United States Department of the Interior

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

SEP 15 2009

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IN REPLY REFER TO:
DESCRM
MC-208

MEMORANDUM

TO: Superintendent, Ft. Berthold Agency

FROM: Regional Director, Great Plains Regional Office

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for four proposed exploratory drilling wells by Petro-Hunt, LLC on *Fort Berthold 147-94-1A-12-1H, Fort Berthold 147-94-2A-11-1H, Fort Berthold 147-94-3A-10-1H, and Fort Berthold 148-94-35D-26-1H* 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)

ENVIRONMENTAL ASSESSMENT

United States Bureau of Indian Affairs

Great Plains Regional Office
Aberdeen, South Dakota

Petro-Hunt, LLC

Four Bakken Formation Exploratory Oil Wells at Four Locations:

Fort Berthold 147-94-1A-12-1H
Fort Berthold 147-94-2A-11-1H
Fort Berthold 147-94-3A-10-1H
Fort Berthold 148-94-35D-26-1H

Fort Berthold Indian Reservation

September 2009

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

Finding of No Significant Impact

Petro-Hunt, LLC
Fort Berthold 147-94-1A-12-1H
Fort Berthold 147-94-2A-11-1H
Fort Berthold 147-94-3A-10-1H
Fort Berthold 148-94-35D-26-1H

Fort Berthold Indian Reservation
Dunn County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for four oil/gas wells, access roads and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 1, Township 147 North, Range 94 West, Section 2, Township 147 North, Range 94 West, Section 3, Township 147 North, Range 94 West, Section 35, Township 148 North, Range 94 West. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

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

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

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

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

5. Environmental justice was fully considered.

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

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

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

Regional Director

9/14/09
Date

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1. Purpose and Need for the Proposed Action

Petro-Hunt, LLC (Petro-Hunt) is proposing to drill four horizontal oil/gas wells from four locations on the Fort Berthold Indian Reservation to evaluate and potentially develop the commercial potential of natural resources. Developments have been proposed on lands held in trust by the United States in Dunn County, North Dakota. The U.S. Bureau of Indian Affairs (BIA) is the surface management agency for potentially affected tribal lands and individual allotments. The BIA also holds title to the subsurface mineral rights. One well would be drilled from each surface location shown in Figure 1. The proposed well pads are located as follows: Fort Berthold 147-94-1A-12-1H: NW¼NE¼ of Section 1, Township 147 North, Range 94 West, Dunn County; Fort Berthold 147-94-2A-11-1H: NW¼NE¼ of Section 2, Township 147 North, Range 94 West, Dunn County; Fort Berthold 147-94-3A-10-1H: NW¼NE¼ of Section 3, Township 147 North, Range 94 West, Dunn County; Fort Berthold 148-94-35D-26-1H: SE¼SE¼ of Section 35, Township 148 North, Range 94 West, Dunn County.

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

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

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

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

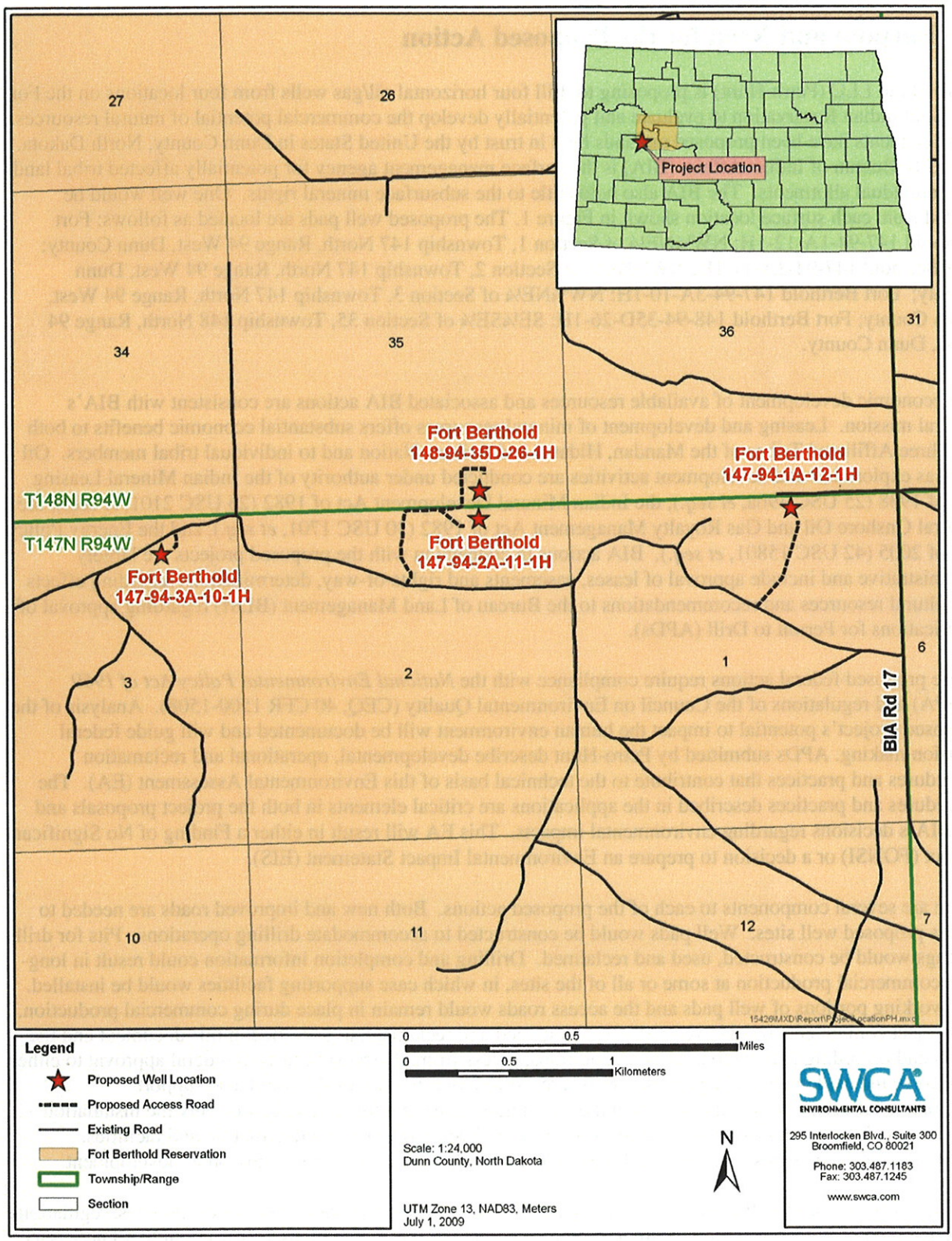


Figure 1: Project locations.

2. Proposed Actions and Alternatives

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

This document analyzes the impacts of specific projects—four exploratory oil and gas wells with varied surface and mineral estates (Table 1). The proposed well locations are in the west-central portion of the Reservation in Dunn County. The Mandaree Indian community is approximately 10 miles north-northwest, and New Town is approximately 27.6 miles north-northeast of the proposed Fort Berthold 147-94-1A-12-1H well. The Mandaree Indian community is approximately 9.7 miles north-northwest, and New Town is approximately 27.8 miles north-northeast of the proposed Fort Berthold 147-94-2A-11-1H well. The Mandaree Indian community is approximately 9.4 miles north-northwest, and New Town is approximately 28 miles north-northeast of the proposed Fort Berthold 147-94-3A-10-1H well. The Mandaree Indian community is approximately 9.6 miles north-northwest, and New Town is approximately 27.7 miles north-northeast of the proposed Fort Berthold 148-94-35D-26-1H well. The proposed wells would test the commercial potential of the Middle Bakken Dolomite Member of the Bakken Formation.

Table 1. Surface and Mineral Ownership of the Exploratory Well Sites

Proposed Well	Surface Owner	Mineral Owner
Fort Berthold 147-94-1A-12-1H	Allotted	Allotted
Fort Berthold 147-94-2A-11-1H	Allotted	Allotted
Fort Berthold 147-94-3A-10-1H	Allotted	Allotted
Fort Berthold 148-94-35D-26-1H	Allotted	Allotted

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

2.1 Field Camps

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

2.2 Access Roads

Up to 7,388.93 feet (1.40 miles) of new access roads would be constructed for the four proposed well locations and 13,227 feet (2.51 miles) will be upgraded or improved. Signed agreements would be in place allowing road construction across affected surface allotments and private land surfaces, and any applicable approach permits and/or easements would be obtained prior to any construction activity. A maximum disturbed right-of-

way (ROW) width of 60 feet for each access road would result in up to 10.18 acres of new surface disturbance. Petro-Hunt would reclaim the disturbance back to approximately 30 feet. Photographs of the proposed road alignments are provided as Figures 6 through 9.

Construction would follow road design standards outlined in the Gold Book. A minimum of six (6) inches of topsoil would be stripped from the access road corridors, with the stockpiled topsoil redistributed on the outslope areas of the borrow ditches following road construction. These borrow ditch areas would be reseeded as soon as practical with a seed mixture determined by the BIA. If commercial production is established from a proposed location, the access road would be graveled with a minimum of four (4) inches of gravel and the roadway would remain in place for the life of the well(s). Details of road construction are addressed in the Multi-Point Surface Use and Operations Plan in the APD.

2.3 Well Pads

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

The level area of the well pads used for drilling and completion operations (including a reserve pit for drill cuttings and stockpiles) would be approximately 350 by 495 feet (4.03 acres) for the Fort Berthold 147-94-1A-12-1H well site and approximately 350 by 470 feet (4.15 acres per well pad) for the remaining three wells. Approximately 16.48 acres will be disturbed for all of the well pads together. Details of pad construction and reclamation are diagrammed in the APDs. Photographs of the proposed well pad locations are provided as Figures 10 through 13.

2.4 Drilling

After securing mineral leases, Petro-Hunt submitted Notice of Staking to the BIA on June 2, 2009, proposing to drill four wells at four locations: (Table 2.4. Drilling Information)

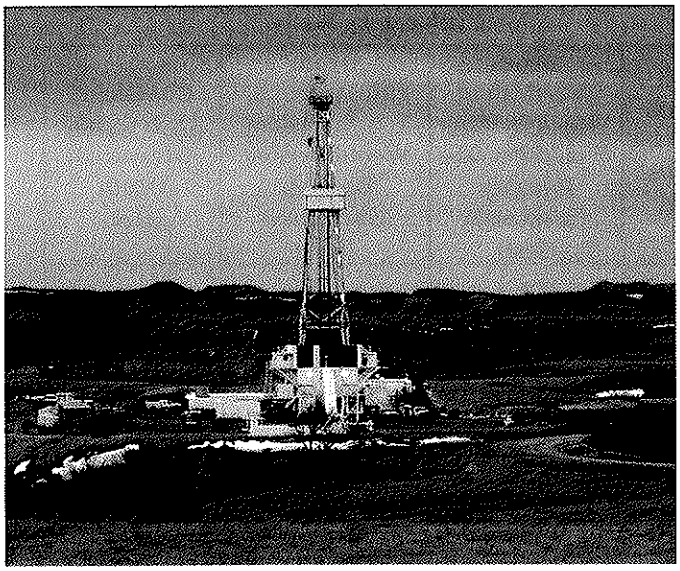
- **Fort Berthold 147-94-1A-12-1H:** 1,220 feet from the east line (FEL) and 550 feet from the south line (FSL) in the SE¼ of the SE¼ of Section 12, Township 147 North, Range 94 West; approximately 9,814.72 feet from the surface hole location.
- **Fort Berthold 147-94-2A-11-1H:** 1,220 feet FEL and 550 feet FSL in the SE¼ of the SE¼ of Section 11, Township 147 North, Range 94 West; approximately 9,806.04 feet from the surface hole location.
- **Fort Berthold 147-94-3A-10-1H:** 1,220 feet FEL and 550 feet FSL in the SE¼ of the SE¼ of Section 10, Township 147 North, Range 94 West; approximately 9,411.47 feet from the surface hole location.
- **Fort Berthold 148-94-35D-26-1H:** 1,420 feet FEL and 550 feet from the north line (FNL) in the NW¼ of the NE¼ of Section 26, Township 148 North, Range 94 West; approximately 9,814.72 feet from the surface hole location.

Table 2.4 Drilling Information for the Middle Bakken Formation Exploratory Wells

Purposed Well	Initial Vertical Depth (feet)	Setback Minimum Achieved by Directional Drilling (feet)	Depth (Vertical) at Which Drilling Would Become Roughly Horizontal (feet)	Depth (Measured) at Which Drilling Would Become Roughly Horizontal (feet)	Completed Drill String Measured Depth (feet)
Fort Berthold 147-94-1A-12-1H	10,148	550 FSL & 1,300 FEL	10,606	10,899	20,229
Fort Berthold 147-94-2A-11-1H	10,237	550 FSL & 1,250 FEL	10,237	10,705	20,315
Fort Berthold 147-94-3A-10-1H	10,363	552 FSL & 1,250 FEL	10,363	11,113	20,046
Fort Berthold 148-94-35D-26-1H	10,237	250 FNL & 1,396 FEL	10,725	10,987	20,260

Rig transport and on-site assembly would take roughly five days for each well. Drilling would require approximately 35 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 30,000 feet. For the first 2,500 feet drilled, a freshwater-based mud system with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage, using approximately 50 gallons of water per foot drilled.

After setting and cementing the near-surface casing, an oil-based mud system (80% diesel fuel and 20% water) would be used to drill to the 7-inch casing point. Oil-based drilling fluids reduce the potential for hole sloughing while drilling through water-sensitive formations (shales). Approximately 9,000 gallons of water and 25,000 gallons of diesel fuel per well would be used to complete vertical drilling. The lateral reach of each borehole would be drilled using 85,000 gallons of fresh water as mud and adding polymer sweeps as necessary to clean the hole. Horizontal drilling would utilize saltwater-based mud drilling fluid. On the surface, toxic fluids would be contained in steel tanks placed on plastic/vinyl liners, then collected during drilling by centrifuging returns to separate the cuttings from fluids. Fluids would be recycled back into the steel tanks for re-use. Upon completion of drilling operations at each location, oil-based fluids would be collected to the extent possible and recycled for use elsewhere. Any free fluids remaining in the reserve pits would be removed and disposed of in accordance with North Dakota Industrial Commission (NDIC) rules and regulations.



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

Figure 2.4: Typical drilling rig

2.5 Casing and Cementing

Surface casing would be set at an approximate depth of 2,500 feet and cemented back to the surface during drilling, isolating all near-surface freshwater aquifers in the project area. (The Fox Hills Formation is approximately 1,700 feet and the Pierre Formation is roughly 1,800 feet.) The Dakota Formation potentially contains a hydrocarbon zone expected at a depth of approximately 4,500 feet. Therefore, a production casing would be set and cemented from 11,256 feet up to approximately 4,000 feet. (This range is from the start of the lateral Bakken Formation drilling up to the Dakota Formation sand at roughly 4,000 feet.) Casing and cementing operations would be conducted in full compliance with *Onshore Oil and Gas Order 2* (Title 43 Code of Federal Regulations 3160).

2.6 Completion and Evaluation

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

2.7 Commercial Production

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

Initially, oil would be collected in tanks and periodically trucked to an existing oil terminal for sales. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both product and water would depend on the volumes and rates of

production (Table 2.7). In the future, Petro-Hunt would consider connections to pipelines and electric lines as they become available.

Table 2.7 Expected Oil and Water Production Initially and after One Year for Each Proposed Well

Proposed Well	Oil Production		Water Production	
	Initially	After 1 Year	Initially	After 1 Year
Fort Berthold 147-94-1A-12-1H	500	400	100	10
Fort Berthold 147-94-2A-11-1H	600	400	100	50
Fort Berthold 147-94-3A-10-1H	500	350	100	50
Fort Berthold 148-94-35D-26-1H	500	400	100	20

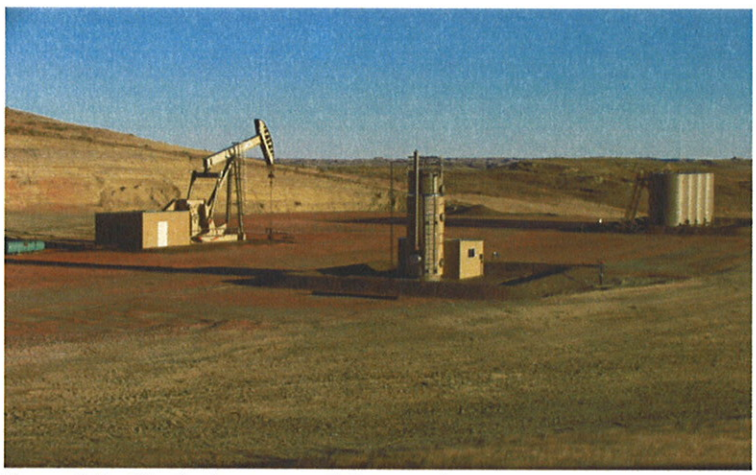


Figure 2.7: Typical commercial operation

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

2.8 Reclamation

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

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

Final reclamation would occur either in the very short term if the proposed well is commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed, reflecting the BIA view of oil and gas exploration and production as temporary intrusions on the landscape. All facilities

would be removed, well bores would be plugged with cement and dry hole markers would be set. Access roads and work areas would be leveled or backfilled as necessary, scarified, re-contoured and re-seeded. Exceptions to these reclamation measures might occur if the BIA approves assignment of an access road either to the BIA roads inventory or to concurring surface allottees. The Surface Use Plan within each APD contains additional details regarding both interim and final reclamation measures. Figure 2.8 shows an example of reclamation from the Gold Book.

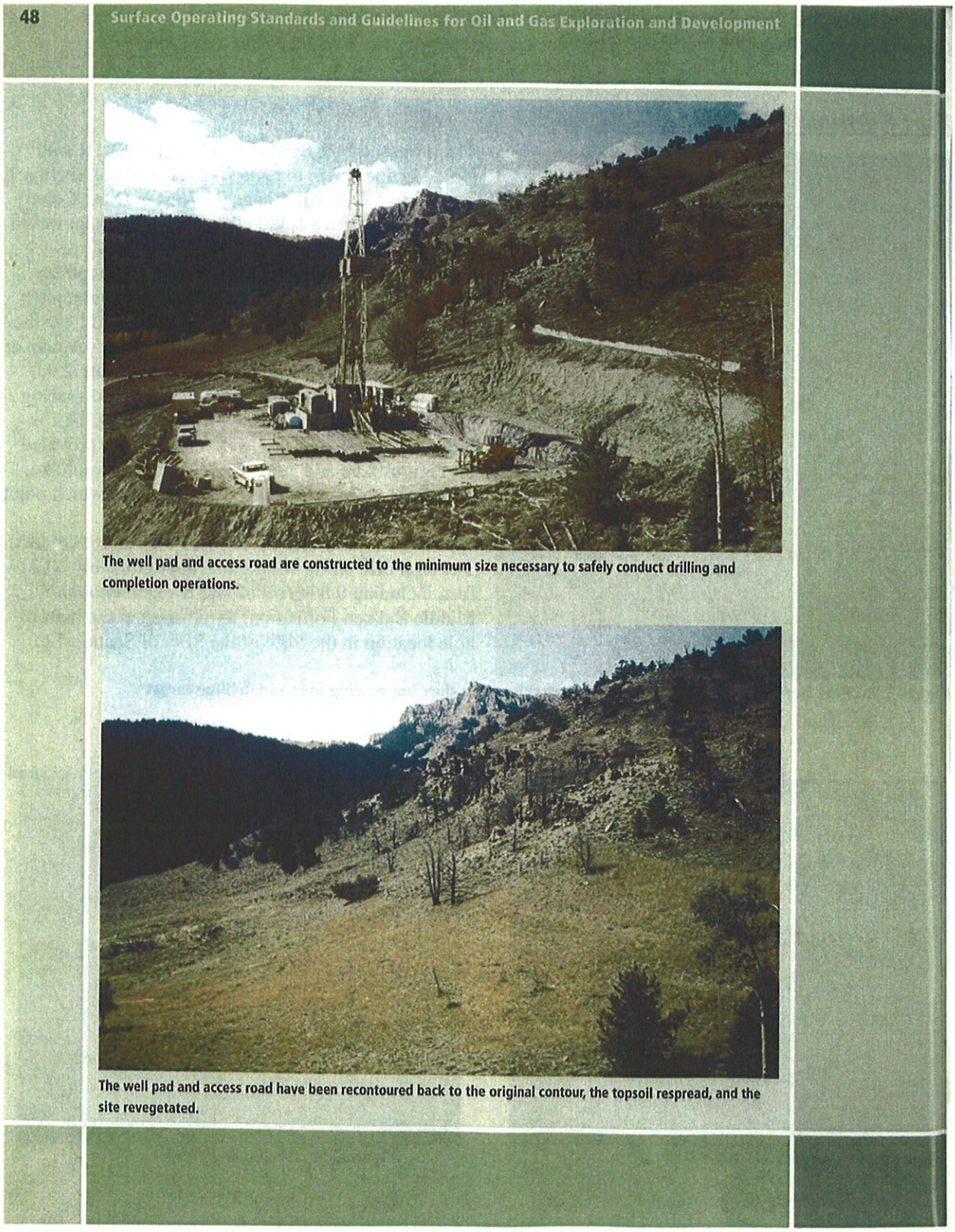
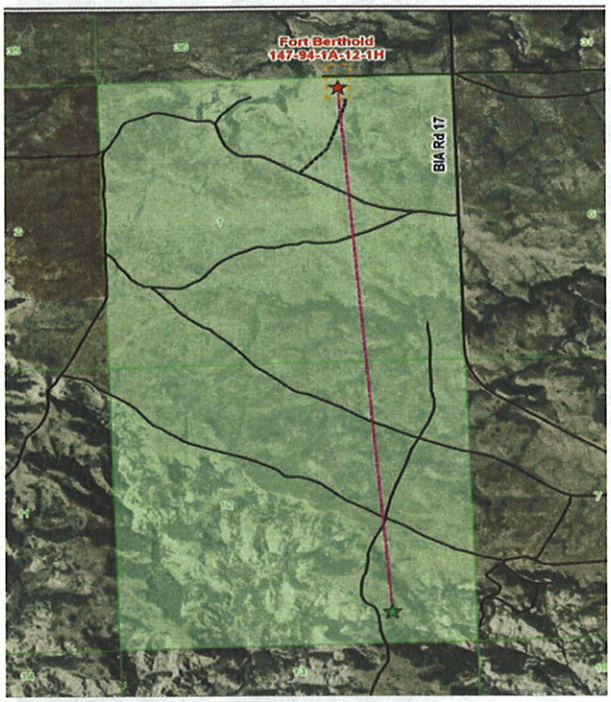


Figure 2.8: Example of reclamation from the Gold Book

2.9 Construction Details at Individual Sites

One wellbore will be drilled from each of the four surface locations to minimize potential impacts.

Fort Berthold 147-94-1A-12-1H



The proposed Fort Berthold 147-94-1A-12-1H well would be located in the NW¼ of the NE¼ of Section 1, Township 147 North, Range 94 West in Dunn County and would access a 1,280-acre spacing unit that would include all of Sections 1 and 12. A new road approximately 1,588.41 feet long would have to be constructed, and approximately 2,521 feet of existing road would have to be upgraded or improved from the existing access to the proposed well location. A map of the proposed access road is provided in Figure 2.9d, and a map of the proposed drilling target and spacing unit is shown in Figure 2.9a. Photographs of the proposed access road and well locations are provided in` Figures 2.9b and 2.9c. Vertical drilling would be completed at approximately 10,148 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 10,899 feet. The total drill string would total approximately 20,229 feet, including 9,800 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the SE¼ of the SE¼ of Section 12.

Figure 2.9a: Fort Berthold 147-94-1A-12-1H proposed location showing spacing unit and drilling target

Figure 2.9b: Access road 147-94-1A-1H

Figure 2.9c: Well pad-147-94-1A-1H

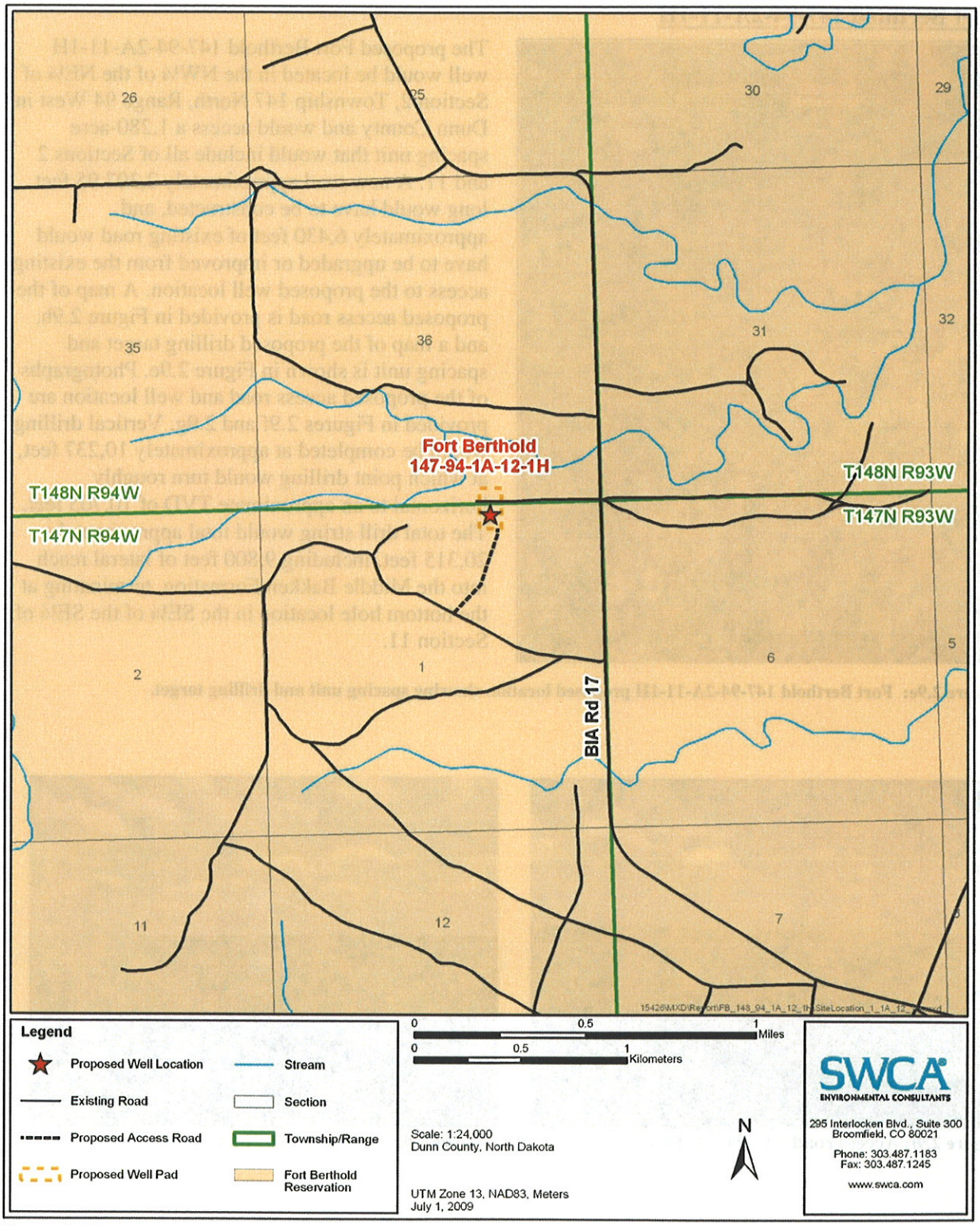
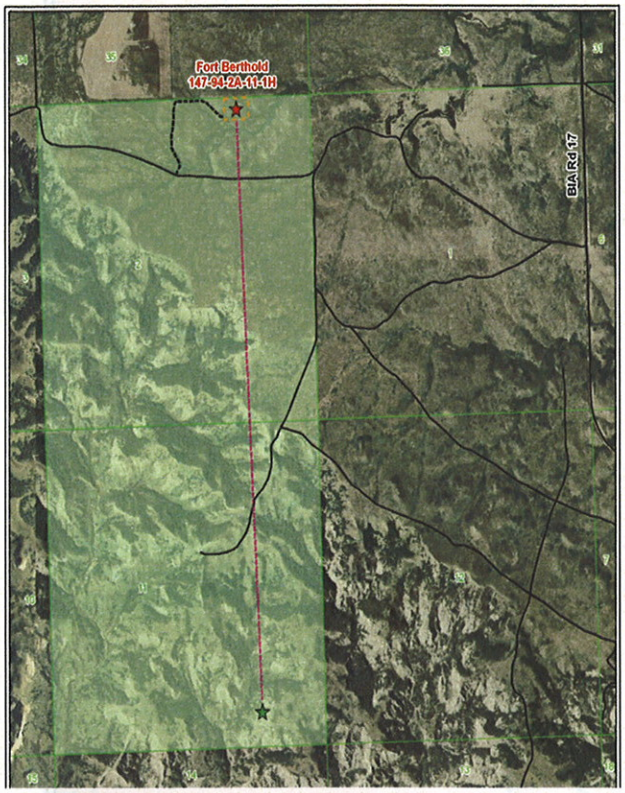


Figure 2.9d: Petro-Hunt's Fort Berthold 147-94-1A-12-1H proposed location

Fort Berthold 147-94-2A-11-1H



The proposed Fort Berthold 147-94-2A-11-1H well would be located in the NW¼ of the NE¼ of Section 2, Township 147 North, Range 94 West in Dunn County and would access a 1,280-acre spacing unit that would include all of Sections 2 and 11. A new road approximately 2,307.95 feet long would have to be constructed, and approximately 6,430 feet of existing road would have to be upgraded or improved from the existing access to the proposed well location. A map of the proposed access road is provided in Figure 2.9h, and a map of the proposed drilling target and spacing unit is shown in Figure 2.9e. Photographs of the proposed access road and well location are provided in Figures 2.9f and 2.9g. Vertical drilling would be completed at approximately 10,237 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,705 feet. The total drill string would total approximately 20,315 feet, including 9,800 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the SE¼ of the SE¼ of Section 11.

Figure 2.9e: Fort Berthold 147-94-2A-11-1H proposed location showing spacing unit and drilling target.

Figure 2.9f: Access road 147-94-2A-11-1H

Figure 2.9g: Well pad 147-94-2A-11-1H

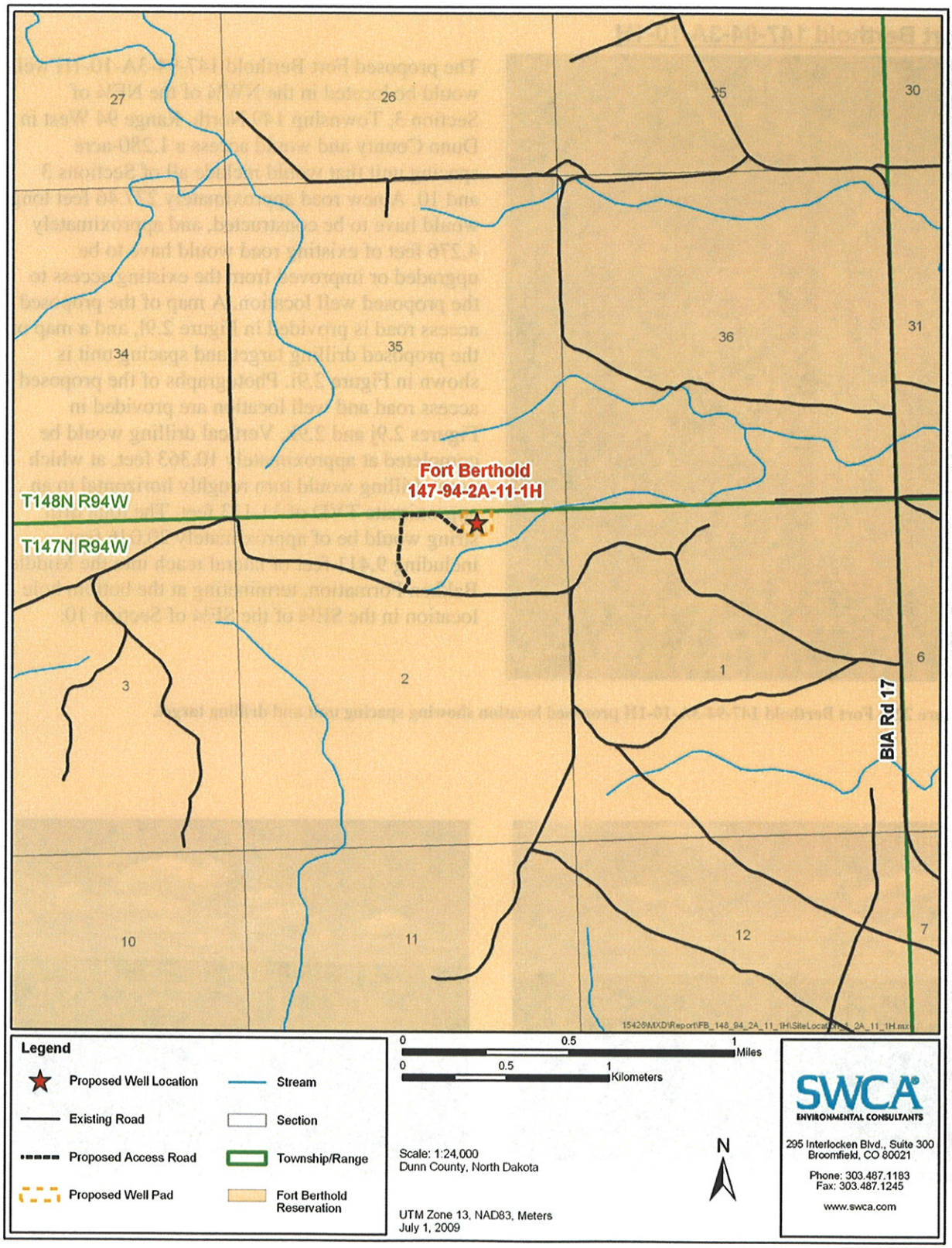


Figure 2.9h: Petro-Hunt's Fort Berthold 147-94-2A-11-1H proposed location.

Fort Berthold 147-94-3A-10-1H

The proposed Fort Berthold 147-94-3A-10-1H well would be located in the NW¼ of the NE¼ of Section 3, Township 149 North, Range 94 West in Dunn County and would access a 1,280-acre spacing unit that would include all of Sections 3 and 10. A new road approximately 277.46 feet long would have to be constructed, and approximately 4,276 feet of existing road would have to be upgraded or improved from the existing access to the proposed well location. A map of the proposed access road is provided in Figure 2.9l, and a map of the proposed drilling target and spacing unit is shown in Figure 2.9i. Photographs of the proposed access road and well location are provided in Figures 2.9j and 2.9k. Vertical drilling would be completed at approximately 10,363 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 11,113 feet. The total drill string would be of approximately 20,046 feet, including 9,411 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the SE¼ of the SE¼ of Section 10.

Figure 2.9i: Fort Berthold 147-94-3A-10-1H proposed location showing spacing unit and drilling target.

Figure 2.9j: Access Road 147-94-3A-10-1H

Figure 2.9k: Well pad 147-94-3A-10-1H

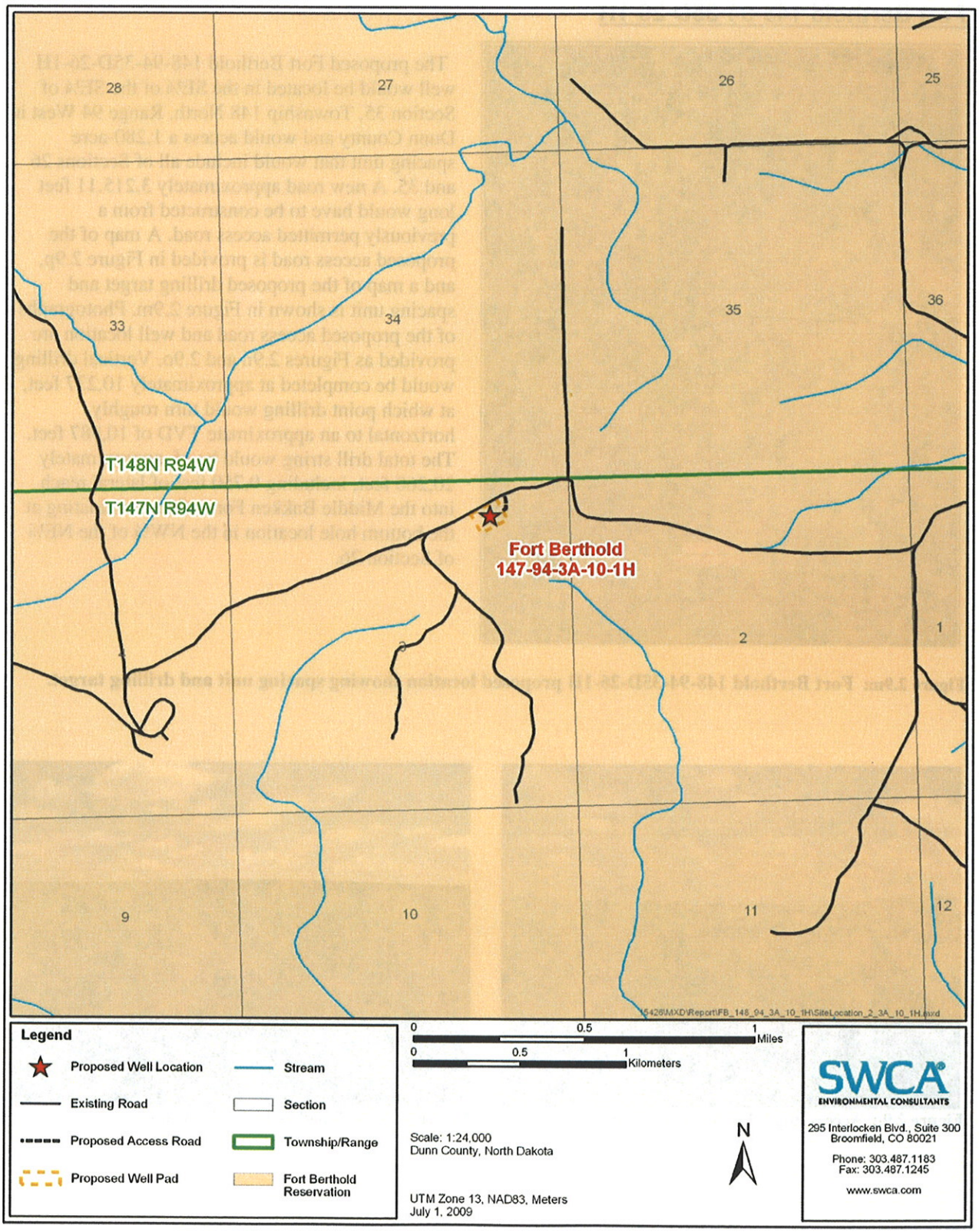


Figure 2.9l: Petro-Hunt's Fort Berthold 147-94-3A-10-1H proposed location.

Fort Berthold 148-94-35D-26-1H

The proposed Fort Berthold 148-94-35D-26-1H well would be located in the SE¼ of the SE¼ of Section 35, Township 148 North, Range 94 West in Dunn County and would access a 1,280-acre spacing unit that would include all of Sections 26 and 35. A new road approximately 3,215.11 feet long would have to be constructed from a previously permitted access road. A map of the proposed access road is provided in Figure 2.9p, and a map of the proposed drilling target and spacing unit is shown in Figure 2.9m. Photographs of the proposed access road and well location are provided as Figures 2.9n and 2.9o. Vertical drilling would be completed at approximately 10,237 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,987 feet. The total drill string would be of approximately 20,260 feet, including 9,750 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the NW¼ of the NE¼ of Section 26.

Figure 2.9m: Fort Berthold 148-94-35D-26-1H proposed location showing spacing unit and drilling target.

Figure 2.9n: Access Road 148-94-35D-26-1H

Figure 2.9o: Well pad 148-94-35D-26-1H

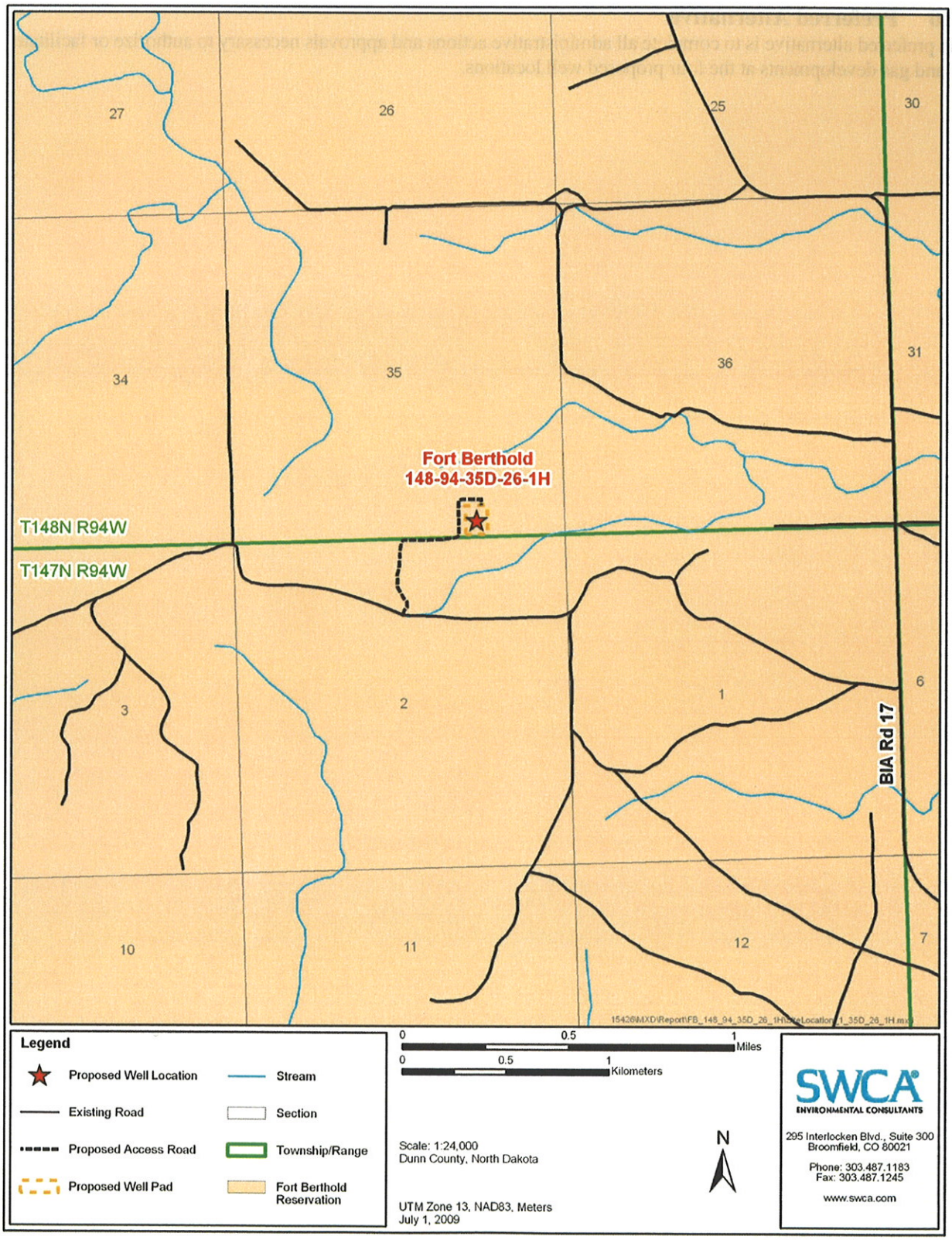


Figure 2.9p. Petro-Hunt's Fort Berthold 148-94-35D-26-1H proposed location

2.10 Preferred Alternative

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

3. The Affected Environment and Potential Impacts

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

The proposed 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 projects. Although earlier oil/gas exploration activity within the Reservation was limited and commercially unproductive, recent economic changes and technological advances now make accessing oil in the Bakken Formation feasible.

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

The proposed well sites and spacing units are in a rural area consisting of grassland and shrubland that is currently either idle or used to graze livestock. The landscape has been previously disturbed by dirt trails and graveled and paved roadways. There are no residences within 2 miles of the proposed well sites. Existing conditions within the proposed drilling units are described below. The broad definition of the human and natural environment under NEPA leads to the consideration of the following elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. Potential impacts to these elements are analyzed for both the No Action Alternative and the Preferred Alternative. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. This EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts. In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* in itself require preparation of an EIS.

3.1 The No Action Alternative

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

3.2 Air Quality

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

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

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	NAAQS (ppm)	County		
				Dunn	McKenzie	Mercer
SO_2	24-Hour	365	0.14	0.004 ppm	0.004 ppm	0.011 ppm
	Annual Mean	80	0.030	0.001 ppm	0.001 ppm	0.002 ppm
PM_{10}	24-Hour	150	--	50 ($\mu g/m^3$)	35 ($\mu g/m^3$)	35 ($\mu g/m^3$)
	Annual Mean	50	--	--	--	--
$PM_{2.5}$	24-Hour	35	--	--	--	--
	Weighted Annual Mean	15	--	--	--	--
NO_2	Annual Mean	100	0.053	0.002 ppm	0.001 ppm	0.003 ppm
CO	1-Hour	40,000	35	--	--	--
	8-Hour	10,000	9	--	--	--
Pb	3-Month	1.5	--	--	--	--
O_3	1-Hour	240	0.12	0.071 ppm	0.072 ppm	0.076 ppm
	8-Hour	--	0.08	0.061 ppm	0.066 ppm	0.067 ppm

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

North Dakota was one of only nine states in 2006 that met standards for all criteria pollutants. The state also met standards for fine particulates and the eight-hour ozone standards established by the U.S. Environmental

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

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

3.3 Public Health and Safety

Health and safety concerns 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. No residences were identified within 1.2 miles of the proposed sites.

Hydrogen sulfide gas (H_2S) is extremely toxic in concentrations above 500 parts per million, but it has not been found in measurable quantities in the Bakken Formation. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H_2S. Release of H_2S at dangerous concentrations is very unlikely. Contingency plans submitted to BLM comply fully with relevant portions of *Onshore Oil and Gas Order 6* to minimize potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within one mile of a well; precautions include automated sampling and alarm systems operating continuously at multiple locations on the well pad. No homes are within 1.2 miles of the proposed well pads and all are typically downwind from the pad, according to 2006 data from the AAQM site at the Dunn Center monitoring site (NDDH 2007). No direct impacts from H_2S are anticipated.

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

If any well proves productive, one small truck would travel to the pad each day to check the pump. Gas would be flared initially, while oil and produced water would be hauled out by tankers, with tanker traffic depending directly on productivity. A successful Bakken Formation well usually produces both oil and water at a high rate initially. In the vicinity of the proposed projects, 500-1,000 barrels of oil per day might be expected at first, along with about 200 barrels of water. Over the next several months, daily production might drop to 200-400 barrels of oil and 30-70 barrels of water. An oil tanker can usually haul 140 barrels of oil per load, while water tankers usually hold 110 barrels. Production service might then start at 3-7 oil tankers and two water haulers in and out daily, before declining to 2-3 oil tankers and a single water load. Established load restrictions for state and BIA roadways would be followed and haul permits would be acquired as appropriate. All traffic must be confined to approved routes and conform to speed limits.

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

3.4 Water Resources

Surface Water

The proposed Fort Berthold 147-94-1A-12-1H well pad is located in the Lower Moccasin Creek sub-watershed (Hydrologic Unit Code [HUC] 101102050605) of the Waterchief Bay Watershed (Figure 18). The watershed is part of the Lower Little Missouri sub-basin, Little Missouri basin, Little Missouri subregion, and Missouri region. Runoff from the well pad will flow to the northeast into Lower Moccasin Creek (HUC 10110205001674) that flows into Lake Sakakawea. Runoff from the well pad will need to travel approximately 11.2 miles in ephemeral swales and creek channels prior to reaching perennial waters in Lake Sakakawea.

The proposed Fort Berthold 147-94-2A-11-1H well pad is located in the Lower Moccasin Creek sub-watershed (HUC 101102050605) of the Waterchief Bay Watershed (see Figure 18). The watershed is part of the Lower Little Missouri subbasin, Little Missouri basin, Little Missouri subregion, and Missouri region. Runoff from the well pad will flow to the south and then to the east into an ephemeral unnamed tributary of Lower Moccasin Creek (HUC 10110205001675) and will need to travel approximately 13.1 miles in ephemeral swales and creek channels prior to reaching perennial waters upstream of Lake Sakakawea.

The proposed Fort Berthold 147-94-3A-10-1H well pad is located in an unnamed sub-watershed (HUC 101102050601) of the Waterchief Bay Watershed (see Figure 18). The watershed is part of the Lower Little Missouri sub-basin, Little Missouri basin, Little Missouri subregion, and Missouri region. Runoff from the well pad will flow to the south in ephemeral unnamed creeks (HUC 10110205001623) and will need to travel approximately 3.3 miles in ephemeral swales and creek channels prior to reaching perennial waters upstream of Lake Sakakawea.

The proposed Fort Berthold 148-94-35D-26-1H well pad is located in the Lower Moccasin Creek sub-watershed (HUC 101102050605) of the Waterchief Bay Watershed (see Figure 18). The watershed is part of the Lower Little Missouri sub-basin, Little Missouri basin, Little Missouri subregion, and Missouri region. Runoff from the well pad will flow to the east into Lower Moccasin Creek and approximately 11.2 miles in ephemeral swales and creek channels prior to reaching perennial waters upstream of Lake Sakakawea.

Given the topography of the project area, over the individual sites runoff occurs largely as sheet flow. Runoff that concentrates near the Fort Berthold 147-94-1A-12-1H, Fort Berthold 147-94-2A-11-1H, and Fort Berthold 148-94-35D-26-1H well pads flows to Lower Moccasin Creek; the Fort Berthold 147-94-3A-10-1H well pad runoff flows to an unnamed creek system above Lake Sakakawea. However, the proposed projects will be engineered and constructed to minimize the concentration of runoff and avoid disruption of drainages. Additionally, erosion control and reclamation best management practices (BMPs) will be applied to prevent the mobilization of disturbed soils in the project area and stop any sediment from being transported to channelized areas via runoff water. No surface water will be used in well drilling operations. Any chemicals or potentially hazardous materials will be handled in accordance with Petro-Hunt's Spill Prevention, Control, and Countermeasure plan. Provisions established under this plan will minimize potential impacts to any surface waters associated with an accidental spill.

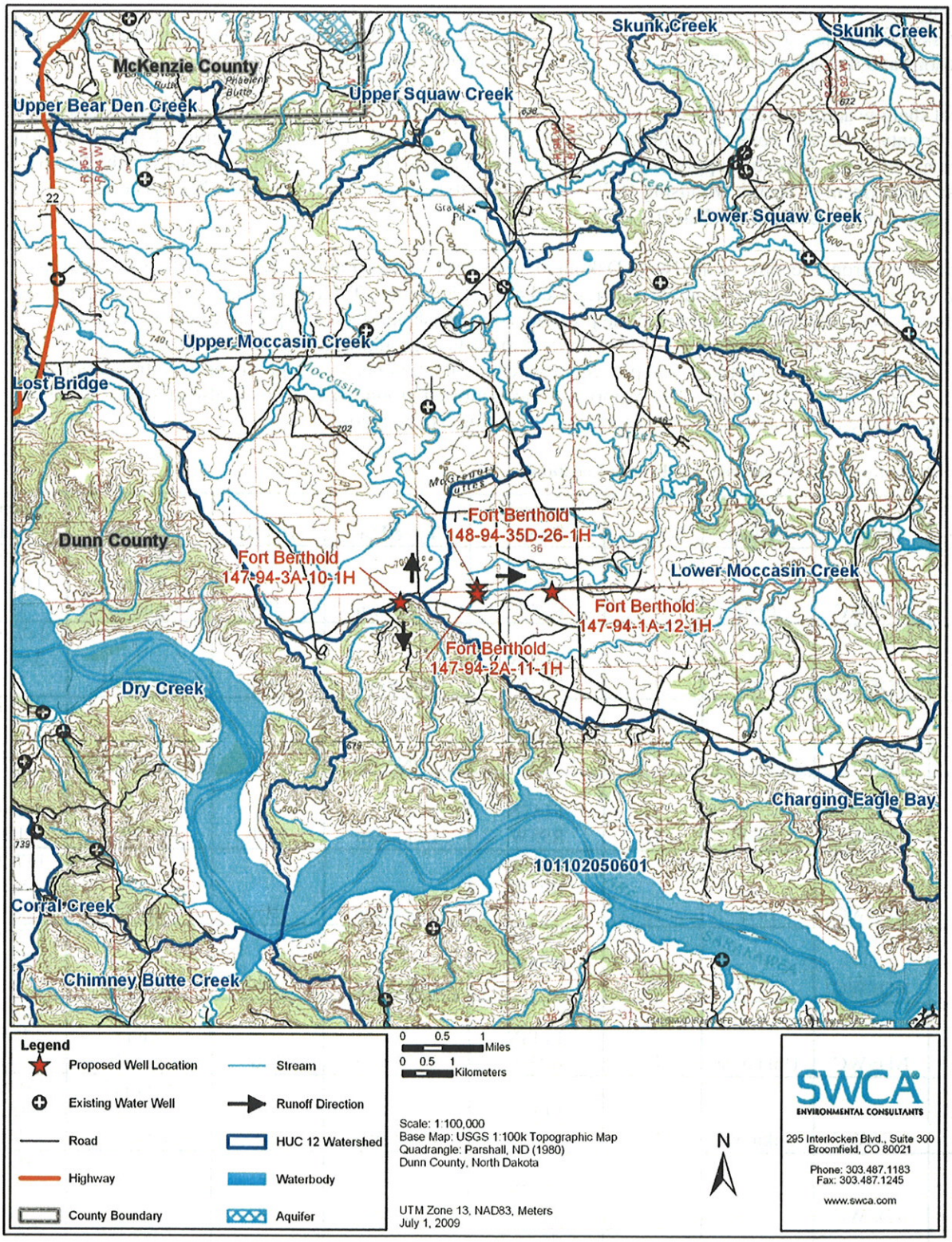


Figure 3.4a. Water resources.

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.

Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in Dunn County; however, none are within the proposed project locations. The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn County and meets standards of the North Dakota Department of Health (Klausing 1979). Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part III, 1979.

Review of electronic records of the North Dakota State Water Commission revealed 45 existing water wells within an approximate 5-mile radius of the proposed project locations (Table 3.4). Since none of the proposed project area lies within the boundaries of the post-glacial outwash aquifers, low porosity bedrock near the proposed wells will act as confining layers to prevent impacts to groundwater resources. Additionally, proposed well completion methods will prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells is also at a great distance from the proposed wells and therefore has minimal hydrologic connection.

Table 3.4 Existing Water Wells near the Project Locations

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth	Aquifer	Nearest Well
147-093-29DCA	NDSWC	1930	29	T147N R93W	Unknown	373	Sentinel Butte Tongue River	147-94-1A-12-1H
147-094-26BCB	NDSWC	1969	26	T147N R94W	Unknown	1500	Fox Hills	147-94-3A-10-1H
147-095-12BCD	NDSWC	Unknown	12	T147N R95W	Unknown	400	Tongue River	147-94-3A-10-1H
147-095-12CAD	NDSWC	1969	12	T147N R95W	Unknown	1410	Fox Hills	147-94-3A-10-1H
147-095-13CCC2	NDSWC	1971	13	T147N R95W	Municipal	1930	Fox Hills	147-94-3A-10-1H
147-095-24AAC	NDSWC	1969	24	T147N R95W	Unknown	1580	Fox Hills	147-94-3A-10-1H
148-093-17BBD	NDSWC	Unknown	17	T148N R93W	Unknown	160	Sentinel Butte Tongue River	147-94-1A-12-1H
148-094-13BBD	NDSWC	Unknown	13	T148N R94W	Unknown	30	Sentinel Butte Tongue River	148-94-35D-26-1H
148-094-14AAB	NDSWC	1992	14	T148N R94W	Monitoring	300	Tongue River	148-94-35D-26-1H
148-095-35BDD	NDSWC	Unknown	35	T148N R95W	Unknown	400	Tongue River	147-94-3A-10-1H

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth	Aquifer	Nearest Well
147-094-24C	Earl Pelton	1989	24	T147N R94W	Stock	1420	Unknown	147-94-2A-11-1H
147-094-25	Earl Pelton	1988	25	T147N R94W	Stock	1280	Unknown	147-94-1A-12-1H
147-094-25AA	Attas Boutrous	2007	25	T147N R94W	Domestic	92	Unknown	147-94-1A-12-1H
147-095-13CCCC	ND Parks and Recreation	1979	13	T147N R95W	Industrial	2130	Unknown	147-94-3A-10-1H
148-094-11AAA2	USGS	1994	11	T148N R94W	Monitoring	58	Unknown	148-94-35D-26-1H
148-094-12DCC	USGS	1992	12	T148N R94W	Monitoring	51	Unknown	147-94-1A-12-1H
148-094-14AAB	USGS	1992	14	T148N R94W	Monitoring	300	Unknown	148-94-35D-26-1H
148-094-15CCC2	USGS	1994	15	T148N R94W	Monitoring	36	Unknown	147-94-3A-10-1H
148-094-17DCD2	USGS	1994	17	T148N R94W	Monitoring	70	Unknown	147-94-3A-10-1H
148-094-21AAB1	USGS	1994	21	T148N R94W	Monitoring	190	Unknown	147-94-3A-10-1H
148-094-21AAB2	USGS	1994	21	T148N R94W	Monitoring	125	Unknown	147-94-3A-10-1H
148-094-26AAA	Matt Young Bird	1973	26	T148N R94W	Domestic	124	Unknown	148-94-35D-26-1H
148-094-28	Matt Young Bird	1982	28	T148N R94W	Domestic	225	Unknown	147-94-3A-10-1H
147-093-03DBB	Tribal	Unknown	3	T147N R93W	Unused	223	Sentinel Butte	147-94-1A-12-1H
147-093-05CDD	Carter Oil Co.	1954	5	T147N R93W	Unused	11105	Unknown	147-94-1A-12-1H
147-093-29DCA	A. Voight	1930	29	T147N R93W	Stock	353	Sentinel Butte	147-94-1A-12-1H

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth	Aquifer	Nearest Well
147-094-02AD	Tribal	1950	2	T147N R94W	Unused	315	Unknown	147-94-2A-11-1H
147-094-26BCB	K. Knutson	1969	26	T147N R94W	Stock	1502	Unknown	147-94-3A-10-1H
147-095-12BCD	T. Sandvick	Unknown	12	T147N R95W	Stock	400	Unknown	147-94-3A-10-1H
147-095-12CAD	T. Sandvick	1969	12	T147N R95W	Stock	1386	Unknown	147-94-3A-10-1H
147-095-13CCC1	NDSPS	1971	13	T147N R95W	Unused	160	Unknown	147-94-3A-10-1H
147-095-13CCC2	NDSPS	1971	13	T147N R95W	Recreation	1935	Unknown	147-94-3A-10-1H
147-095-24AAC	T. Sandvick	1969	24	T147N R95W	Stock	1580	Unknown	147-94-3A-10-1H
148-093-07ADA	R. Goodbird	Unknown	7	T148N R93W	Unused	Unknown	Unknown	147-94-1A-12-1H
148-093-17BBD	J. McKinze	Unknown	17	T148N R93W	Unused	160	Sentinel Butte	147-94-1A-12-1H
148-093-20BCA	Tribal	1950	20	T148N R93W	Unused	450	Unknown	147-94-1A-12-1H
148-093-32CDB	Tribal	1950	32	T148N R93W	Unused	400	Unknown	147-94-1A-12-1H
148-094-13AAD	Tribal	1950	13	T148N R94W	Unused	450	Unknown	147-94-1A-12-1H
148-094-13BBD	R. Hall	1967	13	T148N R94W	Domestic\ Stock	30	Unknown	148-94-35D-26-1H
148-094-14DAC	R. Hall	1968	14	T148N R94W	Stock	100	Buried Glaciofluvial	148-94-35D-26-1H
148-094-20DDD	Tribal	Unknown	20	T148N R94W	Unused	135	Till	147-94-3A-10-1H
148-94-25CCC	J. Chase	Unknown	25	T148N R94W	Unused	120	Unknown	148-94-35D-26-1H

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth	Aquifer	Nearest Well
148-094-26DCA	Tribal	Unknown	26	T148N R94W	Unused	290	Sentinel Butte	148-94-35D-26-1H
148-094-33ACD	Tribal	Unknown	33	T148N R94W	Unused	147	Sentinel Butte	147-94-3A-10-1H
148-095-35BDD	T. Fettig	Unknown	35	T148N R95W	Unused	400	Tongue River	147-94-3A-10-1H

NDSWC = North Dakota State Water Commission
USGS = U.S. Geological Survey
Source: North Dakota State Water Commission (2009).

3.5 Wetland/Riparian Habitat and Threatened or Endangered Species

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

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

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

Table 3.5a. Potential Effect of Threatened and Endangered Species to Occur in the Project Locations

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

No adverse effects on listed species would be expected due to the unlikely nature of their occurrence within the proposed project area. Interim reclamation and the use of BMPs over the life of the project would further reduce long-term impacts to all wildlife. Monitoring of species in the area would occur as part of the normal monitoring processes. Lake Sakakawea and the Little Missouri River contain suitable nesting sites for the piping plover and the interior least tern. The pallid sturgeon also inhabits these bodies of water and could be

indirectly impacted by runoff if proper BMPs are not deployed. Due to the distance from the wells to both the lake and river, disturbance from construction and the running of the wells should not have a direct impact. Table 3.5b summarizes the straight-line distances to Lake Sakakawea and the Little Missouri River from the wells.

Table 3.5b. Straight-line Distance to Lake Sakakawea and the Little Missouri River from Each Well

Proposed Well	Miles to Lake Sakakawea	Miles to Little Missouri River
Fort Berthold 147-94-1A-12-1H	2.5	15.6
Fort Berthold 147-94-2A-11-1H	2.5	16.5
Fort Berthold 147-94-3A-10-1H	2.5	17.6
Fort Berthold 148-94-35D-26-1H	2.6	16.5

3.6 Soils

Site visits were conducted during May 2009 to document existing soil conditions at each well location and the associated proposed and existing access roads. Specialists determined that the existing portions of the access roads are in good condition with no signs of erosion. Table 3.6 below summarizes the soil types and the potential disturbance related to new construction.

Table 3.6 Acres of Soil Disturbance

Soil	Depth (inches)	New Access Road		Well Pad (acres)	Total Acres
		Length (feet)	Acres		
Fort Berthold 147-94-1A-12-1H		**1,588.41**	**2.19**	**4.03**	**6.22**
Access Road and Well Pad					
Silty Clay Loam	0–10				
Silty Clay	10-16				
Fort Berthold 147-94-2A-11-1H		**2,307.95**	**3.18**	**4.13**	**7.31**
Access Road and Well Pad					
Silty Clay Loam	0–7				
Silty Clay	7–16				
Fort Berthold 147-94-3A-10-1H		**277.46**	**0.38**	**4.15**	**4.53**
Access Road and Well Pad					
Silty Clay	0–7				
Clay Loam	7–16				
Fort Berthold 148-94-35D-26-1H		**3,215.11**	**4.43**	**4.21**	**8.64**
Access Road and Well Pad					
Silty Clay Loam	0–9				
Silty Clay	9–16				

Individual Site Descriptions

Fort Berthold 147-94-1A-12-1H

The proposed access road for this location would extend west from BIA 17 on an existing two-track road for approximately 2,500 feet. The access road would then travel north on a newly constructed road for approximately 1,600 feet. The following information was collected from a soil pit at the proposed well pad and access road:

- At a depth of 0 to 10 inches, the soil texture is a silty clay loam, Munsell color 10YR 2/1 (black).

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

This location has a Soil Erodibility Factor (K) of 0.28. Using the Revised Universal Soil Loss Equation (RUSLE), there could be 1.19 tons/acre/year of soil loss from the site. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

Fort Berthold 147-94-2A-11-1H

The proposed access road for this location would extend west from BIA 17 on an existing two-track road for approximately 9,000 feet. The access road would then travel north on a newly constructed road for approximately 2,300 feet. The following information was collected from a soil pit at the proposed well pad and access road:

- At a depth of 0 to 7 inches, the soil texture is a silty clay loam, Munsell color 10YR 3/2 (very dark grayish brown).
- At a depth of 7 to 16 inches, the soil texture is a silty clay, Munsell color 10YR 3/3 (dark brown).
- This pit was excavated on a slope of approximately 0 to 1 degree.

This location has a Soil Erodibility Factor (K) of 0.28. Using the RUSLE, there could be 3.73 tons/acre/year of soil loss from the site. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

Fort Berthold 147-94-3A-10-1H

The proposed access road for this location would extend west from BIA 17 on an existing two-track road for approximately 13,250 feet. The access road would then travel south on a newly constructed road for approximately 277.46 feet. The following information was collected from a soil pit at the proposed well pad and access road:

- At a depth of 0 to 7 inches, the soil texture is a silty clay, Munsell color 10YR 3/1 (very dark gray).
- At a depth of 7 to 16 inches, the soil texture is a clay loam, Munsell color 10YR 4/3 (brown).
- This pit was excavated on a slope of approximately 0 to 1 degree.

This location has a Soil Erodibility Factor (K) of 0.32. Using the RUSLE, there could be 6.52 tons/acre/year of soil loss from the site. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

Fort Berthold 148-94-35D-26-1H

The proposed access road for this location would extend west from BIA 17 on an existing two-track road for approximately 9,000 feet. The access road would then travel north on a newly constructed road for approximately 5,500 feet. The following information was collected from a soil pit at the proposed well pad and access road:

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

This location has a Soil Erodibility Factor (K) of 0.28. Using the RUSLE, there could be 3.83 tons/acre/year of soil loss from the site. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

3.7 Vegetation and Invasive Species

Josh Ruffo and Chris McLaughlin, SWCA biologists, conducted site visits in May 2009 to document existing vegetation conditions at each proposed location.

Fort Berthold 147-94-1A-12-1H

The project area was dominated by little blue stem (*Schizachyrium scoparium*), which can be a fair to good forage species for deer, elk, and various livestock. Additional plant species observed within the project area includes green needle grass (*Nassella viridula*), western snowberry (*Symphoricarpos occidentalis*), blue grama (*Bouteloua gracilis*), dandelion (*Taraxacum* sp.), and silver sagebrush (*Artemisia cana*). The project area was noted as being actively used as pasture land.

Fort Berthold 147-94-2A-11-1H

The project area is positioned in a hay field, which is dominated by western snowberry and field brome (*Bromus arvensis*).

Fort Berthold 147-94-3A-10-1H

Several species of vegetation were observed during the field visit, including green needle grass, purple three-awn (*Aristida purpurea*), blue grama, prairie junegrass (*Koeleria macrantha*), prairie sagewort (*Artemisia frigida*), western snowberry, and dandelions.

Fort Berthold 148-94-35D-26-1H

Several species of vegetation were observed during the field visit, including prairie sagewort, green needle grass, field brome, silver sagebrush.

The proposed project would create approximately 41.03 acres of short- and long-term surface disturbance, during which removal of existing vegetation could introduce noxious weeds into the project area. Infestations within each well location could spread to neighboring lands resulting in reductions in the quality or quantity of forage or crop production.

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

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

No surface disturbance, including disturbance created by driving equipment or vehicles, outside the approved ROWs or well pads would occur. Petro-Hunt would conduct interim reclamation, as required by Onshore Order #1, to restore areas not needed following construction. Areas stripped of topsoil, with the exception of long-term disturbance on the well pads, would be reclaimed at the earliest opportunity. Seeding would occur

after cessation of construction activities in the fall (September to November). If fall seeding cannot be completed, spring seeding should take place in February or March, as conditions dictate. Certified weed-free straw and seed would be used for all construction, seeding, and reclamation efforts.

Table 3.7 Invasive species

Common Name	Scientific Name	Dunn County Acres
Absinth wormwood	*Artemesia abinthium* L.	24,500
Canada thistle	*Cirsium arvense* (L.) Scop	22,705
Dalmation toadflax	*Linaria genistifolia* ssp. *dalmatica*	2
Diffuse knapweed	*Centaurea diffusa* Lam	--
Field bindweed	*Convolvulus arvensis* L.	19,800
Leafy spurge	*Euphorbia esula* L.	8,302
Musk thistle	*Carduus nutans* L.	--
Purple loosestrife	*Lythrum salicaria*	--
Russian knapweed	*Acroptilon repens* (L.) DC.	--
Saltcedar (tamarisk)	*Tamarix ramosissima*	0
Spotted knapweed	*Centaurea maculosa* Lam.	--
Yellow starthistle	*Centaurea solstitialis* L.	--

Source: NRCS Plants Database for North Dakota at http://plants.usda.gov.

3.8 Cultural Resources

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

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

Whatever the nature of the cultural resource addressed by a particular statute or tradition, implementing procedures invariably include consultation requirements at various stages of a federal undertaking. The MHA Nation has designated a Tribal Historic Preservation Officer (THPO) by Tribal Council resolution, whose office and functions are certified by the National Park Service. The THPO operates with the same authority exercised in most of the rest of North Dakota by the State Historic Preservation Officer (SHPO). As a result,

BIA consults and corresponds with the THPO on all projects proposed within the exterior boundaries of the Fort Berthold Reservation. The SHPO may have useful information, but has no official role regarding proposed federal actions on trust land. The MHA Nation has also designated responsible parties for consultations and actions under NAGPRA and cultural resources generally.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using a pedestrian methodology. For the Fort Berthold 147-94-1A-12-1H project approximately 25.2 acres were intensively inventoried on May 28, 2009 (Baer and Retter 2009). Four archaeological sites (32DU1445, 32DU1446, 32DU1447, 32DU1448), consisting of groups of stone circles, were recorded in this inventory, 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 (16 USC 1996). For the Fort Berthold 147-94-2A-11-1H project approximately 15.2 acres were intensively inventoried on May 28, 2009 (Baer 2009a). For the Fort Berthold 147-94-3A-10-1H project approximately 10.1 acres were intensively inventoried on May 28, 2009 (Baer 2009b). For the Fort Berthold 148-94-35D-26-1H project approximately 15.7 acres were intensively inventoried on May 28, 2009 (Baer 2009c). In these latter three inventories no historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 USC 1996). As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for these undertakings, as the archaeological sites recorded in the Fort Berthold 147-94-1A-12-1H well pad inventory can be and should be avoided. This determination was communicated to the THPO on August 25, 2009; the THPO concurred on September 11, 2009

3.9 Socioeconomics

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

Table 3.9a: Population and Demographics

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

Source: U.S. Census Bureau 2007.

In addition to the ranching and farming that are employment mainstays in western North Dakota, employment on the reservation largely consists of ranching, farming, tribal government, tribal enterprises, schools, and

federal agencies. The MHA Nation's Four Bears Casino and Lodge, near New Town, employs over 320 people, 90% of which are tribal members (Three Affiliated Tribes 2008).

As shown in Table 3.9b, counties overlapping the Reservation tend to have per capita incomes, median household incomes, and employment rates that are lower than North Dakota statewide averages. Reservation residents have lower average incomes and higher unemployment rates compared to the encompassing counties. MHA Nation members are in turn disadvantaged relative to overall Reservation incomes and unemployment rates that average in non-Indian data. The most recent census found that per capita income for residents of the Reservation is $10,291 (less than ⅓ the state average). Overcrowded housing skews the median reservation household income upward to $26,274 (about ⅔ the state average). A BIA report in 2003 found that 33% of *employed* MHA Nation members were living below federal poverty levels. The unemployment rate for tribal members is 22 %, compared to 11.1% for the reservation as a whole and 4.6% statewide.

Table 3.9b: Income and Unemployment

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

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

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

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

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

The proposed project is not expected to have measurable impacts on population trends, local unemployment rates or housing starts. Relatively high-paying construction jobs would result from exploration and development of oil and gas reserves on the reservation, but most of these opportunities are expected to be short-term. The proposed actions would require temporary employees during the well construction cycle and

one to two full-time employees for the long-term production cycle. Short-term construction employment would provide some economic benefit. Long-term commercial operations would provide significant royalty income and indirect economic benefits.

3.10 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, was signed by President Clinton in 1994. The Order requires agencies to advance environmental justice (EJ) by pursuing fair treatment and meaningful involvement of minority and low-income populations. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions or operations. Meaningful involvement means federal officials actively promote opportunities for public participation and federal decisions can be materially affected by participating groups and individuals.

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

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

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

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

Potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is significantly reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there will be no historic properties affected. Nothing is known to be present, furthermore, that qualifies for protection under the *American Indian Religious Freedom Act*. Potential for disproportionate impacts is further mitigated by requirements for immediate work stoppage following an unexpected discovery of cultural resources of any

type. Mandatory consultations will take place during any such work stoppage, affording an opportunity for all affected parties to assert their interests and contribute to an appropriate resolution, regardless of their home location or tribal affiliation.

The proposed projects have not been found to pose significant impacts to any other critical element—air, public health and safety, water, wetlands, wildlife, soils or vegetation—within the human environment. Avoiding or minimizing such impacts also makes unlikely disproportionate impacts to low-income or minority populations. The proposed action offers many positive consequences for tribal members, while recognizing Environmental Justice concerns. Procedures summarized in this document and in the APDs are binding and sufficient. No laws, regulations or other requirements have been waived; no compensatory mitigation measures are required.

3.11 Mitigation and Monitoring

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

3.12 Irreversible and Irretrievable Commitment of Resources

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

3.13 Short-Term Use Versus Long-Term Productivity

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

3.14 Cumulative Impacts

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

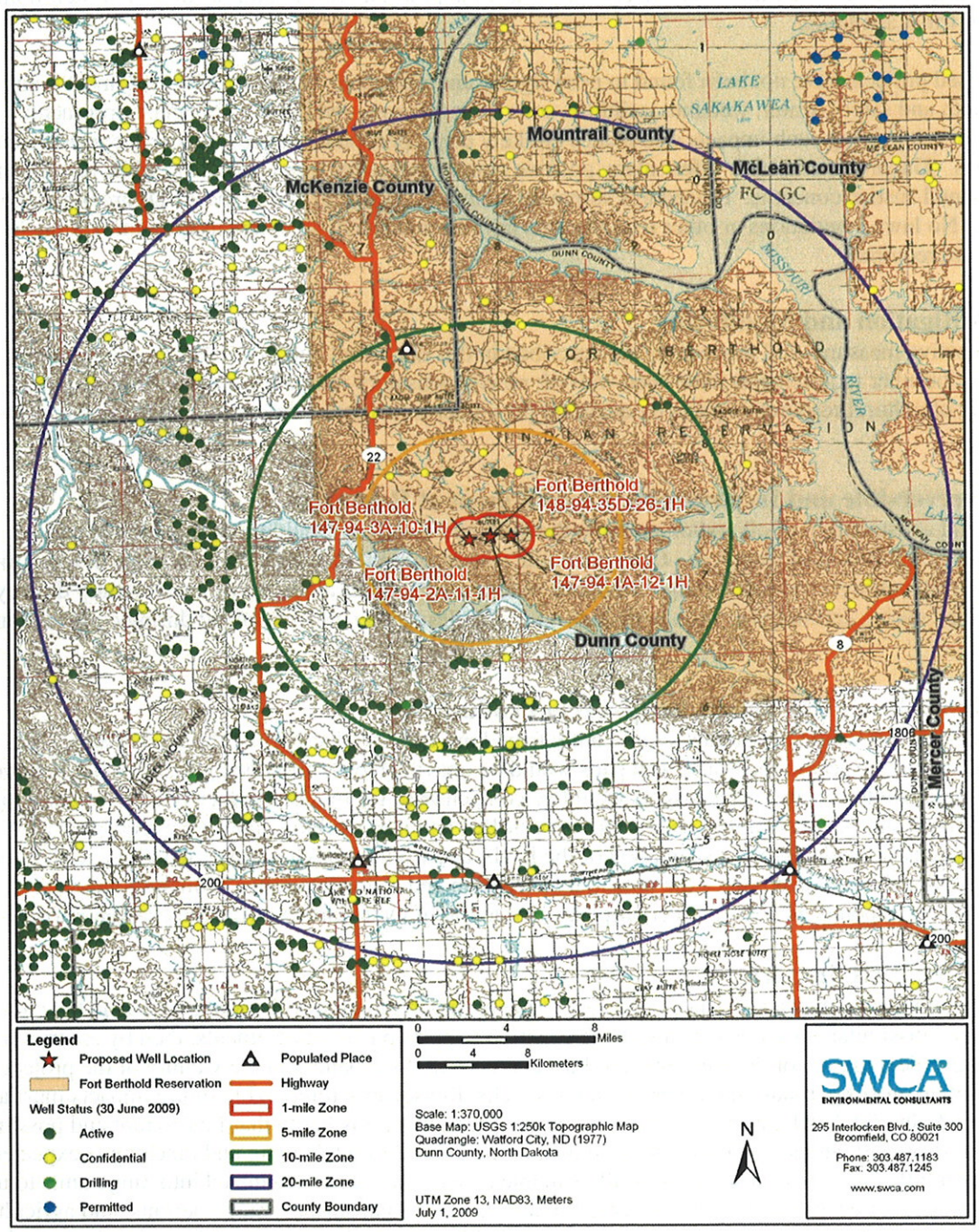


Figure 3.14. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the project locations.

Figure 3.14 shows active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the project area. When this EA support document was prepared, approximately 260 oil and gas wells had been staked within the Reservation (D. Turcotte, BIA Natural Resources Officer, personal communication with Josh Ruffo, SWCA, July 13, 2009). Tables 3.14a through 3.14d summarize the number of confidential, active, and dry wells within a radius of 1, 5, 10, and 20 miles of the project area, respectively. The nearest active, confidential, dry, and water wells to each proposed project site are listed in Table 3.14e.

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

Petro-Hunt has committed to conducting interim reclamation of the roads and well pads immediately following construction and completion. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

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

Reasonably foreseeable oil and gas development can be difficult to accurately track as new proposals are being submitted to the BIA on a regular basis. Petro-Hunt has suggested, but not yet formally proposed, that potentially 12 more wells may eventually be drilled in the same general area as the proposed project, using many of the same main access roads and minimizing the disturbance as much as possible.

Table 3.14a Confidential, Active, and Permitted Wells within a 1-mile Radius of the Project Area

	Fort Berthold 147-94-1A-12-1H		Fort Berthold 147-94-2A-11-1H		Fort Berthold 147-94-3A-10-1H		Fort Berthold 148-94-35D-26-1H	
Reservation (On/Off)	On	Off	On	Off	On	Off	On	Off
Active Wells	**0**	–	**0**	–	**0**	–	**0**	–
Proposed Wells	**0**	–	**0**	–	**0**	–	**0**	–

Table 3.14b Confidential, Active, and Permitted Wells within a 5-mile Radius of the Project Area

	Fort Berthold 147-94-1A-12-1H		Fort Berthold 147-94-2A-11-1H		Fort Berthold 147-94-3A-10-1H		Fort Berthold 148-94-35D-26-1H	
Reservation (On/Off)	On	Off	On	Off	On	Off	On	Off
Active Wells	**6**	–	**7**	–	**6**	–	**7**	–
Proposed Wells	**0**	–	**0**	–	**0**	–	**0**	–

Table 3.14c Confidential, Active, and Permitted Wells within a 10-mile Radius of the Project Area

	Fort Berthold 147-94-1A-12-1H		Fort Berthold 147-94-2A-11-1H		Fort Berthold 147-94-3A-10-1H		Fort Berthold 148-94-35D-26-1H	
Reservation (On/ Off)	On	Off	On	Off	On	Off	On	Off
Active Wells	**19**	**32**	**16**	**37**	**17**	**48**	**19**	**35**
Proposed Wells	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 3.14d Confidential, Active, and Permitted Wells within a 20-mile Radius of the Project Area

	Fort Berthold 147-94-1A-12-1H		Fort Berthold 147-94-2A-11-1H		Fort Berthold 147-94-3A-10-1H		Fort Berthold 148-94-35D-26-1H	
Reservation (On/Off)	On	Off	On	Off	On	Off	On	Off
Active Wells	**45**	**198**	**44**	**230**	**44**	**255**	**47**	**228**
Proposed Wells	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 3.14e Nearest Active, Confidential, Dry, and Water Wells to Each Proposed Site

Well Type	Fort Berthold **147-94-1A-12-1H**	Fort Berthold **147-94-2A-11-1H**	Fort Berthold **147-94-3A-10-1H**	Fort Berthold **148-94-35D-26-1H**
Active	VOIGT 24-21H	VOIGT 24-11H	BURR 16-44H	VOIGT 24-11H
Confidential	VOIGT 32-24H	VOIGT 32-24H	VOIGT 32-24H	VOIGT 32-24H
Dry	EDWARD LOCKWOOD, JR1	MOCCASIN 3-24 BIA	MOCCASIN 3-24 BIA	MOCCASIN 3-24 BIA
Water (Owner)	E. RATEMAN SPRING	E. RATEMAN SPRING	E. RATEMAN SPRING	E. RATEMAN SPRING

The Proposed Action, when combined with other oil and gas projects, may contribute to the depletion of oil and gas resources in the area if the wells prove to be productive. In addition, construction of well pads and access roads for the Proposed Actions combined with the disturbances from future oil and gas projects, road building, and construction of agricultural projects would incrementally alter the topographic character of the area.

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

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

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

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

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

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

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

4. Consultation and Coordination

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

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

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

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

AUG 2 5 2009

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of four oil well pads and access roads in Dunn County, North Dakota. Approximately 66.2 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. Four archaeological sites (32DU1445, 32DU1446, 32DU1447, 32DU1448) consisting of groups of stone circles were recorded in one of the inventories, 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 (16 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for these undertakings, provided that the four archaeological sites are avoided. Catalogued as **BIA Case Number AAO-1657/FB/09,** the proposed undertakings, locations, and project dimensions are described in the following reports:

Baer, Sara
(2009) A Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 147-94-3A-10-1H Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

(2009) A Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 147-94-2A-11-1H Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

(2009) A Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 148-94-35D-26-1H Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

Baer, Sara, and Michael J. Retter
(2009) A Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 147-94-1A-12-1H Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

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

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

Sincerely,

ACTING Regional Director

Enclosures

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

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

September 11, 2009

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

RE: Project # AAO-1657/FB/09
Petro-Hunt Ft. Berthold 147-94-3A-10-1H well pad and access road
Petro-Hunt Ft. Berthold 147-94-2A-11-1H well pad and access road
Petro-Hunt Ft. Berthold 148-94-35D-26-1H well pad and access road
Petro-Hunt Ft. Berthold 147-94-1A-12-1H well pad and access road

Dr. Murdy:

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

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

Sincerely,

Perry Brady pc

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

THPO Concurrence letters

5. List of Preparers

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations.

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

6. References and Acronyms

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Baer, Sara. 2009b. A Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 147-94-3A-10-1H Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

Baer, Sara. 2009c. A Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 148-94-35D-26-1H Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

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Acronyms

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

NOTICE OF AVAILABILITY

THE BUREAU OF INDIAN AFFAIRS (BIA) AND THE THREE AFFILIATED TRIBES ARE PLANNING ON DRILLING FOUR HORIZONTAL OIL/GAS WELLS ON *Fort Berthold 147-94-1A-12-1H, Fort Berthold 147-94-2A-11-1H, Fort Berthold 147-94-3A-10-1H, and Fort Berthold 148-94-35D-26-1H* ON THE FORT BERTHOLD RESERVATION. CONSTRUCTION IS SCHEDULED TO BEGIN IN THE FALL OF 2009.

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

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

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