



**GARNET 21-K PAD ODOR MITIGATION PLAN**

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**Article I. Introduction**

*Location Information*

This document provides site-specific information for the Garnet 21-K Pad Form 2A as the Garnet 21-K Pad OGDP. The information in this document relates specifically to the time during the construction, drilling, and completion, and production of the twenty-four (24) proposed horizontal wells on this location.

The proposed location is rangeland located North of WCR 78 between WCR 29 and WCR 31 using an existing access onto WCR 78. The Pad will be in NWSE Section 21, Township 7 North, Range 66 West zoned AG within Weld County's Near-Urban Planning Area. A 1041 WOGLA was filed as 1041WOGLA20-0093 on 2/18/2021 and approved at hearing on 4/23/2021.

The proposed Pad will be approximately 13 acres, reduced to 6 acres after interim reclamation. The working pad surface will be 9.2 acres. The Pad is on Parcel 070721000040 owned by the City of Thornton. The location is currently used for farming.

The proposed production facility equipment for the Garnet 21-K Pad will be located within the Working Pad Surface adjacent to the wells and will consist of oil tanks, water tanks, multi-use tanks, separators, meters, Instrument Air System, enclosed combustion devices (ECD), gas compressors, Gas Lift, LACT Units, Scrubbers, Sumps, Water Transfer Skid, and proposed electrical and/or solar equipment.

<b>Phase</b>	<b>Duration (days)</b>	<b>Estimated Start Date</b>
Construction	30	3 <sup>rd</sup> Quarter (August) 2022
Drilling	150	3 <sup>rd</sup> Quarter (September) 2022
Completion	180	1 <sup>st</sup> Quarter (February) 2023
Flowback	60	3 <sup>rd</sup> Quarter (August) 2023
Production	25 Years	4 <sup>th</sup> Quarter (October) 2023
Interim Reclamation	10	1 <sup>st</sup> Quarter (January) 2024*

*\*or the first favorable growing season.*

**Article II. Potentially Impacted Parties**

The Working Pad Surface of the Garnet 21-K Pad is within 2,000 feet of the following Building Units or Designated Outside Activity Areas (none):

<b>Name</b>	<b>Distance &amp; Direction</b>
CITY OF THORNTON	1054' SW

**Article III. Mitigation Measures and Best Management Practices**

*Identify Sources*



Operator will identify all potential sources of odors and emission points and conduct emission or leak monitoring for all tanks, compressors, knockout, and oil/water separation vessels, including any pressure relief devices or vacuum devices attached to the vessels, and keep records of any releases from such devices.

### *Odor Sources*

#### Potential Odor Sources by Phase of Operations:

- Drilling
  - Engines
    - Drilling Rig Gen Sets
    - Third Party Vendor Trucks
  - Diesel Fuel Storage
  - Oil Based Drilling Mud & Storage
  - Drill cuttings across shale shakers
  - Drill cuttings haul off to disposal facility
  - Toilets & Dumpsters
- Completions
  - Engines
    - Workover or Coiled Tubing Rig
    - Pump & Sand Trucks
    - Generators
    - Acid Transports
  - Perforating guns
  - Toilets & Dumpsters
- Operations
  - Separators
  - Tanks
  - Compressors
  - Knockouts
  - Dehydrators
  - ECD
  - Generators
  - Chemical Storage
  - Diesel Fuel Tanks
  - Sumps & Scrubbers
  - Toilets & Dumpsters

### *Best Management Practices*

- Oil and gas operations shall 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 XII.
- Oil and gas facilities and equipment shall be operated in such a manner that odors and dust do not constitute a nuisance or hazard to public welfare.



- Operator utilizes a clear, colorless refined distillate derived from petro hydrocarbons that is specifically designed for down hole OBM drilling purposes. This product provides a higher aniline point and a lower BTEX than straight diesel which should reduce the odor associated with the OBM system. The refined distillate is generally classified as a Group II fluid per the manufacturer as it is not a diesel nor is it a synthetic mineral oil or an additive/odor neutralizer.
- An actual odor neutralizer will be utilized in the OBM mud system during drilling operations to help mitigate odors.
- Aromatics will also be mitigated during completion operations by virtue of the utilization of closed flowback tanks with all water/gas vapors being sent to a temporary ECD during the flowback period.
- Hydrocarbon odors from production facilities are minimized and eliminated by keeping produced fluid hydrocarbons and natural gas contained within pipes, separators, tanks, and combustors.
- All tanks will be sealed with thief hatches and gaskets. Tank vapors are captured with properly sized piping and combustors.

#### *Drilling Mud*

The Garnet 21-K Pad will utilize a water-based drilling fluid while drilling the upper 1,500 ft of the wellbore that will be covered by surface casing. Once below surface casing an Oil Based drilling fluid will be used.

<u>Name</u>	<u>Type</u>	<u>Group</u>	<u>Aromatic Content</u>	<u>Additives</u>
Fresh Water	Water Based	N/A	N/A	Gel sweeps for viscosity
D822	Distillate	II	N/A	If applicable

#### *Monitoring*

At least 1 wind direction indicator shall be clearly visible from all principal working areas at all times so that wind direction can be easily determined to evaluate the potential migration pathways of odors.

A Leak Detection and Repair ("LDAR") program along with an audio, visual, olfactory ("AVO") program is planned for this location as part of an overall leak and spill detection program.

#### *Cuttings*

To reduce odors during drilling and completion, the rig will be washed of oily debris before moving in. Operator will utilize drying shakers to minimize residual oil on cuttings prior to transport and will promptly remove cuttings during drilling operations. Cuttings will not be stored on site.

#### *Idling*

Trucks will be prohibited from idling on location when not in use to prevent the accumulation of odors from exhaust.

#### *Complaints*



Upon Director request, the Operator(s) of the Oil and Gas Facility or Facilities subject to the complaint will provide within 48 hours the Director, the Relevant or Proximate Local Government, and the complainant (should the complainant request notification) with a complete description of all activities occurring at the facility during the timeframe specified in the complaint.

Operator will take necessary and reasonable actions to reduce odors, including, but not limited to, conducting air sampling to measure volatile organic compounds at Oil and Gas Facility or Facilities subject to the complaint if required by the Director. Operator will conduct at least two measurements made >15 minutes apart outside of property line of property where odors originate.

**Article IV. Cumulative Odors**

As part of the Cumulative Impacts Analysis, Operator has identified the following Industrial operations and other Oil and Gas Locations as sources of potential odors:

<b>Name/Owner</b>	<b>Type</b>	<b>Distance</b>	<b>Direction</b>	<b>Comment</b>
PDC Thornton 21R-HZ Pad	Oil & Gas Location	2834'	N	Loc ID 432481
BEP Thornton 28-H Pad	Oil & Gas Location	3558'	SW	Loc ID 447778

If the Commission or Director applies additional Best Management Practices, conditions of approval, or guidance requiring additional measures to minimize odors in areas with high concentrations of oil and gas activities that may expose one or more Building Units or Designated Outside Activity Areas to odors from oil and gas sources, Bayswater will comply with such requirements.

**Article V. Exhibits/References/Appendices**

None