

CUMULATIVE IMPACT PLAN



1 Wavetech Harker-Family 31-22

Sec. 22 T12S R43W (NW/4 NE/4)

Cheyenne County, Colorado

Surface: Fee

Submitted as an accompaniment to the Form 2A Application
and consistent with the requirements of Rule 303.a.(5).

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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) 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).

The Cumulative Impacts Plan for the Wavetech Energy, Inc. (Wavetech) 1 Wavetech Harker Family Trust 31-22 location 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

The 1 Wavetech Harker-Family 31-22 Project (Project) includes the construction of one Location for one (1) proposed well. Wavetech plans to drill and test this conventional well which will produce helium containing natural gas, water and possibly oil. All gas production will go directly to the existing Ladder Creek Pipeline gathering system at the tie-in point in Sec. 22 T12S R43W (NE/4 NE/4). The Ladder Creek Pipeline is operated by Tumbleweed Midstream. The gas processing facility will be on lands outside of this Oil and Gas Development Plan. This well will be drilled, perforated, and tested. The legal description for this project is NWNE of Section 22, Township 12 South, Range 43 West, 6th P.M., in Cheyenne County, Colorado.

2.1 SURFACE DISTURBANCE

Construction of the proposed location would result in an estimated 3.7 acres of short-term disturbance. After completion of approximately 2.5 acres of interim reclamation, long-term disturbance would be reduced to an estimated 1.2 acres. Residual disturbance includes acreage that would remain unvegetated for the life of the project, which is estimated to be 10-30 years.

Within six months of operations, site reclamation would be initiated for portions of the well pad not required for the continued operation of the well, 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 Project is located in a rural portion of Cheyenne County, Colorado that is associated with low residential density and dominated by agricultural crop production and livestock grazing. Publicly 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 zero oil and gas locations that are active and built within one mile.

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 10-30 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 pad disturbance. The proposed working pad surface would be located in a field used for agricultural crop production. Based on National Wetland Inventory (NWI) data, there are no mapped wetlands associated with the proposed pad location. NWI wetland data indicates the presence of a mapped wetland (PEM1A; Palustrine, Emergent, Temporarily Flooded) approximately 829 feet northeast of the working pad surface. This mapped wetland is associated with a drainage that is typically dry

throughout the year. There are no known public water systems within one mile of the working pad surface. Water would be obtained from existing, permitted sources of groundwater, including an estimated 1,500 bbls of groundwater.

4.3.1 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 Project could temporarily increase soil compaction on nearby existing roads, and on the proposed access road and well pad. As a result of the localized increases in soil compaction, there is the potential for increased surface runoff in areas associated with the access road and working pad surface. 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.

4.3.2 Cumulative Impacts

Construction and production activities at the proposed Project site 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 this proposed location. Successful implementation of project-related best practices and mitigation measures would result in negligible cumulative impacts to local water resources.

. Use of an estimated 1,500 bbls of total estimated water volume would cumulatively impact additional water usage in the area.

4.4 TERRESTRIAL ECOSYSTEM AND WILDLIFE RESOURCES

4.4.1 Resource Description

The habitats within the proposed Project area are characterized as non-native agricultural crops. No undisturbed native plant communities exist in areas that are proposed for disturbance. No sensitive habitats or wildlife areas are mapped within the proposed Project location. Wildlife observed during this biological survey included: lark bunting (*Calamospiza melanocorys*), Western meadowlark (*Sturnella neglecta*), Red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), Turkey vulture (*Cathartes aura*), and Mourning Dove (*Zenaida macroura*). No special status wildlife species or habitats that support these species were observed.

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool was used to identify federally listed species that have the potential to occur at the Location. The results of this tool identified the Gray Wolf (*Canis lupus*; endangered) as the only federally listed species with the potential to occur at the project Location (USFWS 2022a). Based on occurrence records in the State and on the lack of suitable habitat or prey densities in the vicinity of the proposed Location, the Gray Wolf is not expected to occur at the Location.

Recently, the USFWS listed the LEPC northern Distinct Population Segment (DPS) as threatened under the ESA (USFWS 2022b). A known Production Area exists approximately 1.9

miles from the proposed working pad surface. Occurrence of LEPC in areas proposed for disturbance is not expected based on the low quality LEPC habitat and dynamic nature of the cultivated crops. Additionally, there are four wind turbines within 1,800 meters of the proposed location. The USFWS has suggested Lesser Prairie-chickens may avoid otherwise suitable habitats within 1,800 meters (5,905 ft) of a turbine (LPC Conservation 2021). No other federally listed or state-listed species are expected to occur in areas proposed for disturbance.

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 is 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 from the Project location. Such displacement is expected to have minimal impact on individuals based on the availability and suitability of other habitats in the area. During the construction of the project, 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 loss of 3.7 acres of agricultural crop that may provide forage or cover. Typical indirect impacts, including reductions in habitat quality as the result of the introduction of weeds and the potential of project-related increases in predator densities and concentrations, are less of a concern as the proposed project occurs in a field that is used for active agricultural crop production. Indirect impacts to wildlife species are expected to be minimal based on the current land use as agricultural crop production 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.

As for the Lesser Prairie-chicken, the proposed project would not occur in Production Areas or Connectivity Areas and would not result in the loss or alteration of suitable native habitats. Based on the current agricultural crop production in areas proposed for disturbance and the presence of four wind turbines within 1,800 meters (5,905 ft) of the proposed location, the proposed location is not expected to provide suitable habitats for the Lesser Prairie-chicken.

4.4.3 Cumulative Impacts

Implementation of the proposed Project would have a minor cumulative impact on locally occurring wildlife and wildlife habitats, as the project is proposed for an area that is currently used for agricultural crop production. Implementation of the proposed project would not result in cumulative impacts on High Priority Habitats (HPH) because none exist in areas proposed for disturbance.

4.5 SOIL RESOURCES

4.5.1 Resource Description

Based on Natural Resource Conservation Service (NRCS) soil data, the following soil types are associated with the proposed Location: Ascalon sandy loam, 0 to 3 percent slopes. These soils include Ascalon (85%) Olnest (10%) and Voan (5%). Drainage class for these soils is described as “well drained”. Also associated with the proposed location are Goshen silt loam soils. These soils include Goshen (90%), Lodgepole (1%) and Pleasant (1%). These soils are characterized as well drained to somewhat poorly drained.

4.5.2 Direct and Indirect Impacts

Implementation of the proposed project, 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 project 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 project is located in rural Cheyenne County. The nearest residential building unit (RBU) is estimated to be 3,604 feet southwest of the working pad surface. 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

Based on the lack of human noise receptors in the vicinity of the proposed project combined with project-related mitigation measures to reduce and minimize noise production, direct and indirect impacts are expected to be minimal. Wildlife may be temporarily impacted due to an increase in noise, especially during the construction and drilling phase of the project.

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 project that would be potential sources of odors. There are no known human receptors within 3,000 feet of the proposed project.

Direct and Indirect Impacts

Implementation of the proposed project 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 lack of human receptors near the proposed Project, these potential impacts are expected to be negligible.

4.6.3 Light

Resource Description

The proposed location for the Project 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 project. During the drilling phase, the appearance of a new light source may be perceivable to distant observers. Public county roads in the vicinity of the proposed Project do not typically support high traffic volumes. State Highway 385 is nearly four (4) miles to the west of the proposed project. Drivers along this highway have the potential to recognize new light sources associated with the proposed Project, but would not be expected to be impacted. The project proponent is committed to daylight operations, when possible. There would be no permanent light sources on the working pad surface during operation of the proposed facilities. The only light source during the production phase would be from trucks hauling water. Wildlife may be temporarily impacted during the drilling phase of the project.

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.

Direct and Indirect Impacts

The greatest potential for impacts from dust is during construction of the proposed working pad surface, and construction and use of the proposed access route. Air drilling will most likely be used which can contribute to incremental dust impacts.

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 rapid 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 wattles, 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 air 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.

7.0 REFERENCES

- LPC Conservation LLC (2021). Renewable (Wind and Solar) Energy, Power Line, and Communication Tower Habitat Conservation Plan for the Lesser Prairie-chicken. Colorado, Kansas, New Mexico, Oklahoma, and Texas. Available online at: https://www.fws.gov/sites/default/files/documents/508%20Compliant%20LEPC%20Renewables%20HCP_07.20.2021_rev.pdf. Accessed on September 12, 2022.
- U.S. Fish and Wildlife Service (USFWS). 2022a. Information for Planning and Consultation (IPaC) Resource List for Wavetech sites.
- USFWS. 2022b. Endangered and Threatened Wildlife and Plants; Lesser Prairie-Chicken; Threatened Status with Section 4(d) Rule for the Northern Distinct Population Segment and Endangered Status for the Southern Distinct Population Segment, 50 CFR Part 17. Federal Register 87 (226): 72674-72755. Available online at: <https://www.regulations.gov/document/FWS-R2-ES-2021-0015-0418>. Accessed on December 13, 2022.