



Bureau of Land Management

Anchorage Field Office
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Environmental Assessment

On-shore Drilling and Production of a Natural Gas Well
Aurora Gas, LLC
A-085789
AK-040-06-EA-046

Location:

Seward Meridian, T11N, R12W, Section 20

Prepared By:

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I. INTRODUCTION

Aurora Gas, LLC has submitted an application to the Bureau of Land Management for a permit to drill a natural gas well on a pre-existing pad in a previously developed gas field commonly known as the Nicolai Creek Unit. Cook Inlet Regional Corporation (CIRI) is the surface owner of the lands involved. BLM retains jurisdiction over the project through Oil and Gas lease A-085789. CIRI has been notified of the activities occurring on the surface estate. CIRI is working with the lessee, Aurora Gas, LLC to acquire a Self-Certification Statement showing that CIRI and Aurora Gas, LLC have reached an agreement regarding operations on CIRI's surface estate. The Self-Certification Statement, once issued, would allow the proposed drilling activity to take place and allow heavy equipment to be hauled into and out of the project area along the existing 17(b) road easement. The Nicolai Creek Unit is estimated to contain up to eight billion cubic feet of proven reserves.

A. Purpose and Need for the Proposed Action:

The purpose of the proposed action is to determine the economic and environmental feasibility of natural gas production in this portion of the Nicolai Creek Unit with the aim of bringing the gas to market and meeting the energy needs of the state and the nation.

B. Conformance With Land Use Plan:

The proposed action is in conformance with the principles of the Southcentral Management Framework Plan (MFP), 1980:

Objective: Provide opportunities for the development of identified economic reserves of locatable and leasable minerals.

[Paragraph M-1.]

II. PROPOSED ACTION AND ALTERNATIVE

A. Proposed Action:

Aurora Gas, LLC is proposing to drill a natural gas well (NCU #10) within the Nicolai Creek Unit (NCU) from an existing gravel pad. The gravel pad was constructed in 1967 by Texaco to drill its NCU #3 well, which was completed on 5/4/67. The surface location of the proposed well is 1,799' From the North Line (FNL), and 1,504' From the West Line (FWL) of Section 20, T11N, R12W, Seward Meridian in the Nicolai gas field. The Nicolai Creek No. 10 (NCU #10) gas well will be directionally drilled into the underlying Federally administered unit, which is estimated to contain up to eight billion cubic feet of proven reserves. The NCU #3 gas well produced gas for several years before being shut in. Aurora Gas, LLC recently acquired the unit, and re-completed the NCU # 3 well as a gas producer during operations between 12/6/00 and 12/25/00. Aurora Gas also re-worked the well between 8/6/03 and 8/19/03 to reduce

incidental water production during operations.

The road system used during that period is still in use today, interconnecting several sites, such as the Shirleyville camp facility, the Village of Tyonek and the Beluga power generation facility. The road system is not connected to the Greater Alaska highway system. For this reason, support for industrial activities in the region relies on the use of air and barge transportation. Freight delivered via barge is transported from the OSK dock in Nikiski to the old “Timber Camp” just outside of the village of Tyonek. Freight is offloaded there and transported via the local road system directly to the site. Freight and personnel can also be transported to the region via air, with landing strips at Beluga, Tyonek and Shirleyville, with the Tyonek and Shirleyville airstrips being the preferred support points for work at the Nicolai Creek well project. The local Shirleyville airstrip, constructed in the late 1960’s, supports current oil and gas exploration activities in the region. All airstrips are directly connected to the local road system.

The local road system, which was constructed to support oil and gas exploration, as well as logging activities, is sufficient to meet the needs of activities associated with the drilling of the NCU #10 well. The proposed well will be drilled off of an existing roadway approximately 75 to 100 feet SSW of the existing ANCSA 17(b) road easement. The roads will be maintained as they have been in the past in support of ongoing activity in the region. No new road construction or surface disturbance will be required for the drilling and potential production activity associated with the NCU #10 well. No new construction materials will be required for renovating the site or the access road.

The configuration of production facilities and pipeline on the NCU #10 well pad will be dependant on the outcomes from the drilling and testing of NCU #10 well. This information will be provided when the well has been tested and a surface facility design has been finalized. The applicant believes no new ancillary facilities will be required. A complete support infrastructure is already in place. The crews will be housed at pre-existing facilities 1.5 miles from the drill site in Shirleyville.

- B. Alternative #1 - No Action Alternative:
Aurora Gas, LLC would not drill its #10 Well in the NCU. No further disturbance, construction or activity would take place on the proposed NCU Well #10 pad.

- C. Alternative #2 - New Pad Construction
Aurora Gas, LLC could develop a new pad in Section 19, T11N, R12W, Seward Meridian to access the target reservoir. However, such an alternative is economically and environmentally unsound. Therefore, no

further analysis will be provided.

III. AFFECTED ENVIRONMENT

A. Critical Elements

The following critical elements of the human environment are either not present or would not be affected by the Proposed Action or No Action Alternative:

- Areas of Critical Environmental Concern
- Cultural Resources
- Environmental Justice
- Farmlands (Prime or Unique)
- Floodplains
- Invasive, Non-native Species
- Native American Religious Concerns
- Subsistence
- Threatened or Endangered Species
- Wastes, Hazardous/Solid
- Wild and Scenic Rivers
- Wilderness

1. Air Quality:

No air quality data is available for the NCU Well #10 site. However, air quality for the Cook Inlet and Kenai Peninsula area is generally considered good. Most of the land in the Kenai Peninsula Borough is classified by the Alaska Department of Environmental Conservation (ADEC) as Class II air sheds. Class II air sheds are generally pollution free and allow some industrial development.

A potential for surrounding wells to emit particulate matter, methane gas, carbon dioxide, carbon monoxide and nitrous oxides into the atmosphere still exists.

2. Water Quality (Surface/Ground):

Drainage of the lowlands for this area is generally to the east. Surface water of the wetlands has low turbidity and is often brownish in color. This brownish or “tea colored” water is attributed to the staining by organic compounds and to high iron content. This staining is natural and not associated with oil and gas activities. Generally, surface and ground water quality are considered good.

3. Wetlands/Riparian Zones:

The U.S. Fish and Wildlife Service (USFWS) National Wetlands

Inventory maps of the area identify two types of wetlands along the existing road system. These are generally described as persistent saturated scrub bog and persistent semi permanent flooded scrub bog. An aerial survey of wetlands in June 1999 by Forcenergy and two environmental consultant staff revealed two additional wetland areas consisting of dwarf birch, alder and spruce. These are described as intermittent wetlands, with general drainage from east to west.

The proposed NCU Well #10 will be drilled in an area of open to closed white and/or black spruce forest with scattered stands of birch and cottonwood. These forests are interspersed with wetland openings consisting of lowland sedge-moss bog meadows. Depending on forest canopy, the under story of the forested areas around the proposed well consists of varying amounts of willow and alder, dwarf birch, blueberry, cranberry, Labrador tea, crowberry, feather mosses, etc. Bluejoint grass tends to dominate open areas over a wide range of growing sites.

B. Land Status:

Cook Inlet Region, Inc. (CIRI) controls the surface sand and gravel rights in Section 20, T11N, R12W, Seward Meridian from which Aurora Gas, LLC will drill the NCU #10 well. BLM controls the coal, oil and gas rights in Section 19, T11N, R12W, Seward Meridian under Lease No. A-85789 into which the NCU #10 well will terminate. An existing 60 foot 17(b) road easement may impact access to and egress from the project area.

C. Geology, Topography and Soils:

Karlstrom (1964) describes the surficial geology in this area as Quaternary proglacial-lake-bottom sediments. These sediments underlie a terraced and channeled surface between major morainal belts. Quaternary age sediments are as much as 1,000 feet thick and overlie Tertiary rocks of the Kenai group. This group consists mostly of siltstones, fine sandstones and shales. Soil types in the area consist of glacial till, lacustrine deposits of sand and silt and glacial outwash deposits with layers of gravel and sandy gravel. Isolated peat deposits are also present. Elevations for the area generally range from sea level to a little more than 100 feet above sea level. Earthquakes of Richter magnitude 6.0 to 8.8 could occur in the area surrounding the proposed well, causing major structural damage.

D. Vegetation:

The Proposed Action would occur in and around the Kenai Lowlands area on the west side of Cook Inlet. Because the Kenai Lowlands were created from complex and largely modified moraines, low rolling hills separate the nearly level wetlands of muskeg and swamp. In general, the area is

poorly drained (as evidenced by the muskeg, swamp and numerous lakes) and generally free of perma-frost except for isolated lenses beneath bogs or frosted area. Dwarf shrubs usually dominate over a mat of sedges, mosses and lichen which overlies a peaty substrate.

E. Visual Resources:

Visual Resource Inventory (VRM) Class IV is currently assigned to the proposed project area within the Nicolai Gas Field. The objective of this class is to provide for management activities which require major modification to the character of the existing landscape. The level of change to the characteristic landscape can be high and management activities may dominate the view and be the major focus of viewer attention.

The existing pad has been in existence since 1967. The area of the pad is in a mostly closed canopy spruce forest with mixed hardwood species. Views from the ground tend to be limited in extent by vegetation and very common to the region. A locally used ATV route passes near the drill site.

F. Wildlife:

Moose are common as successional vegetation provides plentiful browse. Other mammals known to inhabit the area include redback voles, red squirrels, muskrats, porcupines and hares (James Montgomery Consulting Engineers, 1992). The Kenai Lowlands support many species of bird and waterfowl. The list of species includes white crowned sparrow, tree swallows, northern or black-backed woodpeckers, juncos, yellow-rumped and yellow warblers, fox sparrows, Lincoln sparrows, Savannah sparrows, least sandpipers, Whimbrels, parasitic jaegers, sandhill cranes, common loons, red-necked grebes, surf scooters, trumpeter swans, greater scaup, American widgeon, arctic terns, mallards, Bonaparte's gulls, Barrow's goldeneyes, red-throated loons and red-necked phalaropes (James M. Montgomery Consulting engineers, 1992, citing a letter from Bailey, 1992; Rosenberg, 1986). Bald eagles nest in the Kenai National Wildlife Refuge. Beaver Lake has a known nest (James M. Montgomery Consulting Engineers, 1992, citing a "personal communication" from Joyce, 1992).

The forested coastal habitats provide year round habitat for black bear, moose, lynx, martin and wolves. Brown bear are found in open habitat. Migrant and resident land birds use the area's shrub and forest communities for nesting. Adjacent coastal mudflats and the intermittent shrub wetlands provide habitat for breeding and migrant shorebirds and waterfowl.

G. Recreation:

Recreation activities are low in frequency and user numbers in the area of

the proposed action. An ATV trail connected to a larger local trail network passes near the pad site and winter trails exist in the area. These trails provide winter and summer transportation routes and access to subsistence hunting and fishing sites.

IV. ENVIRONMENTAL CONSEQUENCES

A. Impacts of the Proposed Action:

1. Critical Elements:

a. Air Quality:

Fires, smoke, volcanic eruptions and pollutants drifting from the west can affect visibility and air quality. Air quality may be temporarily affected by dust and exhaust from construction and operational activities.

b. Cultural Resources:

No historic properties are known for the project area. Since all activities will be performed on previously disturbed ground, no new discoveries are expected. No new ground disturbance will occur in the area of development, resulting in no adverse effects upon cultural resources.

c. Subsistence:

The Proposed Action will not occur on Federal Public Lands as defined in ANILCA Sec. 102(3), and therefore does not fall under the authority of the Federal Subsistence Board and Subsistence Management Regulations for the Harvest of Fish and Wildlife on Federal Public Lands in Alaska. The Proposed Action would not incur additional Federal surface disturbance or habitat alteration than what presently exists on the proposed site or on any ancillary facilities that are required for access and other activities. The Proposed Action will not impact the capability of the area to produce a sustainable harvest of Federal subsistence resources.

Therefore, at this time, the Proposed Action will not significantly restrict Federal subsistence uses, decrease the abundance of Federal subsistence resources, alter the distribution of Federal subsistence resources, or limit qualified Federal subsistence user access from currently existing conditions. No further analysis is necessary at this time.

d. T&E Species:

The impact of the Proposed Action and Alternative on

threatened and endangered plants and animals and their habitats has been evaluated in accordance with the Endangered Species Act of 1973, as amended. Based on currently available information, the Proposed Action would not affect any threatened or endangered species or their habitats. Therefore, no consultation with the USFWS is considered necessary pursuant to Section 7 of the Act and none will be undertaken.

e. Water Quality, Surface/Ground:

Produced water from the onsite NCU #3 well will be used for the make-up of drilling and completion fluids needed during the drilling process. This “produced water” is a by-product of the gas production operations and will be supplemented, if necessary, by water from a shallow pre-existing water well, also onsite.

Although not anticipated and highly unlikely, a release of natural gas liquid and/or liquid hydrocarbons could impact surface and subsurface water quality. Natural gas liquids would rapidly evaporate and disperse into the atmosphere. Heavier liquids could penetrate the soils and enter the ground waters. Should the release pose potential fire/explosive hazards, it would be burned or ignited, consuming the fuel.

Fuel spills, oil leaks, hydraulic line breaks and similar type “spills” also have potential to impact water quality. Such spills would likely be very small in volume and contained on the well pad at the facilities. These spills would be immediately cleaned up.

2. Geology, Topography and Soils:

The total area of surficial disturbance will be negligible. NCU Well #10 will be drilled from a preexisting drilling pad. Minimal surficial disturbance will be incurred during the rigging up and drilling processes. Some minor road bed erosion will likely occur due to the increased traffic flow during production.

3. Vegetation:

Vegetation adjacent to the pad may be adversely affected by vehicle dust. Such effects should be minor, given construction of NCU Well #10 will occur during the summer when rain is fairly common in the region. Impacts to vegetation would be minimal as the project would occur on an existing gravel pad. No new vegetation clearing outside of the existing pad is expected to occur.

4. Visual Resources:

Visual resource quality may be negatively affected during the construction and drilling operations. Permanent impacts to visual resources should be minimal as surface disturbance and vegetation clearing is expected to be limited by utilizing a pre-existing gravel pad for drilling and existing roads for access. Regular users of the ATV trail are familiar with the pad location and the limited viewshed minimizes impacts to visual resources.

The proposed action is consistent with a VRM Inventory Class IV objective.

5. Wildlife:

Motor vehicle access to the immediate area surrounding the construction activities is almost exclusively restricted to oil and gas field workers. The increase in human activity and noise around the proposed construction area may temporarily displace existing wildlife in the immediate area. Upon completion of the construction operations, traffic and human activity will be minimal and should cause minimal displacement.

However, access to the area provided by the preexisting road and airstrip may impact big game, furbearing and waterfowl populations by potentially increasing hunting pressure in an area that would otherwise be inaccessible. The remoteness of the area may also result in the illegal taking of wildlife.

6. Recreation:

Impacts to existing recreation uses and patterns will be minimal. Regular users are familiar with the existing pad location which does not currently impact on their recreational opportunities and activities. Some impact to hunting opportunities may result as wildlife temporarily moves away from the increased noise and human activity associated with the construction and drilling phase.

B. Impacts of Alternative #1 - No Action Alternative:

1. Critical Elements:

a. Air Quality:

Road travel to existing wells that surround the proposed NCU Well #10 would still affect the ambient air quality. A potential for surrounding wells to emit particulate matter, methane gas, carbon dioxide, carbon monoxide and nitrous oxides into the atmosphere still exists.

b. Cultural Resources:

No disturbance of any preexisting cultural resources would occur should drilling not take place.

c. Water Quality, Surface/Ground:

No impacts to subsurface resources would occur. No impacts to surface waters or existing hydrologic conditions would be incurred.

2. Vegetation:

Spills, leaks, etc. could still occur on the airstrip and roadway near the proposed NCU Well #10 site due to traffic in and out of the surrounding well pads. Barring that, no impact would be felt to the vegetation in the area surrounding the proposed well site, should drilling not occur.

3. Visual Resources:

There will be no impact to visual resources near the proposed well site should drilling not occur. The existing pad will continue to be visible to users passing by the site of the proposed action.

4. Wildlife:

Impacts would be the same as under the Proposed Action due to the existence of the road and accompanying airstrip. However, wildlife in the well site area would not be subjected to the displacement impacts associated with facility construction and well installation. Vehicular travel on the road would be less, but would still occur as a result of accessing the nearby existing gas wells.

5. Recreation:

Existing recreation use patterns will continue. No additional impacts to recreation will occur.

C. Cumulative Impacts:

The Proposed Action associated with the Nicolai Creek Unit (NCU) would only slightly increase cumulative impacts to the area resources. The Nicolai Creek Unit was established by TEXACO in the late 1960's when they drilled what is now commonly referred to as the NCU #3 well. The NCU has been in varying stages of development since then. Depending on the success of the proposed NCU #10 well and the continued success of existing production wells, the development of the NCU may progress for years to come.

The well head facilities could slightly increase air emissions, adding to those already existing. Noise levels during facility construction operations would increase over a period of approximately 30 days. After initial

construction was completed, noise levels would be similar to those of existing operations in the vicinity.

Existing operations require little to no monitoring personnel for production to occur. Production of a natural gas well involves the capping of a recently drilled well and transferring the produced gas into a flow line. The captured gas in the flow line is then routed on to a central processing facility (located off-pad) for dewatering and compression. Most flow lines are placed above ground on evenly spaced supports, and tend to follow existing road systems, allowing access to and egress from the well pad. All of the activity would occur, and the infrastructure would be developed if and only if the NCU #10 well proves to be successful.

On-site equipment would be minimal. The only visible infrastructure on-site would be the well head blow out prevention stack (attached directly to the well head), a surface grate (installed at ground level, protecting the well casing) and possibly a metal cage/fence around the entire well head and surface grating. All of these protective measures are done to prevent wildlife, humans and debris from entering and altering the well, well casing and/or the overall well head structure.

D. Stipulations

1. Aurora Gas, LLC shall not obstruct or impede access along the portion of the 17(b) easement right of way that crosses the NCU #10 drilling pad. The road is a public access route for the Village of Tyonek and surrounding communities and, therefore, must be accessible at all times, according to the rules governing 17(b) easement authority.

V. CONSULTATION AND COORDINATION

A. Persons and Agencies Consulted:

Bill Penrose of Fairweather E & P Services was consulted on matters of land status, well location and general drilling and production operation. Randy Jones of Aurora Gas, LLC – Houston, TX, was also consulted regarding surface use agreements between Aurora Gas, LLC and CIRI.

B. List of Preparers:

Jeff Denton, Subsistence Specialist
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Donna Redding, Archaeologist
Bruce Seppi, Wildlife Biologist

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