

Wavetech Energy, Inc.

Oil and Gas Development Plan IV

1 Wavetech Harker-Family 14-26

1 Wavetech Roberts 42-3

1 Wavetech Victor Weed 42-27

Cumulative Impacts Plan

Prepared for:

State of Colorado

Oil and Gas Conservation Commission

On Behalf of:

Wavetech Energy, Inc.

Prepared by:



UPSTREAM

Petroleum Management, Inc.

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1.0 INTRODUCTION

This Cumulative Impacts Plan has been prepared pursuant to Rule 304.c.(19) of the Colorado Oil and Gas Commission and addresses the following resources:

- Air Resources
- Public Health
- Water Resources
- Terrestrial and Aquatic Wildlife Resources and Ecosystems
- Soil Resources
- Public Welfare

This plan documents how the Operator (Wavetech Energy) will address cumulative impacts to resources identified pursuant to Rule 303.a.(5) that includes:

- A. A description of all resources for which cumulative adverse impacts are expected (Section 4.0);
- B. A description of specific measures taken to avoid or minimize the extent to which cumulative adverse impacts are increased (Section 5.0);
- C. A description of all measures taken to mitigate or offset cumulative adverse impacts to any of the resources (Section 6.0); and
- D. Additional information determined to be reasonable and necessary to the evaluation of cumulative impacts by the Operator, the Director, CDPHE, CPW, or the Relevant Local Government (Sections 1.0, 2.0, and 3.0).

This Cumulative Impacts Plan was prepared based on the information included in the preliminary Oil and Gas Location Assessment (Form 2A) and Cumulative Impacts Data Identification (Form 2B).

2.0 PROJECT DESCRIPTION

Wavetech Energy, Inc. proposes three wells in Cheyenne County, Colorado. The Operator plans to drill and develop each well, which will produce helium containing natural gas, water, and possibly oil. The proposed locations are on fee surface and fee minerals. No federal surface or minerals are involved in this project. All operations would be completed in compliance with applicable federal, state, and local laws, rules, and regulations.

The three proposed wells include:

- 1 Wavetech Harker-Family 14-26 Township 12 South, Range 43 West, Section 26, SWSW
- 1 Wavetech Roberts 42-3 Township 13 South, Range 43 West, Section 3, SENE
- 1 Wavetech Victor Weed 42-27 Township 12 South, Range 43 West, Section 27, SENE

2.1 SURFACE DISTURBANCE

Estimated total disturbance for each pad would range between approximately 3.5 to 3.9 acres; the proposed working pad surface for each pad would be approximately 2.1 acres; and interim

reclamation would range between 2.3 to 2.7 acres for each pad. Residual disturbance includes acreage that would remain unvegetated for the life of the project, which is estimated to be 10 years. Within six months of operations, site reclamation would be initiated for portions of the well pads not required for the continued operation of the wells, weather permitting.

3.0 CUMULATIVE IMPACT METHODOLOGY

Cumulative impacts may result when impacts associated with project implementation are added to other similar impacts associated with past, present and reasonably foreseeable future actions. The proposed OGDP is located in a rural portion of Cheyenne County, Colorado that is associated with low residential density and dominated by livestock grazing. Publically available data sources including county, state, federal, and public domains, were used to characterize the past, present, and reasonably foreseeable development in the vicinity of the proposed project. Based on COGCC data, there are existing oil and gas locations that are active and built and plugged and abandoned within one mile of the proposed locations.

Each resource addressed in this cumulative impacts analysis is assigned a spatial and temporal scale that establishes the extent of the analysis. The spatial component of this analysis is referred to as the “Cumulative Impact Analysis Area (CIAA). The CIAA varies by resource and can be relatively smaller for some resources, as for vegetation, or much larger as in the case for air quality. **Table 3-1** presents the geographic extent for each resource CIAA. The temporal boundary for most resources is the 10-year life of the project. For wildlife and vegetation that temporal boundary includes an additional 5 years toward achievement of agency-approved reclamation standards.

Table 3-1 Geographic Scope for Cumulative Impact Analysis

Resource	Cumulative Impact Analysis Area (CIAA)
Air Quality	1-mile radius
Public Health	1-mile radius
Water	½-mile radius
Terrestrial and Aquatic Wildlife Resources and Ecosystems	1-mile radius
Soils	Full extent of disturbance
Vegetation	1-mile radius
Public Welfare	1-mile radius

4.0 SUMMARY OF RESOURCE IMPACTS

4.1 AIR

4.1.1 Resource Description

There a variety of air emission sources at the proposed location and within the CIAA including, vehicle traffic and houses. Implementation of the Project would have a cumulative impact on air quality within the 1-mile CIAA. Demonstrated by the Emissions Inventory in Form 2B, the cumulative effects of the proposed project on air emissions in the CIAA would be minor.

4.1.2 Direct and Indirect Impacts

During the air emissions analysis, it was determined indirect and direct impacts to air quality would be primarily from vehicle traffic and production activities. The following impacts have been identified:

- Incremental contribution of vehicle emissions and dust from vehicles on the access road can lead to a decrease in air quality.
- Incremental contribution of emissions from engines needed for the drilling operations and production stage operations can lead to a decrease in air quality.
- Short-term contribution of emissions from engines needed for the drilling operations can lead to a decrease in air quality.
- Incremental contribution of emissions from engines needed for the production stage operations can lead to a decrease in air quality.

4.1.3 Cumulative Impacts

Impacts to air resources would be minimized and mitigated by the measures described in Sections 5 and 6 of this Plan. Emissions would be permitted and regulated by the Colorado Department of Public Health and Environment, Air Pollution Control Division, and would be subject to appropriate controls to reduce emissions. Based on the level of emissions expected to be released as the result of implementation of this proposed project, the contribution to past, present, and reasonably foreseeable projects represents a minor cumulative increase in emissions within the CIAA.

4.2 PUBLIC HEALTH

As described in Form 2b, The Public Health section refers to emissions of different Hazardous Air Pollutants (HAPs) that may be emitted from equipment and during drilling and/or completion operations on the Location. The following impacts have been identified:

- Incremental contribution of vehicle emissions and dust from vehicles on the access road can lead to a decrease in air quality
- Incremental contribution of emissions from engines needed for the drilling operations and production stage operations can lead to a decrease in air quality.
- Short-term contribution of emissions from engines needed for the drilling operations can lead to a decrease in air quality
- Incremental contribution of emissions from engines needed for the production stage operations can lead to a decrease in air quality.

4.3 WATER RESOURCES

4.3.1 Resource Description

There are no water bodies (i.e., ponds, stream, rivers) in areas proposed for disturbance. Based on National Wetland Inventory (NWI) data, there are no mapped wetlands in areas proposed for disturbance. There are no known public water systems within one mile of the proposed Locations.

4.3.2 Direct and Indirect Impacts

Construction and operation of the proposed Project could potentially impact water resources that exist within ½-mile of the proposed facilities based on the potential for increases in localized erosion and sedimentation rates. Implementation of the proposed Projects could temporarily increase soil compaction on nearby existing roads, and on the proposed access roads and well pads. As a result of the localized increases in soil compaction, there is the potential for increased surface runoff in areas associated with the access roads and working pad surfaces. Based on the lack of substantial pathways (surface drainages) within or near the proposed disturbance and with the successful implementation of project-related soil erosion control measures, there is low likelihood of substantial sedimentation of intermittent drainages in the area.

4.3.3 Cumulative Impacts

Construction and production activities at the proposed Locations combined with other past, present, and reasonably foreseeable activities in the area could increase the possibility for accidental releases of industrial products, including fuels, lubricants, and other petroleum products. Such accidental releases could impact local groundwater resources, if releases are of sufficient magnitude. No production liquids, chemicals or fuels would be stored at these proposed Locations. Successful implementation of project-related best practices and mitigation measures would result in negligible cumulative impacts to local water resources.

Water would be obtained from existing, permitted sources of groundwater, including an estimated 2,000 bbls of groundwater. Use of an estimated 2,000 bbls of total estimated water volume would cumulatively contribute to other water uses in the area.

4.4 TERRESTRIAL ECOSYSTEM AND WILDLIFE RESOURCES

4.4.1 Resource Description

Habitat at each proposed Location is grazed grassland. National Wetland Inventory (NWI) data do not indicate any mapped wetlands associated with the proposed Locations. Trees do not exist at or near any of the proposed Locations, as is typical for this locale.

As an initial evaluation for the occurrence of special status species at the Locations, a United State Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) report was prepared (USFWS 2023). Results indicate the potential for two federally-listed species to occur at the proposed Location, the Gray Wolf (*Canis lupus*; endangered) and the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*; threatened; LEPC). Based on the known distribution of wolves in Colorado, the Gray Wolf is not expected to occur at the proposed Location. Each of the proposed Locations is within LEPC estimated occupied range and two sites are within LEPC connectivity areas. There are no designated critical habitats in areas proposed for disturbance or within the one-mile buffer of the proposed Locations. Critical habitat is a specific geographic area that contains features essential to the conservation of an endangered or threatened species, and that may require special management and protection.

All three locations occur in mapped Lesser Prairie-Chicken (LEPC) estimated occupied range. Two locations, 1 Wavetech Harker-Family 14-26 and 1 Wavetech Roberts 42-3, are within a mapped LEPC connectivity area.

4.4.2 Direct and Indirect Impacts

Implementation of the proposed project could result in direct and indirect impacts to wildlife. Direct impacts are those that result in mortality, injury, and behavioral changes (for example: displacement) to wildlife. Direct impacts to wildlife typically occur during construction when wildlife are unable to avoid operating construction equipment and other project-related vehicles. Wildlife may be injured or killed during surface disturbing activities. Surface disturbing activities, including increases in human presence and associated noise, have the potential to displace wildlife. Such displacement is expected to have minimal impact on individuals based on the availability and suitability of other unaffected habitats in the area. During the construction of the projects, new light sources may be created. New light sources have the potential to attract insects which in turn may attract foraging bat and bird species. There is a potential for injury or mortality to birds and bats through collision with project-related infrastructure. Because the areas proposed for disturbance are not expected to offer high quality habitats for wildlife species, direct impacts are expected to be negligible. Indirect impacts to wildlife include the alteration of native habitats that potentially provide forage and cover; changes in local habitats based on the potential for introduction of noxious weeds; and project-related increases in predator densities or concentrations. Indirect impacts to wildlife species are expected to be minimal; based on the low diversity and relative quality of the impacted habitats and the availability of other undisturbed and suitable habitats in the vicinity. Implementation of the proposed project would not result in impacts to special status wildlife species.

Following USFWS guidance, *Framework for the Review of Lesser Prairie-Chicken Voluntary Conservation Programs* (2021), each of the three proposed Locations was evaluated for the potential to result in impacts to the LEPC. Implementation of the projects has the potential to result in alteration and loss of potentially suitable LEPC habitats through earth moving activities and the addition of new vertical structures. The 2021 USFWS guidance includes a table that summarizes indirect impacts associated with a variety of habitat disturbances, including railroad tracks, transmission lines, improved and unimproved roads, buildings, wind turbines and others. Based on several studies, an impact radius has been assigned to each habitat disturbance type. This indirect impact radius represents the extent each feature can impact the surrounding habitats, essentially rendering the habitat unsuitable for LEPC. The impact radius associated with a wind turbine is 1,800 meters. Habitats located within 1,800 of an existing wind turbine are expected to be unsuitable for LEPC.

The following is a brief summary of LEPC habitat suitability at each of the proposed Locations.

1 Wavetech Roberts 42-3

- Proposed Location is within grassland habitat (active grazing observed in August 2022).
- The Location is bordered by agricultural fields on three sides.
- The Location is within 2,000 meters of an existing wind turbine.
- Location is approximately 1.8 miles from a mapped production area.
- LEPC habitat suitability is expected to range between low and unsuitable based on isolation of the grassland habitat, relatively small size of the grassland patch, the active grazing of the grassland, and the proximity to active wind turbines.

1 Wavetech Harker-Family 14-26

- The proposed location is within grassland habitat (active grazing observed in August 2022).
 - This grassland patch is relatively large and contiguous.
 - Vegetative structure in this grassland is low stature and lacks structure that would support LEPC nesting or hiding.
- Three turbines are within 1,800 meters of the proposed location.
- Location is within 1.2 miles of a mapped production area.
- Habitat at this Location is expected to be unsuitable for LEPC.

1 Wavetech Victor Weed 42-27

- The proposed location is within grassland habitat (active grazing observed in August 2022).
 - This grassland patch is relatively large and contiguous.
 - Vegetative structure in this grassland is low stature and lacks structure that would support LEPC nesting or hiding.
- Four turbines are within 1,800 meters of the proposed location.
- Location is 1.5 miles from a mapped production area.
- Habitat at this Location is expected to be unsuitable for LEPC.

4.4.3 Cumulative Impacts

Implementation of the proposed Projects would have an insignificant cumulative impact on locally occurring wildlife and wildlife habitats, as the projects are proposed for an area that has limited natural/undisturbed habitats. Implementation of the proposed projects would result in cumulative impacts on LEPC High Priority Habitat (HPH) based on the limited disturbance to grassland habitats.

4.5 SOIL RESOURCES

4.5.1 Resource Description

Based on NRCS soils data, the following soil types have been described for the proposed locations:

10 – Colby-Santana complex, 5 to 12 percent slopes

Soils are comprised of 31% of Colby and similar soils, 29% of Santana and similar soils, and 40% of minor components.

The Colby complex drainage class is “Well Drained” with a (0.57 to 2.00 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Colby predominant plant species include Western wheatgrass (20%), Little bluestem (10%), Sideoats grama (10%), Galleta (10%), and Blue grama (-).

Typical profile/horizon

A - 0 to 3 inches: silt loam

C - 3 to 60 inches: silt loam

The Santana complex drainage class is “Well Drained” with a (0.60 to 2.00 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Santana predominant plant species include Western wheatgrass (15%), Needleandthread (10%), Green needlegrass (10%), Prairie sandreed (5%), Miscellaneous perennial forbs (5%), and Blue grama (-).

Typical profile/horizon

A - 0 to 8 inches: loam

Bt - 8 to 16 inches: clay loam

C - 16 to 60 inches: loam

19—Keith-Richfield silt loams, 0 to 2 percent slopes

Soils are comprised of 50% of Keith and similar soils, 30% of Richfield and similar soils, and 20% of minor components.

The Keith complex drainage class is “Well Drained” with a (0.20 to 0.60 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Keith predominant plant species include Blue grama (25%), Sideoats grama (20%), Western wheatgrass (20%), Buffalograss (15%), Big bluestem (5%), Little bluestem (5%), Switchgrass (3%), Slimflower scurfpea (2%), Englemann daisy (2%), Catclaw sensitive briar (1%), Heath aster (1%), and Western ragweed (1%).

Typical profile/horizon

Ap - 0 to 6 inches: silt loam

Bt1 - 6 to 10 inches: silty clay loam

Bt2 - 10 to 25 inches: silty clay loam

C - 25 to 79 inches: silt loam

The Richfield complex drainage class is “Well Drained” with a (0.60 to 2.0 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Richfield predominant plant species include Blue grama (25%), Western wheatgrass (20%), Sideoats grama (20%), Buffalograss (15%), Big bluestem (5%), Little bluestem (5%), Switchgrass (3%), Englemann daisy (2%), Slimflower scurfpea (2%), Catclaw sensitive briar (1%), Heath aster (1%), and Western ragweed (1%).

Typical profile/horizon

Ap - 0 to 6 inches: silt loam

Bt1 - 6 to 18 inches: silty clay loam

Bt2 - 18 to 24 inches: silty clay loam

Bk - 24 to 79 inches: silt loam

24-Kim-Canyon loams, 5 to 35 percent slopes

Soils are comprised of 40% of Kim and similar soils, 25% of Canyon and similar soils, and 35% of minor components.

The Kim complex drainage class is “Well Drained” with a (0.60 to 2.00 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Kim predominant plant species include Western wheatgrass (30%), Needleandthread (10%), Sideoats grama (5%), and Blue grama (-).

Typical profile/horizon

A - 0 to 2 inches: loam

C - 2 to 60 inches: clay loam

The Canyon complex drainage class is “Well Drained” with a (0.20 to 0.60 in/hr) capacity to transmit water; depth to paralithic bedrock can be found anywhere from 10-20” in depth. Please see NRCS attachment.

The Canyon predominant plant species include Little bluestem (25%), Sideoats grama (25%), Miscellaneous perennial forbs (5%), Western wheatgrass (5%), Threadleaf sedge (5%), Miscellaneous shrubs (5%), Needleandthread (5%), and Blue grama (-).

Typical profile/horizon

A - 0 to 3 inches: loam

C - 3 to 13 inches: gravelly loam

Cr - 13 to 17 inches: weathered bedrock

39—Satanta-Colby complex, 3 to 5 percent slopes

Soils are comprised of 50% of Satanta and similar soils, 20% of Cobly and similar soils, and 30% of minor components.

The Satanta complex drainage class is “Well Drained” with a (0.60 to 2.00 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Satanta predominant plant species include Western wheatgrass (15%), Needleandthread (10%), Green needlegrass (10%), Miscellaneous perennial forbs (5%), Prairie Sandreed (5%), and Blue grama (-).

Typical profile/horizon

A - 0 to 8 inches: loam

Bt - 8 to 16 inches: clay loam

Bk - 16 to 60 inches: loam

The Colby complex drainage class is “Well Drained” with a (0.57 to 2.00 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Colby predominant plant species include Western wheatgrass (25%), Sideoats grama (10%), Green needlegrass (10%), Little bluestem (5%), Sand dropseed (5%), Needleandthread (5%), and Blue grama (-).

Typical profile/horizon

- A - 0 to 3 inches: silt loam
- C - 3 to 60 inches: silt loam

54—Wiley complex, 0 to 3 percent slopes, eroded

Soils are comprised of 80% of Wiley, eroded, and similar soils, and 20% of minor components.

The Wiley complex drainage class is “Well Drained” with a (0.60 to 2.00 in/hr) capacity to transmit water; depth to restrictive feature can be found anywhere from 80” or more in depth. Please see NRCS attachment.

The Wiley predominant plant species include Western wheatgrass (30%), Green needlegrass (10%), Needleandthread (5%), and Blue grama (-).

Typical profile/horizon

- A - 0 to 3 inches: silt loam
- Bt - 3 to 23 inches: silt loam
- Ck - 23 to 60 inches: silt loam

4.5.2 Direct and Indirect Impacts

Implementation of the proposed projects, including surface disturbing activities, could result in soil compaction, and subsequent increases in erosion and sedimentation. Compaction of soils can lead to decreases in water and air absorption. Severe compaction can also lead to a conversion from aerobic to anaerobic soil conditions, thereby altering organisms in the soil and subsequently causing changes in soil nutrient cycling.

4.5.3 Cumulative Impacts

Implementation of the proposed projects would have a negligible cumulative impact on soil resources in the area. Past, present, and reasonably foreseeable projects and activities in the area have likely resulted in similar impacts to soil resources.

4.6 PUBLIC WELFARE

4.6.1 Noise

Resource Description

The proposed projects are located in rural Cheyenne County. All three (3) Locations are greater than 1 mile from the work pad surfaces to any Residential Building Units. There are no high occupancy building units (HOBUs, including schools and daycares) within 5,280 feet of the proposed working pad surface.

Direct and Indirect Impacts

It is likely that project-related noise from the proposed 1 Wavetech Roberts 42-3 location may be perceivable at the RBU that exists south of the proposed Location. Potential noise impacts to human receptors is expected to be low based on the expected low intensity and duration of the noise created during construction. Noise production during the operational phase is expected to be low and potentially unperceivable at distances greater than 0.5 miles. Based on the distance between the proposed Location and the RBU combined with project-related mitigation measures to reduce and minimize noise production, direct and indirect impacts are expected to be minimal.

Cumulative Impacts

No substantial cumulative noise impacts are expected.

4.6.2 Odor

Resource Description

There are no other known existing industrial, oil and gas, or other long-term activities within one mile of the proposed projects that would be potential sources of odors. A concentrated animal feeding operation (CAFO) exists south of the proposed 1 Wavetech Roberts 42-3 Location and less than 0.5 miles north of an RBU.

Direct and Indirect Impacts

Implementation of the proposed projects has the possibility of creating short-term and temporary changes to odors in the vicinity of the project.

Cumulative Impacts

Implementation of the proposed project could result in short-term and temporary odor impacts within the ½ mile cumulative impacts analysis area. However, based on the distance between the proposed Locations and the nearest RBU being greater than 0.5 miles, these potential impacts are expected to be negligible.

4.6.3 Light

Resource Description

The proposed locations for these Projects is in a rural area of Cheyenne County, where light sources are limited and dispersed in low densities.

Direct and Indirect Impacts

The greatest potential for light impacts would occur during the drilling phase of the proposed projects. During the drilling phase, the appearance of new light sources may be perceivable to distant observers and to occupants of a RBU located more than one mile south of the 1 Wavetech Roberts 42-3 Location. Public county roads in the vicinity of the proposed Projects do not

typically support high traffic volumes. There would be no permanent light sources on the working pad surfaces during operation of the proposed facilities. The only light source during the production phase would be from trucks hauling water.

Cumulative Impacts

There would not be any long-term permanent light-related cumulative impacts associated with implementation of the proposed project.

4.6.4 Dust

Resources Description

Development of the proposed Project would require earth disturbing activities and travel on unpaved roads, which has the potential to produce fugitive dust emissions. Production of agricultural cash crops is a common practice in the vicinity of the proposed Locations. Agricultural practices can be a source of fugitive dust.

Direct and Indirect Impacts

The greatest potential for impacts from dust is during construction of the proposed working pad surfaces and construction and use of the associated proposed access routes.

Cumulative Impacts

There would not be any long-term permanent dust-related cumulative impacts associated with implementation of the proposed project.

5.0 MINIMIZATION MEASURES

In § 34-60-106 (2.5), C.R.S., the COGCC defines “minimizing adverse impacts” as

”providing necessary and reasonable protections to reduce the extent, severity, significance, or duration of an unavoidable direct, indirect, and cumulative adverse impacts to public health, safety, welfare, the environment, or wildlife resources from oil and gas operations.”

Minimization measures reduce impacts to the greatest degree that is practical and can include operational and mechanical controls. BNL has committed to the minimization measures listed in the following sections.

5.1 AIR QUALITY

- Measures associated with fugitive dust include:
 - Utilize existing vegetation, trees slash or brush piles to cover disturbed areas not used for vehicle traffic.
 - Application of fresh water during dry season.
 - Operations will be confined to the wellpad working surface.
 - Continuous monitoring of disturbed areas to evaluate additional BMPs needed.
 - Fresh water application to disturbed areas during construction.
 - Fresh water or magnesium chloride application to graveled surfaced of the Location and associated roads.

- Speed limit signs will be posted per surface owner agreement.
- Contractors will be notified of speed limits if no signs are posted.
- Regular road maintenance such as grading and adding additional gravel as needed.
- A Leak Detection and Repair Program will be implemented. This will include monthly inspections using infrared cameras.
- There will be no emission-producing reserve pits.

5.2 PUBLIC HEALTH

- No additional mitigation measures are required. This is based on the HAP modeling results that indicate no HAP is expected to exceed the target cancer risk or noncancer hazard index for chronic duration exposures. No HAPS exceed the residential or industrial screening levels for acute duration exposures within the well pad location during pre-production or production phases.

5.3 WATER RESOURCES

- A Stormwater Management Plan will be prepared. This plan will guide site-specific efforts to protect Waters of the State that could receive stormwater runoff from the proposed location.
- There will be no staging, refueling, or chemical storage areas in the vicinity of onsite water resources.
- Potential pollutants located onsite will be sealed, wrapped, covered when not in use so as to eliminate or minimize contact with stormwater runoff.
- Proper storage, safe-handling, good housekeeping and spill prevention practices will be used to prevent pollutants from leaving the site.
- During construction, disturbed slopes will be covered with coconut blankets, straw mulch, or straw wattles and maintained for the life of the project or until slopes are stabilized and revegetated.
- With appropriate landowner authorization, baseline water quality samples will be collected from agency-approved water wells in the vicinity of the proposed oil and gas location.
- Proposed wells will be equipped with technology that will allow for repaid well shutdown in the event of an unplanned release.

5.4 TERRESTRIAL ECOSYSTEMS AND WILDLIFE RESOURCES

- Project employees and contractors will be informed and educated on wildlife conservation practices, including no harassment or feeding of wildlife.
- Proposed site facilities (for example, collection and distribution facilities) will be consolidated and centralized in an effort to minimize impact to wildlife habitats.
- Fugitive dust control measures will be implemented.
- Screens and other nesting barriers will be installed on stacks, heater treater openings, and fired vessels to prevent nesting by migratory bird species.

5.5 SOIL RESOURCES

- Topsoil and Stormwater management plans will be prepared for the proposed site and will include measures that will avoid and minimize impacts to soil resources. Some of these measures include the following:
 - Topsoil will be stripped from the disturbance area and will be stored onsite for future use.
 - Topsoil stockpiles will be protected from wind and water erosion.
 - Weed management practices will be used to prevent weed establishment on the topsoil stockpile.
 - Installation of coconut blankets, straw mulch, or straw waddles, sediment basins, swales, and perimeter ditches will be used to prevent minimize erosion from disturbed areas.
 - Biweekly inspections by a third-party contractor of BMP integrity and effectiveness will be implemented. Deficiencies will be noted and submitted to the operator and addressed in a timely manner.
 - Construction activities will be curtailed during wet periods in an effort to avoid unnecessary soil disturbance.
 - All roads will be recontoured and revegetated to a stable condition, unless the landowner directs differently.
- Cut and fill areas will be regraded to match pre-project contours, to the extent possible.
- The topsoil stockpile will be graded to ensure all surface stability.
- Soils in areas associated with production operations or for subsequent drilling operations will be stabilized toward minimization of dust and erosion in these areas.
- A Spill Prevention, Control, and Countermeasure Plan will be prepared and implemented toward protecting soils from spills and releases.

5.6 PUBLIC WELFARE – NOISE, ODOR, AND LIGHT

Public Welfare

- Equipment, including welding trucks, will be equipped with fire extinguishers and spark arresters.
- Where public exposure to pipeline corridors is possible, warning signs will be installed to inform the public of the presence of the pipeline.
- Vehicle operators will be instructed to travel at low speeds and to stay on existing public roadways, project-related travel routes, and the well pad at all times.
- Vehicle trips to the location will be reduced through the use of technologies that allow for remote monitoring of the wells (for example, SCADA).
- A Transportation Plan will be developed and implemented. This plan will guide management of transportation related issues during implementation of the project.

Noise

- Daylight only operations will be conducted when possible.

Odor

- Oil and gas operations will be in compliance with the Department of Public Health and Environment, Air Quality Control Commission, Regulation No. 2 Odor Emission, 5

C.C.R. 1001-4, Regulation No. 3 (5 C.C.R. 1001-5), and Regulation No. 7 Section XVII.B.1 (a-c) and Section X11.

- A freshwater mud system will be used for surface hole.
- Drill pipe will be wiped to remove residual mud upon tripping out of the hole.

Light

BMPs to minimize light pollution could include:

- Daylight only operations will be conducted when possible.

6.0 MITIGATION MEASURES

COGCC defines “mitigating adverse impacts” as:

“measures that compensate for unavoidable direct, indirect, and cumulative adverse impacts and loss of such resources from oil and operations”.

Mitigation measures are used to offset the intensity or severity of impacts and can include compensatory actions and administrative controls. The following mitigation measures for resources based on the cumulative impact analysis described in this Plan will be implemented.

6.1 AIR QUALITY

Minimization measures described in the previous section will address potential impacts associated air resources in the CIAA. No additional mitigation measures for are quality are included.

6.2 PUBLIC HEALTH

HAP emissions are not expected to contribute to acute or chronic risks to human health within or beyond the well pad location. No additional mitigation measures are required.

6.3 WATER RESOURCES

Minimization measures included in the site-specific SWMP combined with other measures listed in the previous section will address the potential for impacts to water resources in the CIAA. No other mitigation measures are required.

6.4 TERRESTRIAL ECOSYSTEMS AND WILDLIFE RESOURCES

- As part of final reclamation, all roads and pads will be recontoured and revegetated to a condition similar to pre-project conditions.
- For trenches, wildlife escape ramps will be installed every 0.25 mile.

6.5 SOIL RESOURCES

- Signs will be placed on each topsoil stockpile designating and preserving the material for reclamation purposes.