



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

DEC 18 2009

MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: ^{Acting} Regional Director, Great Plains Region

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for the proposed Five Exploratory Oil Wells; Mandaree 09-04H, Mandaree 11-06H, Mandaree 03-08H, Mandaree 01-10H and Mandaree 07-17H 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: Marcus Levings, Chairman, Three Affiliated Tribes (with attachment)
Perry "No Tears" Brady, THPO (with attachment)
Roy Swalling, Bureau of Land Management (with attachment)
Jonathon Shelman, Corps of Engineers (with attachment)

Finding of No Significant Impact

EOG Resources, Inc.

Proposed Five Exploratory Oil Wells:

Mandaree 09-04H

Mandaree 11-06H

Mandaree 03-08H

Mandaree 01-10H

Mandaree 07-17H

Fort Berthold Indian Reservation

McKenzie County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal drill and complete five exploratory wells on the Fort Berthold Indian Reservation (Reservation) located in the Section 4, Township 149 North, Range 94 West, Section 6, T149N, R94W, Section 8, T149N, R94W, Section 10, T149N, R94W and Section 17, T149N, R94W. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

1. Agency and public involvement was solicited and environmental issues related to the proposal were identified.
2. Protective and prudent measures were designed to minimize impacts to air, water, soil, vegetation, wetlands, wildlife, public safety, water resources, and cultural resources. The remaining potential for impacts was disclosed for both the proposed action and the No Action alternative.
3. Guidance from the U.S. Fish and Wildlife Service has been fully considered regarding wildlife impacts, particularly in regard to threatened or endangered species.
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.

ACW:mg


Regional Director

Date

12/18/09

ENVIRONMENTAL ASSESSMENT

**United States Department of 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.

Five Exploratory Oil Wells:

**Mandaree 09-04H
Mandaree 11-06H
Mandaree 03-08H
Mandaree 01-10H
Mandaree 07-17H**

Fort Berthold Indian Reservation

December 2009

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

TABLE OF CONTENTS

	<u>Page</u>
1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION.....	1
2.0 PROPOSED ACTION AND ALTERNATIVES.....	4
2.1 Access Roads.....	5
2.2 Well Pads.....	6
2.3 Drilling.....	9
2.4 Casing and Cementing.....	9
2.5 Completion and Evaluation.....	10
2.6 Commercial Production.....	10
2.6.1 Production Facilities.....	10
2.6.2 Production Traffic.....	10
2.7 Construction Details at Individual Sites.....	11
2.7.1 Mandaree 09-04H.....	11
2.7.2 Mandaree 11-06H.....	14
2.7.3 Mandaree 03-08H.....	16
2.7.4 Mandaree 01-10H.....	19
2.7.5 Mandaree 07-17H.....	21
2.8 Reclamation.....	24
2.8.1 Interim Reclamation.....	24
2.8.2 Final Reclamation.....	24
2.9 Resource Protection Measures and Commitments.....	26
2.10 Total Surface Disturbance.....	27
2.11 Personnel Requirements and Scheduling.....	29
2.12 Preferred Alternative.....	29
3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS.....	30
3.1 The No Action Alternative.....	31
3.2 Air Quality.....	31
3.2.1 Criteria Pollutants.....	32
3.2.2 Project Emissions.....	34
3.2.3 Regulatory Emission Controls.....	34
3.3 Public Health and Safety.....	35
3.4 Water Resources.....	37
3.4.1 Surface Water.....	37
3.4.2 Groundwater.....	40
3.5 Wetlands, Habitat, and Wildlife.....	41
3.5.1 Wetlands.....	41
3.5.2 Wildlife.....	44
3.6 Soils.....	47
3.6.1 Natural Resources Conservation Service Soil Data.....	47
3.6.2 Field-derived Soil Data.....	49
3.6.3 Conclusions Regarding Soil Erodibility and Feasibility.....	56
3.7 Vegetation and Invasive Species.....	58
3.8 Cultural Resources.....	59
3.9 Socioeconomics.....	59
3.9.1 Population.....	61

**TABLE OF CONTENTS
(continued)**

	<u>Page</u>
3.9.2 Employment	61
3.9.3 Income	62
3.9.4 Housing	62
3.10 Environmental Justice	63
3.11 Mitigation and Monitoring	65
3.12 Irreversible and Irrecoverable Commitment of Resources	65
3.13 Short-Term Use versus Long-Term Productivity	65
3.14 Cumulative Impacts	66
4.0 CONSULTATION AND COORDINATION	71
5.0 REFERENCES	79
6.0 ACRONYMS AND ABBREVIATIONS	82
7.0 NRCS SOIL SERIES SUMMARY	84

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Proposed well locations	2
2. Typical road cross sections (USDI and USDA 2007)	8
3. Mandaree 09-04H well pad area, view facing east.	12
4. Mandaree 09-04H access road at Highway 22, view facing west	12
5. Mandaree 09-04H proposed surface and bottom hole locations	13
6. Mandaree 11-06H well pad area, view facing north.	14
7. Mandaree 11-06H proposed surface and bottom hole locations	15
8. Mandaree 11-06H access road area, view facing east	16
9. Mandaree 03-08H well pad area, view facing west.	17
10. Mandaree 03-08H access road area, view facing northeast.	17
11. Mandaree 03-08H proposed surface and bottom hole locations	18
12. Mandaree 01-10H well pad area, view facing southeast	19
13. Mandaree 01-10H proposed surface and bottom hole locations	20
14. Mandaree 01-10H access road area, view facing northwest towards Mandaree 09-04. .	21
15. Mandaree 07-17H well pad area, view facing east.	22
16. Mandaree 07-17H access road area, view facing east	22
17. Mandaree 07-17H proposed surface and bottom hole locations	23
18. Example of reclamation from the BLM Gold Book (USDI and USDA 2007)	25
19. Watersheds, surface runoff direction, and aquifers near the project area.	38
20. Drainage direction from each of the proposed well pads	39
21. Approximate spatial extent of soil types within and around Mandaree 09-04H	50
22. Approximate spatial extent of soil types within and around Mandaree 11-06H	51
23. Approximate spatial extent of soil types within and around Mandaree 03-08H	52
24. Approximate spatial extent of soil types within and around Mandaree 01-10H	53
25. Approximate spatial extent of soil types within and around Mandaree 07-17H	54
26. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations	68

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Proposed Well Locations.	4
2. Estimated Tanker Truck Traffic.....	11
3. Surface Disturbance Details.....	28
4. Additional ROW Details.....	28
5. Personnel Requirements and Scheduling.....	29
6. Distance and Direction from Proposed Wells to Nearest Home.....	30
7. National Ambient Air Quality Standards and Data.....	33
8. Common Aquifers in the Proposed Project Area and Surrounding Region.....	40
9. Existing Water Wells Within 5 Miles of the Project Area.....	42
10. Distance and Direction from Proposed Wells to the Nearest Wetland.....	43
11. Wildlife Observed during Field Surveys at the Proposed Project Areas.....	46
12. Percentage of the Project Area Comprised of Specific Soil Types.....	48
13. Soil Data Obtained through the Excavation of Soil Pits within the Proposed Project Area.....	55
14. Dominant Vegetation at Well Sites.....	59
15. Population and Demographics.....	61
16. Income and Unemployment.....	62
17. Housing Development Data for the Reservation and Encompassing Counties.....	63
18. Confidential, Active, and Permitted Wells within a 1-mile Radius of the Project Area..	66
19. Confidential, Active, and Permitted Wells within a 5-mile Radius of the Project Area..	67
20. Confidential, Active, and Permitted wells within a 10-mile Radius of the Project Area.....	67
21. Confidential, Active, and Permitted Wells within a 20-mile Radius of the Project Area.....	67
22. Public Scoping Comments.....	76

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

EOG Resources, Inc. (EOG), has proposed to drill and complete five exploratory wells 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. Developments have been proposed on lands held in trust by the United States in McKenzie County, 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 located in the Bakken Formation, a known oil reserve. The following proposed well sites, shown in Figure 1, would be located within the Reservation in which the majority of the external boundaries are located above the Bakken Formation.

- Mandaree 09-04H: SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 4, Township (T) 149 North (N), Range (R) 94 West (W)
- Mandaree 11-06H: NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 6, T149N, R94W
- Mandaree 03-08H: NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 8, T149N, R94W
- Mandaree 01-10H: NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 10, T149N, R94W
- Mandaree 07-17H: NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 17, T149N, R94W

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 Three Affiliated Tribes 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 of 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.

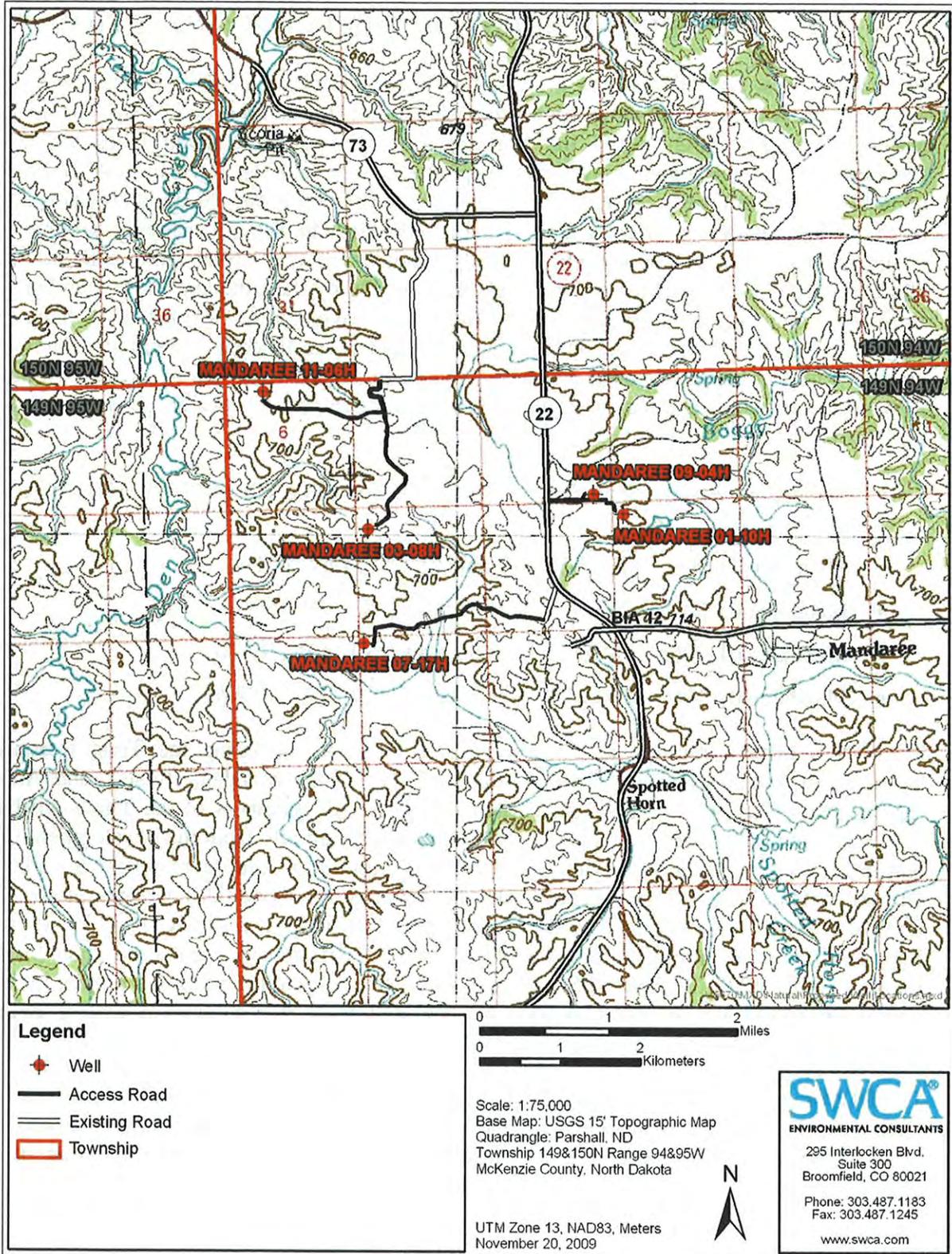


Figure 1. Proposed well locations.

Compliance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500–1508) is required due to the project's location on federal lands. 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. New access roads would be constructed to access each proposed well pad, and one existing access road would be upgraded. Well pads would be constructed to accommodate drilling activities. Pits constructed for drilled cuttings would be used during drilling operations and reclaimed once operations have ceased. If production is established from any of the wells, production facilities would be constructed on the well pad. 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.

The proposed wells are exploratory, meaning that the results of these drilling operations could initiate further exploration of surrounding areas. This EA, however, only addresses the potential effect associated with the installation and possible long-term operation of the above-listed wells and directly related infrastructure and facilities. Further oil and gas exploration and development would require additional 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

No Action

A No Action Alternative is the only alternative consideration to the Proposed Action. The Department of the Interior’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 recommend approve of APDs or grant ROWs for one or more of the proposed locations, and land would remain in its current state.

Proposed Action

This document analyzes the potential impacts of a specific project—five exploratory horizontal oil wells and their associated facilities 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 proposed well locations are in the west-central portion of the Reservation in McKenzie County, North Dakota.

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 and upgrading, constructing, and maintaining access roads. Table 1 presents the surface and bottom hole locations and lease numbers of each well site.

Table 1. Proposed Well Locations.

Well	Surface Location	Bottom Hole Location	Lease Number
Mandaree 09-04H	SE¼ SE¼, Sec. 4, T149N, R94W; 310’ FSL & 700’ FEL	NE¼ NW¼, Sec. 4, T149N, R94W; 500’ FNL & 1,500’ FWL	14-20-A4-1830
Mandaree 11-06H	NE¼ NW¼, Sec. 6, T149N, R94W; 405’ FNL & 1,600’ FWL	SE¼ SE¼, Sec. 6, T149N, R94W; 500’ FSL & 500’ FEL	14-20-A4-8241
Mandaree 03-08H	NW¼ NW¼, Sec. 8, T149N, R94W; 875’ FNL & 620’ FWL	SW¼ SE¼, Sec. 8, T149N, R94W; 550’ FSL & 1,500’ FEL	14-20-A4-8241
Mandaree 01-10H	NW¼ NW¼, Sec. 10, T149N, R94W; 550’ FNL & 500’ FWL	SW¼ SE¼, Sec. 10, T149N, R94W; 500’ FSL & 1,500’ FEL	14-20-A4-8250
Mandaree 07-17H	NW¼ NW¼, Sec. 17, T149N, R94W; 300’ FNL & 250’ FWL	SW¼ SE¼, Sec. 17, T149N, R94W; 500’ FSL & 1,500’ FEL	14-20-A04-8212

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-on-site inspections by the proponent, the civil surveyor, the environmental consultant, the BIA Environmental Specialist, and the Tribal Historic Preservation Office (THPO) monitor on August 26 and 27, 2009. Resource surveys were conducted at the time of pre-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 the previously identified 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). ROW on-site inspections were conducted on September 21, 2009. The proposed well pads and access roads were surveyed on August 27 to 29 and September 2, 2009. 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 State of North Dakota, and the BLM, as appropriate, prior to construction and drilling. The proponent would adhere to all applicable federal, state, county, BIA, 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) (U.S. Department of the Interior [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 laws and regulations that are applicable, including Title 43 CFR 3100; Onshore Oil and Gas Orders Nos. 1, 2, 6, and 7; approved operation plans; and Notices of 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.

2.1 ACCESS ROADS

Up to 23,396 feet (4.4 miles) of new access roads would be constructed to the five proposed well locations, and 1,320 feet (0.25 mile) of road to one proposed well location (Mandaree 07-17H) would be upgraded. 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 tanker trucks. A 66-foot ROW is requested for each access road. The 66-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. Estimated surface disturbance for each ROW is presented in Section 2.10. 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 8%. Surfacing of the well pad and access road would consist of native or commercially obtained materials. 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 scoria to an average minimum depth of 4 inches after compaction. EOG would maintain each access road 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 2.8) once the wells are depleted and abandoned, unless the BIA or surface owners take over responsibility for the roads through a formal agreement.

In addition to roads, natural gas gathering lines from these wells would also be installed in the 66-foot ROW. Connections from gathering lines to trunk lines have not been determined at this time. Future tie-ins to trunk lines would be addressed once their locations are known, including conducting cultural and biological resource surveys and obtaining additional ROWs. Additional NEPA analysis would be conducted for additional ROWs for future tie-ins and trunk lines, as necessary, once the alignments have been determined.

2.2 WELL PADS

Each well would be drilled on a pad measuring approximately 415 by 525 feet, including the area needed for stockpiles, resulting in a surface disturbance of approximately 5 acres for each well pad. See Section 2.10 for well-specific surface disturbance. Locations would be leveled by balancing cut and fill areas. Subsoil and the rock remaining from the reserve 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 reserve pit would be constructed within the disturbed area of each well pad. Each reserve 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 reserve pit liner would have permeability less than 10^{-7} centimeters per second and burst strength greater than or equal to 300 pounds per square inch (psi) or puncture strength greater than or equal to 160 psi and grab tensile strength greater than or equal to 150 psi. A liner would be resistant to deterioration by hydrocarbons and would not be installed directly on a rock surface. Where necessary, bedding

materials, such as sand or geotextile fiber liner, would be installed to prevent contact with exposed rock.

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

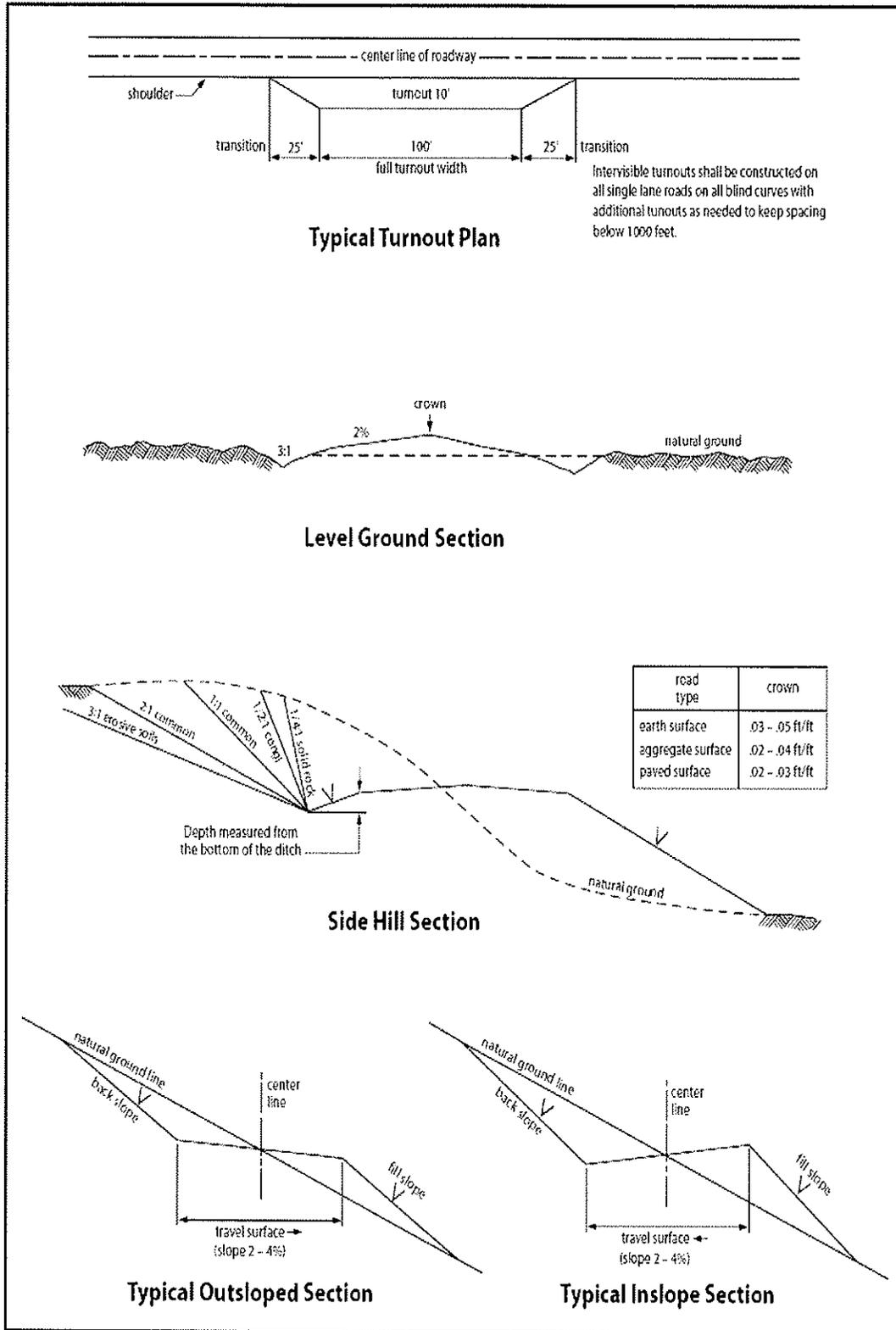


Figure 2. Typical road cross sections (USDI and USDA 2007).

2.3 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 five proposed wells would be drilled from individual well pads vertically to the Bakken Formation at depths ranging from approximately 10,800 to 11,000 total vertical feet. Then a wellbore (i.e., lateral leg) would be drilled horizontally for approximately 5,000 feet. 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.

Each reserve pit would be fenced on three sides during drilling and completion operations. If necessary, a reserve pit would be temporarily used for the storage of fluids produced during testing operations. Fracture stimulation fluids would be flowed back into a pit for evaporation. The fourth side of the pit would be fenced as soon as the completion rig is moved off a location.

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.

2.4 CASING AND CEMENTING

After drilling, downhole geophysical well logs may be run to evaluate a well's production potential. 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).

2.5 COMPLETION AND EVALUATION

Completion operations 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 sand serves as a proppant to keep the created fracture open after the pressure drops, thereby allowing reservoir fluids to move more readily into the well. Hydraulic fracturing is 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. If necessary, a reserve pit would be temporarily used for the storage of fluids produced during testing operations. Reserve pits would be fenced on three sides during drilling and completion operations. Any remaining fluids would be disposed of in accordance to North Dakota Industrial Commission (NDIC) rules and regulations.

2.6 COMMERCIAL PRODUCTION

2.6.1 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 four 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.

2.6.2 Production Traffic

Produced water and oil would be transported from the tanks on each location by trucks or until the well can be connected to gathering pipelines. Table 2 presents estimates of truck traffic anticipated to be necessary to haul fluids from each well. Trucks for normal production operations would utilize 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

would typically 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.^{1,2}

Time Period	Average Daily Tanker Truck Roundtrips Per Well	Average Daily Tanker Round Trips for 5 Wells
Production Day 1–30	5	25
Production Day 31–60	2	8
Production Day 61–ongoing	1	5

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

² Estimates assume all fluids transported via truck from each well.

Natural gas produced in association with the liquid hydrocarbons would initially be flared. A flare pit would be located a minimum of 125 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 Proposed Action would be used to evaluate options for the disposition of the produced natural gas by the proponent. If applicable, the proponent would construct a gas-gathering system at a future time; however, this system is not currently proposed due to the exploratory nature of the Proposed Action. Construction details and timing for a future gas-gathering system would depend on gas production volumes, costs for pipeline installation, commodity prices, and ability to tie into a larger natural gas transportation system. Flaring operations would be conducted in compliance with applicable regulations and would be in accordance with NTLs and adopted NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (North Dakota Century Code [NDCC] 38-08-06.4).

All permanent (on-site six months or longer) aboveground structures constructed or installed, including pumping units, would be painted a flat, non-reflective, earth-tone color, typically Covert 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.

2.7 CONSTRUCTION DETAILS AT INDIVIDUAL SITES

2.7.1 Mandaree 09-04H

The proposed Mandaree 09-04H well pad (Figure 3) would be approximately 2 miles northwest of Mandaree in the SE¼ SE¼ of Section 4, T149N, R94W. A new access road approximately 354 feet long would be constructed to connect to Highway 22 (Figures 4 and 5). The new road would disturb approximately 0.5 acres, while the proposed well pad would disturb approximately 5.0 acres, bringing the total anticipated new disturbance to 5.5 acres.

The spacing unit consists of 640 acres (+/-) with the bottom hole located approximately 5,415 feet northwest of the surface hole location in the NE¼ NW¼ of Section 4, T149N, R94W (Figure 5). Specific information on the location of the drilling target and lease is described in Table 1. A setback of at least 500 feet would be maintained.



Figure 3. Mandaree 09-04H well pad area, view facing east.



Figure 4. Mandaree 09-04H access road at Highway 22, view facing west.

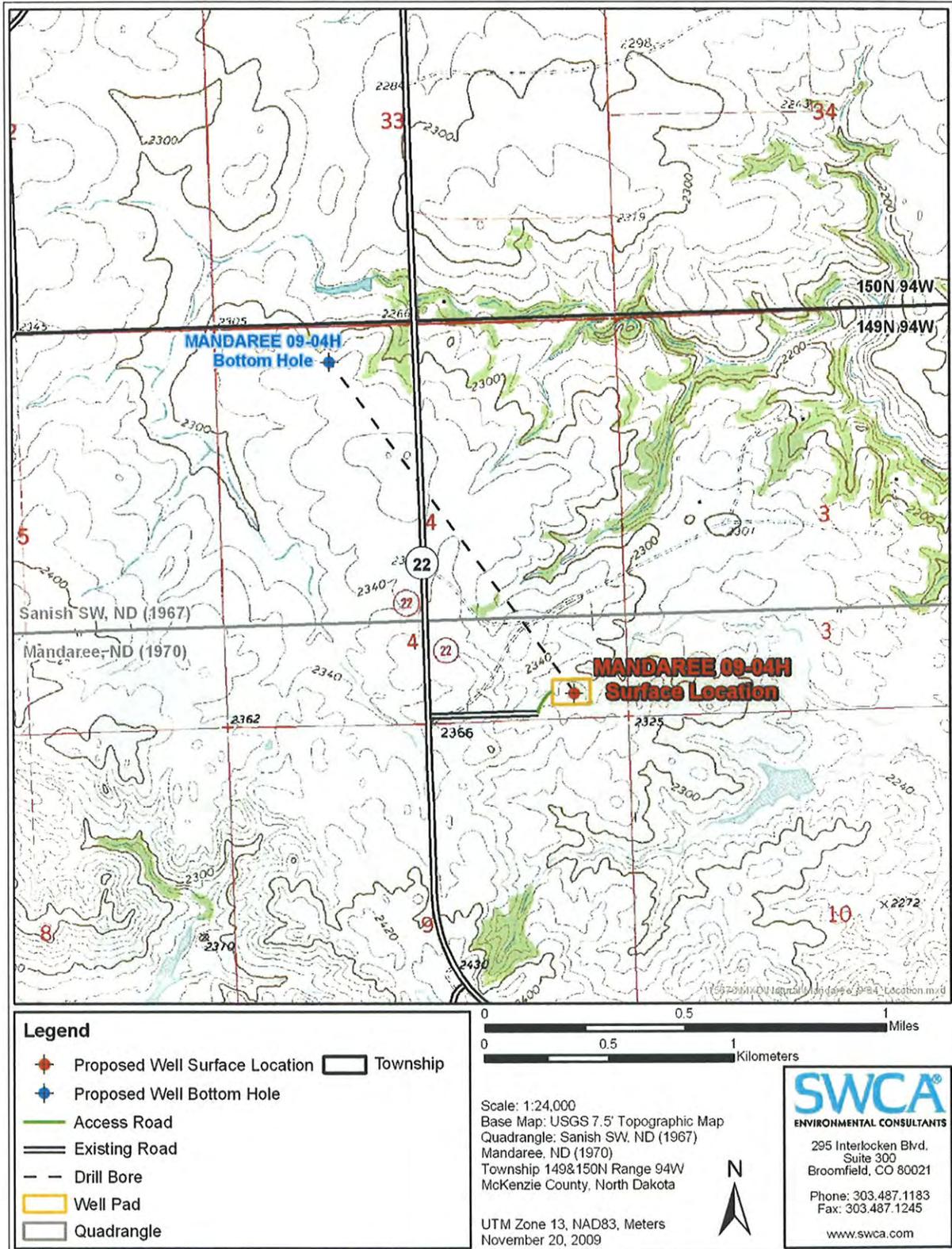


Figure 5. Mandaree 09-04H proposed surface and bottom hole locations.

2.7.2 Mandaree 11-06H

The proposed Mandaree 11-06H well site (Figure 6) would be approximately 4.7 miles northwest of Mandaree in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 6, T149N, R94W. A new access road approximately 5,235 feet long would connect the well to the proposed access road for Mandaree 03-08H (Figures 7 and 8). The new road would disturb approximately 7.9 acres, while the proposed well pad would disturb approximately 5.0 acres, bringing the total anticipated new disturbance to 12.9 acres.

The spacing unit consists of 640 acres (+/-) with the bottom hole located approximately 5,329 feet southeast of the surface hole location in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 6, T149N, R94W (Figure 7). Specific information on the location of the drilling target and lease is described in Table 1. A setback of at least 500 feet would be maintained.



Figure 6. Mandaree 11-06H well pad area, view facing north.

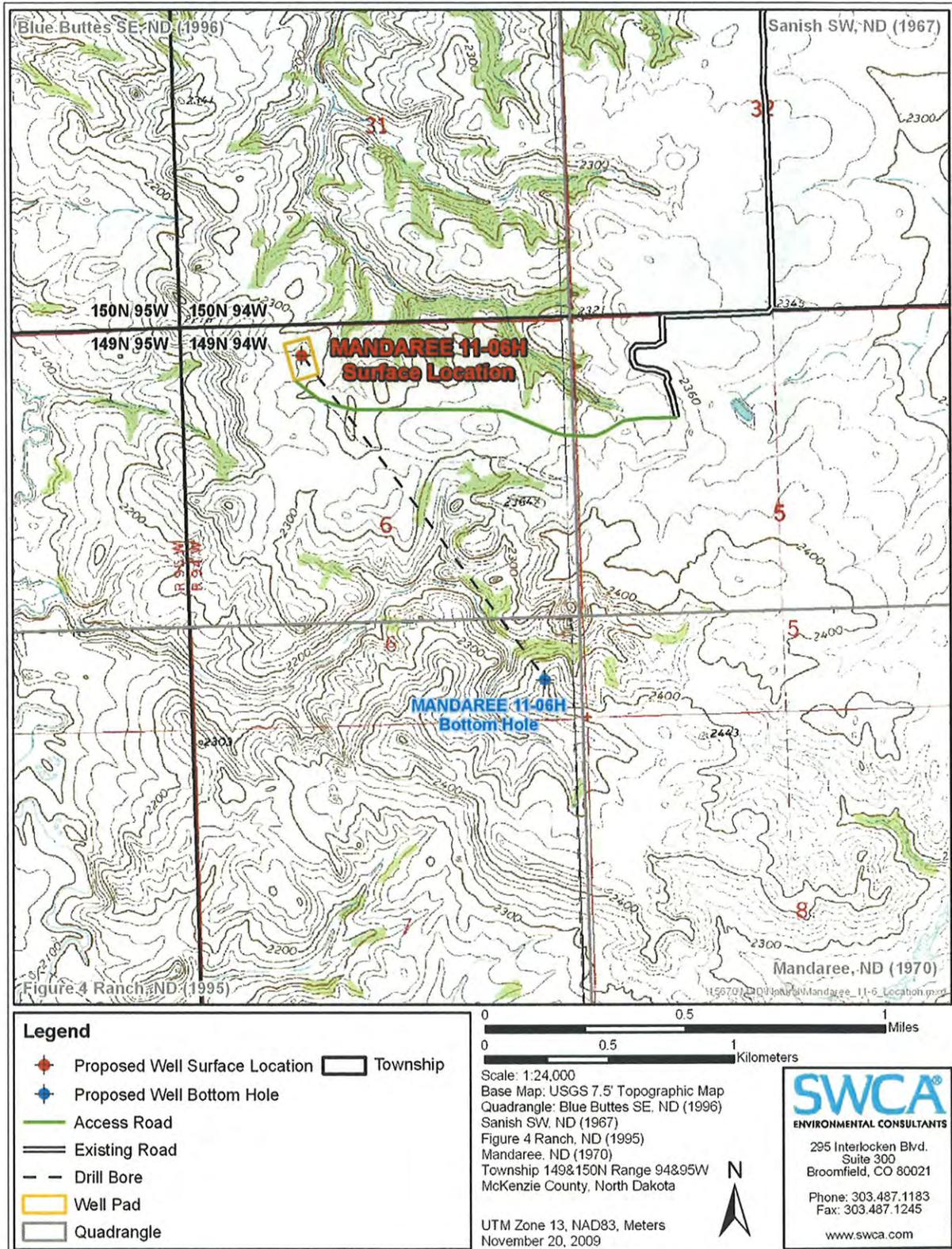


Figure 7. Mandaree 11-06H proposed surface and bottom hole locations.



Figure 8. Mandaree 11-06H access road area, view facing east.

2.7.3 Mandaree 03-08H

The proposed Mandaree 03-08H well site (Figure 9) would be approximately 3.5 miles northwest of Mandaree in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 8, T149N, R94W. A new access road approximately 7,641 feet long would be constructed to connect to the existing Mandaree 10-5H well pad (Figures 10 and 11). The new road would disturb approximately 11.6 acres, while the proposed well pad would disturb approximately 5.1 acres, bringing the total anticipated new disturbance to 16.7 acres.

The spacing unit consists of 640 acres (+/-) with the bottom hole located approximately 5,017 feet southeast of the surface hole location in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 8, T149N, R94W (Figure 11). Specific information on the location of the drilling target and lease is described in Table 1. A setback of at least 500 feet would be maintained.



Figure 9. Mandaree 03-08H well pad area, view facing west.



Figure 10. Mandaree 03-08H access road area, view facing northeast.

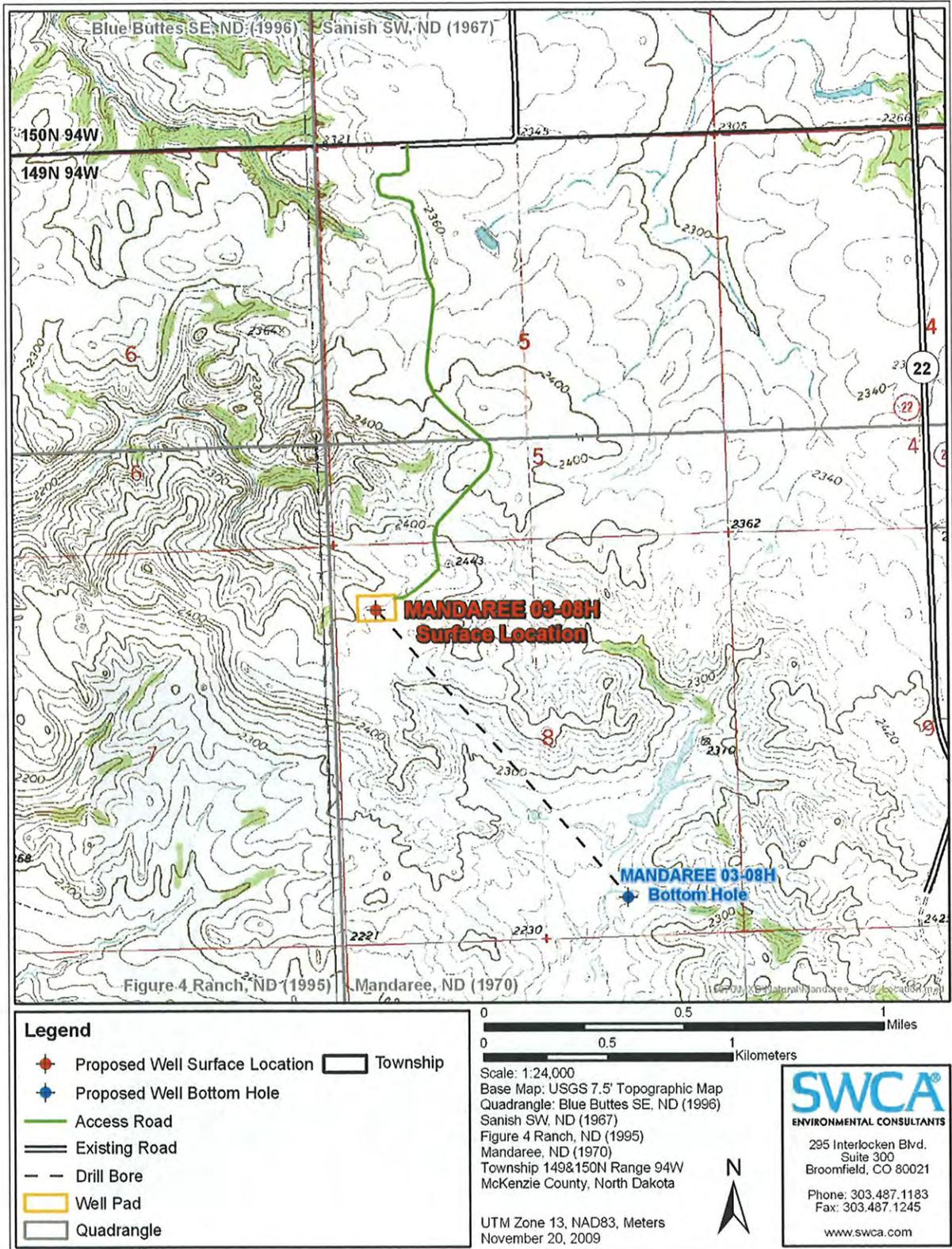


Figure 11. Mandaree 03-08H proposed surface and bottom hole locations.

2.7.4 Mandaree 01-10H

The proposed Mandaree 01-10H well site (Figure 12) would be approximately 1.8 miles northwest of Mandaree in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 10, T149N, R94W. A new access road approximately 3,214 feet long would be constructed to connect to the proposed Mandaree 09-04H access road (Figures 13 and 14). The new road would disturb approximately 4.9 acres, while the proposed well pad would disturb approximately 5.0 acres, bringing the total anticipated new disturbance to 9.9 acres.

The spacing unit consists of 640 acres (+/-) with the bottom hole located approximately 5,346 feet southeast of the surface hole location in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 10, T149N, R94W (Figure 13). Specific information on the location of the drilling target and lease is described in Table 1. A setback of at least 500 feet would be maintained.



Figure 12. Mandaree 01-10H well pad area, view facing southeast.

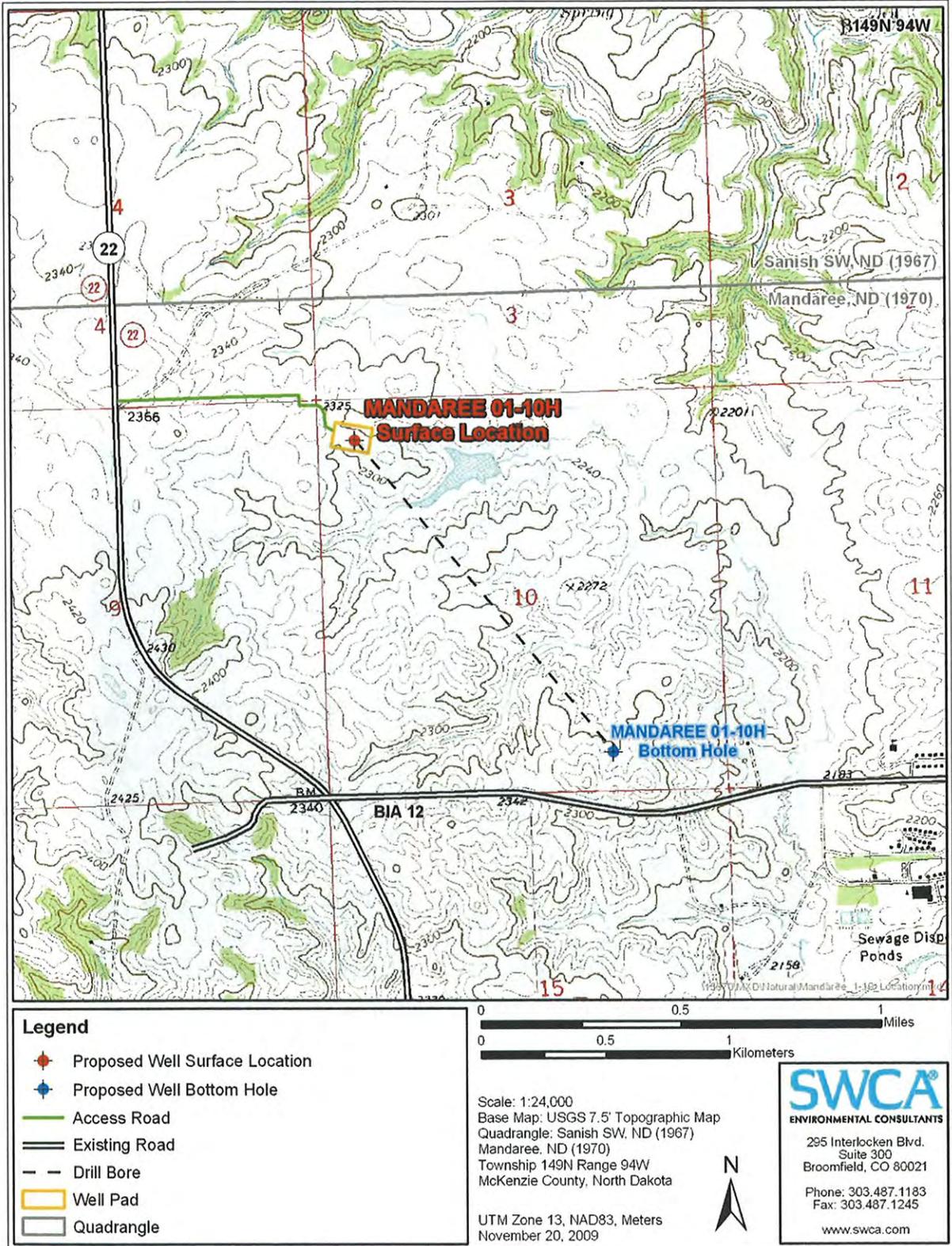


Figure 13. Mandaree 01-10H proposed surface and bottom hole locations.



Figure 14. Mandaree 01-10H access road area, view facing northwest towards Mandaree 09-04.

2.7.5 Mandaree 07-17H

The proposed Mandaree 07-17H well site (Figure 15) would be approximately 3.4 miles northwest of Mandaree in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 17, T149N, R94W. A new access road approximately 6,952 feet long would be constructed to connect to an existing road that connects to Highway 22 (Figures 16 and 17). Approximately 1,320 feet of the existing road would require upgrading. The access road would disturb approximately 12.5 acres, while the proposed well pad would disturb approximately 4.9 acres, bringing the total anticipated new disturbance to 17.4 acres.

The spacing unit consists of 640 acres (+/-) with the bottom hole located approximately 5,690 feet southeast of the surface hole location in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 4, T149N, R94W (Figure 17). Specific information on the location of the drilling target and lease is described in Table 1. A setback of at least 500 feet would be maintained.



Figure 15. Mandaree 07-17H well pad area, view facing east.



Figure 16. Mandaree 07-17H access road area, view facing east.

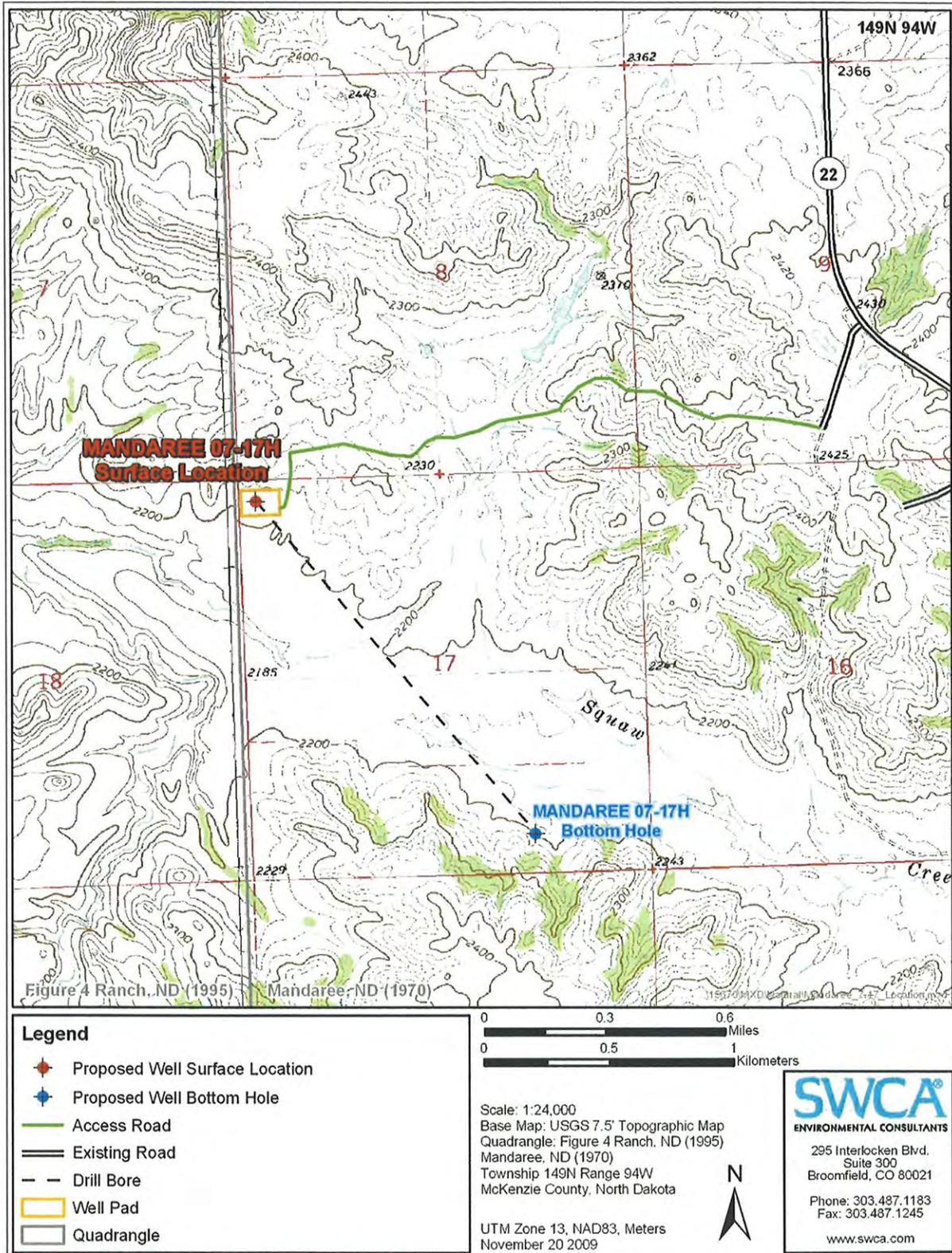


Figure 17. Mandaree 07-17H proposed surface and bottom hole locations.

2.8 RECLAMATION

2.8.1 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 reserve pit would be closed and reclaimed no later than October 1 of the year following drilling and completion operations. The reserve pit would be allowed to dry, and a pit liner, if plastic, would be torn and perforated before a reserve pit is filled. The surface above the reserve 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. Depending on seasonal considerations and weather conditions, the proponent would reseed the entire drill pad and access road, resulting in a long-term surface disturbance of 0.25 acre for a well pad. All seed would be drilled on a contour and planted between 0.25 and 0.5 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.

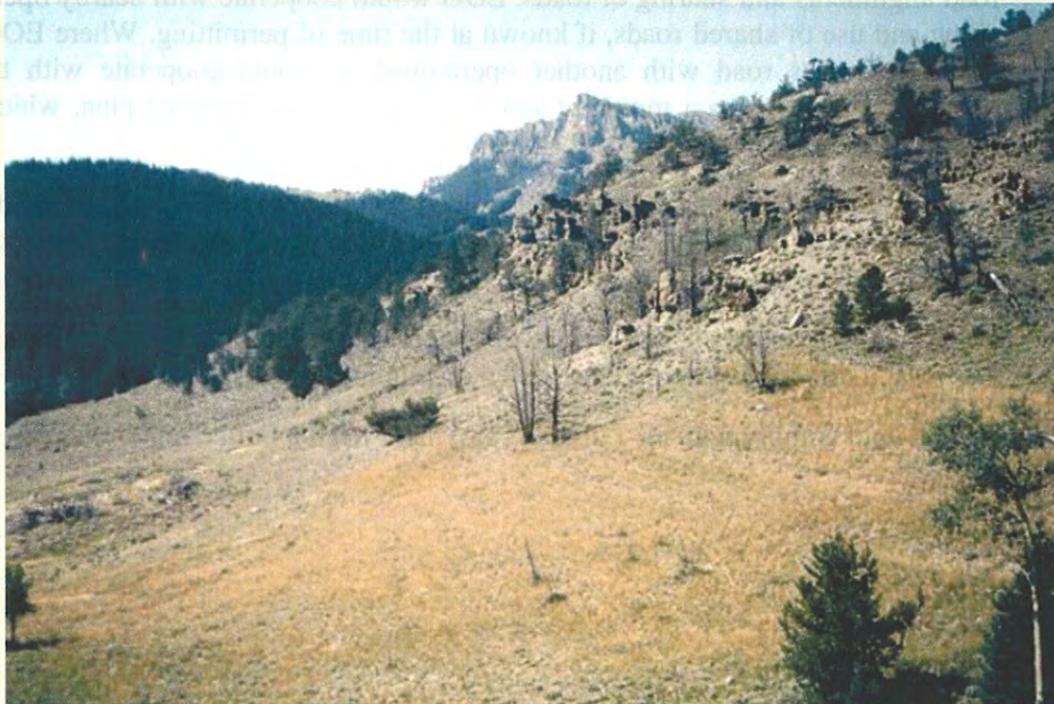
The proponent would control noxious weeds within the exterior boundaries of access roads, well sites, or other applicable facilities by spraying or mechanical removal. Weed control would be conducted in accordance with procedures established by all applicable authorities. Drainage ditches and/or culverts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

2.8.2 Final Reclamation

A depleted well bore would be plugged and abandoned in accordance with applicable state or federal regulations. Typically, all surface facilities associated with a well would be removed during final reclamation. Disturbed surfaces would be returned to the approximate original contours of the land prior to reseeding. Cut and fill slopes would be graded to a 3:1 ratio or less. All topsoil would be re-stripped from areas where interim reclamation had been performed and redistributed over the entire location and access road. The entire disturbed area would be scarified to a depth of 12 inches on 8-inch intervals. 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. Figure 18 shows an example of appropriate reclamation.



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



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

Figure 18. Example of reclamation from the BLM Gold Book (USDI and USDA 2007).

2.9 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 its 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), it 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 fence all well pads constructed in crop lands. The access road at such locations would be installed with a cattle guard or panel gate at the entrance of the well pad, where necessary.
8. EOG would fence each reserve pit in accordance with BIA specifications, specific APDs, and directions at pre-construction on-site inspections.
9. EOG would comply with all Tribal Employment Rights Office requirements.

The following well-specific resource protection measures have been applied based on feedback during BIA and BLM on-site visits:

Mandaree 09-04H: None needed

Mandaree 11-06H:

1. Moved well pad and access road from original location to avoid cultural resources that included cairns and a buffalo rub.
2. Moved access road to ridge to avoid possible surface water on lower elevations.
3. Rounded corner of well pad to avoid cairn. EOG would install a temporary sign to state "do not drive in this area" to ensure avoidance during construction operations.

Mandaree 03-08H:

1. EOG would place straw waddles and a silt fence on fill areas to diminish possible erosion.

Mandaree 01-10H: None needed.

Mandaree 07-17H: None needed.

2.10 TOTAL SURFACE DISTURBANCE

A total of approximately 25.0 acres would be disturbed for well pad construction and 37.4 acres for construction of access roads. Surface disturbance acreage was calculated using the assumption that each well would be a producing well. Of the total ROW disturbance, approximately 15.8 acres of disturbance would be on tribal lands, and 21.6 acres would be on fee (private) lands. Table 3 displays the surface disturbance estimates for each proposed well. Table 4 presents additional detail on ROW lengths on private and tribal/allotted lands.

Table 3. Surface Disturbance Details.

Well	Access Road					Well Pad			Total Disturbance (acres)
	Construct / Upgrade	Length (feet)	ROW width (feet)	ROW Disturbance (acres)	Length (feet)	Width (feet)	Well Pad Disturbance (acres)		
Mandaree 09-04H	Construct	354	66 ¹	0.5	530	410	5.0	5.5	
Mandaree 11-06H	Construct	5,235	66 ¹	7.9	520	415	5.0	12.9	
Mandaree 03-08H	Construct	7,641	66 ¹	11.6	550	400	5.1	16.7	
Mandaree 01-10H	Construct	3,214	66 ¹	4.9	510	430	5.0	9.9	
Mandaree 07-17H	Construct and upgrade ²	8,272	66 ¹	12.5	520	410	4.9	17.4	
Total		24,716		37.4			25.0	62.4	

¹ Although EOG would construct an access road with a 40-foot subgrade, the BIA uses a ROW width of 66 feet.

² Approximately 0.25 mile of this access road would utilize an existing road that leaves Highway 22. This section of the access road would require upgrading only.

Table 4. Additional ROW Details.

Well	Total ROW Length (feet)	ROW Length on (Fee) Surface (feet)	ROW Length on Tribal Land (feet)	ROW Width (feet)	Total ROW Disturbance (acres)
Mandaree 09-04H	354	0	354	66 ¹	0.5
Mandaree 11-06H	5,235	1,397	3,838	66 ¹	7.9
Mandaree 03-08H	7,641	7,641	0	66 ¹	11.6
Mandaree 01-10H	3,214	0	3,214	66 ¹	4.9
Mandaree 07-17H	8,272	5,265	3,007	66 ¹	12.5
Total	24,716	14,303	10,413		37.4

2.11 PERSONNEL REQUIREMENTS AND SCHEDULING

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

Table 5. Personnel Requirements and Scheduling.

Activity	Duration of Activity (average days)	Daily Personnel (average number)	Daily Passenger Vehicle Trips
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.

2.12 PREFERRED ALTERNATIVE

The Preferred Alternative is to complete all administrative actions and approvals necessary to authorize or facilitate oil and gas developments at the five proposed well locations.

3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

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

The proposed wells and access roads are situated geologically within the Williston Basin, where the shallow structure consists of sandstones, silts, and shales dating to the Tertiary period (65 to 2 million years ago), including the Sentinel Butte and Golden Valley formations. The underlying Bakken Formation is a well-known source of hydrocarbons; its middle member is targeted by the proposed project. Although earlier oil 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 Formation feasible.

The Reservation is within the northern Great Plains ecoregion, which consists of four physiographic units: 1) the Missouri Coteau Slope north of Lake Sakakawea, 2) the Missouri River trench (not flooded), 3) the Little Missouri River badlands, and 4) the Missouri Plateau south and west of Lake Sakakawea (Williams and Bluemle 1978). Much of the Reservation is on the Missouri Coteau Slope. Elevations of the glaciated, gently rolling landscape 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. Four residences are within 1 mile of the proposed well sites, but none closer than 1,848 feet (Table 6).

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

Proposed Well	Feet to Nearest Home	Direction to Nearest Home
Mandaree 09-04H	1,848	Southwest
Mandaree 11-06H	11,141	East
Mandaree 03-08H	6,917	East
Mandaree 01-10H	2,640	West
Mandaree 07-17H	7,023	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 both the No Action Alternative and the Preferred Alternative. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. This EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts. In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* in itself require preparation of an EIS. Following discussion of the No Action Alternative below, existing conditions and potential impacts from the proposed project are described.

3.1 THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed project would not be constructed, drilled, installed, or operated. Existing conditions would not be impacted for the following critical elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. There would be no project-related ground disturbance, use of hazardous materials, or trucking of product to collection areas. Surface disturbance, 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.

3.2 AIR QUALITY

The federal Clean Air Act, as amended in 1990, established National Ambient Air Quality Standards (NAAQS) for criteria pollutants to protect public health and welfare. The Clean Air Act also set standards for other compounds that can cause cancer, regulated emissions that cause acid rain, and required federal permits for large sources. National standards have been established for ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM), and lead (Pb). These standards were set for pervasive compounds that are generally emitted by industry or motor vehicles. Standards for each pollutant meet specific public health and welfare criteria; thus, they are called the “criteria pollutants.” Some states have adopted more stringent standards for criteria pollutants or have chosen to adopt new standards for other pollutants. For instance, North Dakota has a standard for hydrogen sulfide (H₂S) that the U.S. Environmental Protection Agency (EPA) does not.

The North Dakota Department of Health (NDDH) network of Ambient Air Quality and Monitoring (AAQM) stations includes Watford City in McKenzie County, Dunn Center in Dunn County, and Beulah in Mercer County. These stations are located west, south, and southeast of the proposed well sites, respectively. Criteria pollutants tracked under NAAQS of the Clean Air Act include SO₂, PM, NO₂, and O₃. Two other criteria pollutants—Pb and CO—are not monitored by any of the three stations.

3.2.1 Criteria Pollutants

Sulfur Dioxide (SO₂) – is a colorless gas with a strong, suffocating odor. Sulfur dioxide is produced by burning coal, fuel oil, and diesel fuel. Sulfur dioxide can trigger constriction of the airways, causing particular difficulties for asthmatics. SO₂ emissions are also a primary cause of acid rain and plant damage.

Particulate Matter (PM) – is a class of compounds that can lodge deep in the lungs causing health problems. PM is regulated under two classes; PM₁₀ is the fraction of total PM 10 microns or smaller, and PM_{2.5} is two and a half microns or smaller. PM can range from inorganic wind-blown soil to organic and toxic compounds found in diesel exhaust.

Nitrogen Dioxide (NO₂) - is a reddish brown gas with an irritating odor. Primary sources include motor vehicles, industrial facilities, and power plants. In the summer months, NO₂ is a major component of photochemical smog. NO₂ is an irritating gas that may constrict airways, especially of asthmatics, and increase the susceptibility to infection in the general population. NO₂ is also involved in ozone smog production.

Ozone (O₃) - 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 in the presence of sunlight. Ozone's health effects can include reduced lung function, aggravated respiratory illness, and irritated eyes, nose, and throat. Ozone can persist for many days after formation and travel several hundred miles.

Carbon Monoxide (CO) – is a colorless, odorless gas that is a byproduct of incomplete combustion. Ambient levels are typically found during periods of stagnant weather, such as on still winter evenings with a strong temperature inversion. Carbon monoxide 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 federal and state governments have set standards based on set criteria for various air pollutants caused by human activity. Table 7 summarizes federal air quality standards and available air quality data from the three-county study area.

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

- SO₂ (parts per million [ppm]) – 0.023 annual arithmetic mean, 0.099 24-hour concentration, and 0.273 one-hour concentration.
- H₂S (ppm) – 10 instantaneous, 0.20 one-hour, 0.10 24-hour, and 0.02 3-month arithmetic mean

All other state criteria pollutant standards are the same as federal as shown in Table 7.

Table 7. National Ambient Air Quality Standards and Data.

Pollutant	Averaging Period	NAAQS ($\mu\text{g}/\text{m}^3$)	NAAQS (ppm)	County	
				Dunn	McKenzie
SO ₂	24-hour	365	0.14	0.003 ppm	0.004 ppm
	Annual Mean	80	0.03	0.000 ppm	0.001 ppm
PM ₁₀	24-hour	150	–	53 $\mu\text{g}/\text{m}^3$	45 $\mu\text{g}/\text{m}^3$
	Annual Mean	50	–	15 $\mu\text{g}/\text{m}^3$	11 $\mu\text{g}/\text{m}^3$
PM _{2.5}	24-hour	35	–	–	–
	Weighted Annual Mean	15	–	–	–
NO ₂	Annual Mean	100	0.053	0.002	0.01
CO	1-hour	40,000	35	–	–
	8-hour	10,000	9	–	–
Pb	3-month	1.5	–	–	–
O ₃	1-hour	240	0.12	0.065 ppm	0.067 ppm
	8-hour	–	0.75	0.060 ppm	0.062 ppm

Source: EPA 2008.

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter; ppm = parts per million.

The air pollutant data shown in Table 7 indicate that Dunn and McKenzie counties are below established NAAQS and are therefore designated as attainment areas for all criteria pollutants. North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008. The counties addressed in Table 7 are also in full attainment and usually far below established limits (American Lung Association 2006). All of the counties contained within the Reservation can be expected to have similar air quality conditions to McKenzie and Dunn counties.

In addition to these criteria pollutants, there are a class of compounds known to cause health problems called Hazardous Air Pollutants (HAPs). HAPs are usually a localized problem near the emission source and are regulated separately from criteria air pollutants. There are several hundred HAPs recognized by the EPA and the State of North Dakota. Unlike regulations for criteria pollutants, there are no ambient air quality standards for HAPs. Examples of HAPs found in gases released by oil field development and operation include benzene, toluene, xylene, and formaldehyde (BLM 2009). The NDDH typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. The state requires that maximum individual cancer risk be calculated using its adopted protocol (the Determination of Compliance in the state's Air Toxics Policy). For new sources emitting HAPs with known negative health effects, an applicant must demonstrate that the combined impact of new HAP emission does not result in a maximum individual cancer risk greater than 1×10^{-5} (one in one hundred thousand).

The Clean Air Act and its amendments also established the mandatory federal Prevention of Significant Deterioration (PSD) Class I and Class II designation. Mandatory federal Class I areas include existing wilderness areas larger than 5,000 acres and national parks, monuments, and seashores larger than 6,000 acres. All other locations in the country where ambient air quality is within the NAAQS (including attainment and unclassified areas) are

designated as PSD Class II areas. Both classes are protected under the PSD regulations, which limit the incremental amount by which pollution levels are allowed to increase above historical levels. Class I areas are identified for somewhat more stringent protection from air pollution damage than Class II areas, except in specified cases. The Reservation can be considered a Class II attainment airshed, which affords it a lower level of protection from significant deterioration.

It should be noted that the EPA published a notice in the Federal Register on March 27, 2008, that stated the NAAQS for ozone has been lowered to 0.075 ppm (40 CFR Parts 50 and 58). The EPA will issue a separate rule to address monitoring requirements necessary to implement the new standards, and the agency intends to issue a final rule in 2009; the EPA will issue designations of attainment, nonattainment, and unclassifiable areas no later than March 2010.

3.2.2 Project Emissions

The proposed project is similar to other projects installed nearby with the approval of state offices and would result in the temporary and intermittent release of combustion, fugitive, and vented emissions. Combustion emissions include SO₂, ozone precursors called volatile organic compounds (VOCs), greenhouse gases (GHGs), and HAPs. Sources include engine exhaust, dehydrators, and flaring. Fugitive emissions include criteria pollutants, H₂S, VOCs, HAPs, and GHGs. Potential sources of these emissions from the proposed project include evaporation pits, produced water tanks, storage tanks, windblown dust from truck and tanker traffic, and construction activity. However, road dust would be controlled as necessary and other best management practices (BMPs) implemented as necessary to limit emissions to the immediate project area (BLM 2009). Vented emissions include GHGs, VOCs, and HAPs. Primary sources are emergency pressure relief valves and dehydrator vents.

3.2.3 Regulatory Emission Controls

Under the Clean Air Act, federal land management agencies have an affirmative responsibility to help protect air quality. The tribes, federal land managers, and the State of North Dakota can make emission controls part of a lease agreement. The proposed project is similar to other projects installed nearby with state approval. State policy for permitting new oil and gas wells is as follows: any oil or gas well production facility that emits or has the potential to emit 250 tons per year or more of any air contaminant regulated under North Dakota code must comply with state permitting requirements. The discussion outlines requirements for control of emissions from treaters, separators, flares, tanks, and other onsite equipment.

The North Dakota Air Pollution Control Rules (2009) require that the owner/operator submit an oil/gas facility registration form. This form must include an analysis of any gas produced from the well. The following sources must register oil and gas wells with the NDDH:

1. Any oil and gas well that is/was completed or re-completed on or after July 1, 1987, must have a registration form submitted within 90 days of the completion or re-completion of the well.

2. The owner or operator of any oil or gas well shall inform the NDDH of any change to the information contained on the registration form for a particular well. The owner shall submit a new gas analysis if the composition or the volume of the gas produced from the well has changed from the previous analysis and causes an increase of 10 tons per year or more of sulfur compounds.
3. North Dakota rules require that all new sources of H₂S and VOCs be flared or treated in an equally effective manner. Flares must have an auto igniter or pilot light. The stack height of flares would be sufficient to allow dispersion of the flared gas. The gas produced from the Bakken Formation is typically low in H₂S so odors from fugitive gas leaks are not expected to be a problem.
4. Chapter 33-15.03.03 of the state rules specify that fugitive dust emissions greater than 40% opacity cannot leave the project site for more than one six-minute period per hour. This applies to all construction and unpaved road emission sources.

It is anticipated that the implementation of BMPs, in concert with the regulatory emissions controls, would result in no detectable or long-term impacts to air quality or visibility within the airsheds of the Reservation, state, or Theodore Roosevelt National Park. No laws, regulations, or other requirements have been waived; no monitoring of compensatory measures is required.

3.3 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.

H₂S is extremely toxic in concentrations above 500 ppm, but it has not been found in measurable quantities in the Bakken Formation. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H₂S. Contingency plans submitted to the BLM comply fully with relevant portions of Onshore Oil and Gas Order No. 6 to minimize potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within 1 mile of a well; precautions include automated sampling and monitoring by drilling personnel stationed at each well site.

As listed in Table 6, satellite imagery identified four homes within 1 mile of any proposed site. The nearest homes are 1,848 feet from Mandaree 09-04H, 2,640 feet from Mandaree 01-10H, 6,917 feet from Mandaree 03-08H, 7,023 feet from Mandaree 07-17H, and 11,141 feet from Mandaree 11-06H. 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 2009). Two of the wells are located within 2 miles of the town of Mandaree but are in the opposite direction of the principle downwind flow. Release of H₂S at dangerous concentration levels is very unlikely, and no direct impacts from H₂S 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 five 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 small pumper truck visit the pad once a day to check the pump. Bakken wells typically produce both oil and water at a high rate initially. Gas would be flared initially, 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 four 400-barrel oil tanks and one 400-barrel water tank would be located on the pad inside a berm of impervious compacted subsoil. The berm would be designed to hold 110% of the capacity of the largest tank. 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 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 reserve pit would be constructed within the disturbed area of each well pad and constructed so as not to leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit. A reserve 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.

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.

3.4 WATER RESOURCES

3.4.1 Surface Water

The project area is within the Bear Den Bay (Hydrologic Unit Code [HUC] 101101012004), Upper Bear Den Creek (HUC 101101012001), and Boggy Creek (HUC 101101012101) watersheds within the Lake Sakakawea subbasin (HUC 10110101) and the Upper Squaw Creek watershed (HUC 101102050607) within the Lower Little Missouri River subbasin (HUC 10110205) (Figure 19). Mandaree 09-04H would be located in the Upper Squaw Creek Watershed, and the western end of the associated access road crosses into the Boggy Creek Watershed. Mandaree 11-06H and the associated access road would be located within the Bear Den Bay Watershed, while Mandaree 03-08H would be located in the Upper Bear Den Creek Watershed. The associated access road crosses through all four watersheds. Mandaree 01-10H and the associated access road would be located within the Upper Squaw Creek Watershed. Mandaree 07-17H would be located in the Upper Bear Den Creek Watershed and the eastern half of the associated access road crosses into the Upper Squaw Creek Watershed.

The major surface water feature in the project vicinity is Lake Sakakawea, which is located on the Missouri River. 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. Figure 20 shows the direction of flow for the ephemeral tributaries in the project area. Runoff that concentrates near the proposed well areas would flow to Squaw Creek, Boggy Creek, or Bear Den Creek, which all subsequently flow into Lake Sakakawea.

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. Stormwater drainage issues were mitigated at that time. For example, during an on-site inspection, the proposed access road for Mandaree 11-06H was relocated to a ridge in order to avoid possible surface water at lower elevations. 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. 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.

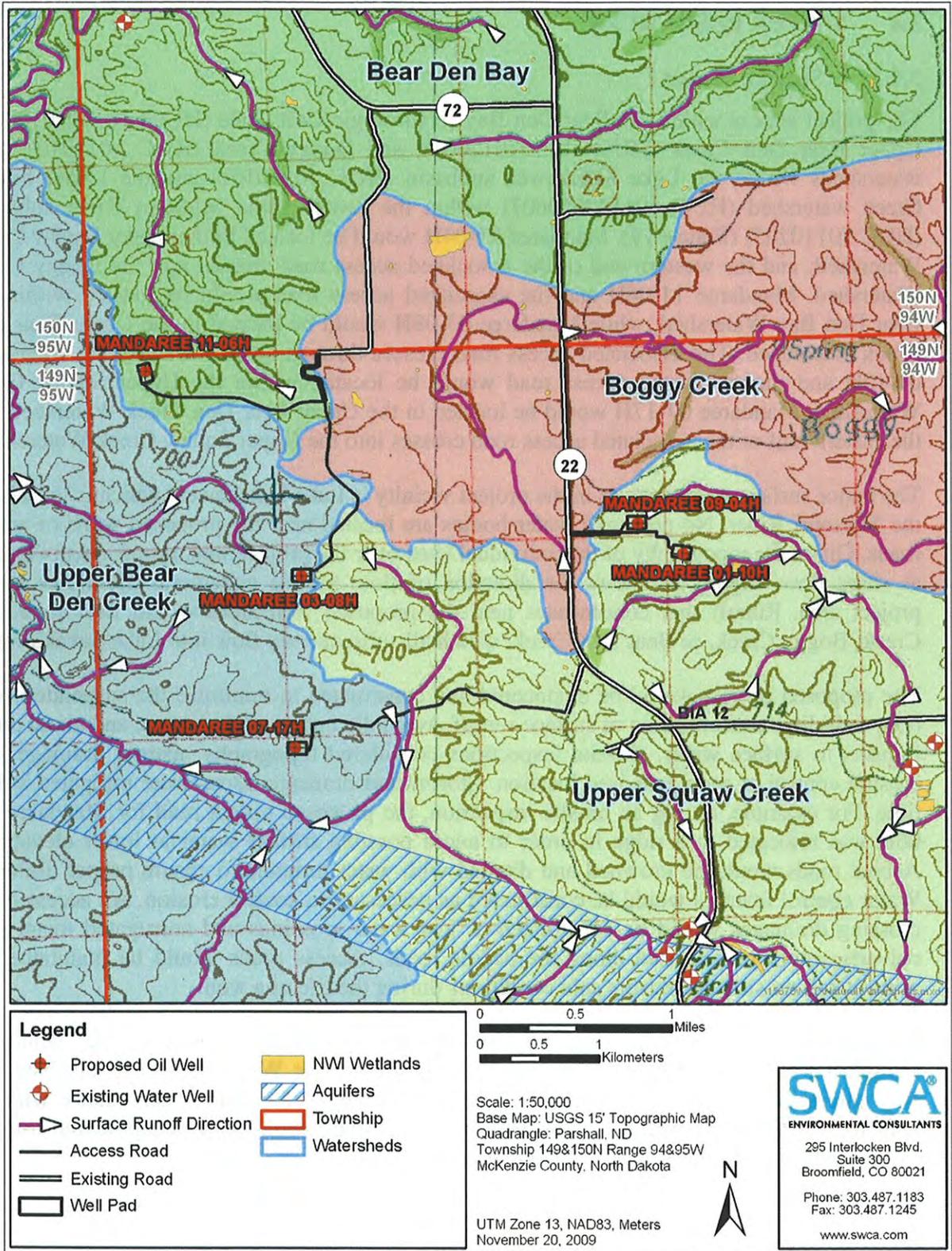


Figure 19. Watersheds, surface runoff direction, and aquifers near the project area.

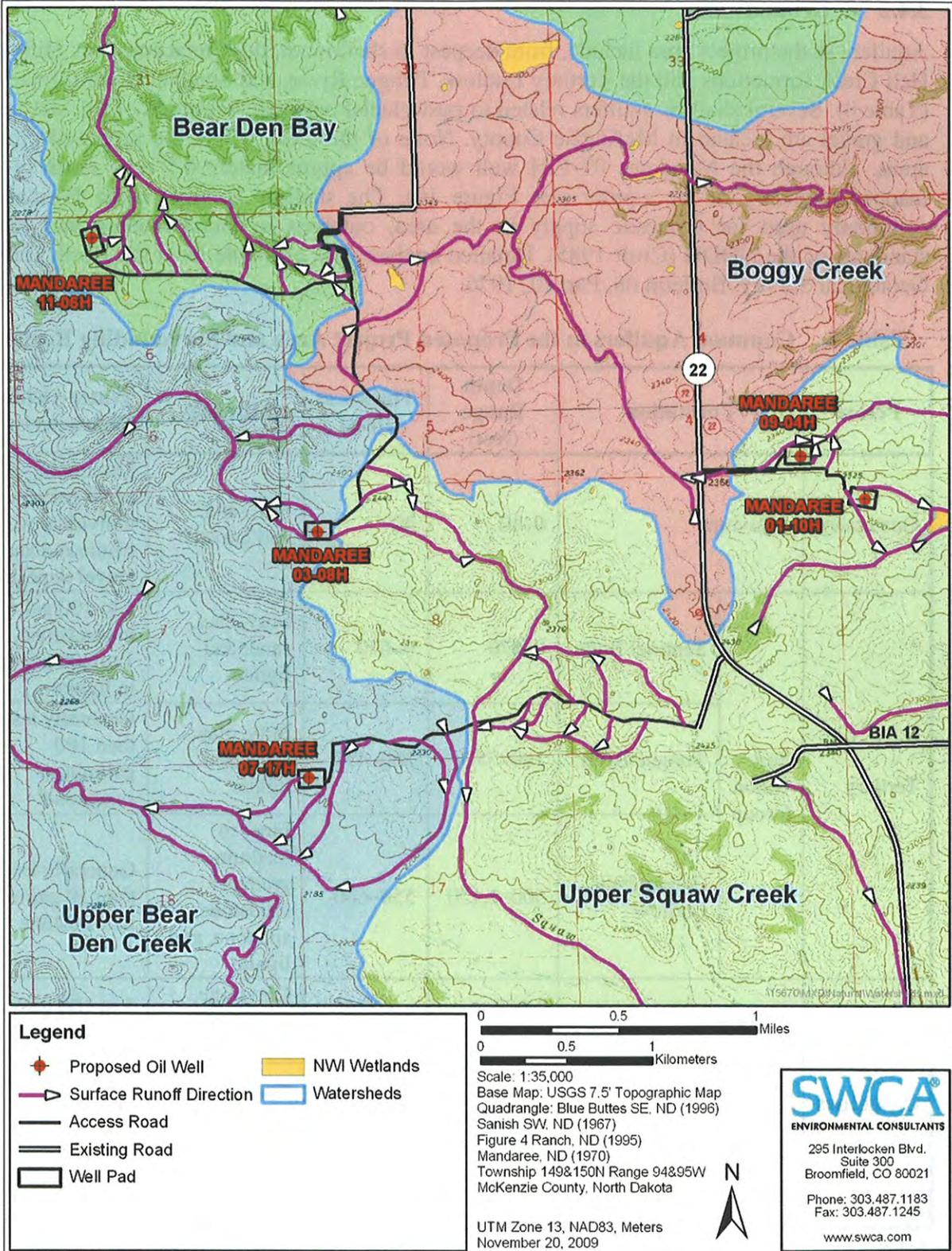


Figure 20. Drainage direction from each of the proposed well pads.

3.4.2 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 McKenzie County. None of these are within the proposed project areas, although the Mandaree 07-17H well would be approximately 0.5 mile north of the mapped boundary of the aquifer (see Figure 19). 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 8. Common Aquifers in the Proposed Project Area and Surrounding Region.

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

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

Review of electronic records of the North Dakota State Water Commission (NDSWC 2009) revealed 25 permitted water wells within an approximate 5-mile boundary of the proposed project areas (Table 9). The closest known water well is more than 1 mile from the project area. 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).

Water use for the proposed wells includes 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 reserve pit would be temporarily used for the storage of fluids produced during testing operations. Fracture stimulation fluids would be flowed back into a pit for evaporation.

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.

3.5 WETLANDS, HABITAT, AND WILDLIFE

3.5.1 Wetlands

National Wetland Inventory (NWI) maps maintained by the U.S. Fish and Wildlife Service (USFWS) identify several wetlands areas in the vicinity of the Proposed Action. According to the USFWS NWI database, several palustrine emergent freshwater wetlands (PEMC) and freshwater ponds (PABFhs) are located near the 66-foot ROW of the proposed access roads, with one approximately 0.5-acre PEMC mapped immediately adjacent to the east of the proposed Mandaree 03-08H access road in a ephemeral drainage (USFWS 2009a). Additionally, several PEMCs and PABFhs are located between 0.2 mile and 0.6 mile from the proposed well sites. Table 10 shows the distance from each well site to the nearest wetland or water body.

A wetland assessment of the project by SWCA Environmental Consultants (SWCA) on August 27 to 29 and September 2, 2009, 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.

Table 9. Existing Water Wells Within 5 Miles of the Project Area.

Water Well Number	Owner	Date Drilled	Section	Township/Range	Type	Depth (feet)	Aquifer	Nearest Well	Miles to Nearest Well
14909414B	Mandaree	00/00/00	14	149N/94W	Unknown	0	Sentinel Butte-Tongue River	Mandaree 01-10H	1.6
14909414BA	Mandaree 3	07/21/70	14	149N/94W	Unknown	1,750	Fox Hills	Mandaree 01-10H	1.6
15009430B	No Data	00/00/00	30	150N/94W	Surface Water Sample Site	0	Surface Water	Mandaree 11-06H	1.8
14909422BBB	NDSWC	09/09/80	22	149N/94W	Test Hole	140	No Observation Well Installed	Mandaree 01-10H	2.0
14909421AAD	NDSWC	09/09/80	21	149N/94W	Observation Well - Destroyed	240	Undefined	Mandaree 01-10H	2.1
14909422BCB	NDSWC	09/09/80	22	149N/94W	Test Hole	80	No Observation Well Installed	Mandaree 01-10H	2.2
14909430CAC	T. Loneflight	00/00/00	30	149N/94W	Unknown	0	Fort Union	Mandaree 07-17H	2.7
14909428AAA1	USGS	06/10/92	28	149N/94W	Observation Well	320	Tongue River	Mandaree 07-17H	2.7
14909428AAA2	USGS	06/10/92	28	149N/94W	Observation Well	120	Sentinel Butte-Tongue River	Mandaree 07-17H	2.7
14909427CB	G. Wolf	05/19/73	27	149N/94W	Domestic Well	36	Undefined	Mandaree 07-17H	3.3
15009422CBA	Youngwolf	01/01/64	22	150N/94W	Unknown	327	Fort Union	Mandaree 09-04H	3.4
15009514DCB	C. Berwald	12/13/72	14	150N/95W	Unknown	35	Fort Union	Mandaree 11-06H	3.7
15009421ABA	Youngwolf	01/01/64	21	150N/94W	Unknown	380	Fort Union	Mandaree 11-06H	3.8
14909515CBB	NDSWC	09/10/80	15	149N/95W	Test Hole	120	No Observation Well Installed	Mandaree 07-17H	4.0
14909516DAD	NDSWC	09/10/80	16	149N/95W	Test Hole	140	No Observation Well Installed	Mandaree 07-17H	4.1
15009331ADD	Three Affiliated Tribes	01/01/61	31	150N/93W	Unknown	0	Sentinel Butte-Tongue River	Mandaree 01-10H	4.2
14909305CDC	No Data	01/01/61	5	149N/93W	Unknown	0	Sentinel Butte-Tongue River	Mandaree 01-10H	4.2
14909509CDD	NDSWC	07/17/84	9	149N/95W	Observation Well	1,740	Fox Hills	Mandaree 11-06H	4.2
15009416ACCI	NDSWC	09/11/80	16	150N/94W	Test Hole	40	No Observation Well Installed	Mandaree 11-06H	4.3

Water Well Number	Owner	Date Drilled	Section	Township/Range	Type	Depth (feet)	Aquifer	Nearest Well	Miles to Nearest Well
15009416ACC2	NDSWC	09/11/80	16	150N/94W	Test Hole	40	No Observation Well Installed	Mandaree 11-06H	4.3
14909504CCB	NDSWC	09/10/80	4	149N/95W	Test Hole	128	No Observation Well Installed	Mandaree 11-06H	4.3
14909508ADA	NDSWC	09/10/80	8	149N/95W	Observation Well - Plugged	200	Undefined	Mandaree 11-06H	4.5
14909308DCC	M. Fox	01/01/60	8	149N/93W	Unknown	0	Sentinel Butte-Tongue River	Mandaree 01-10H	4.5
14909505DCD	NDSWC	09/10/80	5	149N/95W	Test Hole	180	No Observation Well Installed	Mandaree 11-06H	4.7
15009415ABC	N. Fox	01/01/62	15	150N/94W	Unknown	414	Fort Union	Mandaree 01-10H	4.9

USGS = U.S. Geological Survey.
Source: NDSWC (2009).

Table 10. Distance and Direction from Proposed Wells to the Nearest Wetland.

Proposed Well	Wetland Type	Feet to Nearest Wetland	Direction to Nearest Wetland
Mandaree 09-04H	PEMC Freshwater Emergent Wetland	2,463	Southeast
Mandaree 11-06H	PEMC Freshwater Emergent Wetland	1,268	Southeast
Mandaree 03-08H	PABFh Freshwater Pond	3,361	Southeast
Mandaree 01-10H	PEMC Freshwater Emergent Wetland	1,232	South
Mandaree 07-17H	PABFh Freshwater Pond	2,957	Northeast

Data Source: USFWS 2009a.

3.5.2 Wildlife

Several wildlife species that may exist in McKenzie County are listed as threatened or endangered under the Endangered Species Act (ESA). Listed species in McKenzie County include the 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 2009b). Although delisted in 2007, the bald eagle (*Haliaeetus leucocephalus*) remains a species of special concern to the BIA and the Department of the Interior, and is effectively treated the same as listed species. Tribes and states may recognize additional species of concern; such lists are taken under advisement by federal agencies but are not legally binding in the manner of the ESA. The North Dakota Parks and Recreation Department conducted a review of the North Dakota Natural Heritage biological conservation database and found no known occurrences of species of concern within a one-mile radius of the project area, although this may be due to a lack of survey data for the area. Special-status species are described below.

Black-Footed Ferret (*Mustela nigripes*)

Status: Endangered

Likelihood of impact: No effect

Several isolated populations are known to exist within the United States. However, this species is presumed extirpated from North Dakota because it has not been observed in the wild for more than 20 years. No impacts are anticipated.

Gray Wolf (*Canis lupus*)

Status: Endangered

Likelihood of impact: No effect

The project areas do not contain suitable habitat for occupation or colonization by gray wolves. Due to the distance of known gray wolf populations in Minnesota, Canada, Montana, and Wyoming, transient wolves are not expected to be present. No impacts are anticipated.

Interior Least Tern (*Sterna anillarum*)

Status: Endangered

Likelihood of impact: May affect, but is not likely to adversely affect

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

Piping Plover (*Charadrius melodus*)

Status: Threatened

Likelihood of impact: May affect, but is not likely to adversely affect

The entire shoreline of Lake Sakakawea has been designated critical habitat for piping plover. These birds nest on sparsely vegetated shoreline beaches, peninsulas, and islands composed of sand, gravel, or shale. The nearest critical habitat would be greater than or equal to 4.5 miles

from the proposed project areas. Individual piping plovers may transition across or forage at the proposed project areas during construction, drilling, production, or reclamation activities. However, no impact is anticipated though minor impacts could occur as a result of the aforementioned activities.

Whooping Crane (*Grus americana*)

Status: Endangered

Likelihood of impact: May affect, but is not likely to adversely affect

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

Pallid Sturgeon (*Scaphirhynchus albus*)

Status: Threatened

Likelihood of impact: May affect, but is not likely to adversely affect

Activities associated with the construction, production, or reclamation of the project areas are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Pallid sturgeons prefer turbid, main stem river channels. Project areas are all at least 4.5 miles from Lake Sakakawea, which would reduce the likelihood of adverse affect due to activities. No impact is anticipated.

Dakota Skipper (*Hesperia dacotae*)

Status: Candidate

Likelihood of impact: May affect, but is not likely to adversely affect

Project areas are maintained for agricultural use including cultivation and pasture land. Therefore, undisturbed, native prairie areas with a high diversity of wildflowers and grasses were not observed within the proposed project areas. The absence of suitable habitat makes the presence of Dakota skipper unlikely. No impacts are anticipated.

Bald Eagle (*Haliaeetus leucocephalus*)

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

Likelihood of impact: May affect, but is not likely to adversely affect

Project areas are located between 4.5 and 6.5 miles from Lake Sakakawea and do not contain suitable nesting/perching habitat, concentrated feeding areas, or other necessary habitat. No impacts are anticipated.

Golden Eagle (*Aquila chrysaetos*)

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

Likelihood of impact: May affect, but is not likely to adversely affect

The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs that provide nesting habitat. None of the proposed project areas contain suitable nesting habitat for golden eagles; however, eagle prey species may be present within and around the project area. No impacts

are expected as a result of any activities associated with the construction, production, or reclamation of the project areas.

The habitat at all five sites is mixed prairie grassland used for grazing. This habitat supports grassland birds, ungulates, and small mammals. The wildlife species listed in Table 11 were observed during field visits to the proposed project areas. All species listed were visually observed by an ecologist during the field survey (i.e., primary observation). Various secondary indicators, including scat, tracks, and animal carcasses were not observed within the proposed project areas. Mandaree 07-17H is sited within a prairie dog town. Although prairie dog towns provide potential habitat for the black-footed ferret, the USFWS has shown the ferret to be extirpated in North Dakota.

Table 11. Wildlife Observed during Field Surveys at the Proposed Project Areas.

Well Pad Area	Common Name	Scientific Name	Observation Type	Land Use/Habitat
Mandaree 09-04H	Red-tailed hawk	<i>Buteo jamaicensis</i>	Primary	Pasture/Mixed Grass Prairie
	Clay-colored sparrow	<i>Spizella pallida</i>	Primary	Pasture/Mixed Grass Prairie
Mandaree 11-06H	Clay-colored sparrow	<i>Spizella pallida</i>	Primary	Pasture/Mixed Grass Prairie
	Northern leopard frog	<i>Rana pipiens</i>	Primary	Pasture/Mixed Grass Prairie
Mandaree 03-08H	Clay-colored sparrow	<i>Spizella pallida</i>	Primary	Pasture/Mixed Grass Prairie
	Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	Primary	Pasture/Mixed Grass Prairie
	Western meadowlark	<i>Sturnella neglecta</i>	Primary	Pasture/Mixed Grass Prairie
Mandaree 01-10H	Clay-colored sparrow	<i>Spizella pallida</i>	Primary	Pasture/Mixed Grass Prairie
Mandaree 07-17H	Clay-colored sparrow	<i>Spizella pallida</i>	Primary	Pasture/Mixed Grass Prairie
	Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	Primary	Pasture/Mixed Grass Prairie

The primary impacts to wildlife species would come as a result of the construction of five well pad areas, including the construction of new access roads and well pads, drilling, potential commercial production, and the vehicular traffic associated with such activities. No impact on listed species is anticipated due to the low likelihood of their occurrence within the proposed project areas. On-site assessments confirmed that no threatened or endangered species would be impacted by proposed roads or wells. Ground clearing might impact habitat for unlisted species, including small birds, small mammals, and other wildlife species. Proposed project activities may affect raptor and migratory bird species through direct mortality, habitat degradation, and/or displacement of individual birds. No raptors 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. Any impacts to birds in the project area are regulated in part through the Migratory Bird Treat Act of 1918 (916 USC 703–711). Fragmentation of native prairie habitat can detrimentally affect grouse species; however, due to the ratio of each project area to landscape area, the overall disturbance would be negligible.

Several measures designed to mitigate the impacts to wildlife are described in Section 2.0 through 2.9 of this EA. The proponent will 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 will include but not be limited to fencing of well pads, fencing and netting of reserve pits, dust suppression, painting of aboveground facilities, 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.

Some individuals will be affected by temporary disturbances (noise, traffic, dust, etc.) during construction and drilling but no long term impacts are anticipated to the persistence wildlife species in the project area. Wildlife inhabiting the area are likely to adapt to changing conditions and continue to persist without significant adverse impact.

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.

3.6.1 Natural Resources Conservation Service Soil Data

The Natural Resources Conservation Service (NRCS) soil series present on the well pads and access roads, and the respective acreages, can be found in Table 12. A description for each soil series is detailed in Section 7.0 (NRCS 2009). Each individual soil series does not exist individually within the project areas but rather in combination with other soil types (Table 12). 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 21 through 25 display the soils composition that surrounds each proposed well pad and associated access road.

Table 12. Percentage of the Project Area Comprised of Specific Soil Types.

Feature	Soil Series	Percentage of Location	Acres
Mandaree 11-06H			
Well pad	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	100.0%	4.95
Total		100.0%	4.95
Access road	Arikara-Shambo-Cabba loams, 9 to 70 percent slopes	0.4%	0.03
Access road	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	2.2%	0.17
Access road	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	89.8%	7.12
Access road	Rhoades-Daglum complex, 0 to 6 percent slopes	7.7%	0.61
Total		100.0%	7.93
Grand Total			12.88
Mandaree 01-10H			
Well pad	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	47.7%	2.40
Well pad	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	52.3%	2.63
Total		100.0%	5.04
Access road	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	29.6%	1.44
Access road	Williams-Bowbells loams, 3 to 6 percent slopes	13.0%	0.64
Access road	Williams-Zahl loams, 6 to 9 percent slopes	13.9%	0.68
Access road	Williams loam, 6 to 9 percent slopes	13.0%	0.63
Access road	Zahl-Williams loams, dissected, 15 to 45 percent slopes	30.4%	1.48
Total		100.0%	4.87
Grand Total			9.91
Mandaree 03-8H			
Well pad	Arikara-Shambo-Cabba loams, 9 to 70 percent slopes	6.9%	0.35
Well pad	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	93.1%	4.72
Total		100.0%	5.06
Access road	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	32.9%	3.81
Access road	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	53.8%	6.24
Access road	Noonan-Williams loams, 6 to 9 percent slopes	0.8%	0.10
Access road	Rhoades-Daglum complex, 0 to 6 percent slopes	5.3%	0.61
Access road	Williams-Bowbells loams, 3 to 6 percent slopes	7.2%	0.83
Total		100.0%	11.58
Grand Total			16.65

Feature	Soil Series	Percentage of Location	Acres
Mandaree 07-17H			
Well pad	Lambert-Slickspots-Rhoades complex, 0 to 9 percent slopes	100.0%	4.90
Total		100.0%	4.90
Access road	Beisigl-Flasher-Tally complex, 9 to 50 percent slopes	12.4%	1.56
Access road	Cabba-Badland, outcrop complex, 9 to 70 percent slopes	2.4%	0.30
Access road	Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes	0.1%	0.01
Access road	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	20.8%	2.60
Access road	Daglum-Belfield complex, 0 to 6 percent slopes	5.6%	0.71
Access road	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	5.2%	0.65
Access road	Harriet silt loam, 0 to 2 percent slopes	2.8%	0.35
Access road	Lambert-Slickspots-Rhoades complex, 0 to 9 percent slopes	27.5%	3.44
Access road	Vebar-Flasher complex, 6 to 9 percent slopes	23.2%	2.91
Total		100.0%	12.53
Grand Total			17.44
Mandaree 09-04H			
Well pad	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	19.5%	0.97
Well pad	Zahl-Williams loams, dissected, 15 to 45 percent slopes	80.5%	4.02
Total		100.0%	4.99
Access road	Zahl-Williams loams, dissected, 15 to 45 percent slopes	100.0%	0.54
Total		100.0%	0.54
Grand Total			5.53

Source: NRCS 2009

Note: Percentage and acreage totals may not sum exactly due to rounding.

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 13. Additionally, redoximorphic features (i.e., reduced/oxidized iron or manganese) deposits and soil texture were noted at each soil pit. A Munsell Soil Color Chart was used to determine the color of moist soil samples.

K Factor indicates the erodibility of material less than 2 millimeters in size to sheet and rill erosion by water. Values can range from 0.02 (lowest erosion potential) to 0.69 (greatest erosion potential). T represents the maximum amount of soil loss, measured in tons/acre/year, allowed in order to maintain high levels of crop production.

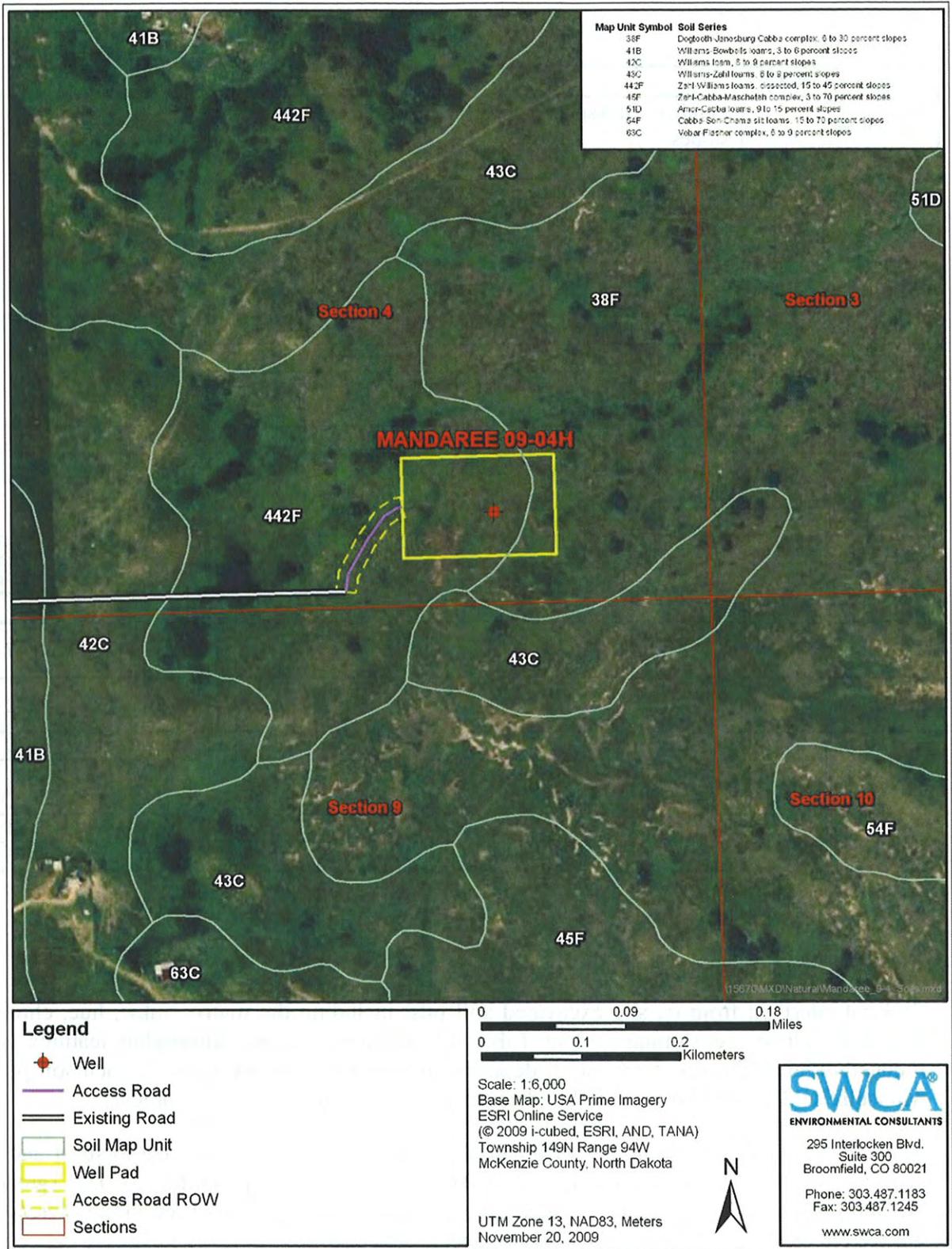


Figure 21. Approximate spatial extent of soil types within and around Mandaree 09-04H.



Figure 22. Approximate spatial extent of soil types within and around Mandaree 11-06H.

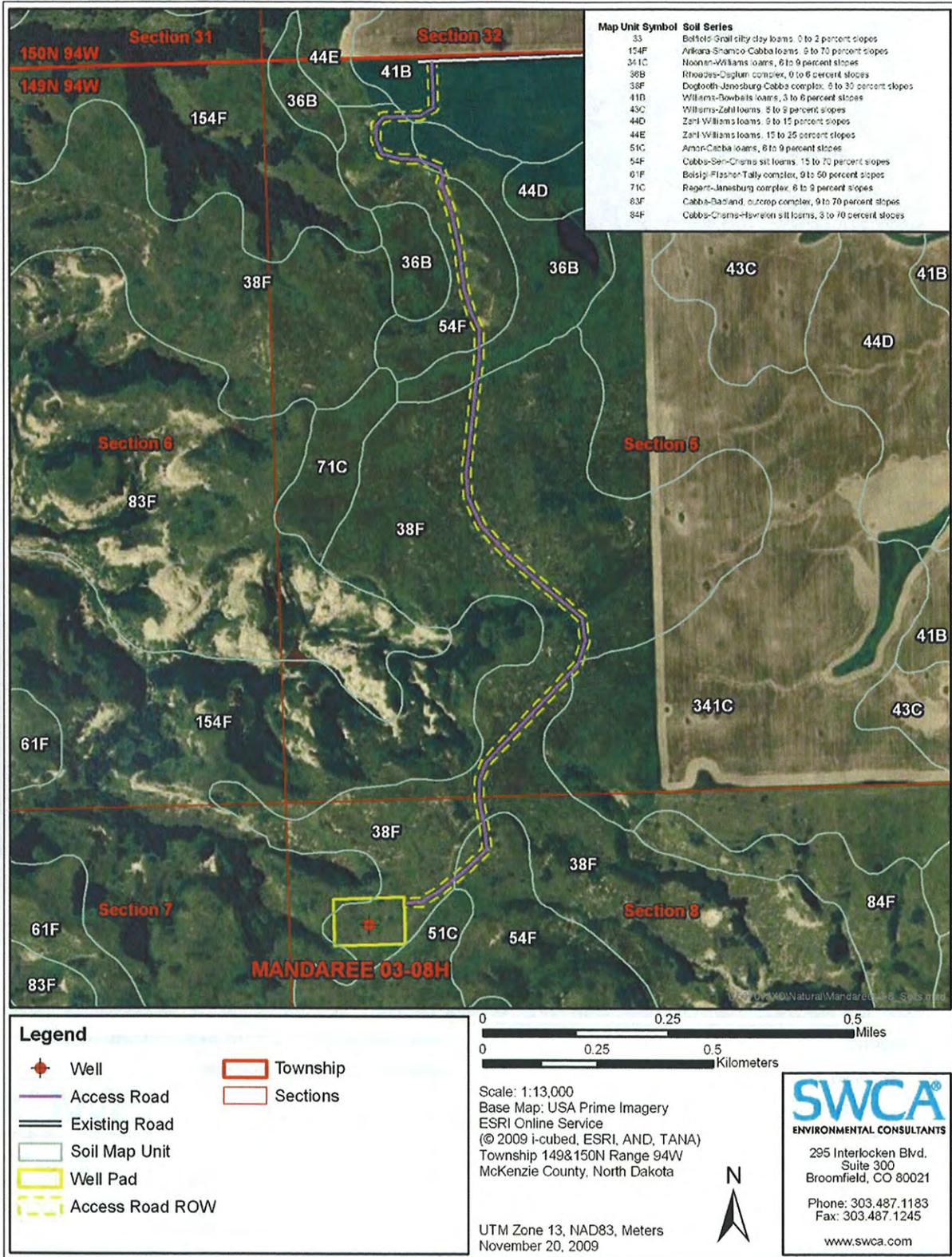


Figure 23. Approximate spatial extent of soil types within and around Mandaree 03-08H.

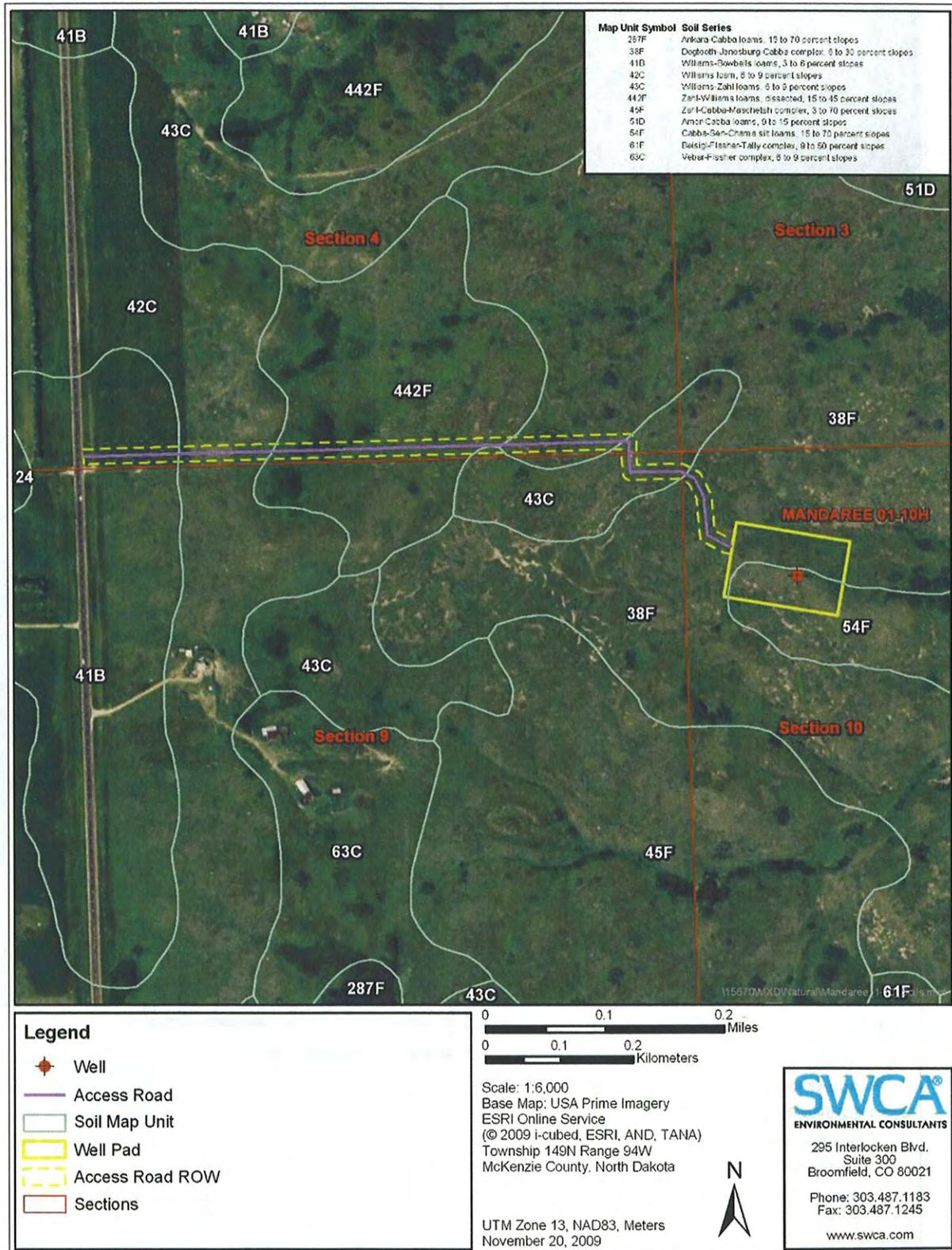


Figure 24. Approximate spatial extent of soil types within and around Mandaree 01-10H.

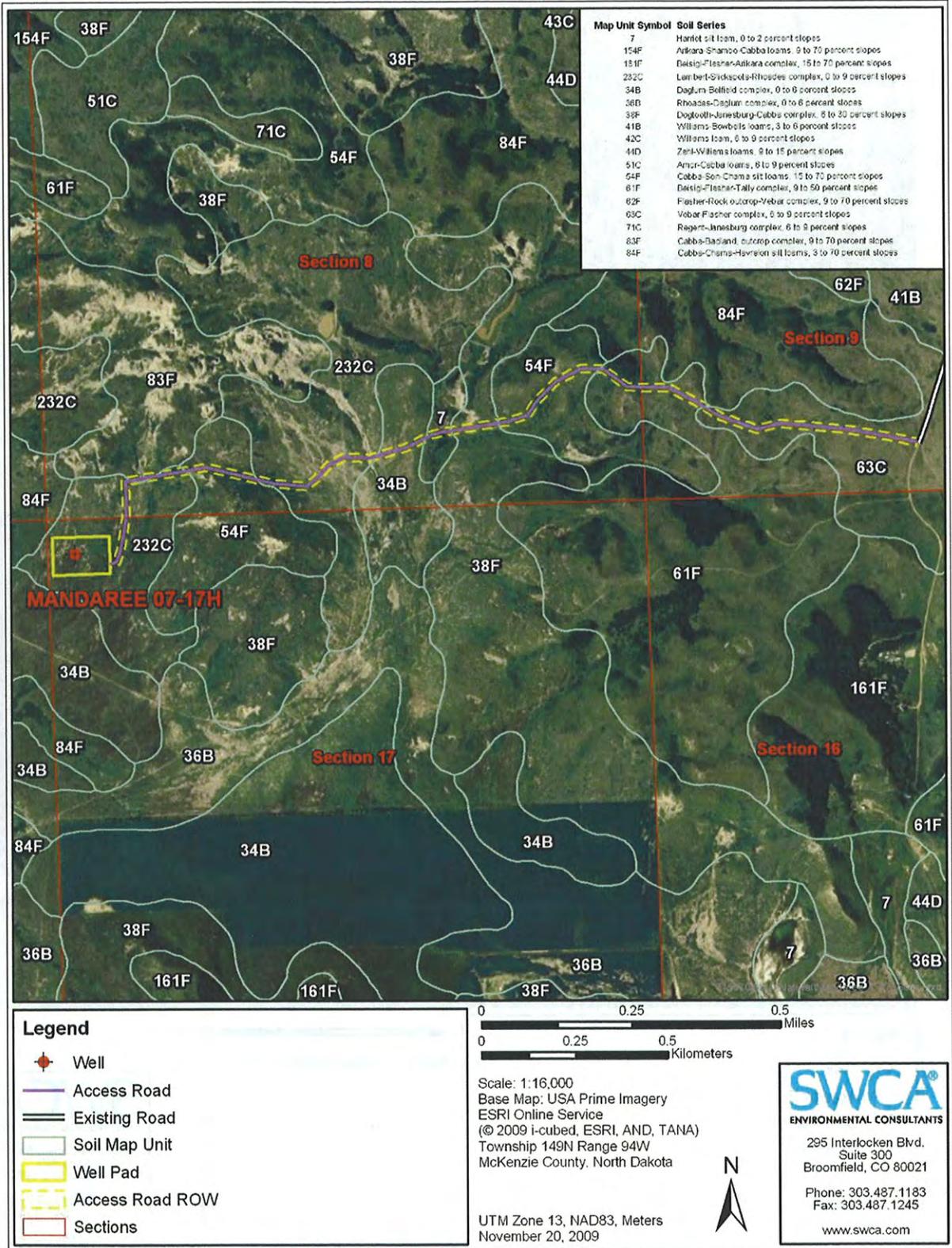


Figure 25. Approximate spatial extent of soil types within and around Mandaree 07-17H.

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

Feature	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (°)	K Factor
Mandaree 11-06H						
Well Pad	0-8	10YR 3/2 (very dark grayish brown)	None Observed	Silty Clay Loam	1-3	0.32
Well Pad	8-16	10YR 4/3 (olive brown)	None Observed	Silt Loam	1-3	0.32
Access Road	0-9	10YR 3/2 (very dark grayish brown)	None Observed	Silty Clay	1-3	0.32
Access Road	9-16	10YR 4/3 (olive brown)	None Observed	Clay Loam	1-3	0.32
Mandaree 01-10H						
Well Pad	0-4	10YR 3/2 (very dark grayish brown)	None Observed	Silty Clay	3-5	0.32
Well Pad	4-16	10YR 7/3 (very pale brown)	None Observed	Silt Loam	3-5	0.32
Access Road	-	Existing Two-track - Natural soil has been altered	-	-	-	-
Mandaree 03-08H						
Well Pad	0-10	10YR 3/2 (very dark grayish brown)	None Observed	Silty Clay	1-3	0.32
Well Pad	10-16	10YR 4/6 (prominent red)	None Observed	Silty Clay	1-3	0.32
Access Road	0-10	10YR 4/2 (dark grayish brown)	None Observed	Silty Clay Loam	1-3	0.32
Access Road	10-16	2.5Y 5/3 (dull brown)	None Observed	Silty Clay	1-3	0.32
Mandaree 07-17H						
Well Pad	0-7	10YR 3/2 (very dark grayish brown)	None Observed	Silty Clay	1-3	0.37
Well Pad	7-16	10YR 4/2 (dark grayish brown)	None Observed	Clay	1-3	0.37
Access Road	-	Existing Two-track - Natural soil has been altered	-	-	-	-
Mandaree 09-04H						
Well Pad	0-9	10YR 4/2 (dark grayish brown)	None Observed	Silty Clay Loam	1-3	0.37
Well Pad	9-16	10YR 4/3 (olive brown)	None Observed	Silty Clay Loam	1-3	0.37
Access Road	-	Existing Two-track - Natural soil has been altered	-	-	-	-

3.6.3 Conclusions Regarding Soil Erodibility and Feasibility

3.6.3.1 Mandaree 11-06H

1. The Mandaree 11-06H well pad is dominated by the Dogtooth-Janseburg-Cabba complex at 100%. The access road is also dominated by the same soil composition at 89.8% (see Table 13).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.
3. The Dogtooth soil series is found on slopes typically ranging from 0% to 25%. The Janseburg series is found on slopes typically ranging from 6% to 9%, and the Cabba soil series is found on slopes ranging from 2% to 70% (NRCS 2009).
4. This soil series is capable of supporting native short- and mid-grass prairie vegetative communities that may substantially increase the probability for successful and permanent reclamation (NRCS 2009).
5. High levels of soil erosion ($K = 0.32$) are not anticipated with the dominant soil types.

3.6.3.2 Mandaree 01-10H

1. The Mandaree 01-10H well pad is dominated by the Dogtooth-Janseburg-Cabba complex at 52.3%. The access road is dominated by the Zahl-Williams loam at 30.4% (see Table 13).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.
3. The Dogtooth soil series is found on slopes typically ranging from 0% to 25%. The Janseburg series is found on slopes typically ranging from 6% to 9%, and the Cabba soil series is found on slopes ranging from 2% to 70% (NRCS 2009). For the access road, the Zahl soil series is found on slopes typically ranging from 0% to 60% and the Williams series is found on slopes typically ranging from 0% to 35%. (NRCS 2009).
4. The soil series complex is capable of supporting native prairie vegetative communities that may substantially increase the probability for successful and permanent reclamation (NRCS 2009).
5. High levels of soil erosion ($K = 0.32$) are not anticipated with the dominant soil types.

3.6.3.3 Mandaree 03-08H

1. The Mandaree 03-08H well pad is dominated by the Dogtooth-Janseburg-Cabba complex at 93.1%. The access road is also dominated by the same soil composition at 53.8% (see Table 13).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.

3. The Dogtooth soil series is found on slopes typically ranging from 0% to 25%. The Janseburg series is found on slopes typically ranging from 6% to 9%, and the Cabba soil series is found on slopes ranging from 2% to 70% (NRCS 2009).
4. The soil series complex is capable of supporting native prairie vegetative communities that may substantially increase the probability for successful and permanent reclamation (NRCS 2009).
5. High levels of soil erosion ($K = 0.32$) are not anticipated with the dominant soil types.

3.6.3.4 Mandaree 07-17H

1. The Mandaree 07-17H well pad is dominated by the Lambert-Slickspots-Rhoades complex at 100%. The access road is also dominated by the same soil composition at 27.5% (see Table 13).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.
3. The Lambert soil series is found on slopes typically ranging from 0% to 65%. The Rhoades series is found on slopes typically ranging from 0% to 25%. Slickspots are classified as ground with minimal to no soil (NRCS 2009).
4. The soil series complex is capable of supporting native prairie vegetative communities that may substantially increase the probability for successful and permanent reclamation (NRCS 2009).
5. High levels of soil erosion ($K = 0.37$) are not anticipated with the dominant soil types.

3.6.3.5 Mandaree 09-04H

1. The Mandaree 09-04H well pad is dominated by the Zahl-Williams loams at 80.5%. The access road is also dominated by the same soil composition at 100% (see Table 13).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.
3. The Zahl soil series is found on slopes typically ranging from 0% to 60%, and the Williams series is found on slopes typically ranging from 0% to 35%. (NRCS 2009).
4. The soil series complex is capable of supporting native prairie vegetative communities that may substantially increase the probability for successful and permanent reclamation (NRCS 2009).
5. High levels of soil erosion ($K = 0.37$) are not anticipated with the dominant soil types.

3.6.3.6 General

Due to the presence of loamy and clay soils and minimal slopes within each of the proposed well pads and access roads (maximum 8% grade), no limitations related to soils are anticipated to constrain construction and development activities within the project areas. The soil types are not anticipated to create unmanageable erosion troubles or interfere with

reclamation of the area. However, some soil erosion is expected to occur due to exposed soils on the proposed well pads and access roads. 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). A minimum of 6 inches of topsoil would be stripped from each access road 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. Any areas stripped of vegetation during construction would be reseeded once construction activities have ceased. The implementation of BMPs by the operator is projected to reduce and maintain negligible levels of erosion.

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, 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 12 plant species in the state as noxious: absinth wormwood (*Artemisia absinthium*), Canada thistle (*Cirsium arvense*), dalmatian toadflax (*Linaria dalmatica*), diffuse knapweed (*Centaurea diffusa*), field bindweed (*Convolvulus arvensis*), leafy spurge (*Euphorbia esula*), musk thistle (*Carduus nutans*), purple loosestrife (*Lythrum salicaria*), Russian knapweed (*Acroptilon repens*), salt cedar (*Tamarix ramosissima*), spotted knapweed (*Centaurea stoebe*), and yellow starthistle (*Centaurea solstitialis*). In addition, McKenzie County lists black henbane (*Hyoscyamus niger*), common burdock (*Arctium minus*), yellow toadflax (*Linaria vulgaris*), and houndstongue (*Cynoglossum officinale*) as noxious (North Dakota Department of Agriculture 2007).

During on-site assessments conducted on August 27 to 29 and September 2, 2009, biologists evaluated dominant vegetation at each proposed well site and associated access road and noted if any invasive species were present. Table 14 indicates vegetation recorded at each location.

Disturbance of approximately 62.4 acres and removal of existing vegetation may facilitate the spread of invasive species. The APD and this EA require the operator to control noxious

weeds throughout project areas. 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 14. Dominant Vegetation at Well Sites.

Well	Dominant vegetation	Noxious weeds
Mandaree 09-04H	green needlegrass, Kentucky bluegrass (<i>Poa pratensis</i>), sweetclover (<i>Melilotus</i> spp.), western snowberry, silver buffaloberry, fringed sage (<i>Artemisia frigida</i>), downy hawthorn (<i>Crataegus mollis</i>)	Russian knapweed
Mandaree 11-06H	western snowberry, green needlegrass, fringed sage, silver buffaloberry	None
Mandaree 03-08H	green needlegrass, Kentucky bluegrass, western snowberry, silver buffaloberry, fringed sage, green ash (<i>Fraxinus pennsylvanica</i>)	None
Mandaree 01-10H	green needlegrass, needle and thread (<i>Hesperostipa comata</i>), western snowberry, silver buffaloberry, fringed sage	Russian knapweed
Mandaree 07-17H	blue grama, little bluestem, green needlegrass, western snowberry, fringed sage, prickly pear (<i>Opuntia</i> sp.)	Russian knapweed

3.8 CULTURAL RESOURCES

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

The area of potential effect (APE) of any federal undertaking must also be evaluated for significance to Native Americans from a cultural and religious standpoint. Sites and practices may be eligible for protection under the *American Indian Religious Freedom Act of 1978* (42 USC 1996). Sacred sites may be identified by a tribe or an authoritative individual (Executive Order 13007). Special protections are afforded to human remains, funerary objects, and objects of cultural patrimony under the *Native American Graves Protection and Repatriation Act* (NAGPRA, 25 USC 3001 *et seq.*).

Whatever the nature of the cultural resource addressed by a particular statute or tradition, implementing procedures invariably include consultation requirements at various stages of a federal undertaking. The MHA Nation has designated a Tribal Historic Preservation Officer (THPO) by Tribal Council resolution, whose office and functions are certified by the National Park Service. The THPO operates with the same authority exercised in most of the rest of North Dakota by the State Historic Preservation Officer (SHPO). As a result, BIA consults and corresponds with the THPO on all projects proposed within the exterior boundaries of the Fort Berthold Reservation. The MHA Nation has also designated responsible parties for consultations and actions under NAGPRA and cultural resources generally.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using an intensive pedestrian methodology. For the Mandaree 09-04H project approximately 10.6 acres were inventoried on August 26, 2009 (Delmas 2009a). For the Mandaree 01-10H project approximately 12.9 acres were inventoried (Delmas 2009b) and for the Mandaree 07-17H project approximately 10.6 acres were inventoried on September 27, 2009 (Higgins 2009). No historic properties were located within any of these project areas that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for these undertakings. This determination was communicated to the THPO on October 30, 2009; however no response was received from the THPO within the allotted 30 day comment period. Approximately 30.2 acres were inventoried for the Mandaree 11-06H project on August 26, 2009 (Cregger *et al.* 2009) and approximately 23.4 acres were inventoried for the Mandaree 03-08H project on August 28, 2009 (Witt *et al.* 2009). Although six archaeological sites were located in these inventories, they will be avoided through rerouting access roads and shifting well pad locations. Accordingly, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for these undertakings. This determination was communicated to the THPO on November 12, 2009; however no response was received from the THPO within the allotted 30 day comment period (see Part 4).

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, the four counties that overlap the Reservation, and the state of North Dakota.

3.9.1 Population

Historic and current population counts for the project area, compared to the state, are provided below in Table 16. The state population showed little change between the last two censuses (1990–2000), but there were notable changes at the local level. Populations in Dunn and McKenzie counties declined by 5% to 11%, while populations on the Reservation increased by approximately 10%. These population changes are anticipated to continue (Rathge et al. 2002). While Native Americans are the predominant group on the Reservation, they are considered the minority in all other areas of North Dakota. Over 67% of the population currently residing within the Reservation are tribal members.

Table 15. Population and Demographics.

County or Reservation	Population in 2000	% of State Population	% Change between 1990–2000	Predominant Group	Predominant Minority (Percent of Population)
Dunn	3,600	0.56	-10.1	Caucasian	Native American (12%)
McKenzie	5,737	0.89	-10.1	Caucasian	Native American (21%)
McLean	9,311	1.45	-11	Caucasian	Native American (6%)
Mountrail	6,631	1.03	-5.6	Caucasian	Native American (30%)
Fort Berthold Reservation	5,915	0.92	9.8	Native American	White (27%)
Statewide	642,200	100	0.005	Caucasian	Native American (5%)

Source: NWAFF 2008.

As presented in Table 16, population growth on the Reservation far exceeds the overall growth in the state of North Dakota. This is evidenced by a 9.8% growth rate on the Reservation and a 0.005% growth rate in the state. An independent market analysis projected the state to grow by 0.4%, compared to the Reservation’s 9.8% growth rate (Fort Berthold Housing Authority 2008). Although Native Americans are the predominant group on the Reservation, they are the minority in the rest of the state. As of 2000, more than two-thirds of the Reservation population were tribal members.

3.9.2 Employment

Employment within the project area is typical of rural communities relying on ranching and farming, the mainstays of western North Dakota. Residents of the Reservation are employed in similar ventures as those outside 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, employs approximately 320 people, of which 90% are tribal members (Three Affiliated Tribes 2008).

3.9.3 Income

Counties that overlap the Reservation tend to have per capita incomes, median household incomes, and employment rates below North Dakota statewide averages (Table 17). Subsequently, Reservation residents and MHA Nation members tend to have per capita incomes, median household incomes, and employment rates below the averages of the encompassing counties, as well as statewide. Therefore, MHA Nation members are disadvantaged relative to overall Reservation incomes and unemployment rates that average in non-Indian data. Per capita income for Reservation residents is approximately 32% lower than the statewide average. The median household income reported for the Reservation (i.e., \$26,274) is likely skewed upward due to overcrowded housing conditions. This median income is approximately 64% below the statewide median. A BIA report in 2003 found that 33% of employed MHA Nation members were living below federal poverty levels. The unemployment rate reported for MHA Nation members is approximately 10.9% and 18.8% greater than the Reservation and North Dakota statewide averages, respectively.

Table 16. Income and Unemployment.

Unit of Analysis	Per Capita Income	Median Household Income	Unemployment Rate (2007)	Employed but Below Poverty Level	Percent of All People in Poverty
MHA Nation members	–	–	22.0%	33%	Unknown
Fort Berthold Reservation	10,291	\$26,274	11.1%	–	Unknown
Mountrail County	29,071	\$35,981	5.7%	–	15.9%
Dunn County	27,528	\$37,632	3.8%	–	13.5%
McKenzie County	27,477	\$41,333	3.1%	–	13.8%
McLean County	32,387	\$44,421	4.6%	–	10.4%
North Dakota	31,871	\$43,936	3.1%	–	11.8%

Source: NWF 2008.

3.9.4 Housing

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 57% lower than the average number of owner-occupied housing units found in the four counties that encompass the Reservation (2,601.5). Additionally, the four counties that encompass the Reservation are ranked extremely low for both the state and national housing starts (Table 18).

Table 17. Housing Development Data for the Reservation and Encompassing Counties.

Housing Development	Reservation	North Dakota County			
	Fort Berthold	Dunn	McKenzie	McLean	Mountrail
New Private Housing Building Permits 2000–2005	–	18	4	135	113
Housing Starts-State Rank	–	51 / 53	15 / 53	21 / 53	17 / 53
Housing Starts-National Rank	–	3,112 / 3,141	2,498 / 3,141	2,691 / 3,141	2,559 / 3,141
Owner-Occupied Units	1,122	1,570	2,009	4,332	2,495
Renter-Occupied Units	786	395	710	932	941
Total	1,908	1,965	2,719	5,264	3,436

Source: NWAFF 2008.

Impacts to the 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. Implementation of the proposed wells is anticipated to require approximately 30 workers in the short-term (approximately 50–60 days after APD approval). Once complete, long-term production would require approximately two full-time employees during commercial activities. The minor increase in workers required for short-term operations would not generate a noticeable increase in population in the area and therefore would not create a noticeable increase in demand for services or infrastructure. As such, the proposed project would not have measurable impacts on housing availability in the area.

Actions proposed to occur on BIA lands would contribute additional revenue to the Reservation, State of North Dakota, and potentially local communities near the Reservation. The majority of spending would occur in McKenzie County. Direct impacts include spending on materials purchased within McKenzie County, which would be subject to sales tax; a small percentage of these revenues would be distributed back to the local economy. Other state, local, and Reservation tax payments and fees would be incurred as a result of the implementation of the proposed project. 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, it is clear that tribal members on the Great Plains qualify for EJ consideration as both a minority and low-income population. The majority population residing in the Dakotas is mainly Caucasian. While some 70% of Reservation residents are tribal members, Native Americans comprise only 5% of the reported North Dakota population and 12% of the Dunn County population. Even in a state with relatively low per-capita and household income, Native American individuals and households are distinctly disadvantaged.

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

The owners of allotted surface within the project 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. Tribal members without either surface or mineral rights would not receive any direct benefits whatsoever. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is significantly reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there 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

mitigated 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 APD. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. Monitoring of cultural resource impacts by qualified personnel is recommended during all ground-disturbing activities. Each phase of construction and development through production would be monitored by the BLM, the BIA, and representatives of the tribe 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

Removal and consumption of oil and/or gas from the Bakken Formation would be an irreversible and irretrievable commitment of resources. Other potential resource commitments include land area devoted to the disposal of 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 to which compensation for land disturbance is owed would be properly compensated for the loss of land use. The initial disturbance area would decrease considerably once the wells are drilled and non-necessary areas have been reclaimed. Access roads and work areas would be leveled or backfilled as necessary, scarified, re-contoured and re-seeded. 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 Formation, which is the target of 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 has accelerated over the Bakken Formation. Most of this exploration has taken place outside the Reservation boundary on fee land, but for purposes of cumulative impact analyses, land ownership and the Reservation boundary are immaterial. Current impacts from existing activity in the area, such as other road development and oil and gas-related activities are still fairly dispersed. Although no active wells are found within a 1-mile radius of the proposed wells, 39 active wells are located within a 5-mile radius (Table 19).

There are 1, 54, 368, and 1,193 oil and gas wells (active, confidential, and permitted) within 1, 5, 10, and 20 miles, respectively, of the proposed project areas (Tables 20 through 22, Figure 26). In total, there are approximately 1,193 wells within a 20-mile radius of the proposed project areas, including all active, confidential, and permitted wells.

Table 18. Confidential, Active, and Permitted Wells within a 1-mile Radius of the Project Area.

Reservation (On/Off)	Mandaree 07-17H		Mandaree 01-10H		Mandaree 03-08H		Mandaree 11-06H		Mandaree 09-04H	
	On	Off								
Confidential Wells	0	0	0	0	0	0	1	0	0	0
Drilling Wells	0	0	0	0	0	0	0	0	0	0
Active Wells	0	0	0	0	0	0	0	0	0	0
Permitted Wells	0	0	0	0	0	0	0	0	0	0

Table 19. Confidential, Active, and Permitted Wells within a 5-mile Radius of the Project Area.

	Mandaree 07-17H		Mandaree 01-10H		Mandaree 03-08H		Mandaree 11-06H		Mandaree 09-04H	
	On	Off								
Reservation (On/Off)	On	Off								
Confidential Wells	5	3	7	1	6	3	3	7	6	1
Drilling Wells	0	0	0	0	0	0	0	0	0	0
Active Wells	4	3	3	2	4	5	3	10	3	2
Permitted Wells	0	0	0	0	0	0	0	0	0	0

Table 20. Confidential, Active, and Permitted wells within a 10-mile Radius of the Project Area.

	Mandaree 07-17H		Mandaree 01-10H		Mandaree 03-08H		Mandaree 11-06H		Mandaree 09-04H	
	On	Off								
Reservation (On/Off)	On	Off								
Confidential Wells	17	15	25	13	18	15	14	17	25	13
Drilling Wells	1	1	1	1	1	1	1	1	1	1
Active Wells	10	52	13	26	9	60	8	76	13	27
Permitted Wells	0	0	0	0	0	0	0	0	0	0

Table 21. Confidential, Active, and Permitted Wells within a 20-mile Radius of the Project Area.

	Mandaree 07-17H		Mandaree 01-10H		Mandaree 03-08H		Mandaree 11-06H		Mandaree 09-04H	
	On	Off								
Reservation (On/Off)	On	Off								
Confidential Wells	59	82	65	73	64	77	63	80	65	74
Drilling Wells	1	2	1	3	1	2	1	2	1	3
Active Wells	42	265	42	255	42	263	42	272	42	260
Permitted Wells	0	0	0	0	0	0	0	0	0	0

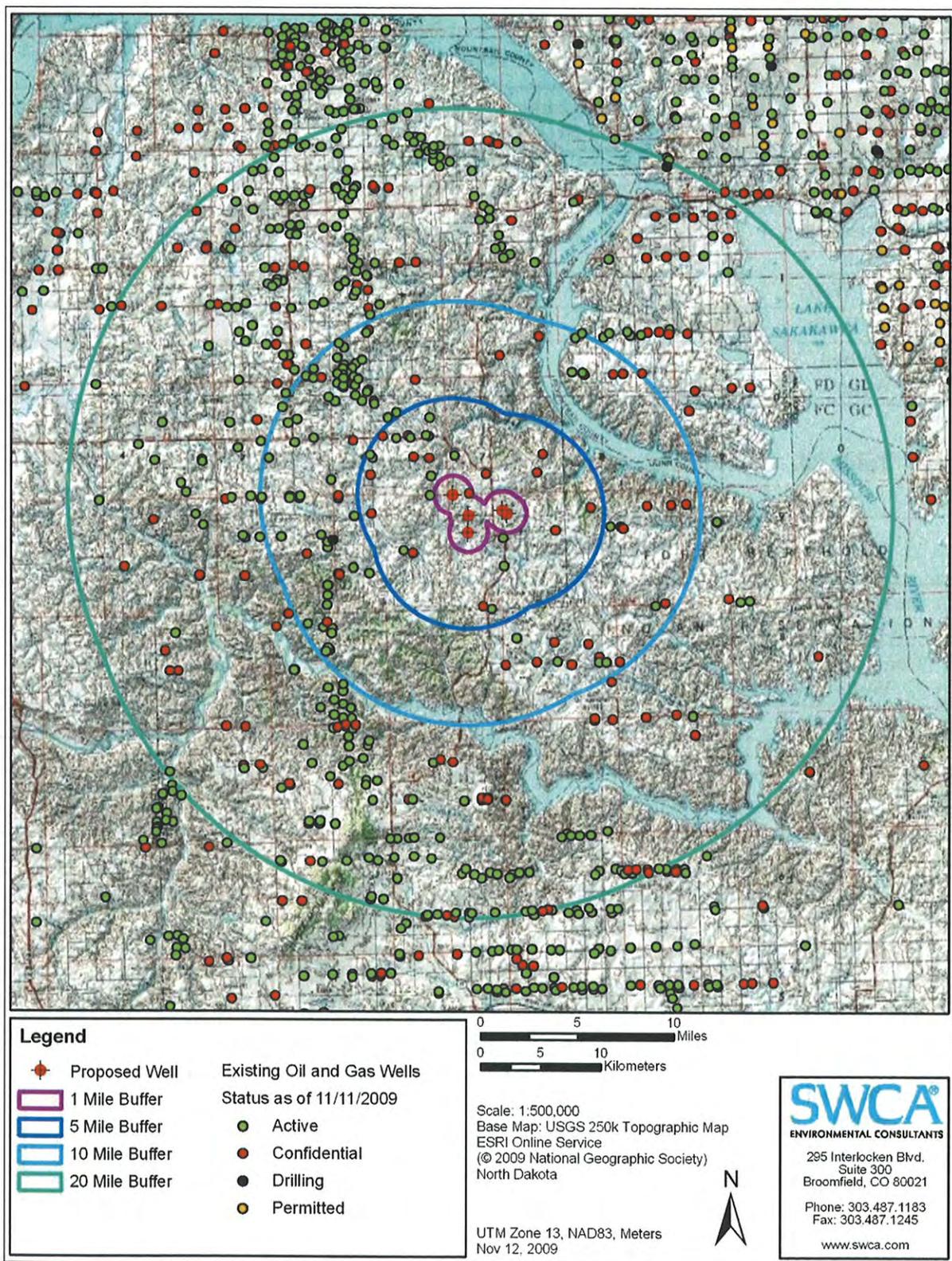


Figure 26. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

Within the Reservation and near the proposed project areas, development projects remain few and widely dispersed. However, if successful commercial production is achieved, new exploratory wells may be proposed, though such developments are merely speculation until APDs are submitted to the BLM and the BIA for approval. At this time, EOG has formally proposed to drill 12 more wells in the same general area as the proposed project, using many of the same main access roads and minimizing the disturbance as much as possible.

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 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. Thus, the Proposed Action could incrementally add to existing and future sources of water quality degradation in the Bear Den Bay, Upper Bear Den Creek, Boggy Creek, and Upper Squaw 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 4.4 miles of new unpaved roadway in the project area and upgrade approximately 0.25 mile of existing road. As such, the Proposed Action would incrementally add to existing and future impacts to soil resources in the general area. However, 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 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.

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. Although several cultural resource sites were newly recorded in the APE of the proposed wells, the location of the wells pad and associated access roads were moved to avoid these sites. As such, no damage or destruction of archaeological resources is anticipated as a result of the Proposed Action, as identified resources would be avoided, negating the cumulative impacts to the archaeological record.

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

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs and commitments contained in the APD would limit potential impacts. No significant negative impacts are expected to affect any critical element of the human environment; impacts would generally be low and mostly temporary. EOG has committed to implementing interim reclamation of the well pads immediately following construction and completion. Roads would also be reclaimed after the life of the project, unless formally transferred to the BIA or landowner. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

4.0 CONSULTATION AND COORDINATION

The BIA must continue to make efforts to solicit the opinions and concerns of all stakeholders. For the purpose of this EA, a stakeholder is considered any agency, municipality, or individual person to which the Proposed Action may affect either directly or indirectly in the form of public health, environmental, or socioeconomic issues. A scoping letter declaring the location of the proposed project areas and explaining the actions proposed at each site was sent in advance of this EA to allow stakeholders ample time to submit comments or requests for additional information. The scoping comments received are summarized in Table 23. Additionally, a copy of this EA should 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
- Matt Loscalzo, Natural Resource Planner
Prepared the EA
- Courtney Higgins, Archaeologist
Conducted cultural resource literature review and prepared the EA
- Richard Wadleigh, Senior NEPA Planner
Reviewed and edited the EA
- Sage Wall, GIS Specialist
Created maps and spatially derived data



United States Department of the Interior

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



OCT 30 2009

IN REPLY REFER TO:
DESCRM
MC-208

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 four oil well pads and access roads in McKenzie County, North Dakota. Approximately 44.1 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. 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 these undertakings. Catalogued as **BIA Case Number AAO-1703/FB/10**, the proposed undertakings, locations, and project dimensions are described in the following reports:

Delmas, Michelle

- (2009) A Class I and Class III Cultural Resource Inventory of the Mandaree 1-10H Well Pad and Access Road on the Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.
- (2009) A Class I and Class III Cultural Resource Inventory of the Mandaree 9-04H Well Pad and Access Road on the Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.
- (2009) A Class I and Class III Cultural Resource Inventory of the Mandaree 10-5H Well Pad on the Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.
- (2009) A Class I and Class III Cultural Resource Inventory of the Mandaree 7-17H Well Pad and Access Road on the Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.

Page 2

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

Enclosures

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

NOV 12 2009

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of two oil well pads and access roads in McKenzie County, North Dakota. Approximately 54.6 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. Six archaeological sites (32MZ2009, 32MZ2010, 32MZ2011, 32MZ2012, 32MZ2013, 32MZ2012) were 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 all of the archaeological sites will be avoided through rerouting access roads and/or shifting well pad locations. Catalogued as **BIA Case Number AAO-1703/FB/10**, the proposed undertakings, locations, and project dimensions are described in the following reports:

Cregger, Michael, Thomas Witt and Judith Cooper
(2009) A Class I and Class III Cultural Resource Inventory of the EOG Mandaree 11-06H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for EOG Resources, Inc., Denver.

Witt, Thomas, Stephanie Lechert and Judith Cooper
(2009) A Class I and Class III Cultural Resource Inventory of the EOG Mandaree 3-08H 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.

Page 2

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

Sincerely,


Regional Director

Enclosures

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

Table 22. Public Scoping Comments.

Name	Organization	Comment	Response to Comment
Bagley, Lonny	Bureau of Land Management	No Comment	
Benson, Barry	Three Affiliated Tribes	No Comment	
Berg, George	NoDak Electric Cooperative, Inc.	No Comment	
Black, Mike	Bureau of Indian Affairs	No Comment	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	No Comment	
Brien, David	Chairman, Turtle Mountain Band of Chippewa	No Comment	
Brugh, V. Judy	Three Affiliated Tribes	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Christenson, Ray	Southwest Water Authority	No Comment	
Cimarosti, Dan	U.S. Army Corps of Engineers	An application was sent increase the project requires a Section 10 and/or Section 404 permit. Request BIA provide USACE with a copy of the FONSI and Final EA.	Noted.
Crooke, Patsy	U.S. Army Corps of Engineers	No Comment	
U.S. Army Corps of Engineers, Omaha District	Garrison Project Office	No Comment	
Danks, Marvin	Fort Berthold Rural Water Director	No Comment	
Dhieux, Joyce	U.S. Environmental Protection Agency	No Comment	
Director, Insurance & Hazard	Federal Emergency Management Agency	No Comment	
Dixon, Doug	Montana Dakota Utilities	No Comment	
Dressler, Patricia	Federal Aviation Administration	No objection provided the FAA is notified of construction or alterations as required.	Noted.
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Flores, J.R.	U.S. Department of Agriculture	No Comment	
Fox, Fred	Three Affiliated Tribes	No Comment	
Glatt, David	North Dakota Department of Health	The department believed that environmental impacts from the proposed construction would be minor and could be controlled by proper construction methods.	Noted.
Gorton, Candace	U.S. Army Corps of Engineers	No Comment	
Guzman, Frank	U.S. Forest Service	No Comment	
Hall, Joseph	U.S. Department of the Interior	No Comment	

Name	Organization	Comment	Response to Comment
Hall, Todd	Three Affiliated Tribes	No Comment	
Hanson, Jesse	North Dakota Parks and Recreation	Based on their review of the North Dakota Natural Heritage biological conservation database, no known occurrences of plant or animal species of concern were located within a one-mile radius of the project area, although this may be due to a lack of surveys.	Noted.
Hauck, Reinhard	Dunn County	No Comment	
His Horse Is Thunder, Ron	Chairman, Standing Rock Sioux Tribe	No Comment	
Hoffman, Warren	Killdeer, Weydahl Field	No Comment	
Hovda, Roger	Reservation Telephone Cooperative	No Comment	
Hudson-Schenfisch, Julie	McLean County Board of Commissioners	No Comment	
Hynek, David	Chair, Mountrail Board of County Commissioners	No Comment	
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadmas, Ray	Dunn County	No Comment	
Kuehn, John	Parshall-Hankins Field Airport	No Comment	
Kulas, Cheryl	Indian Affairs Commission	No Comment	
Laux, Eric	U.S. Army Corps of Engineers	No Comment	
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
Manager	Xcel Energy	No Comment	
McKenna, Mike	North Dakota Game and Fish Department	Avoid native prairie, wooded draws, riparian corridors, and wetland areas to the extent possible.	Noted.
McPhillips, Kelly	Bureau of Reclamation	There are waterlines existing or proposed in the vicinity of the proposed wells and their access roads. Request proponent coordinate construction with Marvin Danks, Fort Berthold Rural Water Director.	.Noted.
Mercer County	Mercer County Board of Commissioners	No Comment	
Miller, Ken	Northern Border Pipeline Company	No Comment	
Missile Engineer, Chief	Minot Air Force Base	No Comment	
NAGPRA Office	Three Affiliated Tribes	No Comment	
Nash, Mike	Bureau of Land Management	No Comment	
Natural Resources Department	Three Affiliated Tribes	No Comment	

Name	Organization	Comment	Response to Comment
Nelson, Richard	U.S. Bureau of Reclamation	No Comment	
Obenauer, Steve	Federal Aviation Administration	No Comment	
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merlan	State Historical Society	SHPO 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	
Representative, Mandaree Segment	Three Affiliated Tribes	No Comment	
Roth, Sandy	Northern Border Pipeline Company	No Comment	
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Schekoph, David	West Plains Electric Cooperative, Inc.	No Comment	
Selvage, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Svoboda, Larry	U.S. Environmental Protection Agency	No Comment	
Thompson, Brad	U.S. Army Corps of Engineers	Ensure that the project is in compliance with floodplain management criteria and 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	No Comment	
U.S. Department of the Interior	National Park Service, Midwest Region	No Comment	
Vodehnal, Dale	U.S. Environmental Protection Agency	No Comment	
Wells, Marcus	Chairman, Three Affiliated Tribes	No Comment	
Whitcalf, Frank	Three Affiliated Tribes	No Comment	
Williams, Damon	Three Affiliated Tribes	No Comment	
Wolf, Malcolm	Three Affiliated Tribes	No Comment	

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Environmental Consultants for EOG Resources, Inc., Denver.

5.0 ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
µg/m ³	micrograms per cubic meter
AAQM	Ambient Air Quality Monitoring (site)
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
FEL	from the east line
FNL	from the north line
FONSI	Finding of No Significant Impact
FSL	from the south line
FWL	from the west line
gal/min	gallons per minute
GHG	greenhouse gas
Gold Book	<i>Surface Operating Standards for Oil and Gas Exploration and Development, 4th Edition</i>
H ₂ S	hydrogen sulfide
HAP	Hazardous Air Pollutant
HUC	hydrologic unit code
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
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIC	North Dakota Industrial Commission
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NO ₂	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTL	Notice to Lessees
NWI	National Wetland Inventory
O ₃	ozone

PABFh	freshwater pond
Pb	lead
PEM	palustrine emergent freshwater wetland
PM	particulate matter
PM₁₀	particulate matter 10 microns or smaller
PM_{2.5}	particulate matter two and a half microns or smaller
ppm	parts per million
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
Reservation	Fort Berthold Indian Reservation
ROW	right-of-way
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Officer
SO₂	sulfur dioxide
SPCCP	Spill Prevention Control and Countermeasure Plan
SUP	Surface Use Plan
SWCA	SWCA Environmental Consultants
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound

6.0 NRCS SOIL SERIES SUMMARY

Arikara

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

Shambo

The Shambo series consists of deep and very deep, well-drained soils found on terraces and fans along stream valleys and uplands. Permeability is moderate with slopes ranging from approximately 0% to 35%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is approximately 42°F. This soil type is usually cropped to small grains, hay, and pasture. Native vegetation species common to this soil type include green needlegrass (*Nassella viridula*), needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), prairie junegrass (*Koeleria pyramidata*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

Cabba

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

Beisigl

The Beisigl series consists of moderately deep, somewhat excessively drained soils found on uplands. Permeability is rapid with slopes ranging from approximately 0% to 50%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is approximately 43°F. This soil type is primarily used for native range, as well as hay, pasture, and cultivated crops. Native vegetation species common to this soil type include needle and thread, prairie sandreed (*Calamovilfa longifolia*), little bluestem, and blue grama (NRCS 2009).

Flasher

The Flasher series consists of shallow, somewhat excessively drained soils found on sandstone on side slopes, shoulder slopes and summits of hills and ridges on uplands and valley side slopes. Permeability is moderately rapid or rapid with slopes ranging from approximately 3% to 70%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and mean annual air temperature is approximately 43°F. This soil type is primarily used for range and pasture. Native vegetation species

common to this soil type include prairie sandreed, little bluestem, blue grama, and upland sedges (*Carex* spp.) (NRCS 2009).

Tally

The Tally series consists of very deep, well-drained soils found on streams terraces, alluvial fans, till plains, drainageways, hills, sedimentary plains, and outwash plains. Permeability is moderately rapid with slopes ranging from approximately 0% to 45%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is approximately 43°F. This soil type is primarily used for irrigated and non-irrigated crops and as rangeland. Native vegetation species common to this soil type include western wheatgrass, needle and thread, prairie junegrass, prairie sandreed, forbs, and shrubs (NRCS 2009).

Chama

The Chama series consists of moderately deep, well-drained soils found on uplands. Permeability is moderate or moderately slow with slopes ranging from approximately 0% to 45%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is approximately 42°F. This soil is cropped to small grains, which are mostly wheat; a significant acreage is in rangeland. Native vegetation species common to this soil type include western wheatgrass, needle and thread, and blue grama (NRCS 2009).

Havrelon

The Havrelon series consists of very deep, well and moderately drained soils found on floodplains of major streams and tributaries. Permeability is moderate with slopes ranging from approximately 0% to 6%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil is used on cultivated areas that are used for growing small grains, hay, corn, and pasture. Native vegetation species common to this soil type include big bluestem (*Andropogon gerardii*), green needlegrass, and western wheatgrass. Trees, including green ash, cottonwood (*Populus* sp.), boxelder (*Acer negundo*), and chokecherry (*Prunus virginiana*), are along the stream channels (NRCS 2009).

Daglun

The Daglun series consists of deep and very deep, moderately well and well-drained soils found on foot slopes and swales on terraces and uplands. Permeability is slow or very slow with slopes ranging from approximately 0% to 25%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil is used for range, pasture, and small grains. Native vegetation species common to this soil type include western wheatgrass, blue grama, green needlegrass, needleleaf sedge (*Carex duriuscula*), and forbs (NRCS 2009).

Dogtooth

The Dogtooth series consists of moderately deep, well-drained soils found in uplands where the predominant slope is between 0% and 25%. Permeability is very slow. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is approximately 42°F. The most common vegetation

species found on this soil type are range and pasture grasses including western wheatgrass and blue grama (NRCS 2009).

Janesburg

The Janesburg series consists of moderately deep, well-drained soils found on upland plains on slopes ranging between 6% and 9%. The parent material consists of a clayey residuum weathered from shale. This soil has a very slow permeability rate and exhibits a low capacity to move water in its most restrictive layer. Shrink-swell potential is high and this soil is not flooded. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is 42°F. This soil type is used for cultivation of small grains, range, and pasture. Native vegetation species historically common to this soil type include western wheatgrass, blue grama, green needlegrass, and sedges (NRCS 2009).

Harriet

The Harriet series consists of very deep, poorly drained soils found on low-lying flats, terraces, drainageways and bottom lands. Permeability is very slow with slopes ranging from approximately 0% to 3%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil type is used for native rangeland or hayland. Native vegetation species historically common to this soil type include western wheatgrass, nuttall's alkaligrass (*Puccinellia nuttalliana*), and inland saltgrass (*Distichlis spicata*) (NRCS 2009).

Lambert

The Lambert series consists of very deep, well-drained soils found on recent alluvium on uplands, fans, and terraces. Permeability is moderately slow with slopes ranging from approximately 0% to 65%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and mean annual air temperature is approximately 42°F. This soil type is used for a mix of cropland and native pasture. Native vegetation in uncultivated areas is composed primarily of western wheatgrass, blue grama, threadleaf sedge (*Carex filifolia*), and needle and thread (NRCS 2009).

Rhoades

The Rhoades series consists of very deep, well or moderately well-drained soils found in swales on uplands and terraces. Permeability is very slow with slopes ranging from approximately 0% to 25%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil type is used for range and pasture. Native vegetation species historically common to this soil type include short- and mid-prairie grasses such as western wheatgrass, blue grama, sedges, and also some legumes, prickly pear (*Opuntia* sp.), and clubmoss (Lycopodiaceae) (NRCS 2009).

Noonan

The Noonan series consists of very deep, well-drained or moderately well-drained soils found on till plains and uplands. Permeability is moderate with slopes ranging from approximately 0% to 15%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and mean annual air temperature is approximately 39°F. This

soil type is used for range and pasture. Native vegetation species historically common to this soil type include short- and mid-prairie grasses such as western wheatgrass and blue grama (NRCS 2009)

Vebar

The Vebar series consists of moderately deep, well-drained soils found on uplands. Permeability is moderate rapid with slopes ranging from approximately 0% to 65%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and mean annual air temperature is approximately 42°F. This soil type is used to grow corn and small grains. Native vegetation species historically common to this soil type include needle and thread and prairie sandreed (NRCS 2009)

Williams

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

Williams Loam

The Williams loams soil type is very deep, slowly permeable, well-drained soils found on knolls on till plains with slopes at approximately 6% to 9%. The parent material consists of fine-loamy till. This well-drained soil exhibits a moderately low capacity to move water at its most restrictive layer. Shrink-swell potential is moderate and this soil is not flooded. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and mean annual air temperature is approximately 40°F. This soil type is largely used for cultivation and the organic matter content in the surface horizon is approximately 4%. Native vegetation species common to this soil type include western wheatgrass, needle and thread, blue grama, and green needlegrass (NRCS 2009). The Williams loams 6% to 9% is listed on the National Hydric Soils List by State but is not listed for McKenzie County (NRCS 2009).

Belfield

The Belfield series consists of deep and very deep, well to moderately well-drained, very slowly permeable soils found on upland flats, terraces, and swales with slopes ranging from approximately 0% to 9%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches, and mean annual air temperature is approximately 43°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, blue grama, and green needlegrass (NRCS 2009).

Daglum

The Daglum series consists of deep and very deep, moderately well and well-drained, slow to very slowly permeable soils found on swales on upland terraces and foot slopes. Slopes range from approximately 0% to 9%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil type is used for rangeland foraging and cultivation of small

grains. Native vegetation species common to this soil type include western wheatgrass, blue grama, and green needlegrass (NRCS 2009).

Zahl

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

Bowbells

The Bowbells series consists of very deep, well and moderately well-drained soils found on glacial till plains and moraines. Permeability is moderate in the upper portions and moderately slow to slow in the substratum. Slopes range from approximately 0% to 9%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches, and mean annual air temperature is approximately 42°F. This soil type is used for cultivation of small grains. Native vegetation species historically common to this soil type include western wheatgrass, green needlegrass, and big bluestem (NRCS 2009).

Notice of Availability and Appeal Rights

EOG Resources, Inc.: Five Exploratory Oil Wells:

Mandaree 09-04H
Mandaree 11-06H
Mandaree 03-08H
Mandaree 01-10H
Mandaree 07-17H

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to five proposed oil and gas wells as shown on the attached map. Construction by EOG Resources, Inc. is expected to begin in 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 January 18, 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 location

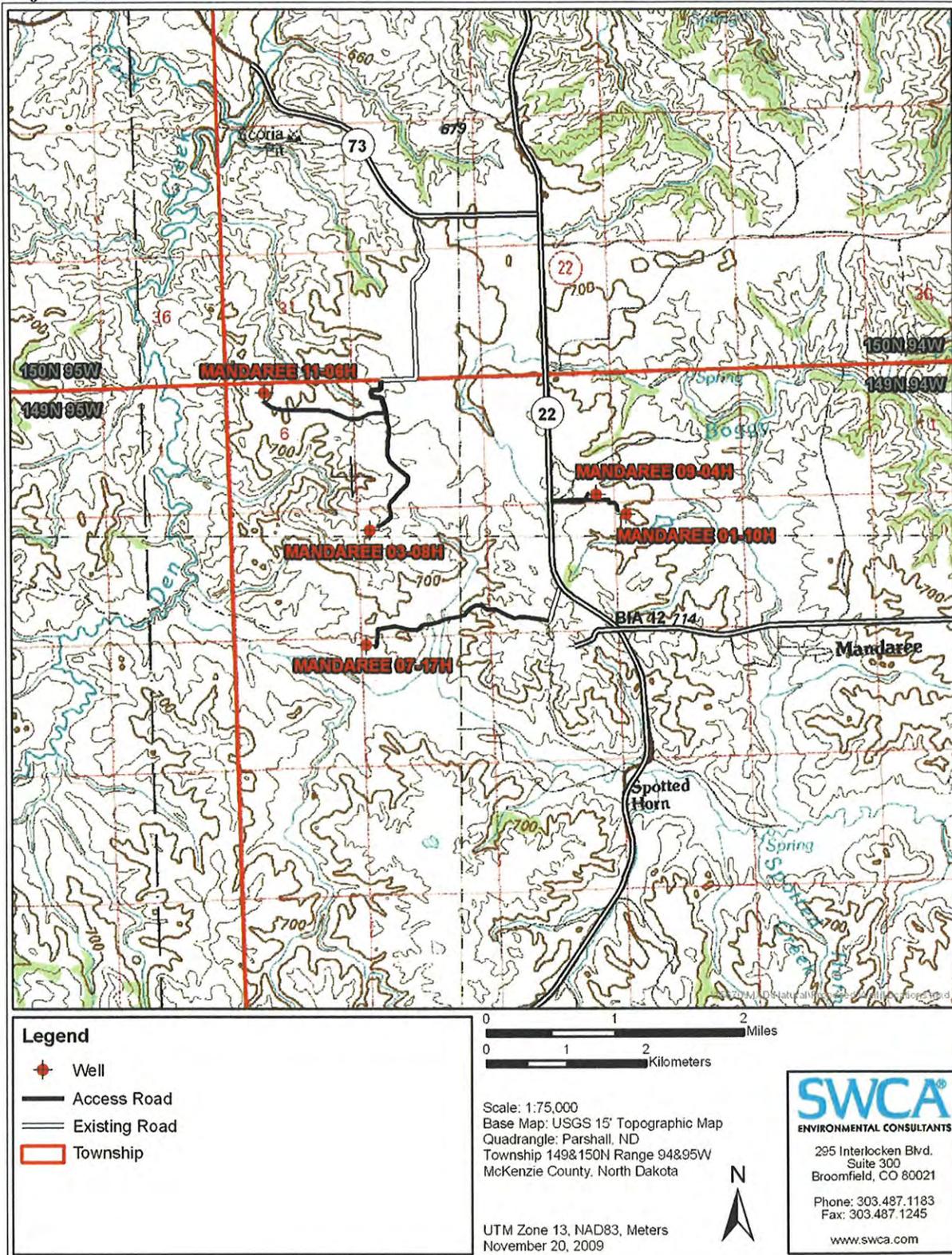
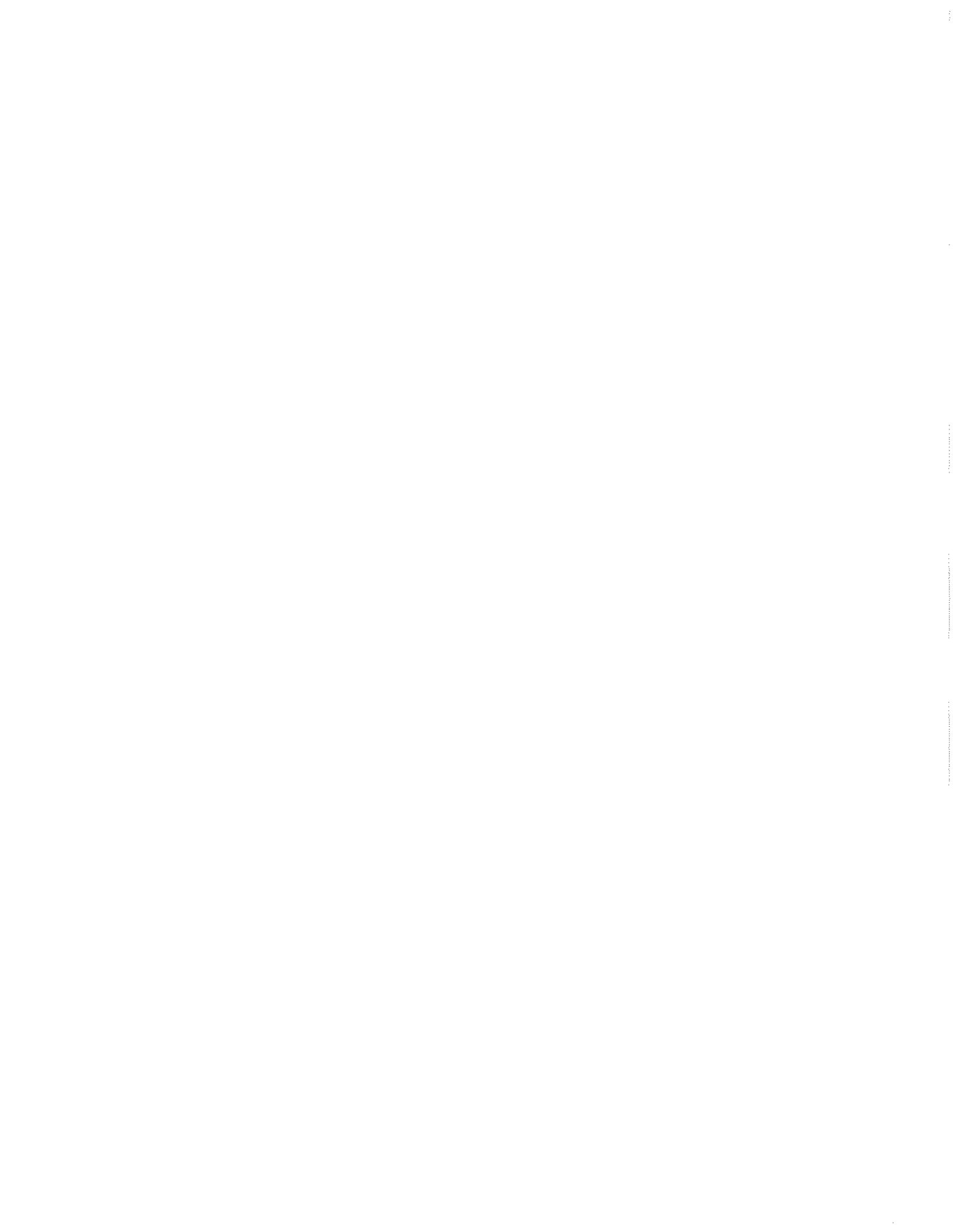


Figure 1. Project Location Map.





REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640
November 3, 2009

North Dakota Regulatory Office

[NWO-2009-02774-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 of **EOG Resources, Inc. (EOG)**, received on November 2, 2009 requesting Department of the Army (DA), United States Army Corps of Engineers (Corps) comments on five proposed oil and gas exploratory wells within the Fort Berthold Indian Reservation. The proposed five wells include; **Mandaaree 09-04H; Mandaree 11-06H; Mandaree 03-08H; Mandaree 01-10H; and Mandaree 07-17H.** The proposed projects are located within 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 (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. In addition, any upgrade and/or construction of access roads that require the placement of fill material in waters of the United States may require a preconstruction notification (PCN) to the Corps. Finally, utility lines that cross waters of the United States may likewise require a PCN to the Corps.

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 12th 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,

A handwritten signature in black ink that reads "Daniel E. Cimarosti". The signature is written in a cursive style with a large, prominent 'D' at the beginning.

Daniel E. Cimarosti
Regulatory Program Manager
North Dakota

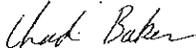
Enclosure
ENG Form 4345

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

Comments should be submitted before November 30, 2009, so that they may be addressed in the final document. 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

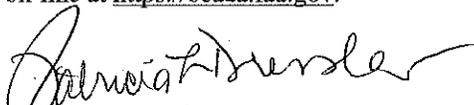


U.S. Department
of Transportation
**Federal Aviation
Administration**

Date 11/17/2009

Dear Mr. Baker:

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
Federal Aviation Administration
Bismarck Airports District Office
2301 University Drive, Building 23B
Bismarck, ND 58504



November 20, 2009

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

Re: Five Exploratory Oil Wells by EOG Resources, Inc.
Mandaree 09-04H, 11-06H, 03-08H, 01-10H & 07-17H
McKenzie County, North Dakota

Dear Mr. Baker:

This department has reviewed the information concerning the above-referenced project 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

Mr. Chad Baker

2.

November 20, 2009

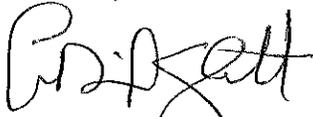
construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

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,

A handwritten signature in black ink, appearing to read "L. David Glatt". The signature is written in a cursive, somewhat stylized font.

L. David Glatt, 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
Douglass A. Prchal, Director
1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

November 17, 2009

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

Re: Five Exploratory Oil Wells and Associated Facilities
Fort Berthold Indian Reservation

Dear Mr. Baker:

The North Dakota Parks and Recreation Department has reviewed the above referenced proposal to drill five exploratory oil wells located in Sections 4, 6, 8, 10, and 17, T149N, R94W, McKenzie 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.

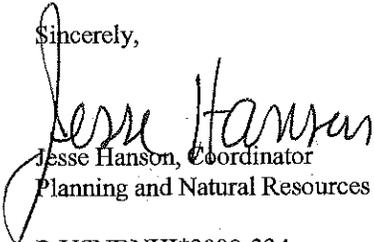
The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historic plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, 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) of our staff if additional information is needed.

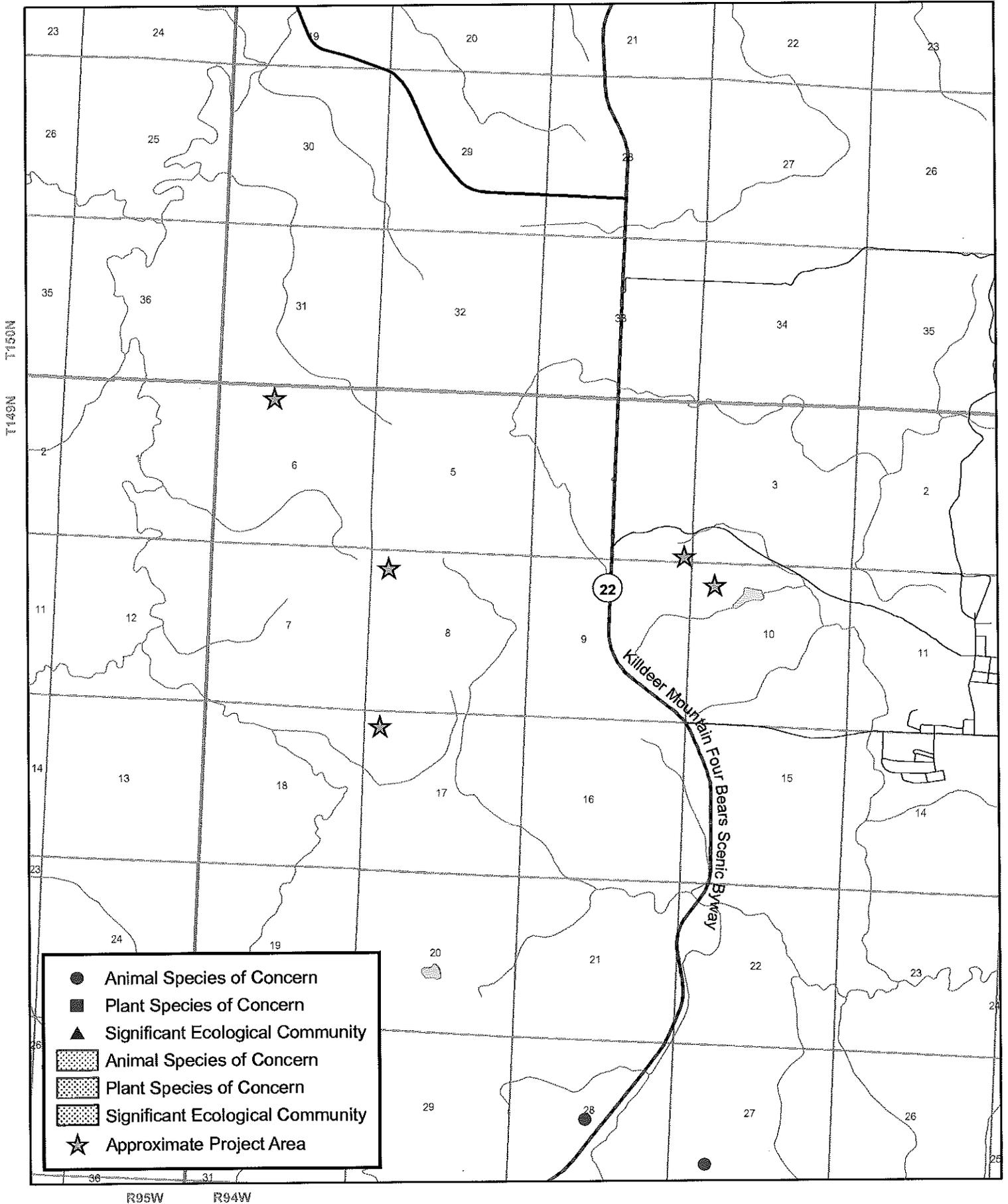
Sincerely,

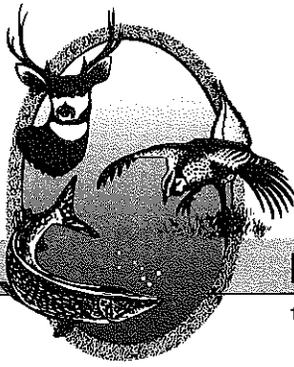

Jesse Hanson, Coordinator
Planning and Natural Resources Division

R.USNDNHI*2009-334

.....
Play in our backyard!

North Dakota Natural Heritage Inventory Species of Concern and Significant Ecological Communities





"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

November 17, 2009

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

Dear Mr. Baker:

RE: Exploratory Oil & Gas Wells
Forth Berthold Reservation

EOG Resources, Inc. has proposed five exploratory oil and gas wells on the Fort Berthold Reservation in sections 4, 6, 8, 10 & 17, T149N, R94W of McKenzie County, 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,

A handwritten signature in cursive script that reads "Steve Ryke".

(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

NOV 9 2009

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

Subject: Solicitation for Environmental Assessment for Drilling and Completion of Five Proposed Oil and Gas Exploratory Wells on the Fort Berthold Reservation in McKenzie County, North Dakota

Dear Mr. Baker:

This letter is written to inform you that your letter was received on November 2 and the information and maps have been reviewed by Bureau of Reclamation staff.

Proposed oil well sites located in McKenzie County could potentially affect Reclamation facilities in the form of the rural water pipelines of the Fort Berthold Rural Water System. All proposed well sites or their access roads are located in the vicinity of a water pipeline either existing or proposed for construction.

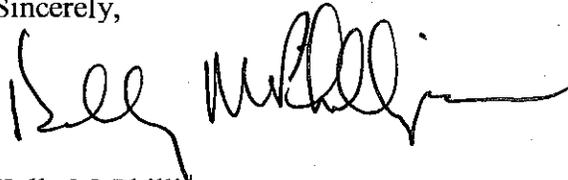
McKenzie County

Mandaree 11-06H: NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 6, T149N, R94W
Mandaree 03-08H: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 8, T149N, R94W
Mandaree 09-04H: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 4, T149N, R94W
Mandaree 01-10H: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 10, T149N, R94W
Mandaree 07-17H: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17, T149N, R94W

We are providing a map depicting the proposed water line alignments in the vicinity of the well site locations that could potentially affect Reclamation facilities. 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. Marvin Danks, 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 Ron Melhouse at 701-221-1288.

Sincerely,

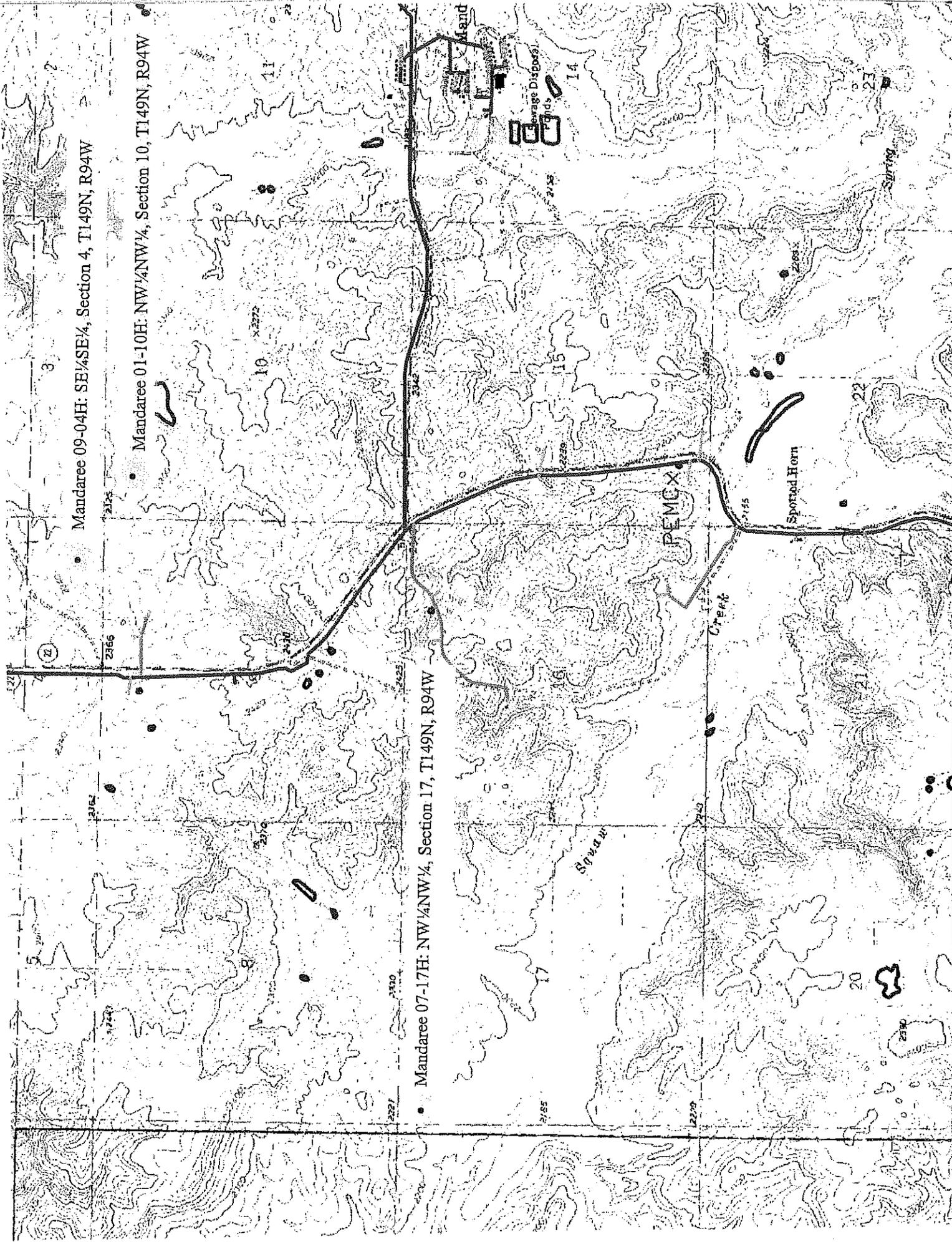
A handwritten signature in black ink, appearing to read "Kelly McPhillips", with a long horizontal flourish extending to the right.

Kelly McPhillips
Natural Resource Specialist

Enclosure

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. Marvin Danks
Fort Berthold Rural Water Director
Three Affiliated Tribes
308 4 Bears Complex
New Town, ND 58763
(w/encl)



• Mandaree 09-04H: SE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 4, T149N, R94W

• Mandaree 01-10H: NW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 10, T149N, R94W

• Mandaree 07-17H: NW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 17, T149N, R94W

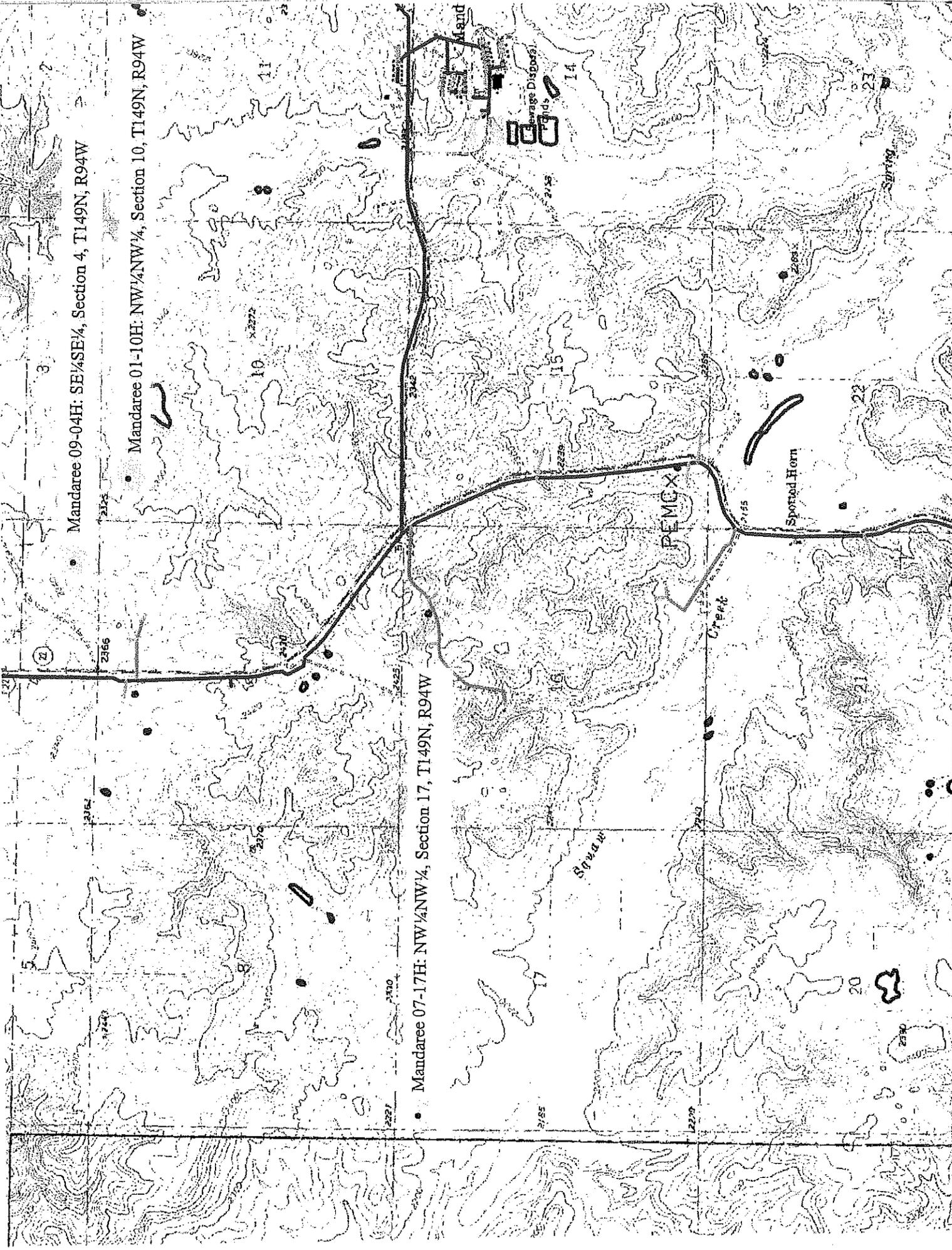
PEMCO

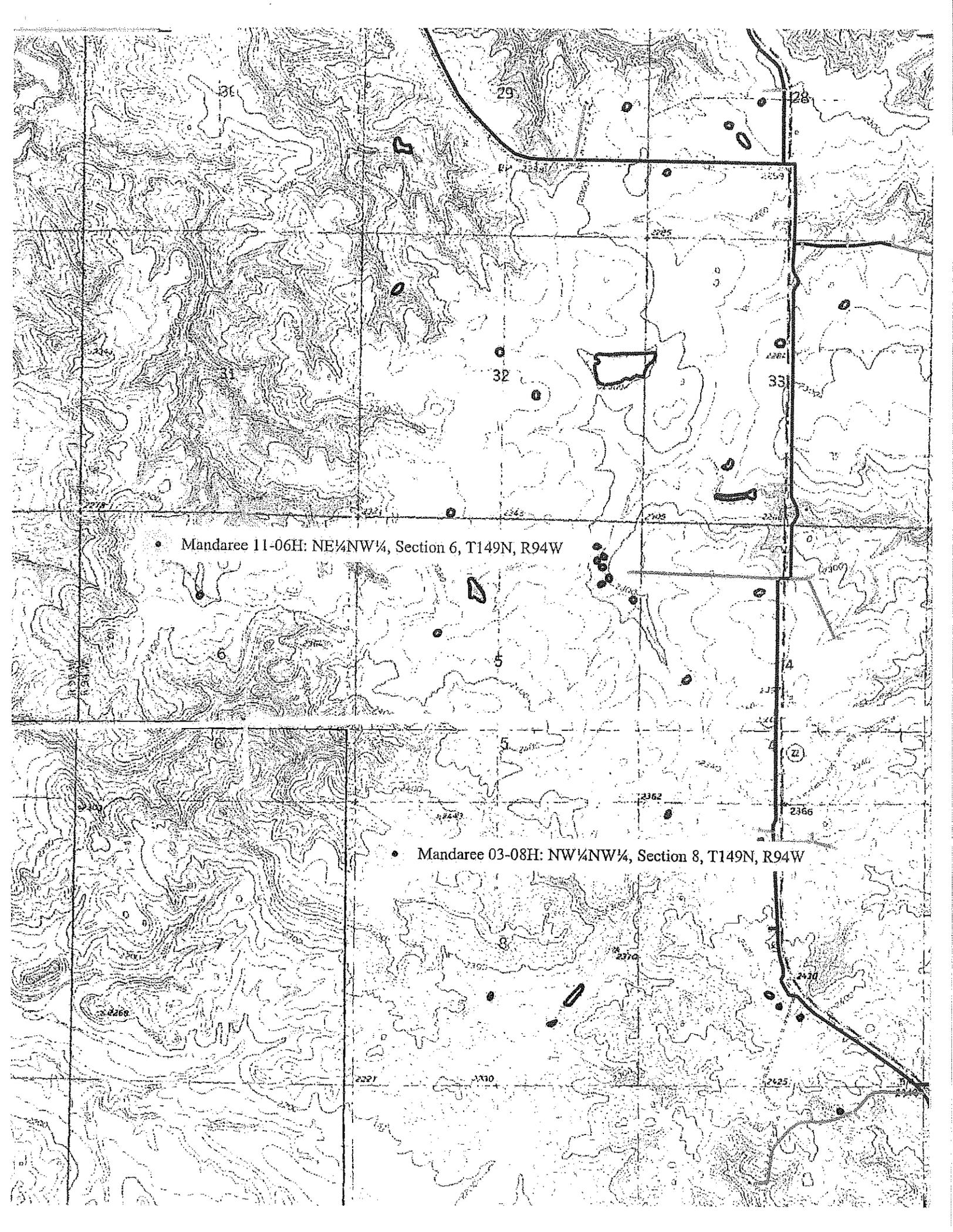
Creek

Spotted Horn

Sewage Disposal Pond

Land





• Mandaree 11-06H: NE¼NW¼, Section 6, T149N, R94W

• Mandaree 03-08H: NW¼NW¼, Section 8, T149N, R94W

LEGEND

PIPELINE

	1" POLY		2½"		6"		12"
	1½"		3"		8"		14"
	2"		4"		10"		



WETLANDS



**STATE
HISTORICAL
SOCIETY**
OF NORTH DAKOTA

John Hoeven
Governor of North Dakota

North Dakota
State Historical Board

Chester E. Nelson, Jr.
Bismarck - President

Gereld Gerntholz
Valley City - Vice President

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Grand Forks

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A. Ruric Todd III
Jamestown

Sara Otte Coleman
*Director
Tourism Division*

Kelly Schmidt
State Treasurer

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Secretary of State

Douglass Prchal
*Director
Parks and Recreation
Department*

Francis Ziegler
*Director
Department of Transportation*

Merlan E. Paaverud, Jr.
Director

Accredited by the
American Association
of Museums

November 3, 2009

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

NDSHPO REF. 10-0174 BIA/MHAN Environmental Assessment for 5 proposed well pads and access roads EOG Resources, Inc. MHAN/Fort Berthold Reservation
Mandaree 09-04H in portions of [T149N R94W Section 4]
Mandaree 11-06H in portion of [T149N R94W Section 6]
Mandaree 03-08H in portion of [T149N R94W Section 8]
Mandaree 01-10H in portion of [T149N R94W Section 10]
Mandaree 07-17H in portion of [T149N R94W Section 17] McKenzie County, North Dakota

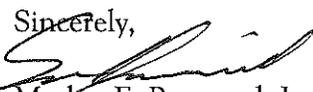
Dear Mr. Baker,

We received your letter regarding NDSHPO REF. 10-0174 BIA/MHAN Environmental Assessment for 5 proposed well pads and access roads EOG Resources, Inc. MHAN/Fort Berthold Reservation, McKenzie County, North Dakota. 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. 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

Sincerely,


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



REPLY TO
ATTENTION OF

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

November 4, 2009

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 postmarked October 30, 2009 regarding the proposed drilling and completion of up to five exploratory oil and gas wells on the Fort Berthold Reservation in McKenzie County, 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
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,

A handwritten signature in black ink, appearing to read "Brad Thompson", with a long horizontal flourish extending to the right.

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

Notice of Availability and Appeal Rights

EOG Resources, Inc.: Five Exploratory Oil Wells:

Mandaree 09-04H
Mandaree 11-06H
Mandaree 03-08H
Mandaree 01-10H
Mandaree 07-17H

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to five proposed oil and gas wells as shown on the attached map. Construction by EOG Resources, Inc. is expected to begin in 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 January 18, 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 location

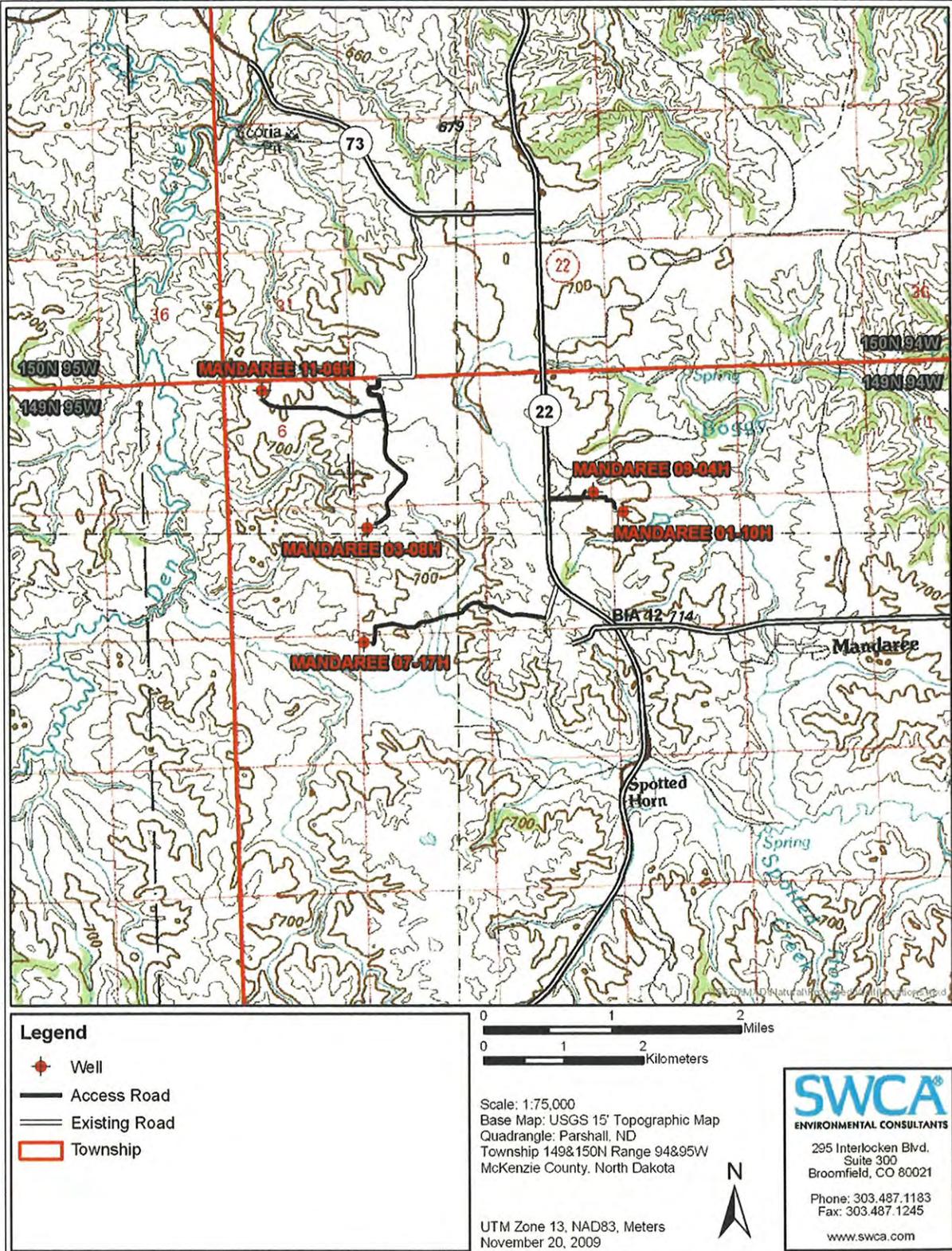


Figure 1. Project Location Map.