIA and USFWS would be notified. If active eagle nests are present, a minimum 0.5-mile buffer would be maintained from any active eagle nest during the nesting season or until the birds fledge, whichever is earlier.

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 Special Status Wildlife**

Several wildlife species that may exist in Dunn and McKenzie counties are listed as threatened or endangered under the Endangered Species Act (ESA) (16 USC 1531 et seq.). Listed species in both counties include 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*) (USFWS 2010a). In addition, the Dakota skipper (*Hesperia dacotae*) is a candidate for listing. The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are species of special concern to the BIA and the USDI and are protected under the Bald and Golden Eagle Protection Act.

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). There were no 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. Special-status species are described below. The USFWS was consulted on July 28, 2010, for input on following impact determinations. USFWS requested more detailed species information for the project and asked for some revised mitigation measures to reduce potential impacts to special-status wildlife. The updated information, determinations, and mitigation measures are provided in this EA.

SWCA did not observe any special status species or their habitats within the project area during surveys. 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 2010b). 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 28 kilometers (km) from the northeast corner of North Dakota, over 400 km 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 2010c). 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 2010d). 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 2010d).

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, 2010d). Approximately 100 pairs breed in North Dakota (USFWS 2010d). 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 2010d).

Suitable shoreline habitats for breeding and nesting plovers does not occur in the project area, and Lake Sakakawea is a minimum of 2 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, 2010e). 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, 2010e). 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, 2010e).

Suitable shoreline habitats for breeding and nesting plovers occur along Lake Sakakawea, at least 2 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 will 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 2010f). 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 2010f). 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 km 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. However, project precautionary measures would be implemented if a whooping crane is sighted in or near the project area. EOG will cease construction if there is a confirmed sighting of a whooping crane within 1 mile of the project area. A confirmed sighting includes sightings that are confirmed by EOG personnel who have been trained in a formal program on the field identification of whooping cranes sponsored by EOG.

**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 km 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 habitats for pallid sturgeon does not occur in the project area, and Lake Sakakawea is at least 2 miles away from the proposed well pads and access roads. However, surface runoff in the project areas run into 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

**Affects Determination:** May Affect, but is Not Likely to Adversely Affect

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. The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding (USFWS 2005). Dakota skippers are not known to occur within the project area; however, suitable habitat does occur. The proposed project may affect, but is not likely to adversely affect this species. 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.

**Bald Eagle (*Haliaeetus leucocephalus*)**

**Status:** Delisted in 2007; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

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 waterbodies. 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 bald eagle may occasionally pass through or forage on carcass within the project area. EOG would have a biologist survey the project area for bald eagle nests at least five days before construction begins. If nests are discovered, the BIA and USFWS would be notified. If active eagle nests are present, a minimum 0.5-mile buffer would be maintained from any active eagle nest during the nesting season (February 15 to July 15) or until the young fledge, whichever is earlier. No adverse impacts to the bald eagle are anticipated.

**Golden Eagle (*Aquila chrysaetos*)**

**Status:** Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

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. The project area does not contain habitat suitable for nesting, but golden eagles may occasionally hunt in the project area. No eagles were observed during the field surveys; however, golden eagles are known to nest in cliffs within 1 mile of the project areas. According to North Dakota Fish and Game records, the closest nest to the proposed project facilities is 0.85 mile from Bear Den #03-30H. EOG would have a biologist survey the project area for golden eagle nests at least five days before construction begins. If nests are discovered, the BIA and USFWS would be notified. If active eagle nests are present, a minimum 0.5-mile buffer would be maintained from any active eagle nest during the nesting season (February 15 to July 15) or until the young fledge, whichever is earlier. No adverse impacts to the golden eagle are anticipated.

**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, consisting of thin limestone and dark gray to black organic-rich shale, is found from the surface to a depth of approximately 4,000 feet. The Greenhorn is subdivided into lower and upper intervals of limestone and calcareous shale with a middle interval of shale. Near-surface sediment is of Recent, Pleistocene, or Tertiary age and includes Sauk, Tippecanoe, Kaskaskia, Absaroka, Zuni, and Tejas Sequences. Soils found near the surface in the project area are derived from the parent material of the Greenhorn Formation and subsequent 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 derived from different soils series that are present on the well pads and access roads, and their respective acreages, are summarized in Table 11. 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. Figures 20 through 23 illustrate the soils composition that surrounds each proposed well pad and associated access road.

**Table 12. Soil Types in the Project Area.**

<b>Project Area</b>	<b>Soil Name</b>	<b>Acres</b>
Horse Camp #02-11H Access Road	Morton-Dogtooth silt loams, 0 to 6 percent slopes	0.13
	Zahl-Williams loams, 9 to 15 percent slopes	2.10
Horse Camp #02-11H Well Pad	Cabba loam, 15 to 45 percent slopes	2.52
	Zahl-Williams loams, 9 to 15 percent slopes	0.74
Horse Camp #03-16H Access Road	Belfield-Savage silty clay loams, 0 to 6 percent slopes	0.01
	Dogtooth-Cabba complex, 9 to 15 percent slopes	0.80
	Heil silty clay loam, 0 to 1 percent slopes	0.36
Horse Camp #03-16H Well Pad	Belfield-Savage silty clay loams, 0 to 6 percent slopes	2.89
	Dogtooth-Cabba complex, 9 to 15 percent slopes	0.21
	Heil silty clay loam, 0 to 1 percent slopes	0.14
Bear Den #03-30H Access Road	Arikara-Shambo-Cabba loams, 9 to 70 percent slopes	0.12
	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	1.06
Bear Den #03-30H Well Pad	Arikara-Shambo-Cabba loams, 9 to 70 percent slopes	0.26
	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	3.14
Clarks Creek #02-17 Access Road	Williams-Zahl loams, 6 to 9 percent slopes	1.37
	Zahl-Cabba-Arikara complex, 9 to 70 percent slopes	0.01
	Zahl-Williams loams, 9 to 15 percent slopes	0.49
Clarks Creek #02-17H Well Pad	Williams-Zahl loams, 6 to 9 percent slopes	3.20
	Zahl-Cabba-Arikara complex, 9 to 70 percent slopes	0.20

Source: NRCS 2010

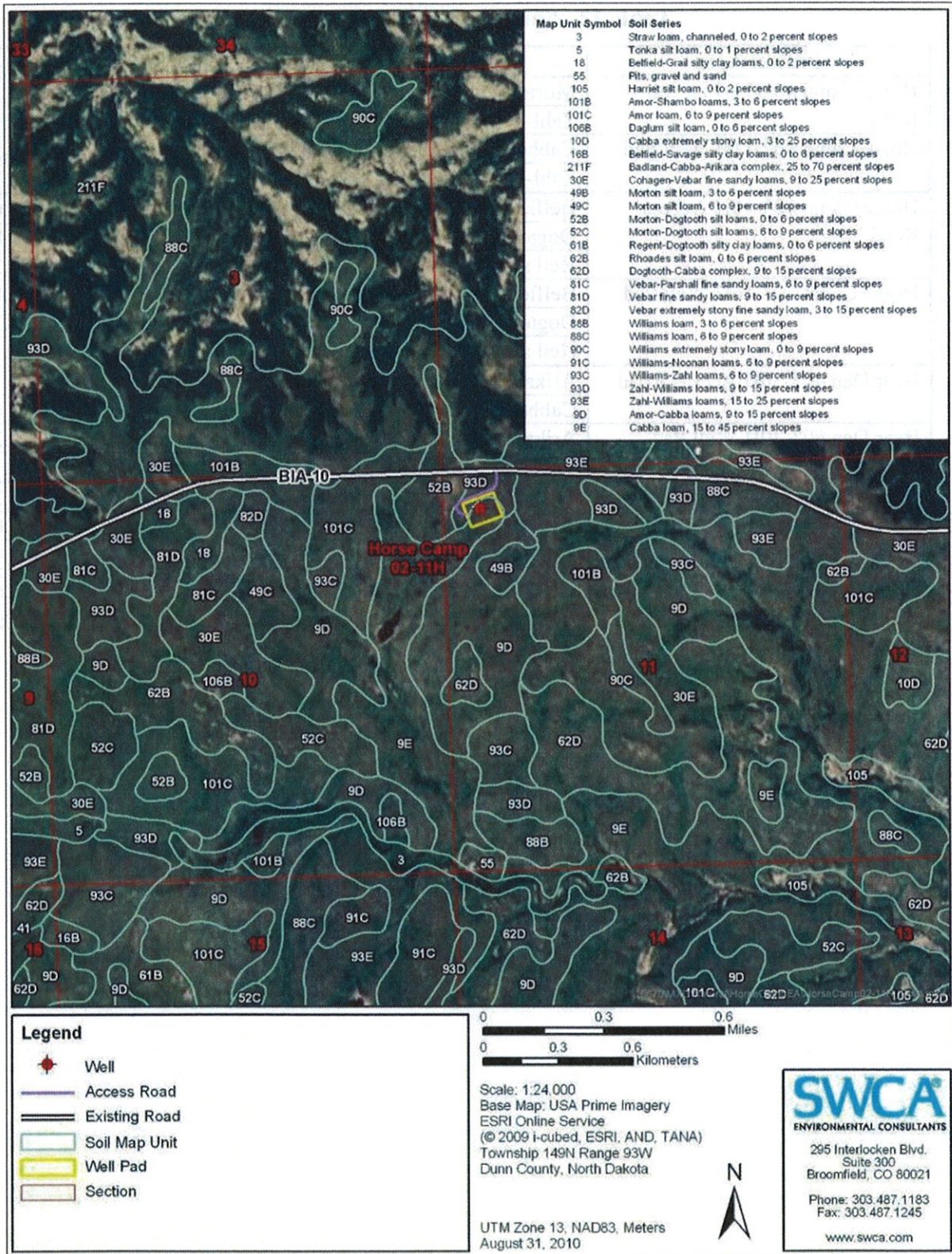


Figure 20. Soil types within and around Horse Camp #02-11H.

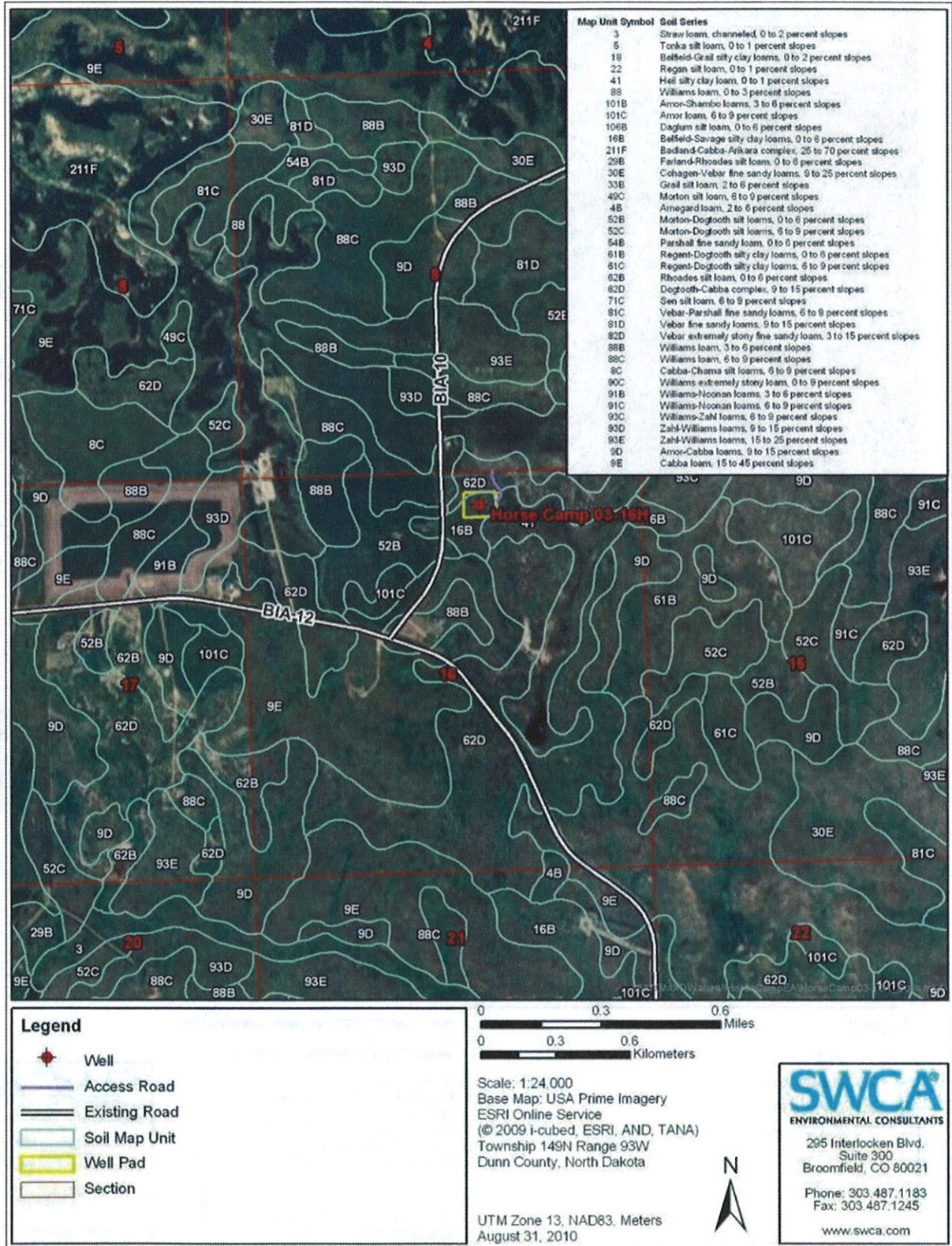


Figure 21. Soil types within and around Horse Camp #03-16H.

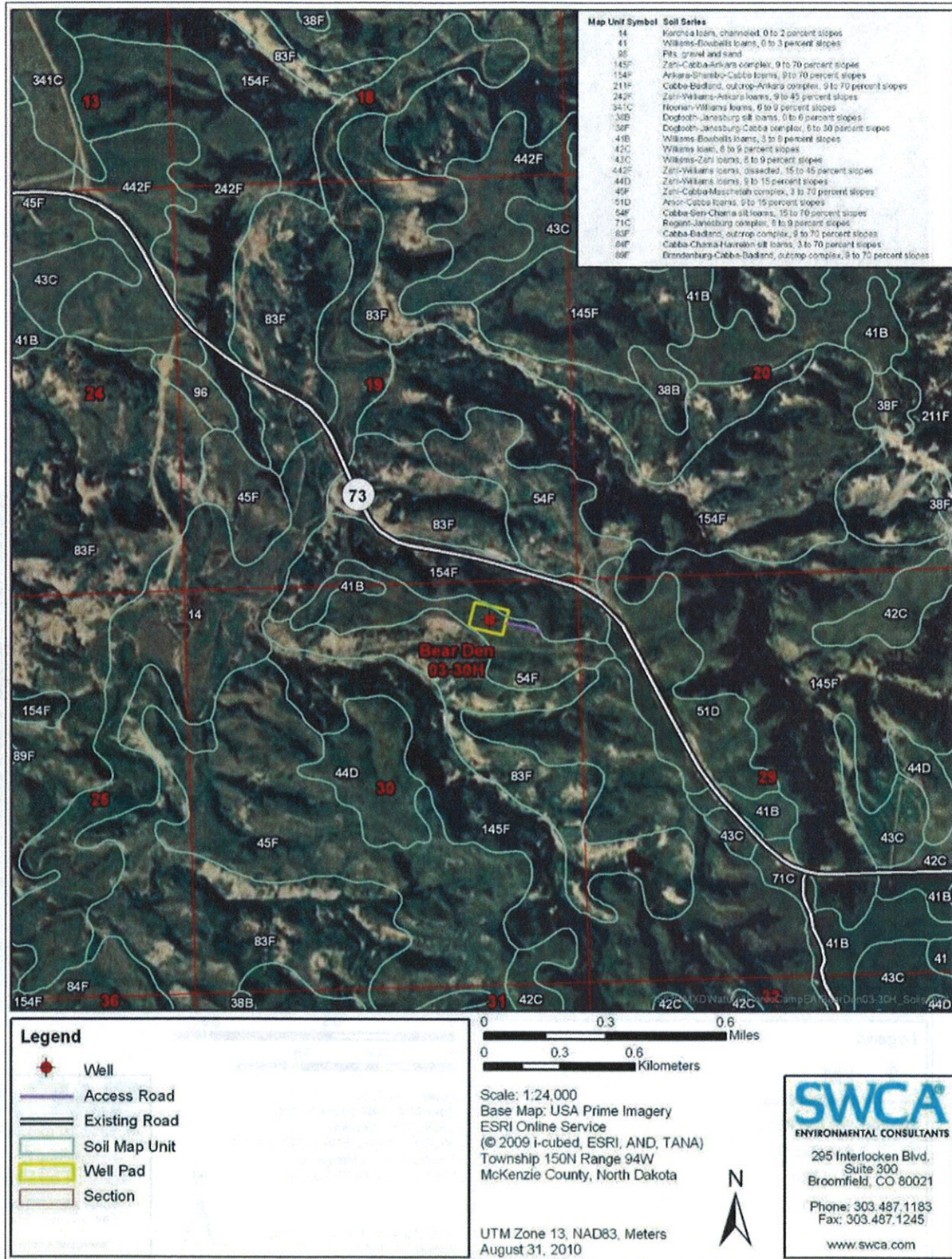


Figure 22. Soil types within and around Bear Den #03-30H.



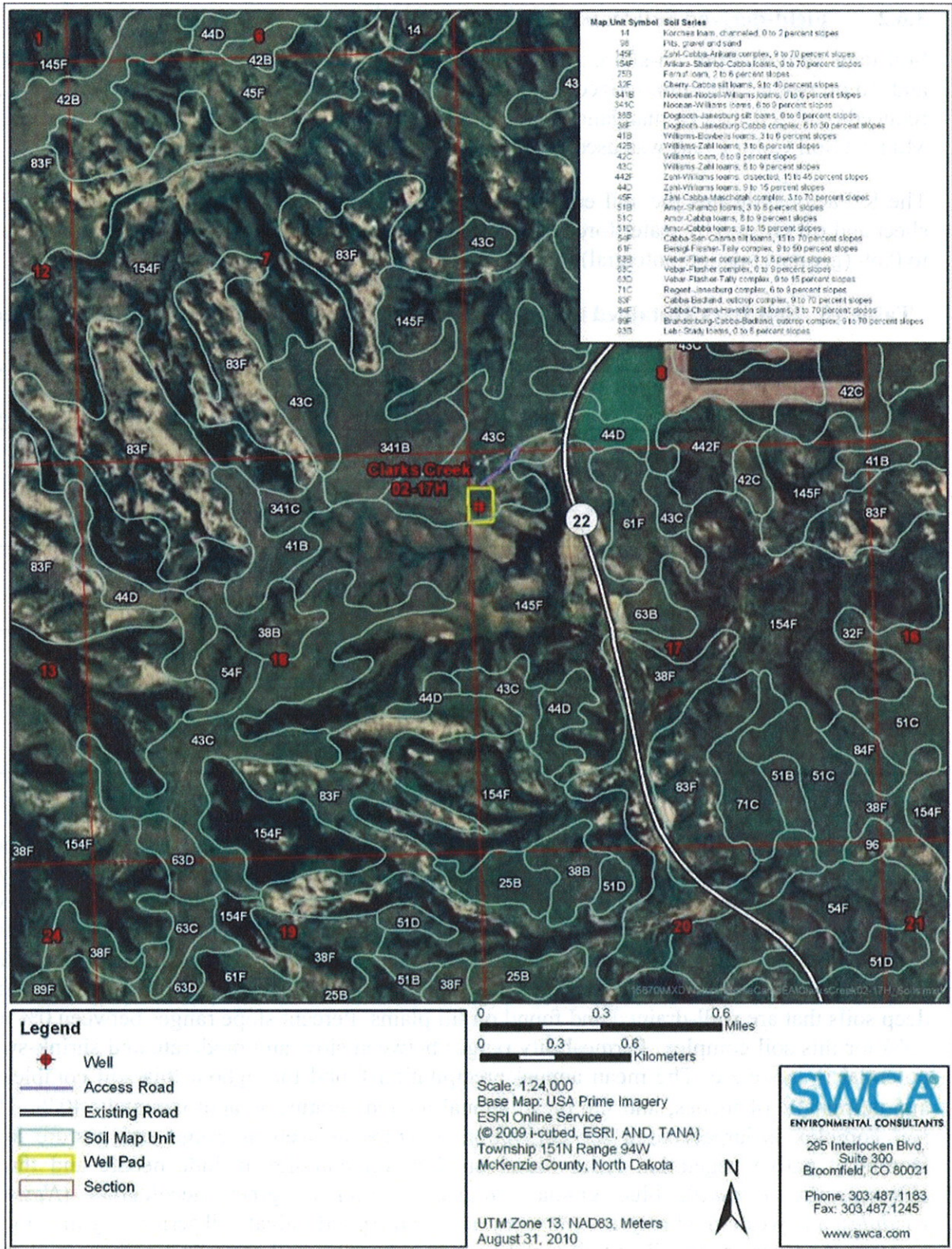


Figure 23. Soil types within and around Clarks Creek #02-17H.

### 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 12. 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.

The K Factor indicates the soil erodibility of soil particles less than 2 millimeters in size to sheet and rill erosion by water forces. K Values can range from 0.02 (lowest erosion potential) to 0.69 (greatest erosion potential).

**Table 13. Soil Data Obtained through the Excavation of Soil Pits within the Proposed Project Area.**

Well	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (°)	K Factor
Horse Camp #02-11H	0-8	10YR 3/2 (very dark grayish-brown)	None Observed	Silty Clay Loam	1-3	0.32
	8-14	10YR 4/2 (dark grayish-brown)	None Observed	Silty Clay Loam		
Horse Camp #03-16H	0-12	10YR 4/2 (dark grayish-brown)	None Observed	Silty Clay Loam	1-3	0.37
Bear Den #03-30H	0-18	10YR 4/4 (dark yellowish-brown)	None Observed	Silty Clay Loam	1-3	0.32
Clarks Creek #02-17H	0-15	10YR 3/2 (very dark grayish-brown)	None Observed	Silty Loam	3-5	0.28

As presented in Table 12, several different soil complexes are found along each project alignment and each well pad. Well pads contain several soil complexes, with one type generally more prominent. Of the four proposed well pads, all are dominated by complexes that are loams or silt/clay loams. The loamy soil types most prevalent in the proposed well pads and access roads are generally defined by the Williams, Cabba, Zahl, Dogtooth, and Belfield soil series. According to the NRCS, Williams complexes generally consists of very deep soils that are well-drained and found on till plains. Percent slope ranges between 0% and 35% for this soil complex. Permeability ranges between slow and moderate and shrink-swell potential is moderate. The mean annual precipitation found throughout this soil complex is approximately 14 inches, and the mean annual air temperature is approximately 40°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 include needle and thread (*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*). Individual soil series vary in value as a potential source of topsoil and ultimately reclamation. One soil series in a soil complex may have greater potential as viable topsoil than the other soil series in the soil complex. The Williams soil series is considered a “good” viable topsoil source which often has high reclamation potential.

The remaining prominent soil series Cabba, Zahl, Dogtooth, and Belfield display a variety of characteristics in their complexes. Generally, these soil complexes consist of shallow, very deep and moderately deep, well-drained soils found on glacial till, wooded slopes, and softshale or mudstone. Percent slope ranges between 0% and 70% for these soil complexes. Permeability ranges between very slow and moderately rapid. Shrink-swell potential ranges between low, moderate, and high. The mean annual precipitation found throughout these soil complexes is approximately 15 inches, and the mean annual air temperature is approximately 41°F. These soils complexes are largely used for grazable woodland, rangeland, and pasture. Dominant native vegetation types found on these soil complexes include big bluestem (*Andropogon gerardii*), blue grama, green needlegrass, and western wheatgrass. The Zahl-Cabba-Arikara complex is considered a “poor” source of potential topsoil which may often have low reclamation potential. The Dogtooth-Cabba complex is also considered a “poor” source of topsoil.

#### 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 due to their cohesive properties. Potential erosion is further reduced due to the minimal slope angles within each of the proposed well pads and access roads (maximum 4% grade). Therefore, the soil types are not anticipated to create unmanageable erosion troubles during construction and development activities within the project areas. However, some soil erosion is expected to occur due to exposed soils on the proposed well pads and access roads required for construction. 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. 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 BMPs by the operator is projected to reduce and maintain negligible levels of erosion.

Reclamation potential for the soil complexes varies by soil series and may need soil amendments to achieve successful reclamation. 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 constructed where grades are 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 areas occur in the Missouri Plateau Ecoregion (Missouri Slope), which is a western mixed-grass and short-grass prairie ecosystem (Bryce et al. 1998). Native grasses include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), 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 13).

**Table 14. Occupied Area for Recognized Noxious Weeds in Dunn and McKenzie Counties, North Dakota.**

Common Name	Scientific Name	Dunn County (acres)	McKenzie County (acres)
<b>State Noxious Weeds</b>			
absinth wormwood	<i>Artemisia absinthium</i>	39,300	15
Canada thistle	<i>Cirsium arvense</i>	28,500	33,600
diffuse knapweed	<i>Centaurea diffusa</i>	0	1
leafy spurge	<i>Euphorbia esula</i>	18,300	26,200
musk thistle	<i>Carduus nutans</i>	0	0
purple loosestrife	<i>Lythrum salicaria</i>	0	0
Russian knapweed	<i>Acroptilon repens</i>	0	0
spotted knapweed	<i>Centaurea stoebe</i>	0	5
yellow toadflax	<i>Linaria vulgaris</i>	0	0
Dalmatian toadflax	<i>Linaria dalmatica</i>	0	1
salt cedar	<i>Tamarix ramosissima</i>	0	2,400
<b>McKenzie County Noxious Weeds</b>			
black henbane	<i>Hyoscyamus niger</i>	N/A	0
common burdock	<i>Arctium minus</i>	N/A	0
houndstongue	<i>Cynoglossum officinale</i>	N/A	0
halogeton	<i>Halogeton glomeratus</i>	N/A	0
baby's breath	<i>Gypsophila muralis</i>	N/A	0
<b>Total</b>		<b>86,100</b>	<b>62,222</b>

Source: North Dakota Department of Agriculture 2007

During on-site assessments conducted in June and September 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 prairie grassland used for grazing. Horse Camp #03-16 is located in a hayfield and Clarks Creek #02-17H is currently used as a feedlot. Vegetation at the sites was sparse and no sensitive habitats were within the project areas. Noxious weeds were not found at any of the well sites. Table 14 summarizes the vegetation recorded at each location.

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 15. Dominant Vegetation at Well Sites and Access Roads.**

Well	Dominant Vegetation	Noxious Weeds
Horse Camp #02-11H	Smooth brome ( <i>Bromus inermis</i> ), western snowberry ( <i>Symphoricarpos occidentalis</i> ), silver sage ( <i>Artemisia cana</i> ), Kentucky bluegrass ( <i>Poa pratensis</i> )	None
Horse Camp #03-16H	Smooth brome, crested wheatgrass ( <i>Agropyron cristatum</i> ), fringed sage ( <i>Artemisia frigida</i> ), sweetclover ( <i>Melilotus</i> sp.)	None
Bear Den 03-#30H	Green needlegrass ( <i>Nassella viridula</i> ), little bluestem ( <i>Schizachyrium scoparium</i> ), fringed sage, western snowberry, silver buffaloberry ( <i>Shepherdia argentea</i> )	None
Clarks Creek #02-17H	Kentucky bluegrass, alfalfa ( <i>Medicago</i> sp.)	None

### 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 Fort Berthold Reservation.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using an intensive pedestrian methodology. For Clarks Creek #02-17H, approximately 9.39 acres were inventoried on May 19, 2010 (Higgins 2010a). Although one archaeological site was revisited, it did not appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking. This determination was communicated to the THPO on August 5, 2010 and the THPO concurred on August 18, 2010.

For Bear Den #03-30H, approximately 8.81 acres were inventoried between May 19 and June 24, 2010 (Higgins 2010b). One archaeological site was located that may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. On the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking, as the archaeological site will be avoided. This determination was communicated to the THPO on August 12, 2010, and the THPO concurred on August 16, 2010.

For Horse Camp #03-16H, approximately 10.49 acres were inventoried on June 24, 2010 (Higgins and Eisenhauer 2010a). 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. 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 September 29, 2010 and the THPO concurred on October 4, 2010.

For the Horse Camp #02-11H project approximately 13.76 acres were inventoried on June 24, 2010 (Higgins and Eisenhauer 2010b). One archaeological site was revisited that may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. On the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking, as the archaeological site will be avoided. This determination was communicated to the THPO on September 29, 2010 and the THPO concurred on October 4, 2010.

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

### **3.9 SOCIOECONOMICS**

The scope of analysis for social and economic resources includes a discussion of current social and economic data relevant to the project area, such as population, demographics, income, employment, and housing. These conditions can be analyzed and compared at various scales. This analysis focuses on the Reservation, four of the six counties that overlap the Reservation, and the state of North Dakota. Due to their distance from the project areas, Ward and Mercer counties are not included in this analysis because these counties are not expected to be impacted by the proposed project.

#### **3.9.1 Population**

Historic and current population counts for the project area, compared to the state, are provided below in Table 15. The state population showed little change between the last two censuses (1990–2000), but there were notable changes at the local level. Populations in all four counties have steadily declined in the past. McLean and Dunn counties have a higher rate of population decline among the four counties at a rate of 10.5% and 7.8%, respectively. These declines can be attributed to more people moving to metropolitan areas, which are perceived as offering more opportunities for personal growth. However, population on or near the Reservation has increased approximately 13.3% since 2000. While Native Americans are the predominant group on the Reservation, they are considered the minority in all other areas of North Dakota.



**Table 16. Population and Demographics.**

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

Source: U.S. Census Bureau 2009a.

<sup>1</sup> Bureau of Indian Affairs 2005. Population shown reflects the Total enrollment in the Tribe in 2005. 2008 data unavailable. All information related to the Fort Berthold Indian Reservation reflects 2005 data, including state population. 11,897 reflects tribal enrollment on or near the Reservation. According to the BIA, near the Reservation includes those areas or communities adjacent or contiguous to the Reservation.

<sup>2</sup> Bureau of Indian Affairs 2001. Reflects percent change between 1991 and 2001.

<sup>3</sup> Reflects percent change between 2001 and 2005.

As presented in Table 15, population growth on or near the Reservation exceeds the overall growth in the state of North Dakota and four counties in the project area. This trend in population growth is expected to continue in the next few years (Fort Berthold Housing Authority 2008).

### 3.9.2 Employment

The economy in the State of North Dakota including the Reservation and four counties in the project area has historically depended on agricultural activity, including grazing and farmland. Recently, energy development and extraction, power generation, and services related to these activities have increased over the last several years. Consequently, service and trade sectors have also become increasingly important in providing services to the growing population. Many of the service sector jobs are directly and indirectly associated with oil and gas development. In 2007, total employment in the state of North Dakota was approximately 487,337 (U.S. Bureau of Economic Analysis 2009a). Of this, government and government enterprises employed the largest number of people at 16.6% (81,218 jobs). Other dominant industries include health care and social assistance at 11.7% (56,990 jobs), and retail trade at 11.3% (55,478 jobs) (U.S. Bureau of Economic Analysis 2009a). Table 16 provides total employment opportunities for the project area for the years 2001 and 2007. Government and government enterprises employed the most people in each county for each year.

**Table 17. Total Employment for the Project Area and State of North Dakota, 2001 and 2007.**

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

Source: U.S. Bureau of Economic Analysis 2009a.

\* Bureau of Indian Affairs 2005. Represents 2005 data.

Although detailed employment information for the Reservation is not provided by the U.S. Bureau of Economics, what is known is that residents of the Reservation are employed in similar ventures as those adjacent to or contiguous to the Reservation. Common mainstays of employment include 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, 4 miles west of New Town, North Dakota, employs approximately 320 people, of which 90% are tribal members (Fort Berthold Housing Authority 2008). Another source of employment is the Fort Berthold Community College, which is tribally chartered to meet the higher education needs of the people of the MHA Nation. As of fall 2006, the Fort Berthold Community College faculty consisted of 11 full-time members and 25 adjunct members in academic year 2006–2007. Approximately 73% of full-time faculty members are of American Indian/Alaska Native descent. Of this, approximately 88% are enrolled members of the MHA Nation. Approximately 65% of the part-time faculty members are of American Indian/Alaska Native descent. Of this, all (100%) are tribal members.

The BIA publishes biannual reports documenting the Indian service and labor market for the nation. According to the 2005 American Indian Population and Labor Force Report, of the 11,897 tribal members on or near the Fort Berthold Reservation, 8,773 were eligible for BIA-funded services. Of this, 4,811 members comprised the MHA Nation's total work force, which includes people 16 years of age and older. Of this, 430 members were unavailable for work (due to age or personal circumstances), leaving those members capable to work at 4,381. Approximately 29%, or 1,287 members were gainfully employed in 2005, resulting in a 71% unemployment rate (as a percent of the labor force) for members living on or near the Reservation. Of the employed, 90.8%, or 1,169 members were employed in the public sector, with the remaining 9.2% employed in the private sector. Of those employed, approximately 60%, or 708 people, were living below poverty guidelines. Compared to 2001, employment on or near the Reservation increased approximately 6.2%, but unemployment (as a percent of the labor force) was lower at 41% and the percentage of employed people living below the poverty guidelines, which was 47% (Bureau of Indian Affairs 2001).

### **3.9.3 Income**

Per capita income is often used as a measure of economic performance, but it should be combined 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 payment, dividends, and rent, it is possible for per capita income to rise even if the average wage per job declines over time. In other words, non-labor sources of income can cause per capita income to rise, even if people are earning less per job.

The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

According to NAICS standards, per capita personal income for Dunn County was \$20,634 in 2000 and \$26,440 in 2007, representing an increase of approximately 28.1%; per capita personal income for McKenzie County was \$21,637 in 2000 and \$32,927 in 2007, representing an increase of approximately 52.1%; per capita personal income for McLean County was \$23,001 in 2000 and \$38,108 in 2007, representing an increase of approximately 65.6%; per capita personal income for Mountrail County was \$23,363 in 2000 and \$32,324 in 2007, representing an increase of approximately 38.3%. These figures compare with a State of North Dakota per capital personal income of \$25,105 in 2000 and \$36,082 in 2007, representing an increase of approximately 43.7% from 2000 (U.S. Bureau of Economic Analysis 2009b).

For the Reservation, the most recent per capita income data is from the 2000 Census. 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 United States average of \$21,587 at that time (Fort Berthold Housing Authority 2008).

With the exception of McLean County, counties that overlap the Reservation tend to have per capita incomes and median household incomes below North Dakota statewide averages (Table 17). However, unemployment rates in all counties, including the Reservation, were equal to or above the state average of 3.1%. Subsequently, Reservation residents and MHA Nation members tend to have per capita incomes and median household incomes below the averages of the encompassing counties, as well as statewide and higher unemployment. Per capita income for residents on or near the Reservation is approximately 28% lower than the statewide average. The median household income reported for the Reservation (i.e., \$26,274) is approximately 59% lower than the state median of \$43,936. According to the BIA, approximately 55% of tribal members living on or near the Reservation were employed, but living below federal poverty levels (Bureau of Indian Affairs 2005).

**Table 18. Income and Unemployment 2007.<sup>1</sup>**

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

<sup>1</sup> U.S. Bureau of Economic Analysis 2009b

<sup>2</sup> United States Department of Agriculture (USDA) 2009

<sup>3</sup> North Dakota State Data Center 2009.

<sup>4</sup> Unemployment data reflect a percent of the civilian labor force, which was 3,993.

N/A – Data not available.

### 3.9.4 Housing

Workforce-related housing is one of the key issues associated with the proposed project. Historical information on housing in the four counties in the project area was obtained from the U.S. Census Bureau. Current housing situations can be difficult to characterize quantitatively, since the status of the housing market and housing availability changes daily. Therefore, this section discusses the historical housing market.

Although the U.S. Census Bureau provides annual total housing unit estimates, detailed housing information, such as occupancy rate for smaller communities, is from the 2000 census. Table 18 provides housing unit supply estimates in the project 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. Housing information is summarized in Table 18.

Availability and affordability of housing could impact oil and gas development and operations. The number of owner-occupied housing units (1,122) within the Reservation is approximately 58% lower than the average number of owner-occupied housing units found in the four counties that encompass the Reservation (1,921). Housing on the Reservation typically consists of mutual-help homes built with the help of various government programs, low-rent housing units, and scattered-site homes.

**Table 19. Housing Development Data for the Reservation and Encompassing Counties.**

Region	Total Housing Units						
	Occupied	Owner Occupied	Renter Occupied	Vacant	Total	Total	% Change
	2000	2000	2000	2000	2000	2008	2000–2008
Dunn County	1,378	1,102	276	587	1,965	1,968	0.1
McKenzie County	2,151	1,589	562	568	2,719	2,781	2.2
McLean County	3,815	3,135	680	1,449	5,264	5,420	2.9
Mountrail County	2,560	1,859	701	878	3,438	3,528	2.6
Fort Berthold Indian Reservation	1,908	1,122	786	973	2,881	N/A	N/A

Source: U.S. Census Bureau 2009b

Impacts to socioeconomic resources of the project area would be minimal and therefore 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, while longer-term effects would occur during the production phase. Impacts would be significant if the affected communities and local government experienced an inability to cope with changes, such as substantial housing shortages, fiscal problems, or breakdown in social structures and quality of life.

Implementation of the proposed action is anticipated to require an average of 31 workers per well in the short-term (approximately 50–60 days after APD approval) for construction, drilling, and completion. If proven successful, EOG would install production facilities and commence long-term production. This would require approximately two full-time employees during commercial activities. It is anticipated that a mix of local and operator employees would work in the project areas. Therefore, any increase in workers would constitute a minor increase in population in the project area required for short-term operations and therefore would not create a noticeable increase in demand for services or infrastructure on the Reservation or the communities near the project area. Because the communities likely impacted by the project have experienced a recent decline in population between 2000 and 2008 (as shown in Table 15) coupled with the historic housing vacancy rate (as shown in Table 18), these communities are able to absorb the projected slight increase in population related to this 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.

Implementation of the proposed action would likely result in direct and indirect economic benefits associated with industrial and commercial growth in the area, including the Reservation, State of North Dakota, and potentially local communities near the Reservation. There would be increased spending by contractors and workers for materials, supplies, food,

and lodging in McKenzie County and the surrounding areas, which would be subject to sales tax. 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 economy. 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 Executive 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 Executive 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 19 summarizes relevant data regarding minority and low-income populations for the project area.

In 2008, North Dakota's total minority population comprised approximately 55,209, or 8.6% of the state's total population. This is an increase of approximately 17.4% since the 2002 minority population, compared with the 1.2% overall increase for the state's total population during the same time. Although 91.3% of the population in North Dakota is classified as Caucasian, this is a decrease of 1.3% from 2002. Conversely, as presented in Table 19, the minority population of the state has increased steadily since 2002. For example, the American Indian and Alaska Native population increased 0.6%, from 4.9% of the 2002 state population to 5.5% of the 2008 state population. Approximately 70.0% of Reservation residents are tribal members and 14.0% of the Dunn County population and 21.6% of the McKenzie County population is American Indians and Alaska Natives.

**Table 20. Population Breakdown by Race, 2002–2008.**

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

Source: Northwest Area Foundation 2009.

Poverty rate data for the counties in the project area are summarized in Table 20. The data show that poverty rates for Dunn County, Mountrail County, and the State of North Dakota increased from 2000 to 2007. Poverty rates have decreased for McKenzie and McLean counties.

**Table 21. Poverty Rates for the Project Area.**

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

Source: U.S. Census Bureau 2009c.

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 project 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 development of additional tracts owned by currently non-benefitting allottees. In addition to increased revenue for land and mineral holders, exploration and development would increase employment on the Reservation with oversight from the Tribal Employment Rights Office, which would help alleviate some of the poverty prevalent on or near the Reservation. Tribal members without either surface or mineral rights would not receive any direct benefits, except through potential employment, should they be hired. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Additional potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there would be no effect to historic properties. Furthermore, nothing is known to be present that qualifies as a TCP or for protection under the American Indian Religious Freedom Act. Potential for disproportionate impacts is further reduced by requirements 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.

Table 21 and Figure 24 show the active, confidential, and permitted oil and gas wells currently existing within 1, 5, 10, and 20 miles of the proposed wells. Some of these wells are within the radius of more than one of the proposed wells. Totals without duplication are shown in Table 22. There are seven active wells within 1 mile of the proposed wells.

Potential cumulative impacts of the proposed project plus 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. The Proposed Action would create new long-term disturbance of 24.56 acres of grassland habitat for roads and well pads out of a total 345,910 acres within a 20-mile radius of the project. Similar levels of disturbance have occurred at 956 existing wells within the 20-mile radius (Table 22). This level of development is estimated to have disturbed approximately 9,560 acres (10 acres per well), or approximately 0.76% of the available surface area within the 20-mile radius. The relative incremental increase of the proposed new wells to the existing disturbance is estimated to be 0.25% of the cumulative surface disturbance.

**Table 22. Active, Confidential, Drilling, and Permitted Wells within 20 Miles of the Proposed Wells.**

Type of Well	Bear Den #03-30H		Clarks Creek #02-17H		Horse Camp #02-11H		Horse Camp #03-16H	
<b>1-mile Radius</b>								
Reservation	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>
Active Wells	1	0	0	0	1	0	5	0
Confidential Wells	0	0	0	0	0	0	0	0
Drilling Wells	0	0	0	0	0	0	0	0
Permitted Wells	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	5	0
<b>5-mile Radius</b>								
Reservation	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>
Active Wells	3	11	7	6	13	0	12	0
Confidential Wells	14	8	5	3	10	0	9	0
Drilling Wells	0	0	2	0	0	0	0	0
Permitted Wells	2	0	1	0	0	0	0	0
Total	19	19	15	9	23	0	21	0
<b>10-mile Radius</b>								
Reservation	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>
Active Wells	25	85	31	127	50	0	41	2
Confidential Wells	25	18	27	25	59	0	54	0
Drilling Wells	0	1	4	3	1	0	0	0
Permitted Wells	2	1	1	2	3	0	3	0
Total	52	105	63	157	113	0	98	2
<b>20-mile Radius</b>								
Reservation	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>Off</i>
Active Wells	92	312	90	401	126	181	108	216
Confidential Wells	105	107	9	127	141	45	27	46
Drilling Wells	7	10	4	8	18	4	16	4
Permitted Wells	4	9	4	17	7	7	7	3
Total	208	438	107	553	292	237	158	269

**Table 23. Wells within 1, 5, 10, and 20 Miles of the Proposed Wells.**

Radius	Active	Confidential	Drilling	Permitted	Total
1 mile	7	0	0	0	7
5 miles	41	40	2	3	86
10 miles	225	115	9	6	355
20 miles	627	299	6	24	956

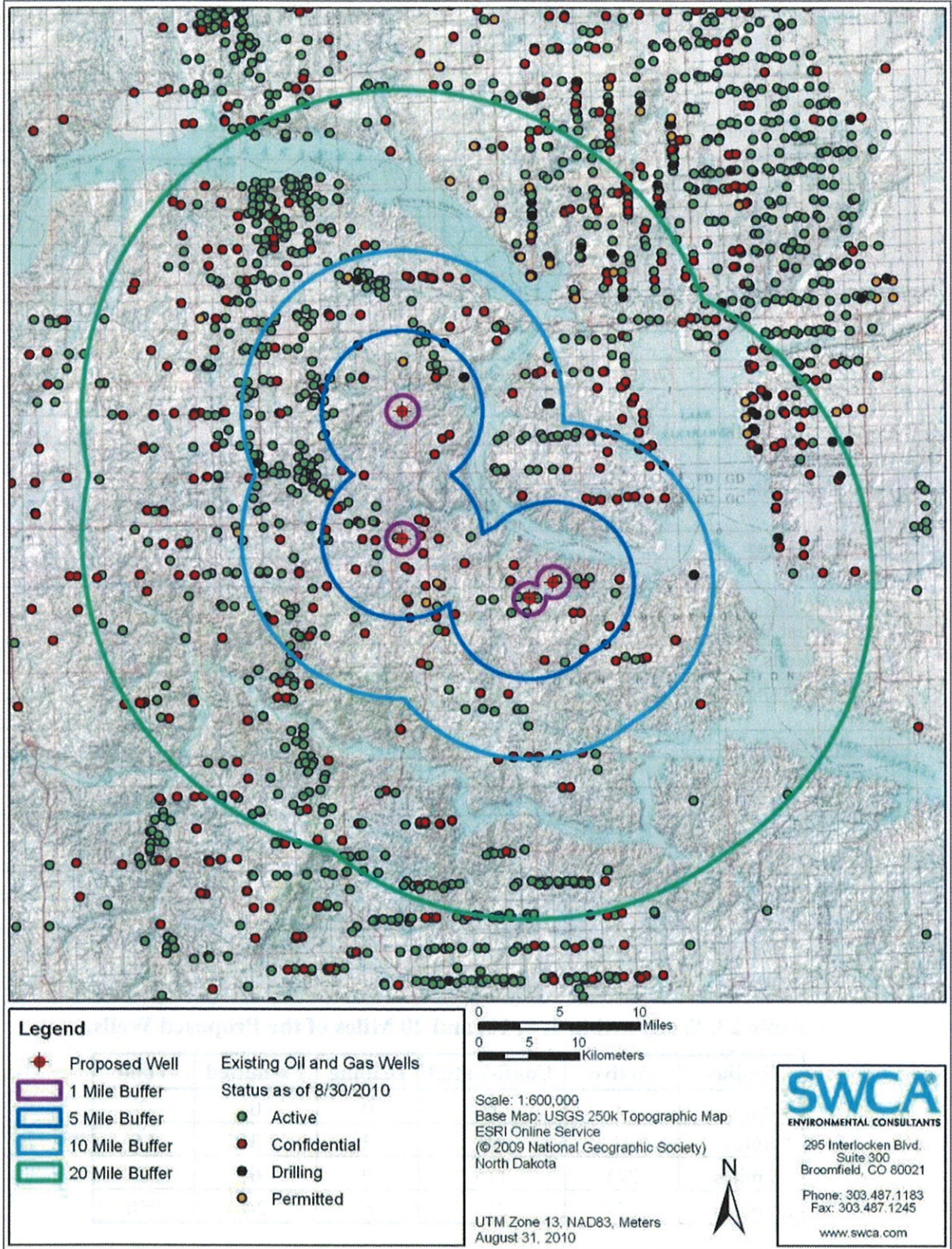


Figure 24. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

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 Bear Den Bay, Skunk Creek, Shell Creek Church, and 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.

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 0.5 mile 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 side 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.

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 Dunn and McKenzie counties 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 sent on July 28, 2010. The scoping comments received for both announcements are summarized in Table 23 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

### SWCA Environmental Consultants

- Chad Baker, Project Manager/Environmental Specialist  
*Prepared the EA*
- Kara Altvater, Environmental Specialist  
*Prepared the EA*
- Joshua Ruffo, Wildlife Biologist  
*Conducted natural resource surveys for well pads and access roads. Reviewed and edited the EA.*
- Jon Markman, Archaeologist/Field Coordinator  
*Conducted cultural resource surveys for well pads and access roads.*
- Stephanie Lechert, Archaeologist  
*Conducted cultural resource surveys for well pads and access roads.*
- Nancy Eisenhauer, Archaeologist  
*Conducted cultural resource literature review and prepared the EA*
- Richard Wadleigh, Senior NEPA Planner  
*Reviewed and edited the EA*
- Mike Agena, GIS Specialist  
*Created maps and spatially derived data*

**Table 24. 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	Concurs and requests notification of any NAGPRA issues.	Noted.
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, Dan	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 objection to the project provided notification of construction or alterations.	Noted.
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 and found no known occurrences of species of concern within 1 mile of the project areas.	Information was included in the wildlife section of this EA.
Hauck, Reinhard	Dunn County	No Comment	
Hefferman, Dan	U.S. Environmental Protection Agency	No Comment	



Name	Organization	Comment	Response to Comment
Hoffman, Warren	Killdeer, Weydahl Field	No 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.	No Comment	
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadmas, 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	
McKenna, Michael	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.
Melhouse, Ronald	Bureau of Reclamation	There are waterlines existing or proposed 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	

Name	Organization	Comment	Response to 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	
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	
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, and avoiding critical habitat for listed species.	Noted.
Strahs, Arnold	Three Affiliated Tribes	No Comment	
Svoboda, Larry	U.S. Environmental Protection Agency	No Comment	
Sweeney, Paul	U.S. Department of Agriculture, Natural Resources Conservation Service	Recommended avoiding wetland impacts or minimize using provided guidelines.	Noted.
Thompson, Brad	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	Provided a list of federally listed species that may be present in the project vicinity as part of informal Section 7 consultation under ESA. Provided information on migratory birds and wildlife habitat. Construction and mowing should be scheduled to avoid disrupting migratory birds during breeding season (Feb 1-July 15). Work should be halted when whooping cranes observed in the project vicinity. Aerial surveys for raptor nests are recommended.	The information is incorporated into the wildlife section and mitigation 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	

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## 6.0 ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AAQM	Ambient Air Quality Monitoring
AO	Authorized Officer
APD	Application for Permit to Drill
APE	area of potential effect
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
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 <sub>2</sub> S	hydrogen sulfide
HAP	hazardous air pollutant
km	kilometer
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
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NO <sub>2</sub>	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTL	Notice to Lessees
NWI	National Wetland Inventory
O <sub>3</sub>	ozone
Pb	lead
PM	particulate matter
ppm	parts per million
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
Reservation	Fort Berthold Indian Reservation
ROW	right-of-way
SHPO	State Historic Preservation Officer

<b>SO<sub>2</sub></b>	sulfur dioxide
<b>SPCCP</b>	Spill Prevention, Control, and Countermeasure Plan
<b>SUP</b>	Surface Use Plan
<b>SWCA</b>	SWCA Environmental Consultants
<b>TCP</b>	traditional cultural property
<b>THPO</b>	Tribal Historic Preservation Officer
<b>USACE</b>	U.S. Army Corps of Engineers
<b>USC</b>	United States Code
<b>USDA</b>	U.S. Department of Agriculture
<b>USDI</b>	U.S. Department of the Interior
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>VOC</b>	volatile organic compound





Denver Office  
295 Interlocken Boulevard, Suite 300  
Broomfield, Colorado 80021  
Tel 303.487.1183 Fax 303.487.1245  
www.swca.com

July 28, 2010

Dear Interested Party:

The Bureau of Indian Affairs (BIA) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) for the construction of four exploratory oil wells and associated facilities on the Fort Berthold Indian Reservation by EOG Resources, Inc. (EOG). The surface locations for the wells are proposed in the following locations within Dunn and McKenzie counties, North Dakota, and are shown on the enclosed project location maps for each proposed well.

- **Horse Camp #02-11H:** NW¼ NW¼, Section 11, Township (T) 149 North (N), Range (R) 93 West (W), Dunn County, North Dakota
- **Horse Camp #03-16H:** NW¼ NE¼, Section 16, T149N, R93W, Dunn County, North Dakota
- **Bear Den #03-30H:** NE¼ NE¼, Section 30, T150N, R94W, McKenzie County, North Dakota
- **Clarks Creek #02-17H:** NW¼ NW¼, Section 17, T151N, R94W, McKenzie County, North Dakota

Each well would initially require a well pad and access road to be constructed. Production facilities such as a well head and pump jack, a flare pit, a heater-treater, a recirculating pump, and a tank battery would then be installed if the well is proven to be productive. Production fluids would be stored on each well pad in tanks. Each well pad would require approximately 4 to 5 acres of surface disturbance, including areas for associated stockpiles, reserve pits, and production facilities.

State Highways 22 and 73 provide access to the proposed wells, connecting to the existing road network and finally to the proposed well access roads. EOG also requests a 100-foot-wide right-of-way (ROW), approximately 0.4 mile in total length for new access roads and natural gas and liquids gathering lines. See attached survey plats for well pad location and proposed road access.

Onsite inspections and resource surveys were conducted on 19 May 2010 and 24 June 2010 to review the proposed pad locations, access road routes, and pipeline routes. During these inspections, final locations of the well pads were determined and the BIA gathered relevant information to develop site-specific mitigation measures that would be incorporated into an approved Application for Permit to Drill (APD). Each well would be drilled as soon as possible after approval of its APD.

To ensure that social, economic, and environmental effects are analyzed accurately, we solicit your views and comments on the proposed action, pursuant to Section 102(2)(D)(IV) of NEPA, as amended. We are interested in developments proposed or underway that should be considered in connection with the proposed project. We also ask your assistance in identifying any property or resources that you own, manage, oversee, or otherwise value that might be adversely impacted. Please send your replies and requests for additional project information to:

SWCA Environmental Consultants  
Chad Baker, Project Manager  
295 Interlocken Boulevard, Suite 300  
Broomfield, Colorado 80021  
(303) 487-1183  
Cbaker@swca.com



July 28, 2010

Page 2

Comments should be submitted before August 28, 2010, so that they may be addressed in the final EA. Questions for the BIA can be directed to Marilyn Bercier, Division Chief, BIA Division of Environmental, Safety, and Cultural Resource Management, at (605) 226-7656.

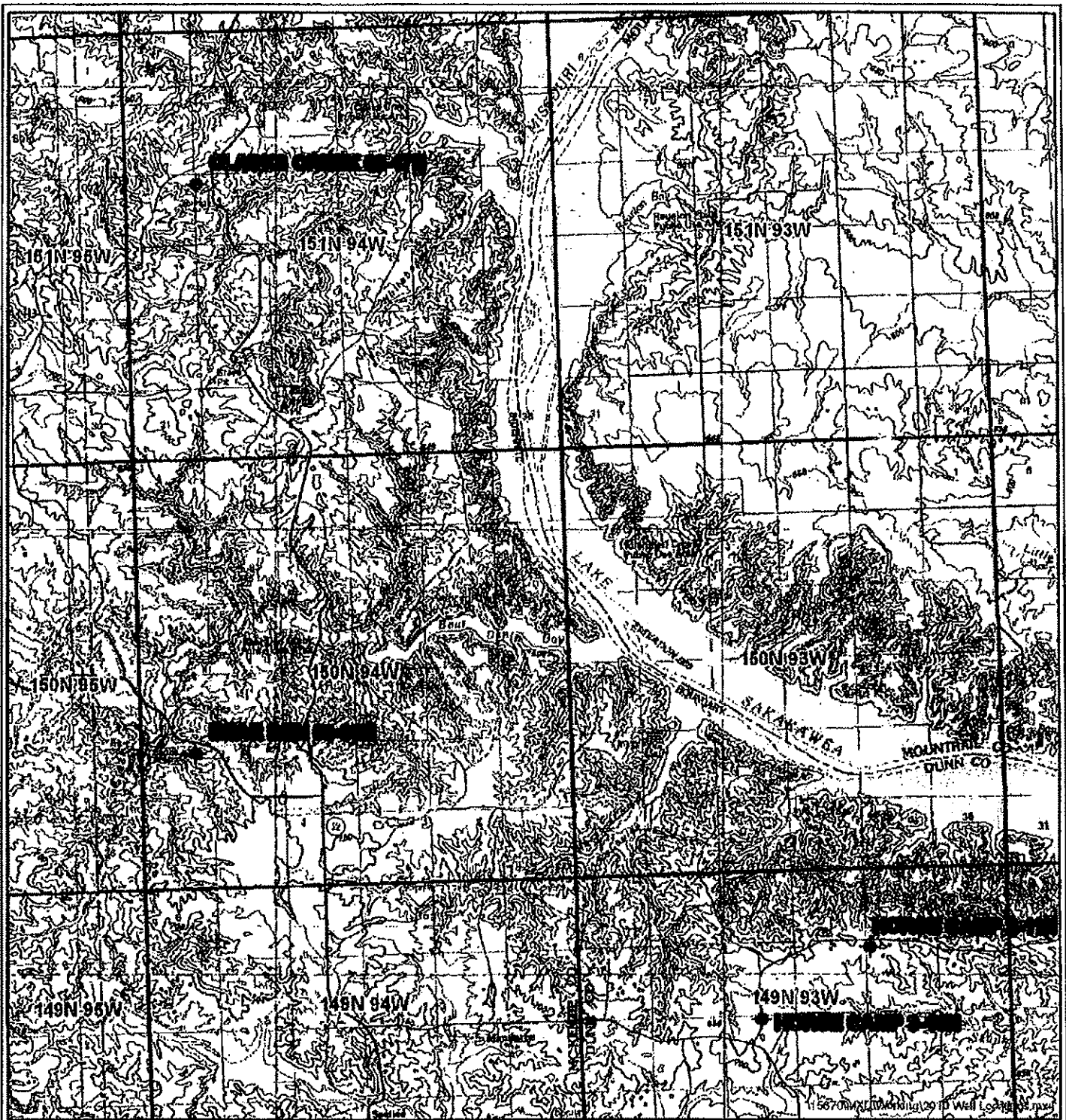
Sincerely,

A handwritten signature in cursive script that reads "Chad Baker".



Chad Baker  
Project Manager

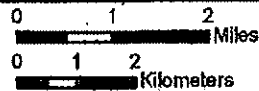






**Legend**

-  Proposed Well
-  Township



Scale: 1:150,000  
 Base Map: USGS 15' Topographic Map  
 Quadrangle: Parshall, ND  
 Township 149-151N Range 92-95W  
 McKenzie County, North Dakota

UTM Zone 13, NAD83, Meters  
 July 19, 2010



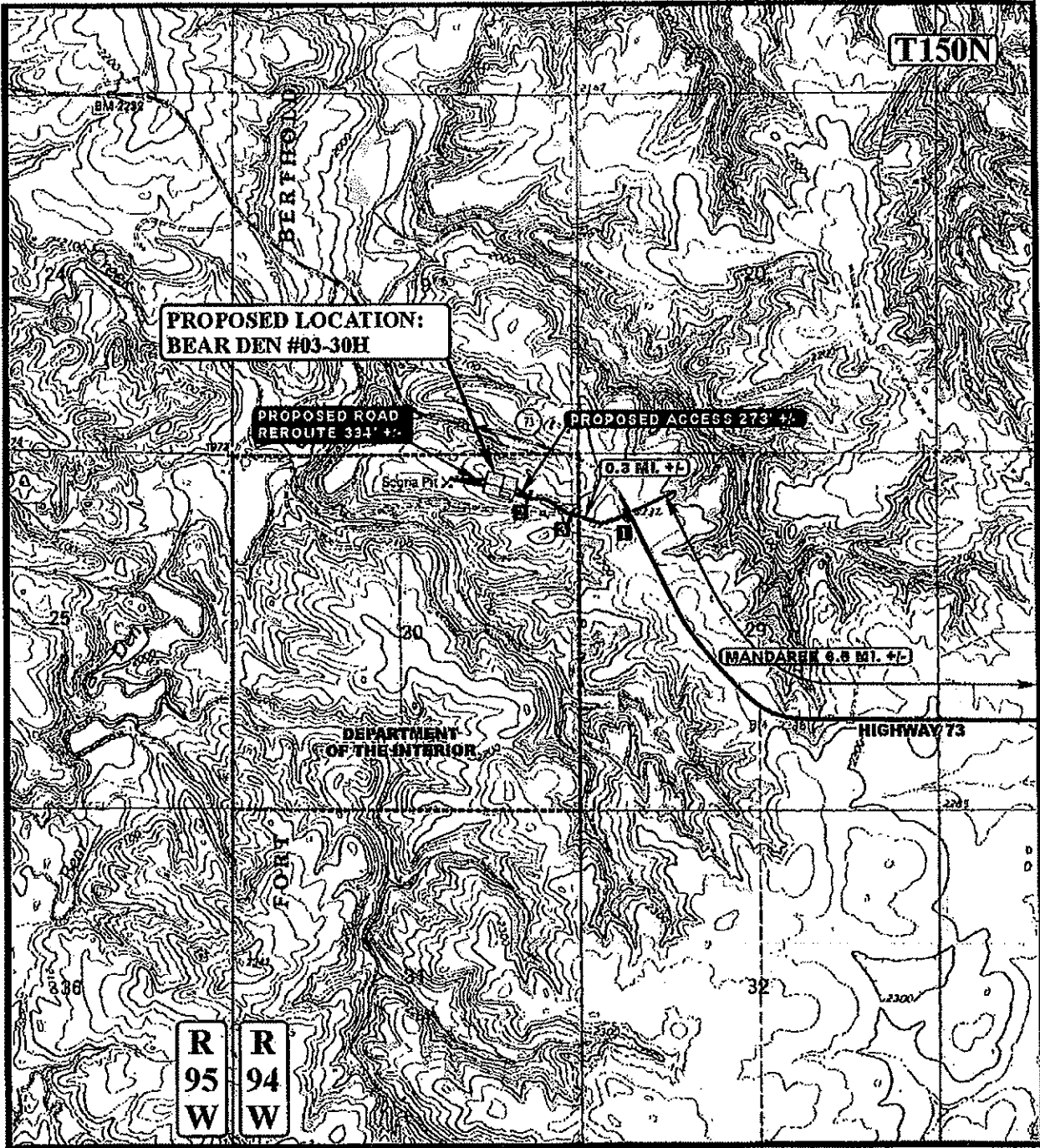
**SWCA**<sup>®</sup>  
 ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd.  
 Suite 300  
 Broomfield, CO 80021

Phone: 303.487.1183  
 Fax: 303.487.1245

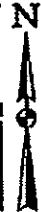
www.swca.com





**LEGEND:**

- EXISTING ROAD
- - - - - PROPOSED ACCESS ROAD
- - - - - PROPOSED ROAD REROUTE
- EXISTING 18" CMP    ■ 18" CMP REQUIRED
- EXISTING CMP NEEDS REPAIR



**EOG RESOURCES, INC.**

**BEAR DEN #03-30H**  
**SECTION 30, T150N, R94W, 5th P.M.**  
**500' FNL 1134' FEL**

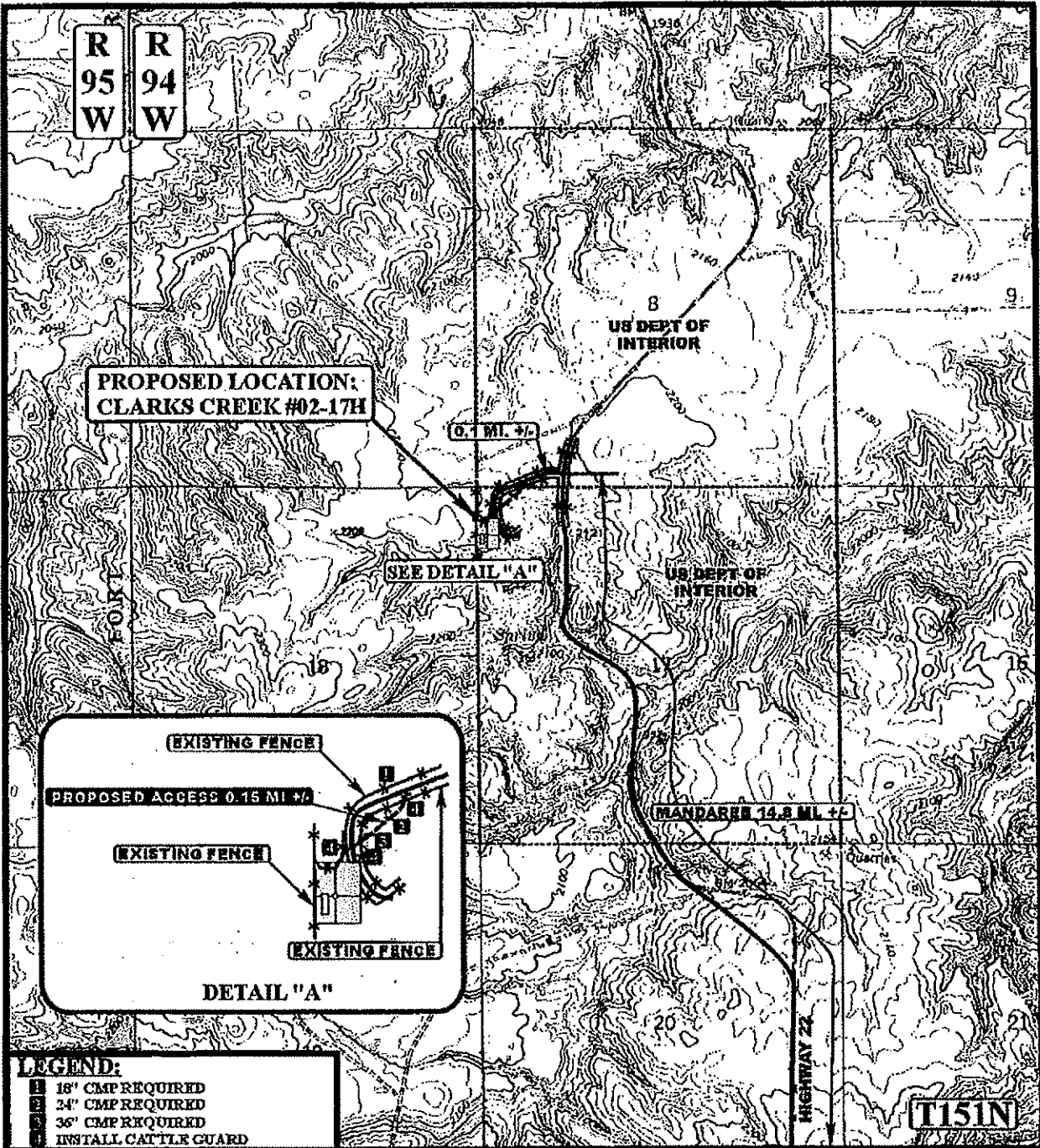


**Utah Engineering & Land Surveying**  
 85 South 200 East Vernal, Utah 84078  
 (435) 789-1017 • FAX (435) 789-1813

**TOPOGRAPHIC** 05 | 14 | 10  
**MAP** MONTH | DAY | YEAR  
 SCALE: 1" = 2000'    DRAWN BY: ZL    REV: JH. 06-16-10







**LEGEND:**

- 1 18" CMP REQUIRED
- 2 24" CMP REQUIRED
- 3 36" CMP REQUIRED
- 4 INSTALL CATTLE GUARD

**LEGEND:**

- EXISTING ROAD
- - - - - PROPOSED ACCESS
- \* \* \* \* \* EXISTING FENCE



**EOG RESOURCES, INC.**

**CLARKS CREEK #02-17H**  
**SECTION 17, T151N, R94W, 5th P.M.**  
**707' FNL 155' FWL**

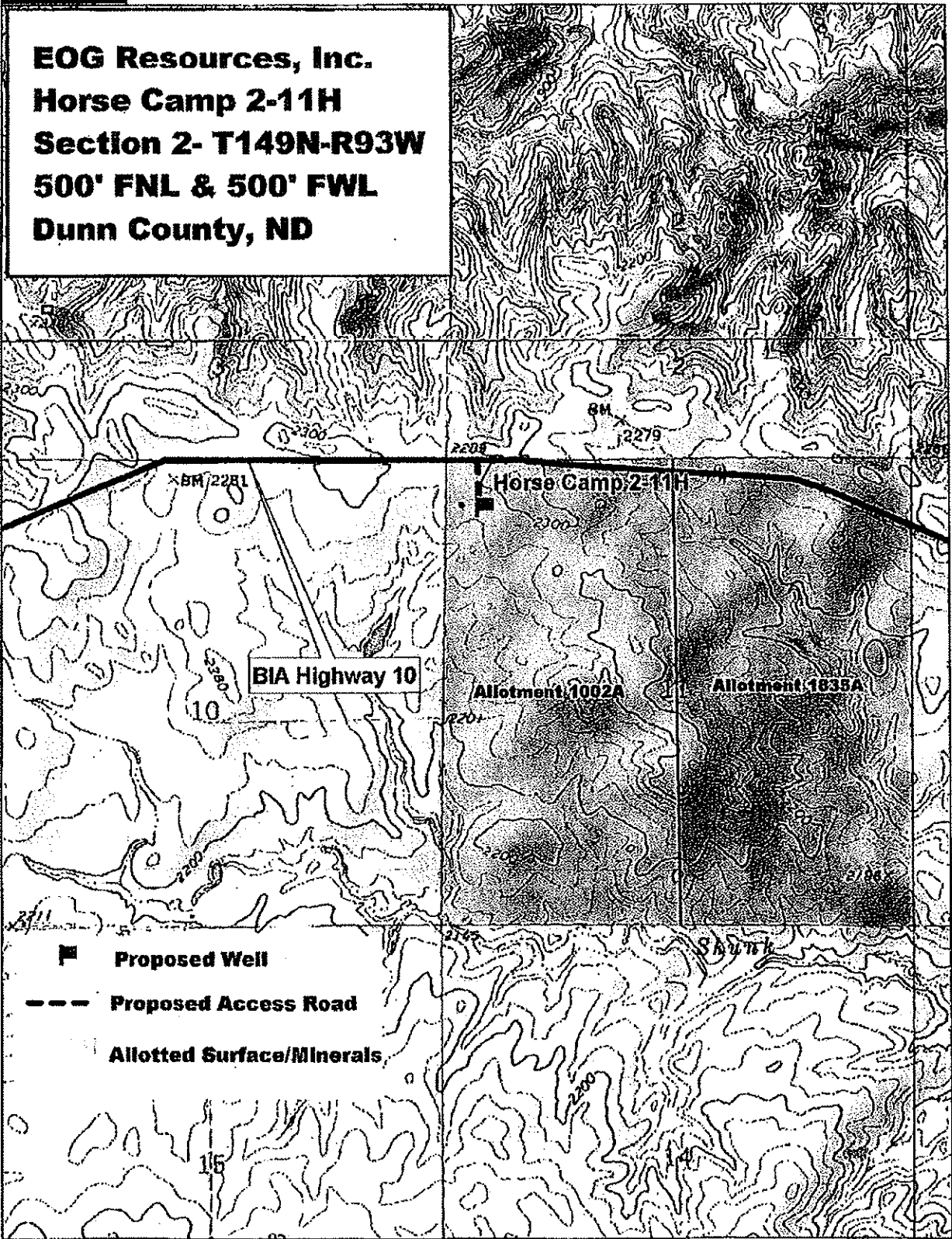
**U&Ls**  
**Utah Engineering & Land Surveying**  
 35 South 200 East Vernal, Utah 84078  
 (435) 789-1017 \* FAX (435) 789-1913

**TOPOGRAPHIC MAP** 04 | 13 | 10  
 MONTH | DAY | YEAR  
 SCALE: 1" = 1000' DRAWN BY: Z.L. REVISED: 00-00-00

**B**  
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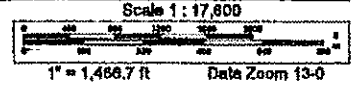


**EOG Resources, Inc.**  
**Horse Camp 2-11H**  
**Section 2- T149N-R93W**  
**500' FNL & 500' FWL**  
**Dunn County, ND**



- Proposed Well**
- Proposed Access Road**
- Allotted Surface/Minerals**






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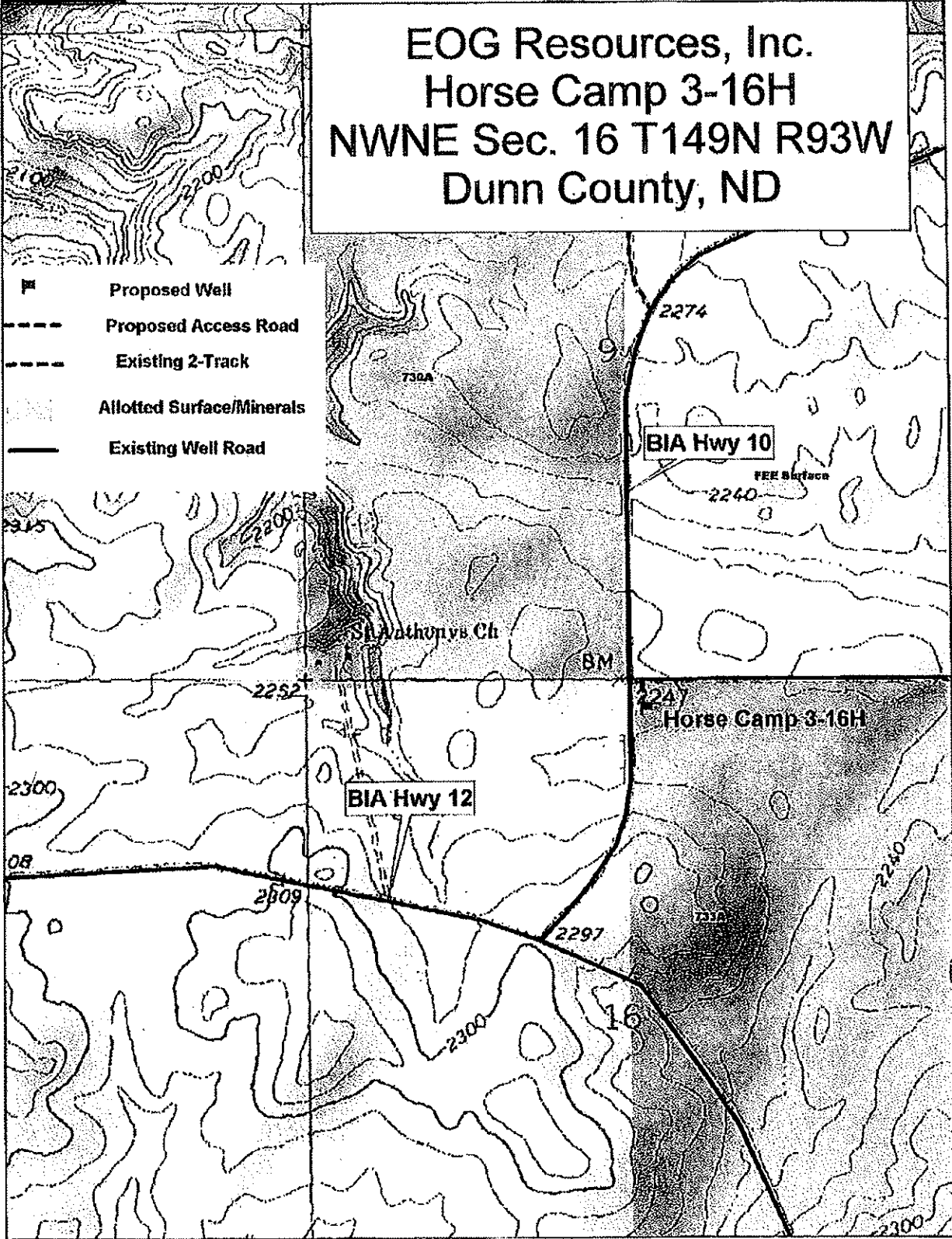




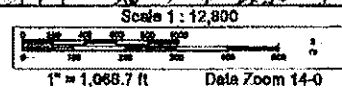


**EOG Resources, Inc.  
 Horse Camp 3-16H  
 NWNE Sec. 16 T149N R93W  
 Dunn County, ND**

-  Proposed Well
-  Proposed Access Road
-  Existing 2-Track
-  Allotted Surface/Minerals
-  Existing Well Road



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**TRIBAL HISTORIC PRESERVATION**

*Mandan Hidatsa Arikara*

Perry 'No Tears' Brady, Director

404 Frontage Road,

New Town, North Dakota 58763

Ph/701-862-2474 fax/701-862-2490

pbrady@mhamation.com

August 20, 2010

SWCA Environmental Consultants  
Chad Baker, Project Manager  
295 Interlocken Boulevard, Suite 300  
Broomfield, Colorado 80021

**RE: Recommendation and Concurrence:**

**As Director of the Tribal Historic Preservation Office and the Tribal Historical Preservation Office representing the Mandan Hidatsa Arikara Nation.**

**I Concur after Review of the Documentation provided by your office, we respectfully request to be notified should any NAGPRA issues arise as the project progresses.**

**Horse Camp #02-11H  
Horse Camp #03-16H  
Bear Den#03-30H  
Clarks Creek #02-17H**

**If your office has any questions or need additional information, you can contact me at (701) 862-2474 or Cell number (701) 421-0547**

Sincerely,

**Perry "No Tears" Brady  
Director of the THPO**

**Cc. file**





REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**CORPS OF ENGINEERS, OMAHA DISTRICT**  
**NORTH DAKOTA REGULATORY OFFICE**  
1613 SOUTH 12<sup>TH</sup> STREET  
BISMARCK ND 58504-6640

August 3, 2010

North Dakota Regulatory Office

[NWO-2010-01702-BIS]

SWCA Environmental Consultants  
Attn: Chad Baker, Project Manager  
295 Interlocken Boulevard, Suite 300  
Broomfield, Colorado 80021

Dear Mr. Baker:

This is in response to your solicitation letter on behalf **EOG Resources, Inc. (EOG)**, received on August 2, 2010 requesting Department of the Army (DA), United States Army Corps of Engineers (Corps) comments on four proposed oil and gas exploratory wells located within the Fort Berthold Indian Reservation. The proposed well pad locations include **Horse Camp #02-11H within Section 11, Township 149 North, Range 93 West, Dunn County, North Dakota, Horse Camp #03-18H within Section 16, Township 149 North, Range 93 West, Dunn County, North Dakota, Bear Den #03-30H within Section 30, Township 150 North, Range 94 West, McKenzie County, North Dakota, and Clarks Creek #02-17H within Section 17, Township 151 North, Range 94 West, McKenzie County, North Dakota.**

Corps Regulatory Offices administer Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Section 10 of the Rivers and Harbors Act regulates work in or affecting navigable waters. This would include work over, through, or under Section 10 water. Section 10 waters in North Dakota include the Missouri River (including Lake Sakakawea and Lake Oahe), Yellowstone River, James River south of Jamestown, North Dakota, Bois de Sioux River, Red River of the North, and the Upper Des Lacs Lake. Section 404 of the Clean Water Act regulates the discharge of dredge or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

For any proposed well where the well line and/or bottom hole is under or crosses under Lake Sakakawea, regardless of depth, we require that project proponent provide a DA permit application (ENG Form 4345) to the Corps.

Enclosed for your information is the fact sheet for Nationwide Permit 12, Utility Line Activities. Pipeline projects are already authorized by Nationwide Permit 12 **provided the utility line can be placed without any change to pre-construction contours and all other proposed construction activities and facilities are in compliance with the Nationwide's permit conditions and 401 Water Quality Certification is obtained**. Please note the pre-construction notification requirements on page 2 of the fact sheet. **If a project involves any one of the seven notification requirements, the project proponent must submit a DA application**. Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 12 and 13 of the fact sheet. [The following info is for activities on a reservation] Please be advised that the United States Environmental Protection Agency (EPA), Region 8 has denied 401 Water Quality Certification for activities in perennial drainages and wetlands. Furthermore, EPA has placed conditions on activities in ephemeral and intermittent drainages. It is recommended you contact the U.S. Environmental Protection



Agency, Region 8, Attn: Brent Truskowski, 1595 Wynkoop Street, Denver, Colorado 80202-1129 to review the conditions pursuant to Section 401 of the Clean Water Act prior to any construction.

Also enclosed for your information is the fact sheet for Nationwide Permit 14, Linear Transportation Projects. Road crossings are already authorized by Nationwide Permit 14 **provided the discharge does not cause the loss of greater than ½ acre of waters of the United States per crossing and all other proposed construction activities are in compliance with the Nationwide's permit conditions**. Please note the pre-construction notification requirements on the front page of the fact sheet. **If a project involves (1) the loss of waters of the United States exceeding 1/10 acre per crossing; or (2) there is a discharge in a special aquatic site, including wetlands, the project proponent must submit a DA application prior to the start of construction.** Please reference General Condition 27, Pre Construction Notification on page 8 of the fact sheet. Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 11 and 12 of the fact sheet. [The following is included for activities on a reservation] Enclosed is a copy of the United States Environmental Protection Agency, Region 8's; General Conditions for all Nationwide Permits and specific conditions for Nationwide Permit 14.

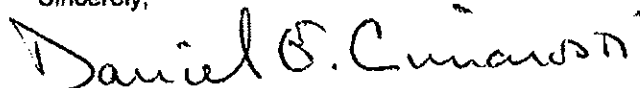
In the event your project requires approval from the U.S. Army Corps of Engineers and cannot be authorized by Nationwide Permit(s), a Standard or Individual Permit will be required. A project that requires a Standard or Individual Permit is intensely reviewed and will require the issuance of a public notice. A Standard or Individual Permit generally requires a minimum of 120 days for processing but based on the project impacts and comments received through the public notice may extend beyond 120 days.

**This correspondence letter is neither authorization for the proposed construction nor confirmation that the proposed project complies with the Nationwide Permit(s).**

If any of these projects require a Section 10 and/or Section 404 permit, please complete and submit the enclosed Department of the Army permit application (ENG Form 4345) to the U.S. Army Corps of Engineers, North Dakota Regulatory Office, 1513 South 12<sup>th</sup> Street, Bismarck, North Dakota 58504. If you are unsure if a permit is required, you may submit an application; include a project location map, description of work, and construction methodology.

If we can be of further assistance or should you have any questions regarding our program, please do not hesitate to contact this office by letter or phone at (701) 255-0015.

Sincerely,



Daniel E. Cimarosti  
Regulatory Program Manager  
North Dakota

Enclosure  
ENG Form 4345  
Fact Sheet NWP 12 and 14  
EPA 401 Conditions for Nationwide Permits

CF w/o encl  
EPA Denver (Brent Truskowski)



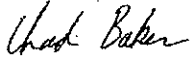


July 28, 2010

Page 2

Comments should be submitted before August 28, 2010, so that they may be addressed in the final EA. Questions for the BIA can be directed to Marilyn Bercier, Division Chief, BIA Division of Environmental, Safety, and Cultural Resource Management, at (605) 226-7656.

Sincerely,



Chad Baker  
Project Manager

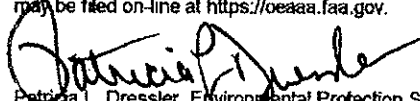


U.S. Department  
of Transportation  
Federal Aviation  
Administration

*SOCA  
4 weeks*

Date 8/4/10

No objection provided the Federal Aviation Administration is notified of construction or alterations as required by Federal Aviation Regulations, Part 77, Objects Affecting Navigable Airspace, Paragraph 77.13. Notice may be filed on-line at <https://oeaaa.faa.gov>.



Patricia L. Dressler, Environmental Protection Specialist  
FAA/Bismarck Airports District Office  
2301 University Drive, Building 23B  
Bismarck, ND 58504





**NORTH DAKOTA**  
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION  
Gold Seal Center, 918 E. Divide Ave.  
Bismarck, ND 58501-1947  
701.328.5200 (fax)  
www.ndhealth.gov



August 9, 2010

SWCA Environmental Consultants  
Chad Baker, Project Manager  
295 Interlocken Boulevard, Suite 300  
Broomfield, CO 80021

Re: Four Exploratory Oil Wells by EOG Resources, Inc.  
Dunn and McKenzie Counties, North Dakota

Dear Mr. Baker:

This department has reviewed the information concerning the above-referenced project submitted under date of July 28, 2010, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Development of the production facilities and any access roads or well pads should have a minimal effect on air quality provided measures are taken to minimize fugitive dust. However, operation of the wells has the potential to release air contaminants capable of causing or contributing to air pollution. We encourage the development and operation of the wells in a manner that is consistent with good air pollution control practices for minimizing emissions.
2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
3. Oil and gas related construction activities located within tribal boundaries within North Dakota may be required to obtain a permit to discharge storm water runoff from the U.S. Environmental Protection Agency. Further information may be obtained from the U.S. EPA website or by calling the U.S. EPA - Region 8 at (303) 312-6312. Also, cities or counties may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

Environmental Health  
Section Chief's Office  
701.328.5150

Division of  
Air Quality  
701.328.5188

Division of  
Municipal Facilities  
701.328.5211

Division of  
Waste Management  
701.328.5166

Division of  
Water Quality  
701.328.5210



Mr. Chad Baker

2.

August 9, 2010

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,



L. David Glat, P.E., Chief  
Environmental Health Section

LDG:cc  
Attach.





**Construction and Environmental Disturbance Requirements**

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

**Soils**

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

**Surface Waters**

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

**Fill Material**

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.







John Hoeven, Governor  
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3  
Bismarck, ND 58503-0649  
Phone 701-328-5357  
Fax 701-328-5363  
E-mail [parkrec@nd.gov](mailto:parkrec@nd.gov)  
[www.parkrec.nd.gov](http://www.parkrec.nd.gov)

August 24, 2010

Chad Baker  
SWCA Environmental Consultants  
295 Interlocken Boulevard, Suite 300  
Broomfield, CO 80021

Re: EOG Resources, Inc. Four Exploratory Oil Wells Proposal

Dear Mr. Baker:

The North Dakota Parks and Recreation Department has reviewed the above referenced project proposal for the completion of four exploratory oil and gas wells located in Section 30, T150N, R94W and Section 17, T151N, R94W, McKenzie County; and Sections 11 and 16, T149N, R93W; Dunn County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Parks and Recreation Department is responsible for coordinating North Dakota's Scenic Byway and Backway Program. This proposed project is in proximity to the Killdeer Mountain Four Bears Scenic Byway and as such we recommend any project development be completed with the least amount of or no visual impact to the immediate and distant views from that Byway. North Dakota Parks and Recreation Department staff should be contacted at 701-328-5355 to assist in mitigation of any potential impacts.

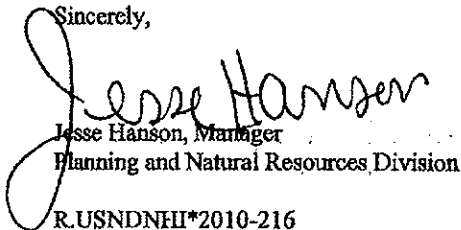
The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historic plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, there are no known occurrences within or adjacent to the project area.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttonhefner (701-328-5370 or [kgduttonhefner@nd.gov](mailto:kgduttonhefner@nd.gov)) of our staff if additional information is needed.

Sincerely,

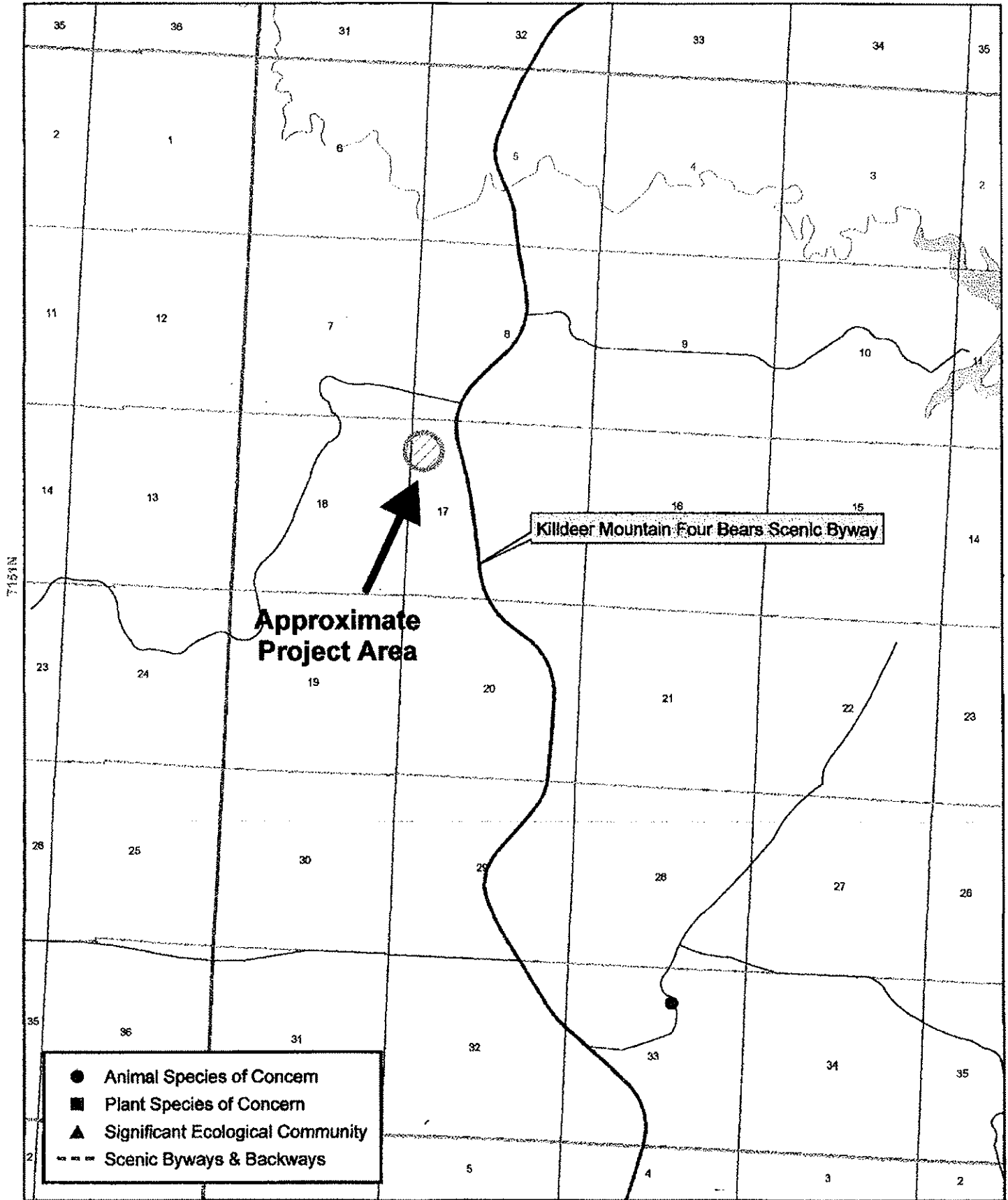
  
Jesse Hanson, Manager  
Planning and Natural Resources Division

R.USNDNHI\*2010-216  
CD/0818/DL0828

.....  
*Play in our backyard!*



# North Dakota Parks and Recreation Department North Dakota Natural Heritage Inventory



R95W R94W

August 2010





**FEMA**

R8-Mitigation

July 6, 2010

Mr. Chad Baker, Project Manager  
SWCA Environmental Consultants  
295 Interlocken Boulevard, Suite 300  
Broomfield, Co 80021

Dear Chad Baker:

Thank you for your inquiry regarding the proposed projects on the Fort Berthold Reservation, Horse Camp #02-11H, #03-162H, Bear Den #03-30H and Clarks Creel #2-17H. FEMA's major concern is if the property is located within a mapped Special Flood Hazard Area, as development in these areas requires further consideration.

We recommend that you contact the local Floodplain Manager, Cliff Whitman, DES Director for the Fort Berthold Reservation at 701-627-4805, to receive further guidelines regarding the impact that these projects might have to the regulations and policies of the National Flood Insurance Program. Considering that floods are the most devastating of all natural disasters in this country, any efforts to reduce the impacts of that hazard is worthwhile.

Let me know if I can be of assistance and please feel free to contact me at 303-235-4721. Thank you for giving us the opportunity to assist you in the impending construction, drilling, completion and production of the wells on the Fort Berthold Reservation.

Sincerely,

A handwritten signature in black ink, appearing to read "David A. Kyner".

David A. Kyner  
NFIP Program Specialist





"VARIETY IN HUNTING AND FISHING"

**NORTH DAKOTA GAME AND FISH DEPARTMENT**

100 NORTH BIGMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5005 PHONE 701-328-6300 FAX 701-328-8352

August 25, 2010

Chad Baker  
Project Manager  
SWCA Environmental Consultants  
295 Interlocken Boulevard, Suite 300  
Broomfield, CO 80021

Dear Mr. Baker:

RE: Horse Camp 02-11H  
Horse Camp 03-16H  
Bear Den 03-30H  
Clarks Creek 02-17H

EOG Resources, Inc. has proposed four exploratory oil and gas wells on the Fort Berthold Indian Reservation in Dunn and McKenzie Counties, North Dakota.

Our primary concern with oil and gas development is the fragmentation and loss of wildlife habitat associated with construction of the well pads and access roads. We recommend that construction be avoided to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.

We also suggest that botanical surveys be completed during the appropriate season and aerial surveys be conducted for raptor nests before construction begins.

Sincerely,

(for) Michael G. McKenna  
Chief  
Conservation & Communication Division

js







# United States Department of the Interior

## BUREAU OF RECLAMATION

Dakotas Area Office

P.O. Box 1017

Bismarck, North Dakota 58502



DK-5000  
ENV-6.00

AUG 4 2010

Mr. Chad Baker  
Project Manager  
SWCA Environmental Consultants  
295 Interlocken Boulevard, Suite 300  
Broomfield, CO 80021

Subject: Solicitation for an Environmental Assessment for the Proposed Construction of Four Exploratory Oil Wells and Associated Facilities by EOG Resources, Inc., on the Fort Berthold Reservation in Dunn and McKenzie Counties, North Dakota

Dear Mr. Baker:

This letter is written to inform you that we received your letter dated July 28, and the information and maps have been reviewed by Bureau of Reclamation staff.

Proposed oil well sites located in Dunn and McKenzie Counties could potentially affect Reclamation facilities in the form of the rural water pipelines of the Fort Berthold Rural Water System. Development of the following four oil wells and associated facilities could potentially impact proposed or existing water pipelines:

Horse Camp No. 02-11H: NW $\frac{1}{4}$ NW $\frac{1}{4}$  section 11, T. 149 N., R. 93 W.  
Horse Camp No. 03-16H: NW $\frac{1}{4}$ NE $\frac{1}{4}$  section 16, T. 149 N., R. 93 W.  
Bear Den No. 03-30H: NE $\frac{1}{4}$ NE $\frac{1}{4}$  section 30, T. 150 N., R. 94 W.  
Clarks Creek No. 02-17H: NW $\frac{1}{4}$ NW $\frac{1}{4}$  section 17, T. 151 N., R. 94 W.

We are providing an index map, detailed maps depicting water pipeline alignments in the vicinity of the proposed well sites, and a copy of our requirements for crossing rural water lines. Since Reclamation is the lead Federal agency for the Fort Berthold Rural Water System, we request that any work planned on the reservation be coordinated with Mr. Lester Crows Heart, Fort Berthold Rural Water Director, Three Affiliated Tribes, 308 4 Bears Complex, New Town, North Dakota 58763.

Thank you for providing the information and opportunity to comment. If you have any further questions, please contact me at 701-221-1288 or Kelly McPhillips at 701-221-1287. Questions concerning water line crossings can be directed to Ryan Waters at 701-221-1262.

Sincerely,

Ronald D. Melhouse  
Environmental Specialist

Enclosure



**Subject: Solicitation for an Environmental Assessment for the Proposed Construction of  
Four Exploratory Oil Wells and Associated Facilities by EOG Resources, Inc. on  
the Fort Berthold Reservation in Dunn and McKenzie Counties, North Dakota**

**cc: Bureau of Indian Affairs  
Great Plains Regional Office  
Attention: Ms. Marilyn Bercier  
Regional Environmental Scientist  
115 Fourth Avenue S.E.  
Aberdeen, SD 57401**

**Mr. Lester Crows Heart  
Fort Berthold Rural Water Director  
Three Affiliated Tribes  
308 4 Bears Complex  
New Town, ND 58763  
(w/encl)**





**STATE  
HISTORICAL  
SOCIETY  
OF NORTH DAKOTA**

John Hoeven  
*Governor of North Dakota*

North Dakota  
State Historical Board

Chester E. Nelson, Jr.  
*Bismarck - President*

Gerold Gerntholz  
*Valley City - Vice President*

Richard Kloubec  
*Fargo - Secretary*

Albert I. Berger  
*Grand Forks*

Calvin Grinnell  
*New Town*

Diane K. Larson  
*Bismarck*

A. Ruric Todd III  
*Jamestown*

Sara Otte Coleman  
*Director  
Tourism Division*

Kelly Schmidt  
*State Treasurer*

Alvin A. Jaeger  
*Secretary of State*

Mark A. Zimmerman  
*Director  
Parks and Recreation Department*

Francis Ziegler  
*Director  
Department of Transportation*

Merlan E. Paaverud, Jr.  
*Director*

*Accredited by the  
American Association  
of Museums since 1986*

August 3, 2010

Mr. Chad Baker  
Project Manager  
295 Interlocken Boulevard, Suite 300  
Broomfield CO 80021

ND SHPO REF. 10-1914 BIA/MHAN Four EOG Resources oil and gas wells and access routes  
Horse Camp 02-11H: In a portion of [T149N R93W Section NW NW] Dunn County  
Horse Camp 03-16H: In a portion of [T149N R93W Section 16 NW NE ¼] Dunn County  
Bear Den 03-30H In a portion of [T150N R94W Section 30 NE NE] McKenzie County  
Clarks Creek 02-17H: In a portion of [T151N R94W Section 17 NW NW] McKenzie County

Dear Mr. Baker,

We received your letter regarding ND SHPO REF. 10-1914 BIA/MHAN Four EOG Resources oil and gas wells and access routes in Dunn and McKenzie Counties, North Dakota, as detailed above.

We request that a copy of cultural resource site forms and reports be sent to this office so that the cultural resources archives can be kept current for researchers. Perhaps one might consider putting TCP (Traditional Cultural Properties) related information in separate reports not sent to this office.

Thank you for your consideration. Consultation is with MHAN THPO. If you have any questions please contact Susan Quinnell, Review & Compliance Coordinator at (701)328-3576 or [squinnell@nd.gov](mailto:squinnell@nd.gov)

Sincerely,

Merlan E. Paaverud, Jr.  
State Historic Preservation Officer (North Dakota)  
and Director, State Historical Society of North Dakota



**From:** Sorensen, Charles G NWO [mailto:Charles.G.Sorensen@usace.army.mil]  
**Sent:** Monday, August 30, 2010 2:30 PM  
**To:** Chad Baker  
**Cc:** Sorensen, Charles G NWO  
**Subject:** Comments on EOG Well Locations on the Fort Berthold Indian Reservation

Mr. Baker

The U.S. Army Corps of Engineers Garrison Dam/Lake Sakakawea Project would like to thank EOG Resources Inc. and SWCA for the opportunity to provide comments regarding the proposed EOG Resources Inc. Horse Camp # 2, Horse Camp # 3 Bear Den # 3 and the Clarks Creek well locations as listed in your letter dated July 28, 2010.

The USACE would request that EOG Resources Inc. Resource Corporation North Dakota consider the construction/establishment of a catch trench located on the down sloping side of the well pad. Said trench would help in containing any hazardous wastes from the well pad. Those fluids that accumulate in the trench should be pumped out and disposed of properly

To aid in the prevention of hazardous wastes from possibly entering Lake Sakakawea and contamination to lands managed by the U.S. Army Corps of Engineers, the Garrison Dam/Lake Sakakawea Project strongly recommends that a Closed Loop Drilling Method be used in the exploration phase of the aforementioned wells.

Should living quarters be established onsite it is requested that all sewage collection systems be of a closed design and all holding tanks are to be either double walled or contained in a secondary containment system. All sewage waste removed from the well site location should be disposed of properly.

That all additional fill material required for the construction of the well pad is obtained from a private supplier whose material has been certified as being free of all noxious weeds.

That prior to the drilling rig and associated equipment be placed that said equipment be either pressure washed or air blasted off Tribal lands to prevent the possible transportation of noxious or undesirable vegetation onto Tribal lands

That no surface occupancy be allowed within ½ mile of any known Threatened or Endangered Species critical habitat.

If you have any questions regarding the above recommendations please feel free to contact me

Charles Sorensen  
Natural Resource Specialist  
U.S. Army Corps of Engineers  
Garrison Dam/Lake Sakakawea Project

Riverdale, North Dakota Office  
(701) 654 7411 ext 232





United States Department of Agriculture



Natural Resources Conservation Service  
P.O. Box 1458  
Bismarck, ND 58502-1458

---

August 18, 2010

SWCA Environmental Consultants  
Chad Baker, Project Manager  
295 Interlocken Boulevard, Suite 300  
Broomfield, Colorado 80021

RE: Horse Camp #02-11H  
Horse Camp #03-16H  
Bear Den #03-30H  
Clarks Creek #02-17H  
Dunn and McKenzie Counties, ND

Dear Mr. Baker:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated July 28, 2010, concerning the construction, drilling, completion, and production of four exploratory oil wells and associated facilities on the Fort Berthold Indian Reservation by EOG Resources, Inc. (EOG). These sites are located in Dunn and McKenzie Counties, North Dakota.

NRCS has a major responsibility with the Farmland Protection Policy Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. It appears your proposed project is not supported by federal funding or actions; therefore, FPPA does not apply and no further action is needed.

The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. The NRCS has developed the following guidelines for the installation of permanent structures where wetlands occur. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.



Mr. Baker

Page 2

NRCS would recommend that impacts to wetlands be avoided. If the installment of permanent structures requires passage through a wetland, NRCS can complete a certified wetland determination if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, Liaison Soil Scientist, NRCS, Bismarck, ND at 701-530-2019.

Sincerely,

A handwritten signature in cursive script, appearing to read "Paul J. Sweeney".

PAUL J. SWEENEY  
State Conservationist

cc:

Susan Tuhy, DC, NRCS, Killdeer, ND

Kyle Hartel, DC, NRCS, Watford City, ND

Terrance Gisvold, ASTC (FO), NRCS, Dickinson, ND





**DEPARTMENT OF THE ARMY**  
**CORPS OF ENGINEERS, OMAHA DISTRICT**  
1616 CAPITOL AVENUE  
OMAHA NE 68102-4901

REPLY TO  
ATTENTION OF

August 6, 2010

Planning, Programs, and Project Management Division

Mr. Chad Baker  
SWCA Environmental Consultants  
295 Interlocken Boulevard, Suite 300  
Broomfield, Colorado 80021

Dear Mr. Baker:

The U.S. Army Corps of Engineers, Omaha District (Corps) has reviewed your letter dated July 28, 2010, regarding the proposed drilling and completion of four exploratory oil and gas wells at four pad locations on the Fort Berthold Reservation Dunn and McKenzie Counties, North Dakota. The Corps offers the following comments:

Since the proposed project does not appear to be located within Corps owned or operated lands, we are providing no floodplain or flood risk information. To determine if the proposed project may impact areas designated as a Federal Emergency Management Agency special flood hazard area, please consult the following floodplain management office:

North Dakota State Water Commission  
Attention: Jeff Klein  
900 East Boulevard Avenue  
Bismarck, North Dakota 58505-0850  
jjkein@nd.gov  
T-701-328-4898  
F-701-328-3747

Your plans should be coordinated with the U.S. Environmental Protection Agency, which is currently involved in a program to protect groundwater resources. If you have not already done so, it is recommended you consult with the U.S. Fish and Wildlife Service and the North Dakota Game and Fish Department regarding fish and wildlife resources. In addition, the North Dakota State Historic Preservation Office should be contacted for information and recommendations on potential cultural resources in the project area.

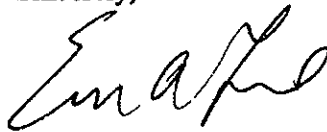
Any proposed placement of dredged or fill material into waters of the United States (including jurisdictional wetlands) requires Department of the Army authorization under Section 404 of the Clean Water Act. You can visit the Omaha District's Regulatory website for permit applications and related information. Please review the information on the provided web site (<https://www.nwo.usace.army.mil/html/od-r/district.htm>) to determine if this project requires a 404 permit. For a detailed review of permit requirements, preliminary and final project plans should be sent to:



U.S. Army Corps of Engineers  
Bismarck Regulatory Office  
Attention: CENWO-OD-R-ND/Cimarosti  
1513 South 12th Street  
Bismarck, North Dakota 58504

If you have any questions, please contact Mr. John Shelman of my staff at (402) 995-2708.

Sincerely,



*for* Brad Thompson  
Chief, Environmental Resources and Missouri Recovery  
Program and Plan Formulation, Planning Branch  
Planning, Programs and Project Management Division







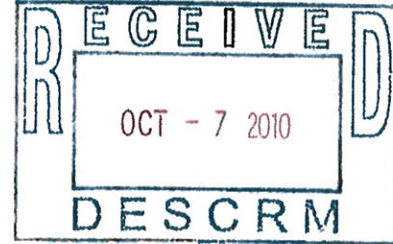
**TRIBAL HISTORIC PRESERVATION**

*Mandan Hidatsa Arikara*

Perry 'No Tears' Brady, Director.  
404 Frontage Road,  
New Town, North Dakota 58763  
Ph/701-862-2474 fax/701-862-2490

[pbrady@mhanation.com](mailto:pbrady@mhanation.com)

October 4, 2010



Dr. Carson Murdy  
BIA  
Great Plains Regional Office  
115 Fourth Avenue S, E,  
Aberdeen, South Dakota 57401

**RE: BIA Case Number AAO-1739/FB/10**

Mr. Murdy

After review of the documentation provided by your Office, the Mandan Hidatsa Arikara Nations Tribal Historic Preservation Office determines there will be 'No Adverse Affect/No Historic Properties Affected' to regard to any Pre and post-historic relics, artifacts or sacred In addition, cultural resources in the proposed Project area this Office *concurs with BIA Case number AAO-1739/FB/10*

**Higgins, Courtney, and Nancy Eisenhower**

**(2010) A Class I and Class III cultural Resource Inventory of the Horse Camp 3-16H Well Pad and Access Road Alternate Location on the Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants For EOG Resources, Inc., Denver.**

We respectfully request to be notified should any cultural/tribal issue or others arise as the Project progresses. If you have any questions or need additional information please feel free to contact this office at any time.

Sincerely,

Perry 'No Tears' Brady  
Director of the Mandan Hidatsa, & Arikara Nation





**TRIBAL HISTORIC PRESERVATION**

*Mandan Hidatsa Arikara*

Perry 'No Tears' Brady, Director

404 Frontage Road,

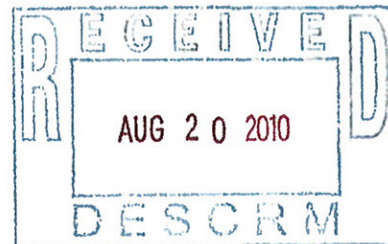
New Town, North Dakota 58763

Ph/701-862-2474 fax/701-862-2490

ptbrady@mhahakion.com

2010 AUG 19 AM 9:11

B. I. A. REGIONAL  
DIRECTOR'S OFFICE  
GREAT PLAINS



August 16, 2010

Bureau of Indian Affairs  
Great Plains Regional Office  
315 Fourth Avenue S.E.  
Aberdeen, South Dakota 57401

RE: Recommendation and Concurrence:

As Director of the Tribal Historic Preservation Office and the Tribal Historical Preservation Officer representing the Mandan Hidatsa Arikara Nation I Concur with, BIA Case Number AO-1739/FB/10

Higgins, Courtney  
(2010) a Class I and Class III Cultural Resource Inventory of the EOG Bear Den 3-30 Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota SWCA Environmental Consultants for EOG Resources, Inc., Denver.

We respectfully request to be notified should any NAGPRA issues arise as the Project progresses also we advise all company to at least stay 75 ft. from identified sites.

If you have any questions or need additional information, you can contact me at (701) 421-2474

Sincerely,

Perry "No Tears" Brady  
Director

Cc.file

Route	Initial	Date
___ Regional Director	___	___
✓ Deputy Regional Director 102	___	8/19/10
___ Deputy Regional Director	___	___
✓ 208	___	___
___	___	___





**TRIBAL HISTORIC PRESERVATION**

*Mandan Hidatsa Arikara*

Perry 'No Tears' Brady, Director

404 Frontage Road,

New Town, North Dakota 58763

Ph/701-862-2474 fax/701-862-2490

pbrady@nhdhpo.com

August 18, 2010

Dr. Carson Murdy  
Great Pains Regional Office  
115 Fourth Ave. S.E.  
Aberdeen, South Dakota 57401

**RE: Recommendation and Concurrence:**

As Director of the Tribal Historic Preservation Office and the Tribal Historical Preservation Officer representing the Mandan Hidatsa Arikara Nation I concur with the, **BIA Case Number AAO-1739/FB/10**

**Higgins, Courtney**

**(2010) A Class I and Class III Cultural Resource Inventory of the EOG Clark Creek 2-17H Well Pad And Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.**

If you have, any further question please contact this office at anytime and the office number (701) 862-2474 or cell number (701) 421-0547

Sincerely,

A handwritten signature in black ink, appearing to read "Perry Brady", written in a cursive style.

Perry ("No Tears") Brady  
Director of the THPO

Cc. file





# United States Department of the Interior

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



IN REPLY REFER TO:  
DESCRM  
MC-208

SEP 29 2010

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of an oil well pad in Dunn County, North Dakota. Approximately 13.76 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. One archaeological site (32DU1471) was revisited which may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (42 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking, as the archaeological site will be avoided. Catalogued as **BIA Case Number AAO-1739/FB/10**, the proposed undertaking, location, and project dimensions are described in the following report:

Higgins, Courtney, and Nancy Eisenhauer  
(2010) A Class I and Class III cultural Resource Inventory of the Horse Camp 2-11H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.

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

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

Sincerely,

Regional Director

Enclosure

cc: Chairman, Three Affiliated Tribes  
Superintendent, Fort Berthold Agency







# United States Department of the Interior

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



IN REPLY REFER TO:  
DESCRM  
MC-208

SEP 29 2010

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of an oil well pad in Dunn County, North Dakota. Approximately 10.49 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. No historic Properties were located which appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (42 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking. Catalogued as **BIA Case Number AAO-1739/FB/10**, the proposed undertaking, location, and project dimensions are described in the following report:

Higgins, Courtney, and Nancy Eisenhauer  
(2010) A Class I and Class III cultural Resource Inventory of the Horse Camp 3-16H Well Pad and Access Road Alternate Location on the Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.

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

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

Sincerely,

Regional Director

Enclosure

cc: Chairman, Three Affiliated Tribes  
Superintendent, Fort Berthold Agency





# United States Department of the Interior

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



IN REPLY REFER TO:  
DESCRM  
MC-208

AUG 12 2010

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of an oil well pad in McKenzie County, North Dakota. Approximately 9.39 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. One archaeological site (32MZ2086) was located which may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (42 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking, as site 32MZ2086 will be avoided. Catalogued as **BIA Case Number AAO-1739/FB/10**, the proposed undertaking, location, and project dimensions are described in the following report:

Higgins, Courtney  
(2010) A Class I and Class III Cultural Resource Inventory of the EOG Bear Den 3-30H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.

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

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

Sincerely,

ACTING  
Regional Director

Enclosure

cc: Chairman, Three Affiliated Tribes  
Superintendent, Fort Berthold Agency





# United States Department of the Interior

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



IN REPLY REFER TO:  
DESCRM  
MC-208

AUG 05 2010

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of an oil well pad in McKenzie County, North Dakota. Approximately 9.39 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. Although one archaeological site (32MZ666) was found once again, it did not appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (42 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking. Catalogued as **BIA Case Number AAO-1739/FB/10**, the proposed undertaking, location, and project dimensions are described in the following report:

Higgins, Courtney

(2010) A Class I and Class III Cultural Resource Inventory of the EOG Clarks Creek 2-17H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota.  
SWCA Environmental Consultants for EOG Resources, Inc., Denver.

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

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

Sincerely,

Acting

Regional Director

Enclosure

cc: Chairman, Three Affiliated Tribes  
Superintendent, Fort Berthold Agency





**TRIBAL HISTORIC PRESERVATION**

*Mandan Hidatsa Arikara*

Perry 'No Tears' Brady, Director.

404 Frontage Road,

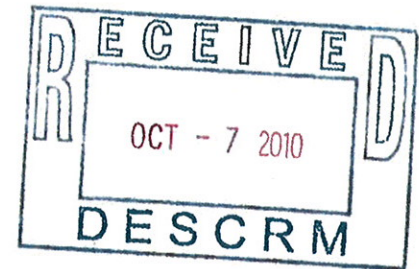
New Town, North Dakota 58763

Ph/701-862-2474 fax/701-862-2490

[pbrady@mhanation.com](mailto:pbrady@mhanation.com)

October 4, 2010

Dr. Carson Murdy  
BIA  
Great Plains Regional Office  
115 Fourth Avenue S, E,  
Aberdeen, South Dakota 57401



**RE: BIA Case Number AAO-1739/FB/10**

Mr. Murdy

After review of the documentation provided by your Office, the Mandan Hidatsa Arikara Nations Tribal Historic Preservation Office determines there will be 'No Adverse Affect/No Historic Properties Affected' to regard to any Pre and post-historic relics, artifacts or sacred In addition, cultural resources in the proposed Project area this Office *concur with BIA Case number AAO-1739/FB/10*

**Higgins, Courtney, and Nancy Eisenhower  
(2010) A Class I and Class III cultural Resource Inventory of the Horse Camp 2-11H  
Well Pad and Access Road, Fort Berthold Reservation, Dunn County, North  
Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver**

We respectfully request to be notified should any cultural/tribal issue or others arise as the Project progresses. If you have any questions or need additional information please feel free to contact this office at any time.

Sincerely,

Perry 'No Tears' Brady  
Director of the Mandan Hidatsa, & Arikara Nation







# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
3425 Miriam Avenue  
Bismarck, North Dakota 58501



NOV 23 2010

Mr. Chad Baker, Project Manager  
SWCA Environmental Consultants  
295 Interlocken Boulevard., Suite 300  
Broomfield, Colorado 80021

Re: Request for Review and Concurrence  
on EOG Proposed Well Horse Camp  
02-11H and Horse Camp 03-16H,  
Dunn County, North Dakota

Dear Mr. Baker:

This is in response to a scoping letter and a series of emails and telephone conversations regarding your request for review and concurrence for two proposed exploratory oil and gas wells on four well pads, proposed to be drilled and completed by EOG Resources, Inc. (EOG) on the Fort Berthold Reservation, Dunn County, North Dakota. On July 28, 2010, SWCA Environmental Consultants (SWCA) submitted a scoping letter for multiple well pad sites. The U.S. Fish and Wildlife Service (Service) responded via email on August 27, 2010. On October 21, 2010, Ms. Heather Smith of EOG contacted Ms. Heidi Riddle of my staff with questions and concerns regarding measures that the Service had recommended for the protection of whooping cranes. This letter includes our response to the measure agreed upon by EOG and the Service.

Specific locations for the proposed pads are:

- **Horse Camp #02-11H:** NW¼ NW¼, Section 11, T. 149 N., R. 93 W., Dunn County, North Dakota
- **Horse Camp #03-16H:** NW¼ NE¼, Section 16, T. 149 N., R. 93 W., Dunn County, North Dakota

We offer the following comments under the authority of and in accordance with 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).



## **Threatened and Endangered Species**

In an e-mail dated October 13, 2009, the Bureau of Indian Affairs (BIA) designated SWCA Environmental Consultants (SWCA) to represent the BIA for informal Section 7 consultation under the ESA. Therefore, the U.S. Fish and Wildlife Service (Service) is responding to you as the designated non-Federal representative for the purposes of ESA, and under our other authorities as the entity preparing the NEPA document for adoption by the BIA.

As stated in our August 27, 2010, email, the Service concurs with your “may affect, not likely to adversely affect” determination for piping plovers, interior least tern, and pallid sturgeon. This concurrence is predicated on EOG’s proposed placement of the Horse Camp 02-11H and Horse Camp 03-16H approximately 2.0 and 3.0 miles from Lake Sakakawea, respectively.

The Service concurs with your “may affect, is not likely to adversely affect” determination for whooping cranes. This concurrence is predicated on EOG’s commitment to notify the Service if there is a confirmed sighting of a whooping crane within one mile of the project area. EOG will cease construction if a whooping crane is observed within one mile of the project area. A confirmed sighting includes sightings that are confirmed by EOG personnel who have been trained in a formal program on the field identification of whooping cranes sponsored by EOG.

The Service acknowledges your no effect determination for gray wolf and black-footed ferret.

The Dakota skipper and Sprague’s pipit are candidate species for listing under the ESA; therefore, an effects determination is not necessary for these species.

## **Migratory Birds and Bald and Golden Eagle Protection Act**

Your correspondence states that EOG will implement the following measures to avoid/minimize take of migratory birds:

- Construction will be done outside of the migratory bird nesting season (Feb. 1-July 15);
- Or, vegetation within the construction ROW will be regularly mowed to discourage nesting by migratory birds;
- Or, surveys will be conducted for nesting migratory birds within five days of construction. The Service will be contacted for additional guidance if any birds/nests are found.

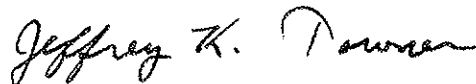
No known bald or golden eagle nests are known within 0.5 mile of the proposed project sites. EOG is also committed to conducting eagle nest surveys within 0.5 mile of the project areas, and will contact the Service if any nests are discovered.



The Service believes that EOG's commitment to implement the aforementioned measures does demonstrate compliance with the MBTA and the BGEPA.

Thank you for the opportunity to comment on this EA. If you require further information or the project plans change, please contact me or Heidi Riddle of my staff at (701) 250-4481 or at the letterhead address.

Sincerely,



Jeffrey K. Towner  
Field Supervisor  
North Dakota Field Office

cc: Bureau of Indian Affairs, Aberdeen  
(Attn: Marilyn Bercier)  
Bureau of Land Management, Dickinson  
Director, ND Game & Fish Department, Bismarck

# **Notice of Availability and Appeal Rights**

**EOG: Horse Camp #02-11H, Horse Camp #03-16H, Bear Den #03-30H,  
and Clarks Creek #02-17H**

**The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to installation of four well pads with up to 10 wells as shown on the attached map. Construction by EOG Resources is expected to begin in the Winter 2010.**

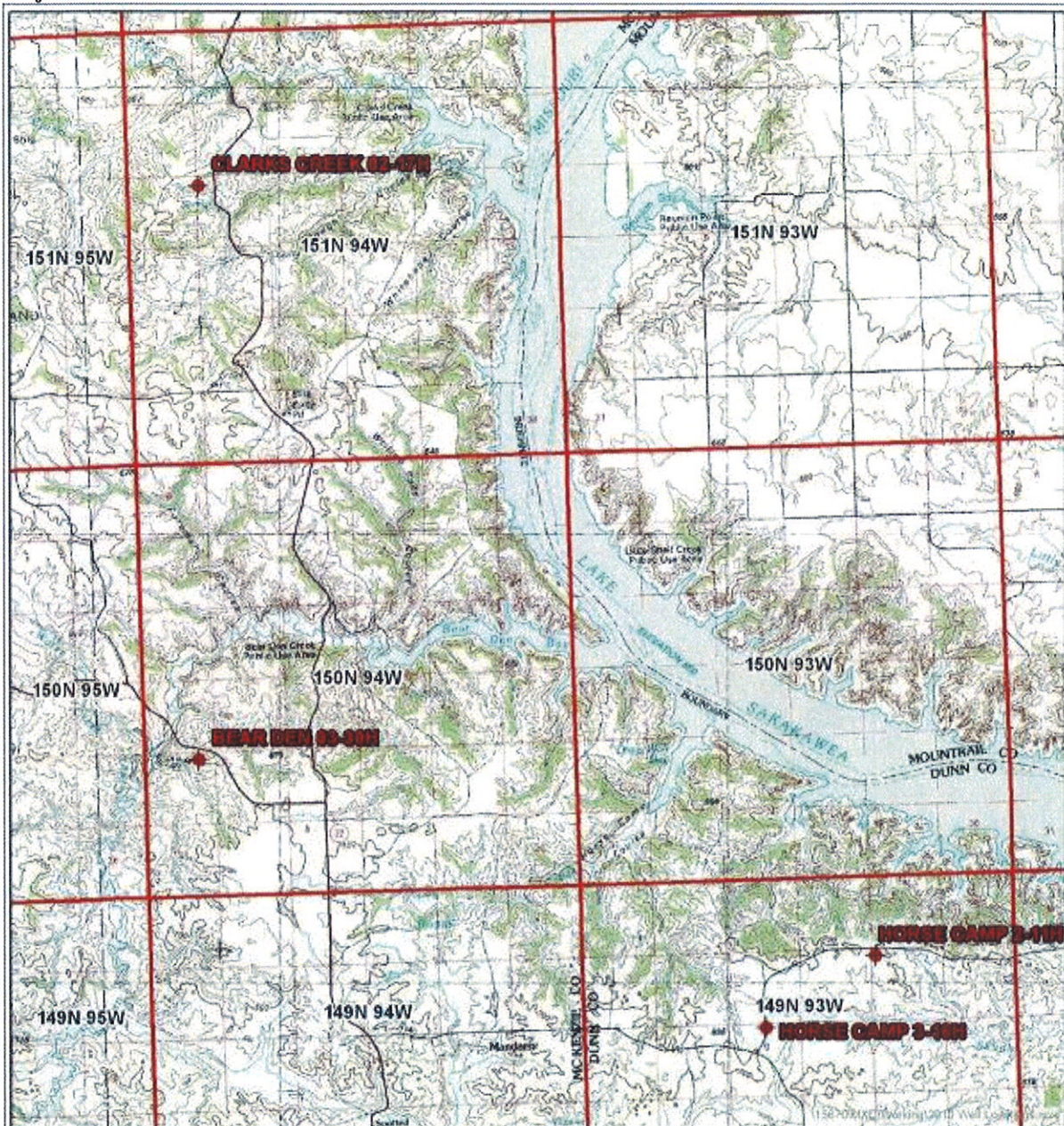
**An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No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

**The FONSI is only a finding on environmental impacts – it is not a decision to proceed with an action and *cannot* be appealed. BIA's decision to proceed with administrative actions *can* be appealed until December 29, 2010 by contacting:**

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

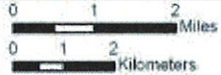
**Procedural details are available from the BIA Fort Berthold Agency at 701-627-4707.**

**Project locations.**



**Legend**

- ◆ Proposed Well
- Township



Scale: 1:150,000  
 Base Map: USGS 15' Topographic Map  
 Quadrangle: Parshall, ND  
 Township 149-151N Range 92-95W  
 McKenzie County, North Dakota

UTM Zone 13, NAD83, Meters  
 July 19, 2010



**SWCA**  
 ENVIRONMENTAL CONSULTANTS

295 Interlocken Blvd.  
 Suite 300  
 Broomfield, CO 80021

Phone: 303.487.1183  
 Fax: 303.487.1245  
[www.swca.com](http://www.swca.com)