



**PLANNING & DEVELOPMENT DEPARTMENT MEMORANDUM
#57-2019**

DATE: November 25, 2019

TO: Honorable Mayor Esquibel and City Council Members

THROUGH: Heather Geyer, City Manager 

FROM: Brook Svoboda, Director of Planning and Development 
Corey Hoffmann, City Attorney
Matthew Sura, Special Legal Counsel

SUBJECT: CR-145 – Oil and Gas Best Management Practices

PURPOSE

To adopt Best Management Practices (BMP) for the administration of the new Oil and Gas Regulations, which are being considered in CB-1937.

BACKGROUND

In the spring of 2019, the Colorado State Legislative Assembly approved Senate Bill 19-181, titled “Protecting Public Welfare in Conduct of Oil and Gas Operations.” This bill acted to reform the Colorado Oil and Gas Conservation Commission’s mission to protect public health and the environment, give local government clear regulatory authority, and reform forced pooling laws. As a result of this state legislative action, the City retained special counsel Matt Sura to review the City’s current oil and gas regulations within the Unified Development Ordinance (UDO). The proposed new regulations have been presented to Council in CB-1937 – Oil and Gas Regulations.

An Oil and Gas Best Management Practices document is proposed to be adopted in conjunction with the proposed Code revisions. The BMP document will serve as expert guidance for any Oil and Gas Permit application review. The BMP document will be posted on the City’s website, and the City Council may update the document by Resolution “as necessary to reflect changes to technology, state regulations, and industry practices.”

The proposed Best Management Practices document was recommended for approval by the Planning Commission at their October 1, 2019 meeting.

STAFF RECOMMENDATION

Staff recommends approval of CR-145.

BUDGET/TIME IMPLICATIONS

There are no anticipated direct budgetary impacts from this item.

STAFF REFERENCE

If City Council members have any comments or questions, they may contact Brook Svoboda, Director of Planning and Development, at 303.450.8937 or bsvoboda@northglenn.org.

CR-145 – Oil and Gas Best Management Practices

SPONSORED BY: MAYOR ESQUIBEL

COUNCILMAN'S RESOLUTION

RESOLUTION NO.

No. CR-145
Series of 2019

Series of 2019

A RESOLUTION ADOPTING THE OIL AND GAS BEST MANAGEMENT PRACTICES IN CONJUNCTION WITH THE CITY'S ADOPTION OF NEW OIL AND GAS REGULATIONS AS SET FORTH IN SECTION 11-3-6(b)(4) OF THE NORTHGLENN MUNICIPAL CODE

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF NORTHGLENN, COLORADO, THAT:

Section 1. The City Council hereby adopts the City of Northglenn Oil and Gas Best Management Practices (BMPs), attached hereto as **Exhibit A** and incorporated herein by this reference, which BMPs shall provide additional detail and be utilized by the City in implementing the provisions of Section 11-3-6 of the Northglenn Municipal Code.

DATED, at Northglenn, Colorado, this ____ day of _____, 2019.

ANTONIO B. ESQUIBEL
Mayor

ATTEST:

JOHANNA SMALL, CMC
City Clerk

APPROVED AS TO FORM:

COREY Y. HOFFMANN
City Attorney

CITY OF NORTHGLENN
OIL AND GAS BEST MANAGEMENT PRACTICES
(“BMP Document”)

A. Introduction.

1. This BMP Document, and each Best Management Practice (each, a “BMP”), are enacted by the City Council of the City of Northglenn (“City”) pursuant to the authority established in Section 11-3-6 of the Northglenn Municipal Code (“Code”) and any enabling and amending ordinance and shall be enforced as set forth in the Code. This BMP Document and each BMP is reasonable and necessary to achieve the purposes stated herein.
2. This BMP Document, and each BMP, is enacted to protect public health, safety, and welfare and the environment by regulating specific areas of Oil and Gas Operations (“Operations”) within the City. These BMPs establish **minimum** standards and may be exceeded voluntarily or as determined by the City in the processing of an Oil and Gas Permit, depending on the nature of the proposed Operations and location.
3. Where used in this BMP Document, the term “practicable” shall mean, in the Director of Planning and Development’s (“Director’s”) opinion, that: (a) there is no technology reasonably available to conduct the proposed Operations in compliance with the BMP and waiver of the provision will not have a significant adverse effect on public health, safety, welfare, or the environment; (b) an alternative approach not contemplated by the BMP is demonstrated to provide a level of protection of public health, safety, welfare, and the environment that would be at least equivalent to the BMP; or (c) application of the BMP would create an undue hardship because of unique physical circumstances or conditions existing on or near the site of the Oil and Gas Facility, which may include without limitation topographical conditions, shape or dimension of the site, or inadequate public infrastructure, provided adequate protection of public health, safety, welfare, and the environment will be ensured through other means. Except where the term “practicable” is used, modifications of these BMPs shall not be permitted.
4. All terms used herein shall have the meaning set forth in the Code, unless a different definition is stated in this document; otherwise, terms and abbreviations shall have their generally accepted meaning as determined by reference to industry and regulatory standards.
5. Each BMP is an integral part of this BMP Document and the City’s regulations of oil and gas development. Notwithstanding the foregoing, if any BMP or a part thereof (or any application thereof) is found to be invalid by a court, such invalidity shall not affect the remaining parts of the BMP or this BMP Document which can be given effect without the invalid portion or application, provided such remaining portions or applications are not determining by the court to be inoperable. To this end, BMPs are declared to be severable.

B. Summary of Revisions. [Reserved]

C. Air Quality. Operator shall comply with these air quality standards to: protect human health and safety; prevent injury to plant and animal life; prevent damage to property; prevent unreasonable interference with the public welfare; preserve visibility; and protect scenic, aesthetic, and historic values in the City. These standards are established to prevent or mitigate the degradation of the City’s air and visibility resource; prevent odors and other air pollution problems; and to improve the quality of life and the general welfare in the City.

1. *Minimization of Emissions.*

- a. Operator shall use electric equipment for permanent production equipment, such as electric compressors and pneumatic valves, and use line power as detailed in this BMP Document.
- b. Air emissions from the Operations shall be, at a minimum, in compliance with the permit and control provisions of the Colorado Air Quality Control Program, C.R.S. § 25-7-101 et seq. as may be amended.
- c. All fossil-fuel powered engines used for drilling and completions on Well Sites shall employ the latest emission-reduction technologies that are economically practicable.
- d. Operator shall comply with the transportation and circulation section addressing traffic provisions as detailed in this BMP Document.
- e. Operator shall utilize pipelines as detailed in this BMP Document.
- f. Operator shall, through a manufacture-test or other recognized data analysis method, demonstrate hydrocarbon destruction or control efficiency that complies with a design destruction efficiency of 98% or better.
- g. Operator shall use no-bleed continuous and intermittent pneumatic devices. This requirement can be met by replacing natural gas with electricity or instrument air or routing the discharge emissions to a closed loop-system or process.
- h. Any flare, auto ignition system, recorder, vapor recovery device or other equipment used to meet the hydrocarbon destruction or control efficiency requirement shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.
- i. Operators shall not use glycol dehydrators or desiccant gas processing dehydrators.
- j. Compressor engines are prohibited within the City limits except for wellhead, sales, and gas lift compressors, air and/or gas gathering compressors which shall be located on the Well Sites. Operator shall use enclosures of compressor engines where necessary to provide visual and/or noise mitigation. Any compressors that are used as part of the vapor recovery units (air pollution controls) will be limited to 6-8 small engine drive units. VRU compressors will be installed with sound walls to buffer noise.
- k. Operator shall comply with odor requirements, as established by COGCC and CDPHE regulations, year-round.
- l. Operator's Well Site and equipment design shall reduce emissions of associated gas from hybrid gas-oil wells (i.e., gas that is co-produced from a well that primarily produces oil).
- m. Operator shall use current best management practices during liquids unloading (i.e. maintenance activities to remove liquids from existing wells that are inhibiting production), designed to minimize hydrocarbon emissions to the greatest extent practicable. This may require practices and technology beyond those specifically listed in this BMP Document.
- n. Operator shall reduce emissions from oil and gas pipeline maintenance activities such as pigging or blowdowns. Any maintenance activity involving the intentional venting of gas from a well tank, compressor or pipeline, beyond routine pipeline maintenance activity and pigging, requires forty-eight (48) hour advance written notice to the City of such proposed venting. Such notice shall identify the

duration and nature of the venting event, a description as to why venting is necessary, a description of what vapors will likely be vented, what steps will be taken to limit the duration of venting, and what steps Operator proposes to undertake to minimize similar events in the future. If venting is required, or if accidental venting occurs, Operator shall provide such notice to the City of such event as soon as possible, but in no event longer than 24 hours from the beginning of the event, including without limitation the information listed above, an explanation as to the cause, and how the event will be avoided in the future; notices shall be supplemented as additional information becomes available.

- o. Operator shall eliminate or minimize flaring to the maximum extent practicable
- p. Operator shall comply with dust suppression techniques in this BMP Document.
- q. Operator shall comply with odor requirements in this BMP Document.
- r. Operator shall consolidate product treatment and storage facilities within a Well Site.
- s. Operator shall centralize compression facilities within a Well Site.
- t. Operator shall use telemetric control and monitoring systems, including surveillance monitors, to detect when pilot lights on control devices are extinguished.
- u. Operator shall comply with all CDPHE rules and regulations, including air permits, if any, and all OSHA work practice requirements with respect to benzene.
- v. Operator shall participate in Natural Gas STAR program or other equivalent voluntary programs to encourage innovation in pollution control at each Well Site.
- w. Operator shall use pressure-suitable separator and vapor recovery unit (VRU) where applicable.
- x. Operator shall construct pipeline infrastructure prior to the Production Phase.
- y. For hydraulic fracturing pumps, Operator shall use Tier 4 or better engines.

2. *Leak Detection and Repair.*

- a. Operator shall develop and maintain an acceptable leak detection and repair (“LDAR”) program as required by CDPHE using modern leak detection technologies such as infrared (“IR”) cameras for equipment used at a Well Site.
- b. At least once per year, the Operator shall notify the City ten (10) business days prior to an LDAR inspection of its facilities to provide the City the opportunity to observe the inspection.
- c. For a five (5) year period beginning with the start of the Production Phase per well location at each Well Site, Operator shall conduct quarterly IR camera monitoring of all equipment at each Well Site.
- d. Thereafter, Operator shall conduct IR camera monitoring at least twice annually until all the wells on the Well Site are plugged and abandoned.
- e. Except when a circumstance would necessitate an immediate repair, Operator must repair leaks as soon as possible. If more than 48-hours repair time is needed after a leak is discovered, an explanation of why more time is required must be submitted to the City.

- f. Operator shall conduct continuous pressure monitoring to detect leaks.
3. *Ambient Air Modeling.* Operator shall provide access to the Well Sites to the City's designated personnel or agent to allow air sampling to occur, without condition. Operator will provide a regionally based air modeling and emissions inventory.
4. *Ozone Air Quality Action Days.*
 - a. On Air Quality Action Day advisories posted by the CDPHE for the Front Range Area, the Operator shall implement CDPHE-suggested air emission reduction measures, including the following, for the duration of an Air Quality Action Day advisory:
 - i. Minimize vehicle and engine idling;
 - ii. Reduce truck traffic and worker traffic;
 - iii. Delay vehicle refueling;
 - iv. Suspend or delay use of fossil fuel powered ancillary equipment; and
 - v. Postpone construction activities, if practicable.
 - b. Within 30 days following the conclusion of each annual Air Quality Action Day season, Operator must submit a report to the City that details which measures it implemented during any Action Day advisories.
5. *Electric Equipment.*
 - a. All permanent production equipment, such as compressors, motors and artificial lift equipment, shall utilize electric line power to mitigate noise and to reduce emissions.
 - b. All drilling rigs capable of drilling to Total Depth (TD) on a well shall be required to utilize electric line power unless the Director waives this BMP in writing for a specific location or for any well not located within 2000' of a Residential Building Unit or not within 2000' of a High Occupancy Structure.
 - c. At any location where Operator is not required by this BMP to utilize line power for drilling, Operator will utilize line power if available in sufficient quantity from the utility provider.
 - d. At any location where line power is not used for drilling, Operator shall provide to City at City's request the source(s) used for power.
 - e. Operator shall minimize use of diesel generators for temporary power, including the use of liquified or compressed natural gas for power generation to further reduce emissions and noise.
6. *Exhaust.* The exhaust from all engines, motors, coolers and other mechanized equipment shall be vented up or in a direction away from the nearest occupied building.
7. *Flares and Combustion Devices.* To the extent flares, thermal oxidizers, or combustion devices are utilized, all such flares shall be designed and operated as follows:

- a. Flares shall be fired with natural gas and designed to operate with a 98% of higher hydrocarbon destruction efficiency.
- b. Flares shall be designed and operated in a manner that will ensure no visible emissions during normal operation. "Visible emissions" means observations of smoke for any period or periods of duration greater than or equal to one (1) minute in any fifteen (15) minute period during normal operation, pursuant to EPA Method 22. Visible emissions do not include radiant energy or water vapor.
- c. Flare shall be operated with a flame present at all times when emissions may be vented to it or shall utilize another mechanism that does not allow uncontrolled emissions.
- d. All combustion devices must be equipped with an operating auto-igniter.

8. *Fugitive Dust.*

- a. Silica dust must be contained to the maximum extent practicable during the hydraulic fracturing process.
- b. Dust associated with on-site activities and traffic on access roads shall be minimized throughout construction, drilling and operational activities such that there are no visible dust emissions from access roads or any Well Site to the extent practical given wind conditions.
- c. No untreated produced water or other process fluids shall be used for dust suppression.
- d. The Operator will not create dust or conduct dust suppression activities within 300' of the ordinary high-water mark of any waterbody, unless the dust suppressant is water.
- e. Material Safety Data Sheets (MSDS) for any chemical-based dust suppressant, other than magnesium chloride, shall be submitted to the City prior to use.
- f. If a resident of a Residential Building Unit within 2000' of a Well Site complains of dust (either directly to the Operator, to the COGCC, or to the City) Operator shall determine whether the dust is caused by Operator's Operations. Operator shall report its conclusions, including the factual basis for the conclusions, to the City and the complainant. If the dust is caused by Operator's Operations, Operator shall resolve the dust concern to the maximum extent practicable within 24 hours.

9. *Odor Containment.*

- a. Operator shall control and prevent odors from Operations from affecting adjacent properties and shall proactively address and, to the extent possible, resolve complaints filed by impacted members of the community.
- b. Operator shall use a filtration system or additives to the drilling and fracturing fluids to minimize odors.
- c. Operator shall not use fragrance to mask odors.
- d. Operator shall implement one or more of the following measures as necessary:
 - i. Running mud through a cooler to reduce odor;

- ii. Wiping down the drill pipe each time that the drilling operation “trips” out of the hole;
 - iii. Increase additive concentration;
 - iv. Operator will employ the use of drilling fluid with low to negligible aromatic content during drilling operations after surface casing is set for the protection of fresh-water aquifers;
 - v. Operator will haul drill cuttings off on a daily basis; and
 - vi. Utilizing an electric drilling rig, where practicable.
- e. If a resident of a Residential Building Unit within 2000’ of a Well Site complains of odor (either directly to the Operator, to the COGCC, or to the City) Operator shall determine whether the odor is caused by Operator's Operations. Operator shall report its conclusions, including the factual basis for the conclusions, to the City and the complainant. If the odor is caused by Operator's Operations, Operator shall resolve the odor concern to the maximum extent practicable within 24 hours.

10. *Reduced Emission Completions (Green Completions).*

- a. Operator shall employ reduced emission completions (“Green Completions”) in compliance with federal and state requirements.
- b. Operator shall safely maximize resource recovery and minimize releases to the atmosphere during flowback and subsequent recovery/operation.
- c. Operator shall install gas gathering lines, separators, and sand traps capable of supporting green completions, per the provisions of COGCC Rule 805, as may be amended.
- d. Operator shall comply with 40 CFR 60 (Subpart OOOO), as may be amended, for green completions.
- e. Operator shall not conduct or permit uncontrolled venting other than where necessary for safety.
- f. If allowed, temporary flowback flaring and oxidizing equipment shall include the following:
 - i. Adequately sized equipment to handle 1.5 times the largest flowback volume of gas from a vertical/directional and/or horizontally completed well respectively as reported to the COGCC in a ten-mile radius;
 - ii. Valves and porting available to divert gas to flaring and oxidizing equipment; pursuant to the above Rules 40 CFR 60 (Subpart OOOO) for green completions & COGCC Rule 805, as each may be amended;
 - iii. Auxiliary fueled with sufficient supply and heat to combust or oxidize non-combustible gases in order to control odors and hazardous gases; and
 - iv. Flowback combustion devices shall be equipped with a reliable continuous ignition source over the duration of flowback, except in conditions that may result in a fire hazard or explosion.

11. *Annual Report.*

- a. The Operator shall submit annual reports to the Director certifying:
 - i. Compliance with these air quality requirements unless demonstrated to be inapplicable and documenting any periods of material non-compliance, including the date and duration of each such deviation and a compliance plan and schedule to achieve compliance;
 - ii. That the equipment at each Well Site continues to operate within its design parameters, and if not, what steps will be taken to modify the equipment to enable the equipment to operate within its design parameters;
 - iii. The accuracy and completeness of the report, signed by a responsible corporate official.
- b. Operator may satisfy this reporting obligation, in whole or in part, by submitting its AQCC Regulations No. 7 annual reports for the prior calendar year to the City and supplementing them as needed to meet these reporting requirements for covered facilities within the City.
- c. The Operator will also provide the City with a copy of any self-reporting submissions that Operator provides to the CDPHE due to any incidence of non-compliance with any CDPHE air quality rules or regulations at any Well Site.

D. *Water Quality Protection.* Operator shall comply with these water quality protection standards to: protect human health and safety; prevent injury to plant and animal life; prevent damage to property; prevent unreasonable interference with the public welfare; and to protect water quality. These standards are established to prevent or mitigate the degradation of the City's water resources; prevent odors and other pollution problems; and to improve the quality of life and the general welfare in the City.

1. *Chemical Disclosure.*

- a. Prior to utilizing fracturing chemicals on a Well Site, the Operator shall submit to the City, in table format, the name, Chemical Abstracts Service (CAS) number, storage, containment and disposal method for all such chemicals. The identification of such chemicals shall not be considered confidential or proprietary and the City may make available to the public as public records.
- b. Fracturing chemicals used at any Well Site shall be uploaded onto the Frac Focus website within sixty days of the completion of fracturing operations.

2. *Chemical Storage & Prohibitions.*

- a. Operator shall not permanently store fracturing chemicals, flowback from hydraulic fracturing, or produced water in the City limits.
- b. Operator shall remove all hydraulic fracturing chemicals from a Well Site within thirty (30) days following the completing of hydraulic fracturing at that Well Site.
- c. In addition to any substances that are not permitted to be used in accordance with state or federal rules or regulations, as may be amended, the chemicals listed in Table 1 shall not be utilized in hydraulic fracturing fluid at any Well Site in the City.

TABLE 1

Ingredient Name	CAS #
Benzene	71-43-2
Lead	7439-92-1
Mercury	7439-97-6
Arsenic	740-38-2
Cadmium	7440-43-9
Chromium	7440-47-3
Ethylbenzene	100-41-4
Xylene-F	1330-20-7
1,3,5-trimethylbenzene	108-67-8
1,4-dioxane	123-91-1
1-butanol	71-36-3
2-butoxyethanol	111-76-2
N,N-dimethylformamide	68-12-2
2-ethylhexanol	104-76-7
2-mercaptoethanol	60-24-2
benzene, 1,1'-oxybis-, tetrapropylene derivatives, sulfonated, sodium salts (BOTS)	119345-04-9
butyl glycidyl ether	8/6/2426
polysorbate 80	9005-65-6
quaternary ammonium compounds, dicoco alkyldimethyl, chlorides (QAC)	61789-77-3
hexamethylene triamine penta methylene phosphonic acid (BMPA)	35657-77-3
diethylenetriamine penta (methylene-phosphonic acid)(DMPA)	15827-60-8
FD&C blue no. 1	3844-45-9
Tetrakis(triethanolaminate) zirconium(IV) (TTZ)	101033-44-7

3. *Closed-Loop Pitless Systems for the Containment and/or Recycling of Drilling Fluids.*

- a. Wells shall be drilled, completed and operated using closed-loop pitless systems for containment and/or recycling of all drilling, completion, flowback and produced fluids.
- b. Operator shall recycle fluids to the maximum extent practicable, with the understanding that Operator is limited in its ability to recycle all fluids, as doing so would necessitate the use of permanent tanks, which is otherwise prohibited, and result in the potential for additional emissions.

4. *Containment Berms.*

- a. Operator shall utilize steel-rim berms (or similar material of comparable durability, designed and installed to prevent leakage and resist degradation from erosion or routine operation) around all permanent separation and storage equipment at the Well Sites with sufficient capacity to contain 1.5 times the maximum volume of liquids that such equipment will contain at any given time plus sufficient freeboard to prevent overflow.

- b. All berms and containment devices shall be inspected quarterly by Operator and maintained in good condition.
 - c. Secondary containment, such as duck ponds or lined earthen berms for temporary tanks, shall be used.
 - d. Secondary containment shall be constructed with a synthetic or engineered liner that contains all primary containment vessels and is mechanically connected to the steel ring to prevent leakage.
 - e. No potential ignition sources shall be installed inside the secondary containment area unless the containment area encloses a fired vessel or such sources are rated in accordance with industry codes and standards.
 - f. For locations within 500' and up-gradient of a surface water body, tertiary containment, such as an earthen berm, is required around respective production facilities.
5. *Spill Response Kits.* Operator shall make available at each Well Site, or require to be carried by field staff or contractors, Spill Response Kits capable of mitigating small to mid-size spills (e.g., 5 to 50 gallons).
6. *Maintenance of Machinery.*
- a. Operator shall not conduct vehicle maintenance at any Well Site.
 - b. Operator shall not conduct routine field maintenance of mobile machinery within 300' of any water body as defined by the Code.
 - c. All fueling must occur over impervious material.
7. *Spills.*
- a. Operator shall notify the City of spills at any Well Site that has a reportable spill quantity under any law.
 - b. Operator shall provide the City with a copy of any self-reporting submissions that Operator provides to the COGCC due to any spills at any Well Site.
8. *Stormwater.* All Operations shall comply and conform to the City's stormwater control regulations.
9. *Water Quality Monitoring Plan.*
- a. Operations shall not cause degradation to surface or ground water within the City or to wetlands within the City.
 - b. Any approved variance to COGCC rules and regulations relating to the same matters shall be reported to the City and shall modify these requirements.
 - c. Using records of the Colorado Division of Water Resources, Operator must implement a water quality monitoring plan that includes the following:
 - i. Operator must attempt to collect initial baseline samples and subsequent monitoring samples from all available potable water sources within a one-half (1/2) mile radius of the Well Sites. Potable water sources include registered water wells or permitted or adjudicated springs.

- ii. Operator must attempt to collect initial testing of baseline samples from all available water sources prior to the commencement of drilling a well, or prior to the re-stimulation of an existing well for which no samples were collected and tested during the previous 6-12 months.
- iii. Post-stimulation samples of all those same water sources shall be collected and tested pursuant to the following time frame:
 - a) One sample approximately one (1) year after commencement of the Production Phase;
 - b) One sample approximately five (5) years after commencement of the Production Phase; and
- iv. Operator shall collect a sample from at least one upgradient and two down-gradient water sources within a one-half (1/2) mile radius of a Well Site. If no such water sources are available, Operator shall collect samples from additional water sources within a radius of up to one (1) mile from the Well Site until samples from a total of at least one upgradient and two down-gradient water sources are collected. Operator should give priority to the selection of water sources closest to the Well Site.
- v. Operator may rely on existing groundwater sampling data from any water source within the radii described above that was collected in accordance with accepted standards, provided the data was collected within the 12 months preceding the commencement of Drilling Phase for such Well Site, the data includes measurement of all of the constituents measured in Table 2 below and there has been no significant oil and gas activity within a one-mile radius in the time period between the original sampling and the commencement of the Drilling Phase for such Well Site.
- vi. Operator shall make reasonable efforts to obtain the consent of the owner of the water source. If the Operator is unable to locate and obtain permission of the water source, the Operator must advise the City that Operator could not obtain access to the water source from the surface owner.
- vii. Testing for the analytes listed in Table 2 below, and subsequent testing as necessary or appropriate.
- viii. Operator shall follow standard industry procedures in collecting samples, consistent with the COGCC model Sampling and Analysis Plan.
- ix. Operator shall report the location of the water source using a GPS with submeter resolution.
- x. Operator shall report results of field observations including reporting on damaged or unsanitary well conditions, adjacent potential pollution sources, odor, water color, sediment, bubbles, and effervescence.
- xi. Operator shall provide copies of all test results to the City, the COGCC, and the water source owners within 30 days after receiving the samples.
- xii. Subsequent sampling. If sampling shows water contamination, additional measures shall be required including:
 - a) If free gas or a dissolved methane concentration level greater than one (1) milligram per liter (mg/l) is detected in a water source, determination of the gas type using gas compositional analysis and stable isotope analysis of the methane (carbon and hydrogen).

- b) If the test results indicate thermogenic or a mixture of thermogenic and biogenic gas, an action plan to determine the source of the gas.
- c) Immediate notification to the City, the COGCC, and the owner of the water well if the methane concentration increases by more than five (5) mg/l between sampling periods, or increases to more than ten (10) mg/l.
- d) Immediate notification to the City, the COGCC and the owner of the water well if BTEX and/or TPH are detected as a result of testing. Such detections may result in required subsequent sampling for additional analytes.
- e) Further water well sampling in response to complaints from water source owners.
- f) Timely production and distribution of test results in electronic deliverable format to the City, the COGCC and the water source owners.
- g) Qualified Independent Professional Consultant. All subsequent water source testing must be conducted by a qualified independent professional consultant.

TABLE 2

GENERAL WATER QUALITY

Alkalinity, Conductivity & TDS, pH, Dissolved Organic Carbon (or Total Organic Carbon), Bacteria, Perfluorinated Compounds (PFCs), and Hydrogen Sulfide

MAJOR IONS

Bromide, Chloride, Fluoride, Magnesium, Potassium, Sodium, Sulfate, and Nitrate + Nitrite as N

METALS

Arsenic, Barium, Boron, Chromium, Copper, Iron, Lead, Manganese, Selenium, Strontium, Mercury, Uranium, and Radium

DISSOLVED GASES and VOLATILE ORGANIC COMPOUNDS

Methane, Ethane, Propane, BTEX as Benzene, Toluene, Ethylbenzene and Xylenes, Total Petroleum, and Hydrocarbons (TPH)

OTHER

Water Level, Stable isotopes of water (Oxygen, Hydrogen, Carbon), Phosphorus.

10. *Wastewater and Waste Management.*

- a. Operator shall implement a Waste Management Plan to the City that complies with the following:
 - i. All fluids shall be contained and there shall be no discharge of fluids.
 - ii. Wastewater shall be stored in tanks, transported by tanker trucks and/or pipelines, and disposed of at licensed disposal or recycling sites in accordance with applicable law.
 - iii. Operator shall not dispose of any wastewater within the City.
 - iv. All other waste shall be disposed of in accordance with state regulations.
 - v. The plan shall incorporate secondary containment and stormwater measures consistent with this BMP Document.

- vi. No land treatment of oil impacted or contaminated drill cuttings are permitted.
- b. A copy of the Operator's Spill Prevention, Control, and Countermeasure Plan (SPCC) describing spill prevention and mitigation practices will be given to the City.

11. *Well Integrity.*

- a. Operator shall equip the bradenhead access to the annulus between the production and the surface casing, as well as any intermediate casing, with a fitting to allow safe and convenient determinations of pressure and fluid flow.
- b. Valves used for annular pressure monitoring shall remain exposed and not buried to allow for visual inspection.
- c. Operator shall take bradenhead pressure readings as required by the COGCC.

12. *Wetlands Protection Plan.* If applicable, Operator shall implement a Wetlands Protection Plan demonstrating the oil and gas operations shall, to the maximum extent practicable, avoid causing degradation to wetlands within Northglenn. Among other methods to achieve compliance with this standard, the proposed oil and gas operation shall not alter historic drainage patterns and/or flow rates or shall include acceptable mitigation measures to compensate for anticipated drainage impacts.

13. *Water Supply.*

- a. Operator shall comply with applicable State of Colorado, Department of Natural Resources and other applicable State regulations concerning the source(s) of water used in the Drilling Phase and Completions Phase.
- b. Operator shall notify the City, upon its request, of the source(s) of water to be used at Well Sites during the Drilling Phase and Completion Phase and will provide the City with an estimate of the volumes of water to be utilized, with such estimates subject to change.
- c. All water volumes actually used by Operator shall be reported by the Operator to the State of Colorado in accordance with its regulations.
- d. All fresh water for hydraulic fracturing shall be transported to the Well Sites by means other than by truck, unless the Operator provides notice after demonstration of extenuating circumstances which will short amount of time seven days or less. If the transportation of water by means other than truck exceeds seven (7) days the operator will seek any necessary amendments to the Oil and Gas Permit.

E. *Safety.* Operator shall comply with these safety standards to: protect human health and safety; prevent injury to plant and animal life; prevent damage to property; and prevent unreasonable interference with the public welfare.

1. *Use of Pipelines.*

- a. Operator shall use pipelines for the transport of oil, gas, and produced water from Well Sites where feasible, and shall utilize such pipelines at each Well Site before the Production Phase commences.
- b. Operator shall be permitted to utilize temporary tanks during drilling, flowback, workover, completion, hydraulic fracturing and maintenance operations.

- c. Operator shall obtain all permits necessary for the construction and use of pipelines, including a conditional use permit.
2. *Bradenhead Monitoring.* Operator shall conduct bradenhead monitoring on all wells in accordance with COGCC rules and regulations.
3. *Burning.* No open burning shall occur on the site of any oil and gas operation except flaring as allowed in this BMP Document.
4. *Discharge Valves.* Open-ended discharge valves on all storage tanks, pipelines and other containers within any Well Site shall be secured and shall not be accessible to the general public. Open-ended discharge valves within any Well Site shall be placed within the interior of the secondary containment area.
5. *Flammable Material.* All ground within 25' of any tank, or other structure containing flammable or combustible materials, shall be kept free of dry weeds, grass or rubbish, and shall conform to COGCC 600 Series Safety Regulations and the applicable fire code. Landscaping is prohibited within 25' of any tank or other structure containing flammable or combustible materials.
6. *Flowlines.*
 - a. Any newly constructed or substantially modified flowlines on any Well Site shall be constructed and operated under the provisions of the COGCC 1100 Series Flowline Regulations and any future COGCC Flowline Regulations, as either may be amended, and any applicable surface use agreements with the surface owners.
 - b. Operator shall pressure test all flowlines following their construction, including those rated at less than 15 PSI.
 - c. Operator will provide to the City all records required to be submitted to state agencies related to inspections, pressure testing, accidents and other safety incidents related to flowlines at any Well Site and, upon specific request by the City, Operator will provide to the City any other records submitted to State agencies related to flowlines at the Well Sites.
 - d. All new flowlines and pipelines shall have the legal description of the location recorded with the Adams County Clerk and Recorder within thirty (30) days of completion of construction.
 - e. Abandonment of any recorded flowlines shall be recorded with the Adams County Clerk and Recorder within thirty (30) days after abandonment.
 - f. Operator will provide the City with GIS files for the location of flowlines.
 - g. Flowlines will be removed when last well utilizing the lines are plugged and abandoned unless this requirement is waived in writing by the Director.
7. *General Maintenance.* Operator shall operate and maintain all equipment pursuant to manufacturer specifications consistent with technological limitations and reasonable and customary maintenance practices.
8. *Plugged and Decommissioned Well Testing.*

- a. Before and after the hydraulic fracturing of any new well, Operator shall assess the integrity of all oil and gas and disposal wells (Active, Dry & Abandoned, Injecting, Plugged & Abandoned, Producing, Shut-In, and Temporarily Abandoned) where the surface location of such wells are within the City and within 1500' of the completion interval of the projected track of the borehole of the proposed new well, based upon examination of COGCC and other publicly available records. This shall include assessment of leaking gas, oil, or water to the ground surface or into subsurface water resources, taking into account plugging and cementing procedures described in any recompletion or plugged and abandoned report filed with the COGCC. The analysis shall be provided to the City.
- b. Based on the results of the assessment, the City may require Operator to plug and abandon, in compliance with all COGCC rules in relation to abandonment and plugging, any of the Operator's existing oil and gas or disposal wells or such wells under the Operator's ownership, control or authority. Additionally, the City may request Operator to attempt to negotiate the plugging and abandonment of other wells of concern, that are not owned by the Operator, but that are within 1500' of the completion interval of the projected track of the borehole of the proposed new well. If wells of concern are not plugged and abandoned, Operator must supply a mitigation plan and a follow-up monitoring plan that will be used to prevent or detect any communication between the well of concern and the proposed wells.
- c. Operator shall provide notification to the City and applicable fire district not less than fourteen (14) days prior to commencing plugging operations. Operator shall notify the City and COGCC of the results of plugging and cementing procedures.
- d. For each well abandoned by Operator within the City for which access and permission to test is granted, a soil gas survey to test the soil within a 10' radius of the well shall be completed prior to production from a proposed new well and again one (1) year after production has commenced on the new well. Every well abandoned by Operator shall also be subject to the testing one (1) year after production has commenced on a new well. Operator shall provide the results of the soil gas survey to the City and the COGCC within one (1) month of conducting the survey or advise the City that access to the previously abandoned wells could not be obtained from the surface owner.

9. *Surface Safety Valve and Automatic Safety Protective Systems.*

- a. Operator will install an automated safety system, governed by safety devices and a programmable logic computer, at each Well Site.
- b. Each system shall include a Surface Safety Valve ("SSV") or wellhead master control valve installed for each new well before the commencement of the Production Phase connected to the production tubing at the surface. The SSV or wellhead master control valve shall monitor multiple flowing pressures and rates which have predetermined maximum and/or minimum threshold values programmed and will remotely shut the well in should certain upset conditions be detected. Additionally, the automated safety system shall provide the ability to remotely shut-in wells on demand through operator remote intervention.
- c. The SSV will have documented, quarterly testing to ensure functionality per manufacturer's specifications.

10. *Flowback Best Management Practices*

- a. Before flowback, Operator shall:

- i. Construct the production facility capable of remote emergency shut down consistent with this BMP Document;
 - ii. Tie flowback equipment into combustors;
 - iii. Notify appropriate fire district at least twenty-four (24) hours before production flowback is scheduled to begin for the first time on a well pad; and
 - iv. Conduct a pre-startup safety review (PSSR), which will review facility and equipment spacing requirements and safety procedures.
- b. During flowback, Operator shall:
- i. Utilize gas monitors that are capable of detecting Lower Explosive Level and H2S, which emit an audible tone linked to cell phones to notify people on and off location;
 - ii. Utilize automatic tank gauging to measure tank levels and have 24-hr manned operations;
 - iii. Send flowback gas to sales pipeline, when possible.

11. *Safety Management Plans.* Operator shall maintain safety management plans for oil and gas operations including: hazard review, operating procedures, safety training program, maintenance procedures, compliance audits, and design measures.

F. *Visual & Noise Mitigation.* Operator shall comply with these visual and noise mitigation standards to: protect human health and safety; prevent damage to property; prevent unreasonable interference with the public welfare; preserve visibility; and protect scenic, aesthetic, and historic values in the City. These standards are established to improve and to prevent degradation to the quality of life and the general welfare in the City.

1. *Visual Mitigation Methods.* The City may require Operator to implement the following visual mitigation methods may be required on a site-specific basis:

- a. Use of low-profile tanks less than 16 ft. in height;
- b. Use of equipment with reduced height and profiles;
- c. Facility painting, vegetative or structural screening, land berming, and landscaping;
- d. Earthen berms around the perimeter of fencing with turf grass or ground cover generally recognized by landscape architects and horticulturalists for local area use for the purpose of general screening;
- e. Establishment and proper maintenance of ground cover, trees and shrubs for screening and aesthetic purposes;
- f. Designing an Oil and Gas Facility to utilize natural screens where possible; and
- g. Construction of fences for use with or instead of landscaping or berming;

2. *Landscaping.*

- a. If water for irrigation use is unavailable at the location, the initial phase may utilize natural topography and fencing surrounding the location, as well as any trees already established near the property.
- b. Initial landscaping, if required by an approved Landscaping Plan, and any fencing will be installed within 6 months of finishing drilling and completion operations.
- c. Once water for irrigation use is available to the area, the Operator must implement any final landscaping as described in the Landscaping Plan. The Operator must consult with the City as well as meet Code requirements at the time the final landscaping is installed.
- d. Existing significant trees (greater than eight inches in caliper) shall be preserved to the maximum extent practicable and may help satisfy the landscaping and visual mitigation requirements. All required landscape plans shall accurately identify the locations, species, size, and condition of all significant trees, each labeled showing Operator's intent to either remove, transplant, or protect. Trees that meet one or more of the following removal criteria shall be exempt from the requirements contained in this subsection:
 - i. Dead, diseased, or naturally fallen trees, or trees found to be a threat to public health, safety or welfare;
 - ii. Trees that are determined by the city to substantially obstruct clear visibility at driveways and intersections; or
 - iii. Tree species that constitute a nuisance to the public such as cotton-bearing cottonwood, Siberian or Chinese elm, Russian olive and female box-elder. Native cotton-bearing cottonwood trees and female box-elder trees, when located in a natural area buffer zone, are not nuisance tree species.

3. *Lighting.*

- a. Exterior lighting shall be directed away from residential and other sensitive areas or shielded from said areas to eliminate glare. Light spillage beyond the perimeter of a Well Site should be minimized.
- b. All permanent lighting or lighting higher than a perimeter wall must be downward facing.
- c. All bulbs must be fully shielded to prevent light emissions above a horizontal plane drawn from the bottom of the fixture.
- d. Prior to installation of permanent lighting on any Well Site, Operator shall submit to the City a Lighting Plan and the City shall communicate with Operator any modifications to the plan that it deems appropriate. Operator shall make such modifications as reasonably required by the City and as required by law.
- e. The Lighting Plan shall indicate the location of all outdoor lighting on the site and any structures, and include cut sheets (manufacturer's specifications with picture or diagram) of all proposed fixtures.
- f. During the Drilling and Completion Phases, consistent with applicable law, Operator will construct a minimum 32 ft.in height wall around as much of the perimeter of the well pads as operations allow to reduce light escaping from the site, unless taller, shorter, or no walls are mutually agreed to by City and Operator on a site-specific basis.

4. *Artificial Lift.* Artificial lift will not be accomplished through the use of traditional pump jacks. Alternatives such as gas lift, linear rod pumps, or hydraulic pumping unit may be used, and are to be as low profile as practicable with a maximum height of 30 ft. An alternative artificial lift system may be used if it is less visible or auditory impacts and is agreed to by both parties.
5. *Trailers.*
 - a. A construction trailer(s) is permitted as an accessory use during active construction, drilling and well completion or workover operations only.
 - b. Permanent residential trailers are prohibited at Well Sites.
 - c. Until ninety (90) days following the end of the Completion Phase on a Well Site, temporary residential and/or security trailers are permitted, as needed for on-site operations, for exclusive use by the Operator's personnel and the personnel of its subcontractors on a temporary basis.
6. *Noise.*
 - a. Operator shall use quiet completions technology for any well located within 2000' of a Residential Building Unit or a High Occupancy Structure unless Operator obtains waivers from all affected property owners within that distance.
 - b. Operator shall conduct a Baseline Noise Mitigation Study to ascertain baseline noise levels at each Well Site to demonstrate that noise is expected to be mitigated to the extent practicable. A copy will be provided to the City.
 - c. The City may require Operator to implement additional noise mitigation if there is a Residential Building Unit, Public Park, or High Occupancy Structure within 2000' of the Well Site and based on any of the following additional site-specific characteristics:
 - i. Nature and proximity of adjacent development (design, location, use);
 - ii. Prevailing weather patterns, including wind directions;
 - iii. Type and intensity of the noise emitted; and
 - iv. Vegetative cover on or adjacent to the site or topography.
 - d. Additional noise mitigation measures may include:
 - i. Continuous noise monitoring by a third-party contractor, at expense of Operator, during construction, drilling, and completions, with instruments placed between the Oil and Gas Location and Residential Building Units within 2000'. Data shall be provided to the City.
 - ii. The Operator shall address C scale noise/vibration through berming, capable sound walls, and other practices.
 - iii. During the drilling and completion, the operator may be required to construct a perimeter wall and/or comparable measures to mitigate noise as appropriate on a case-by-case or modeled basis.

- iv. Additional mitigations must be taken by the Operator if C-scale noise levels are increased the larger of either 5db over ambient or above 65db at 25' from the nearest occupied building unit.
- v. Use of electric-powered motors and pumping systems.
- vi. Construction of buildings or other enclosures where Operations create noise and visual impacts that cannot otherwise be mitigated due to proximity, density or intensity of adjacent land use.

G. *Community Outreach, Notification, Reporting & Oversight; Hazards & Emergencies.* Operator shall comply with these standards to: protect human health and safety; prevent damage to property; and prevent unreasonable interference with the public welfare. These standards are established to improve and to prevent degradation to the quality of life and the general welfare in the City.

1. *Outreach to Affected Residents.*

- a. Operator shall maintain a list, updated annually, of the residents and business owners within ¼ mile (1320') of a Well Site ("Affected Residents").
- b. Operator shall:
 - i. Provide at least fourteen (14) days advanced written notice to Affected Residents of mobilization in, rig up (MIRU);
 - ii. Notify Affected Residents in writing within seven (7) days of any reportable events that could have off-site impacts including fires, explosions, blow-outs, venting, or large spills (over 100 barrels);
 - iii. Provide these notices to the local fire district and Police Department emergency managers.

Operator may satisfy these notification requirements through direct correspondence or through direct mail.

2. *Bi-Annual Updates to City.*

- a. Operator biannually shall provide a formal written Progress Report update to the Director, to be shared publicly, as to the progress of Operations, including but not limited to:
 - i. Any reportable spills or reportable accidents at locations;
 - ii. Any notice of alleged violations from the City or COGCC; and
 - iii. A summary of complaints to the Operator and COGCC.
- b. Updates shall begin at the beginning of construction and continue throughout drilling and completion operations and cease once the final well approved for a Well Site has been drilled and has been in production for one full year.

3. *Complaint Response.*

- a. Operator shall maintain a dedicated phone line to receive complaints that is open 24 hours per day, 7 days a week. The phone number shall be posted at all Well Sites and provided to the City's LGD.

- b. Operator shall document and review all complaints and provide the complainant with an initial response within twenty-four (24) hours. Responses to complaints shall also be provided to the City's LGD and, if appropriate, state officials.
 - c. Any additional responses or corrective actions will be communicated to the complainant, landowner, City's LGD, and, if appropriate, state officials.
4. *Risk Management.* Operator shall create and implement a Risk Management Plan for Well Sites and Oil and Gas Facilities that are part of an Oil and Gas Permit. The plan shall include risk identification, responsibilities, assessment, response, planning mitigation and, methods of risk avoidance and control that implement techniques to prevent the accident/loss and reduce the impact after an accident/loss occurs. Operators shall periodically update and revise the plan, but at least every three years and after any incident.
- a. Operator shall develop a risk identification in a risk table which will identify the particular site by name, describe the risk, identify any health, safety, or environmental impact, identify any impact to Operator's development schedule, provide a description of the risk area and associated factors, and whether it is an unmitigated or mitigated risk.
 - b. Operator shall assign persons or entities under its control or direction to have responsibility for the managing risk identified and plans support the risk mitigation. Such assignment shall not limit the Operator's responsibility.
 - c. Operator shall identify any planned mitigation response (including emergency response, tactical response, and notifications) for certain identified risks.
 - d. Operator will implement a compliance and audit program. The Operator shall determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected. If Operator utilizes a self-reporting mechanism to any respective agency, that self-reporting mechanism will be described in the Risk Management Plan. If Operator self-reports, any findings included in the self-reporting to any other respective agency will be provided to the City.
 - e. City may retain outside consultants, at Operator's cost, to review Risk Management Plan and may require modifications to Risk Management Plan based on its review.
5. *Incident and accident reporting.*
- a. Within twenty-four (24) of any reportable safety event, as defined by the COGCC in Rule 602(c), as may be amended, or any accident or natural event involving a fire, explosion or detonation requiring emergency services or completion of a COGCC Form 22, Operator shall submit a report to the City that includes the following, to the extent available: fuel source, location, proximity to residences and other occupied buildings, cause, duration, intensity, volume, specifics and degree of damage to properties, if any beyond the Well Site, injuries to persons, emergency response, and remedial and preventative measures to be taken within a specified amount of time. Additional reporting shall be provided after the conclusion of the event, if the event lasts longer than twenty-four (24) hours.
 - b. The City may require Operator to conduct a root cause analysis of any reportable safety events or Grade 1 gas leaks, each as defined by the COGCC.
 - c. Any spill or release that is reportable to the COGCC shall be simultaneously reported to the City's LGD and the applicable fire district.

6. *Signs and Markers.* Operator shall mark each and every well in a conspicuous place, from the time of initial drilling until final abandonment, as follows:
 - a. General Sign Requirements.
 - i. No sign required under this BMP shall be installed at a height exceeding 6’.
 - ii. Operator shall maintain signs in a legible condition and shall replace damaged or vandalized signs within sixty (60) days.
 - b. Drilling and Recompletion Operations.
 - i. Operator shall provide directional signs, no less than three (3) and no more than six (6) sq. ft. in size, during all drilling and recompletion operations.
 - ii. Such signs shall be at locations sufficient to advise emergency crews where drilling or recompletion is taking place.
 - iii. Such sign locations shall include the first point of intersection of a public road and the rig access road and thereafter at each intersection of the rig access route, except where the route to the well is clearly obvious to uninformed third parties in any weather or condition.
 - iv. Such signs not needed to meet other obligations under these rules shall be removed as soon as practical after drilling and recompletion operations are complete.
 - c. Permanent Designations.
 - i. Oil and Gas Wells. Within sixty (60) days after the Completion Phase of an Oil and Gas Well, a permanent sign shall be located at both the wellhead and surface equipment (if not at the wellhead), which shall identify the Oil and Gas Well, the name and contact information of the Operator and the legal location, including the quarter section.
 - ii. Surface Equipment. Within sixty (60) days after the installation of a tank battery, a permanent sign shall be located at the tank battery. At the option of the Operator, or at the request of the City, the sign may be placed at the intersection of the lease access road with a public road nearest the tank battery, if the tank battery is readily apparent from such location. Such sign, which shall be no less than three (3) sq. ft. and no more than six (6) sq. ft., shall provide: the name of the Operator; a phone number at which the Operator may be reached at all times; a phone number for local emergency services; the lease name or Oil and Gas Well name(s) associated with the tank battery; the public road used to access the site; and the legal location, including the quarter section.
 - iii. Tanks and Containers. All tanks with a capacity of ten (10) barrels or greater shall be labeled or posted with the following information:
 - a) Name of Operator;
 - b) Operator’s emergency contact telephone number;
 - c) Tank capacity;
 - d) Tank contents; and

e) National Fire Protection Association (NFPA) Label.

7. *Emergency Response Plan.*

- a. Operator shall complete and implement all components of a detailed Emergency Response Plan subject to the approval of the City's Emergency Manager and the applicable fire district must approve of the Emergency Response Plan ("Plan") before the Drilling Phase commences.
- b. Operator shall review the plan annually and file any updates with the City Manager (aka Director of Emergency Management) and the applicable fire district. If no updates to the Plan are made then Operator shall provide notice of "No Change."
- c. The Plan shall include:
 - i. Name, address and phone number, including twenty-four-hour numbers for at least two (2) persons responsible for field operations as well as the contact information for any subcontractor of Operator engaged for well-control emergencies;
 - ii. A process by which the Operator notifies surrounding neighbors to inform them about the on-site operations and emergencies and to provide sufficient contact information for surrounding neighbors to communicate with the Operator;
 - iii. An as-built facilities map in a format suitable for input into the City's GIS system depicting the locations and type of above and below ground facilities, including sizes and depths below grade of all oil and gas flow lines and associated equipment, isolation valves, surface operations and their functions, as well as transportation routes to and from exploration and development sites, for response and management purposes. The information concerning flowlines and isolation valves shall be marked and treated as confidential and shall only be disclosed in the event of an emergency or to emergency responders or for the training of emergency responders;
 - iv. Detailed information addressing each reasonable potential emergency that may be associated with the operation, including without limitation: explosions; fires; gas; oil or water pipeline leaks or ruptures; hydrogen sulfide or other toxic gas emissions; hazardous material vehicle accidents or spills; and natural disasters;
 - v. An emergency evacuation plan for the Well Site and any person within one-half (1/2) mile of the Well Site.
 - vi. A provision that any spill outside of the containment area, that has the potential to leave the facility or to threaten waters of the state, or as required by the City-approved plan shall be reported to the local dispatch and the COGCC Director in accordance with COGCC regulations;
 - vii. Detailed information identifying access, and health care facilities anticipated to be used;
 - viii. A project-specific plan for any project that involves drilling or penetrating through known zones of hydrogen sulfide gas;
 - ix. A provision obligating the Operator to reimburse the appropriate agencies for their expenses resulting from the Operator's operations; and

- x. A statement and detailed information indicating that the Operator has adequate personnel, supplies, and training to implement the plan immediately at all times during construction and operations.
- d. The Operator shall have current Material Safety Data Sheets (MSDS) for all chemicals used or stored on a Well Site. The MSDS sheets shall be provided immediately upon request to City officials, a public safety officer, or a health professional as required by COGCC Rule 205.
- e. All training associated with the Plan shall be coordinated with the City and the fire districts within the City.
- f. Operator shall provide the City with its shutdown protocols and promptly notify the City of any shut downs that would have an impact to any area beyond the confines of the Well Site.

H. Reclamation. Operator shall comply with these reclamation standards to: protect human health and safety; prevent injury to plant and animal life; prevent damage to property; and prevent unreasonable interference with the public welfare. These standards are established to restore the City’s resources and to improve the quality of life and the general welfare in the City.

1. *Interim Reclamation Plan.* Operator shall implement an interim reclamation plan including:
 - a. *Removal of Debris.* All construction-related debris shall be removed from the site for proper disposal in a timely manner. The site shall be maintained free of debris and excess materials at all times during operation. Operator shall not burn or bury debris at any time on any Well Site.
 - b. *Removal of Equipment.* All equipment used for drilling, re-completion and maintenance of the facility shall be removed from the site within thirty (30) days of completion of the work, weather condition permitting, unless otherwise agreed to by the surface owner. Permanent storage of removable equipment on any Well Site is prohibited.
2. *Final Reclamation Plan.* Operator must submit an oil and gas Well Site Final Reclamation Plan and reclaim a Well Site not later than six (6) months after plugging and abandoning the last well at such Well Site, weather and planting season permitting. In addition to any COGCC reclamation requirements, Operator shall:
 - a. Remove all pipelines, gathering lines and flowlines after one (1) year of non-use when last well utilizing lines are plugged and abandoned unless this requirement is waived in writing by the Director; and
 - b. Reclaim and revegetate, to the original state prior to Operations, all temporary access roads associated with Operations at a Well Site within a reasonable amount of time, taking into account planting seasons, or as directed by the landowner in a Surface Use Agreement and subject to applicable COGCC variances.

I. Transportation and Circulation.

1. *General.*
 - a. Operator will comply with all Transportation and Circulation requirements as contained in the Code and as may be reasonably required by the City’s Traffic Engineer.
 - b. Operator will comply with all applicable hazardous material regulations.

- c. Operator will obtain necessary access permits, which the City will not unreasonably withhold.
2. *Traffic Control Plan.* Operator shall establish a Traffic Control Plan including the following:
 - a. Estimated weights of vehicles when loaded, a description of the vehicles, including the number of wheels and axles of such vehicles and trips per day;
 - b. Detail of access locations for each well site including sight distance, turning radius of vehicles and a template indicating this is feasible, sight distance, turning volumes in and out of each site for an average day and what to expect during the peak hour;
 - c. Truck routing map and truck turning radius templates with a listing of required and determined that certain improvements are necessary at intersections along the route;
 - d. Restriction of non-essential traffic to and from any Well Site to periods outside of peak am and pm traffic periods and during school hours (generally 7-8am and 3-6pm) if Well Site or access road are within 1000' of school property.
 - e. Identification of need for any additional traffic lanes, which would be subject to the final approval of the City's engineer.
 3. *Public Improvements.* If public road improvements are necessary to accommodate an Operation, and before work will be permitted within any City right-of-way, the Operator shall draft engineered drawings to be prepared by a Colorado licensed civil engineer, in conformance with City standards, for review and approval by the City.
 4. *Private Access Roads.*
 - a. Access points to public roads must be located, improved and maintained to assure adequate capacity for efficient movement of existing and projected traffic volumes and to minimize traffic hazards.
 - b. Permanent access roads must be improved a minimum distance of 200' on the access road from the point of connection to a public road.
 - c. All access roads must be in conformance with the City's standards and specifications. A geotechnical report and pavement design will be submitted to the City for approval.
 - d. Access roads must be improved as a hard surface (concrete or asphalt) for the first 100' from the public road, unless public road is not already a hard surface, in which case, Operator shall meet the current standards of the public road.
 - e. Access roads must be improved with a crushed surface (rock, concrete, or asphalt) for the next 100' in the appropriate depth to support the weight load requirements of the vehicles accessing the Well Site.
 - f. If an access road intersects with a pedestrian trail or walk, the Operator shall pave the access road as a hard surface (concrete or asphalt) a distance of 100' either side of the trail or walk, unless the trail or walk is not already a hard surface, in which case, Operator shall meet the current standards of the trail or walk. If necessary, Operator shall replace the trail or walk to address the weight load requirements of the vehicles accessing the well and production facilities.
 5. *Mud Tracking.*

- a. Operator shall take all practicable measures to ensure that vehicles do not track mud or debris onto public streets.
 - b. Operator shall immediately clean any mud or debris deposited on public streets that is more than *de minimis*.
 - c. The Director of Public Works or designee may authorize a delay in the cleaning of mud or debris from public streets if Operator submits a plan for removal that is approved.
6. *Chains*. Traction chains from heavy equipment shall be removed before entering a public street.

[END OF BMP DOCUMENT]