Comparison of Draft Regulations and Legal Committee Recommendations 4/8/2018

Requirements in Legal Committee Recommendations (LCR)	Requirements in Draft Regulations	Differences Between the Two
1. Application Process & Requirements. Create one section in the municipal code that lists all documents required of an Operator in the application process. Along with a complete application for a use by special review permit, an Operator shall submit a Comprehensive Drilling and Production Plan including the following for any proposed oil and gas project in the City and County of Broomfield: • Project design documents that comprehensively identify and describe all planned facilities, equipment and operations, both temporary and permanent, including pertinent location and dimensional data; • Project schedules for all phases, including site construction, pipeline construction, drilling, completions (broken down into activity-based components), commissioning, operations, reclamation and abandonment; • Summary of the outcome of the Alternative Site Analysis process undertaken with the City via the pre-application process; • Administrative fees, as determined appropriate by the City;	**17-54-080 - Documents submitted prior to drilling; use by special review** All drilling activities for use permitted by special review approved by the city council pursuant to chapter 17-30, B.M.C., for an oil and gas facility shall require compliance with the final plans listed below. Such final plans must be approved by the city council and county manager prior to the commencement of drilling. The city and county manager has the discretion to refer any revised plan to city council for its consideration and decision. If the city did not require modification or supplementation of a draft plan submitted with the application under section 17-54-040, and the operator has not otherwise updated the plan, the version of the plan submitted with the application under section 17-54-050, shall be deemed to be the final plan. In such a case, the plan need not be resubmitted to the city for approval. (A) A response letter that outlines how the permit requirements have been met; (B) A list of all permits or approvals obtained or to be obtained from local, state, or federal agencies other than the COGCC;	The proposed regulations are more detailed than the LCR recommendations. All LCR recommendations are included in the draft regs.

• Facility baseline surveys for air quality, groundwater, soil, noise and traffic; • Facility emissions inventories and air quality impact studies for drilling, completions and operations phases, based upon proposed equipment use; • Facility noise modeling of equipment proposed for the site for drilling, completions and operations phases; • Air Quality Impact Mitigation Plan, including additional measures to reduce emissions on Air Quality Action Days and including establishing compliance with the air quality provisions, including a leak detection and repair program, and an estimate of all emissions associated with the oil and gas facility including criteria air pollutants, hazardous air pollutants, hydrogen sulfide, if present, and greenhouse gases; • Noise Impact Mitigation Plan; • Hazardous Materials Management Plan, with listings of all potential chemicals brought on site (including chemicals to be disclosed through the "FracFocus" process); • Waste Management Plan to include information identifying the projected waste from the site and plans for management and disposal of such waste.	(C) Copies of all permits requested, including any exceptions; (D) A detailed site plan for all well sites that includes submittal to the City of all documents required to be submitted with COGCC Form 2A, a depiction of all visible improvements within 500 feet of the proposed location, to include buildings/residences, public roads and trails, major above-ground utilities, railroads, pipelines, mines, oil/gas/injection/water/plugged wells, etc. as required by COGCC Rule 303.d(3)C, and the site plan requirements of the Broomfield Municipal Code, as amended; (E) A summary of planned operations, including identified access points and operational timeline for posting to a local community information web page; (F) A site plan for site preparation, mobilization, and demobilization; (G) A plan for interim reclamation and revegetation of the well pad and final reclamation of the well pad; (H) Vicinity maps for each well site, including maps that show the following information: (1) the location of all existing water bodies and watercourses, including direction of water flow; (2) the location for existing oil and gas wells or injection wells as reflected in COGCC records; and	

• Traffic Impact and Management Plan; • Water Quality Control Plan that establishes that all operations shall use most effective performance techniques and best management practices to minimize impacts to water quality,including plans for water quality testing, prevention of illicit or inadvertent discharges, and containment of pollutants as required by state and federal agencies. The Water Quality Control Plan will detail compliance with the water quality provisions of the code. The plan may include details such as the owner or operator's plans for water quality testing, prevention of illicit or inadvertent discharges, stormwater discharge management, containment of pollutants, and spill notification and response as required by federal and state agencies. The owner or operator shall provide the City with the information it provides to the COGCC ensuring compliance with the water quality protection standards contained in Rule 317(B), 609, Rule 910, and any other applicable COGCC rules governing water quality protection. The owner or operator shall provide all water well test results to the City. The owner or operator shall provide its plans concerning downhole	(3) the location of the drill site. (I) Final project schedules for all phases, including site construction, pipeline construction, drilling, completions (broken down into activity-based components), commissioning, operations, reclamation, and abandonment; (J) Administrative fees; (K) Information demonstrating the operator is capable of fulfilling and is likely to fulfill the obligations imposed by Section 17-54-050 and the Oil and Gas Conservation Act; (L) A final alternative site analysis; (M) A final noise modeling protocol (N) Noise Impact Mitigation Plan; (N) A final plan for light and dust mitigation; (O) A final traffic management plan and a reasonable bond to cover any damage to public infrastructure during active drilling and completion; (P) A final detailed traffic plan that determines any operational changes and geometric modifications necessary for extraction activities; (Q) A final Air Quality Mitigation Plan that demonstrates compliance with the following: (1) EPA, CDPHE, and COGCC standards for emissions and odors; (2) 2017 CDC Agency for Toxic	

construction details and installation practices, including casing and cementing design, and shall inform the City how the plans establish that the operation does not create significant degradation to surface waters or drinking water aquifers; • Stormwater Control Plan; • Risk Management Plan; • Emergency Response Plan; • Pipeline diagram and compliance with the City's Public/Private Improvement Permit and easement processes for all pipelines installed in City owned property or City rights of way; • Grading, drainage, dust mitigation, & erosion control plan; • Electrification Plan identifying all sources of electricity that will be brought to or used at the oil and gas facility during all phases including drilling, completions, and operations; and • Wetlands Protection Plan. Information identifying wetlands in the area and demonstrating compliance with the standards. • Plan for abandoning existing wells.	Substances and Disease Registry and USEPA Integrated Risk Information System ambient air quality guidelines; and (3) The provisions of Section 17-54-060; (R) A final Air Modeling Plan that demonstrates that emissions from the proposed well sites meet the following: (1) EPA and state emission standards; (2) Facility emissions inventories and air quality impact studies for drilling, completions and operations based upon proposed equipment use, and operation phases, and any emissions reductions associated with plugging and abandonment; and (3) Demonstration that the Facility will not result in any increase of VOCs from Operator's existing and planned development in the City; (S) A final Air Monitoring Plan that describes how the operator will conduct baseline monitoring within 500 feet of a proposed facility prior to construction; (T) A final Electrification Plan; (U) A final Emergency Preparedness and Response Plan; (V) A final weed control plan; (W) A final Landscaping and Visual Mitigation Plan; (X) A final Water Quality Plan; (Y) A final grading, drainage, and erosion control plan;	

	(Z) A final Stormwater Management Plan; (AA) A final Risk Management Plan; (BB) A final Abandoned Wells Plan; (CC) A final Wetlands Protection Plan; (DD) A final Hazardous Materials Management Plan (EE) A final Waste Management Plan; (FF) A final assessment of historical and cultural resources in and around the proposed oil and gas development, including proposed mitigation measures; (GG) A final Water Supply Plan; and (HH) Additional information. If the City and County Manager determines that the City needs additional information to determine whether the proposed oil and gas operation meets the criteria in Chapter 17-54-060 B.M.C., the City and County Manager may require the Applicant to submit such information.	
2. Compliance with Laws & Regulations. An operator shall comply with all applicable state and federal laws and regulations	**17-54-090(V) Regulations.** An operator shall comply with all applicable state and federal laws and regulations, as such regulations exist now and to more stringent regulations adopted in the future.	17-54-090 is more specific as it requires compliance with more stringent regulations adopted in the future.
3. Setback. Use all methods available to pursue oil and gas facility and pipeline setbacks that are protective of public health, safety, welfare, and the environment, and appropriate for oil and gas development in an urban area,	**17-54-070(D).** The well location and setbacks comply with the setback requirements of the COGCC and when applicable, compliance with location provisions in section 17-54-100.	LCR has more setback requirements than the proposed regulations.

including: • Require all new surface developments to be no closer than 1,320 feet to an existing oil or gas well, unless there is written notice and informed consent from each individual surface property purchaser and owner. • Require all new oil and gas development wells to comply with buffer zone requirements. Taking into account the number of wells per pad and the number of existing or platted residences, occupied buildings, parks and schools (collectively referred to as "Buildings") within 3,000 feet of such well pad the following buffer zones shall apply: Level 1: One well: Buffer zone of 500 feet Level 2: 2-8 wells per pad, buffer zone of 750 feet, unless there are more than 100 homes within 3,000 feet, in which case it moves to 1000 feet Level 3: 9-17 wells per pad, buffer zone of 1000 feet, unless there are more than 125 homes within 3,000 feet, in which case it moves to 1,320 feet Level 4: 18+ wells per pad, buffer zone	**17-54-100(P)(4).** For pipelines outside the well pad and subject to use by special review, setbacks from residential, commercial, or industrial buildings, places of public assembly, the high-water mark of any surface water body and sensitive environmental features will be determined on a case-by-case basis in consideration of the size and type of pipeline proposed and features of the proposed site.	

of 1320 feet For the purposes of identifying the appropriate buffer zone, if the separation distance between the two nearest wellheads on two different well pads is less than 500 feet, the total number of wells on the two well pads will be treated as if those were located one well pad. The separation is 500 feet between two nearest wellheads on two pads. • Require all new oil and gas development wells to be no closer than 1,320 feet to water bodies at design capacity, unless a variance is granted based upon the inclusion of specific safety requirements during site construction, drilling. completions, and operations. • Encourage new oil and gas development pipelines to be in public rights of way and no closer than 5 feet from property lines. • Broomfield will work with the State of Colorado, other Colorado counties and other Colorado municipalities to complete a comprehensive quantitative risk assessment (QRA) of oil and gas operations within an urban environment in close proximity to		

people, schools, hospitals, recreation areas, etc. This QRA focus should be on establishing appropriate setbacks for oil and gas operations.		
4. Notice for Concept Review. Pre-application notices shall be sent to the City and to property owners within 2,640 feet of any proposed oil and gas facility space via US Mail, with a list of recipients provided to the city, as follows: 1. Preliminary Notice - ninety days prior to submission of any spacing or density applications; and 2. Pre-application Submittal - to include number of wells, size of well pad, type and measurements of proposed major equipment, sixty days prior to any spacing or density applications. (provide form of notice in reg)	**17-54-050(A).** Pre-submittal Materials submitted by operator to staff. Prior to the submission of an application for a use permitted by special review, the operator is required to submit operator name, parent companies or related companies, demonstration of financial capability of operator, previous violations of the operator, proposed location of operations, number of wells and access points, amount and type of equipment, and any previous spacing unit approvals.	LCR requires pre-submittal notice to be sent to property owners, while 17-54-050 does not.
5. Notice for Mailed Notice. Within 10 days of concept review meeting with the City, the Operator shall mail, at cost of operator, written notice, which includes at a minimum the information required by the City, to property owners, water source owners, physical addresses, homeowners associations, and mineral lessees within 2,640 feet of well site or oil and gas facility and property owners within 500 feet from all pipelines leaving the well site	**17-54-050(E)(1).** Notification. a. The Operator shall mail notice of the application no more than ten working days after an application has been submitted to the city. Owners of record shall be ascertained according to the records of the Broomfield Assessor's Office. Notice of the application shall include reference to the neighborhood meeting and be made as follows: i. To the surface owners of the	The LCR requires notice to be mailed to water source owners, homeowners associations, and mineral lessees, while the proposed regulations do not. LCR also requires notice to be sent to property owners within 500 feet from all pipelines and requires operator to certify to the City a list of persons to whom notice was mailed, while the proposed regulations do not.

or oil and gas facility and within the City. Operator shall certify to the City a list of persons or entities to whom written notice was provided.	parcels of land on which the oil and gas operation is proposed to be located; i. To the surface owners of the parcels of land in the City and County of Broomfield within 2,640 feet of the parcel on which the oil and gas operation is proposed to be located	
6. Posted Notice. Within 10 days of the concept review meeting the Operator shall post notice, with specific wording of notice approved by the City, including total acreage, type of equipment, number of wells, etc. and posted on the City's website and the Operator's website, if one exists.	**17-54-050(E)(2).** Posted notice. The real property proposed to be developed shall also be posted with a sign, giving notice to the general public of the proposed development. For parcels of land exceeding fifteen acres in size, two signs shall be posted. The size of the sign required to be posted shall be as established in the supplemental notice requirements of chapter 17-52 of the city's Land Use Code. Such signs shall be provided by the city and shall be posted on the subject property by the applicant in a manner and at a location or locations reasonably calculated by the city to afford the best notice to the public, which posting shall occur a minimum of ten calendar days prior to the neighborhood meeting.	LCR states that posted notice should include total acreage, type of equipment, number of wells, etc. and posted on the City's website and the Operator's website, if one exists, while 17-54-050 does not.
7. Neighborhood Meeting. The meeting for neighborhoods in the designated spacing unit(s), or within ½ mile of a well site or an oil and gas facility, shall take place not less than 45 days in advance of	**17-54-050(E)** Neighborhood Meeting. Following the submission of an application to the Planning Division, and before submitting an application to COGCC, Operator will schedule and	LCR states when the meeting must be held and what information the operator must provide, and also that the meeting must be for neighborhoods within the spacing unit or within ½ mile of a well

any spacing and density applications being filed with the COGCC. At the first neighborhood meeting the operator shall provide information, including surface facilities, flowlines, gathering lines, project timing, emergency response, etc.	notice a neighborhood meeting. A neighborhood meeting shall be required on any oil and gas facilities, even on existing well pads, that require an application for a use permitted by special review. The operator shall notice, attend and conduct the neighborhood meeting. The city shall be responsible for scheduling and coordinating the neighborhood meeting. The public may submit comments on the application to the Operator at the neighborhood meeting. Operator shall prepare a written summary of the neighborhood meeting, including any public comments received, and submit to Staff.	site or oil and gas facility, while the proposed regulations do not contain this information. The proposed regulations allow the public to submit comments and require the operator to submit a written summary of the meeting, while the LCR does not.
8. Notification to City and Public. Thirty days prior to any major activity on a well site or an oil and gas facility site, including, but not limited to, major construction, drilling, hydraulic fracturing, flowback, recompletion, redrilling or plugging and abandoning, operators shall provide notice to the City for public posting.	**17-54-200(B)(2)(d).** Notification to the city and the public regarding commencement of operations. At least two weeks prior to the commencement of any new drilling operations, the operator shall provide to the city for posting on the website the information outlined in section 17-54-050, regarding commencement of operations, which the operator may revise from time to time during operations, with prior approval from the city.	The regulations differ slightly in that they only require notice prior to commencement of operations, not prior to any major activity on a well site. In addition, the regulations provide for 2 weeks notice, while the LCR provides for 30 days notice.
9. Inspections. City can enter upon advance notice, which can include notification at the gate.	**17-54-030** - Inspections. In recognition of the potential impacts associated with oil and gas drilling and well operation in an urban setting, all	The regulations and LCR are substantially the same although the draft regulation is more detailed.

	wells and accessory equipment and structures may be examined by the inspectors of the city at reasonable times to determine compliance with applicable provisions of this chapter, the International Fire Code, the International Building Code, and all other applicable standards in this title. For the purpose of implementing and enforcing the provisions of this chapter, the Inspector and other authorized personnel have the right to enter upon private property after reasonable notification to the operator, which provides the operator an opportunity to be present. The city may use the information collected on the inspections to enforce the requirements of this chapter. The city may also report this information to appropriate state and federal officials, including but not limited to information regarding alleged violations of state and federal rules. Operator must make available to City, upon request, all records required to be maintained by these rules Sections [XX] and by the Colorado Department of Public Health and Environment (CDPHE), including permits, air Pollutant Emission Notices (APENs) and other documents required to be maintained by CDPHE and these rules.	
10. Containment Berms. Permanent steel	**17-54-100(D).** Liquid spills and	The regulations and LCR are substantially

rim berms around tanks to contain 1.5 times volume of any tank. Construction requirements. No stationary ignition source within secondary containment area. For locations up to 500 feet from surface water tertiary containment is required. Facility pad needs to be designed in a fashion to contain spills with adequate allowance for rain and snow.	releases. To minimize spills and releases from oil and gas facilities, the following measures may be required, including, but not limited to, one or more of the following: … (2) Construction of containment berms using steel rings, designed and installed to prevent leakage and resist degradation from erosion or routine operation.	the same.
11. Closed loop pitless systems & recycle of fluids. Require closed loop drilling system and pitless well site. No more than 60 day storage of waste on site. Fluids shall be recycled to maximum extent possible.	**17-54-100(A)(1).** To protect air quality, emissions control measures may be required during construction, drilling, hydraulic fracturing, flowback, production and abandonment and reclamation stages, including, but not limited to, one or more of the following:… (w) Closed loop, pitless drilling, completions and production systems without permanent on-site storage tanks for containment and/or recycling of all drilling, completion, flowback and produced fluids and any required venting routed to 98% effective emissions control devices.	The regulations and LCR are substantially the same.
12. Anchoring. Anchoring is required within floodplain or geological hazard areas, as needed to resist flotation, collapse, lateral movement, sinking, or subsidence, and in compliance with Federal Emergency Management Agency	**17-54-090(B).** Anchoring. Anchoring is required within floodplain or geological hazard areas, as needed to resist flotation, collapse, lateral movement, sinking, or subsidence, and in compliance with Federal Emergency Management Agency	No differences.

(FEMA).	(FEMA).	
13. Burning. No open burning.	**17-54-090(C).** Burning. No open burning of trash.	The regulations provide for no open burning of trash, while the LCR provides for no open burning in general.
14. Chains. Traction chains must be removed from heavy equipment within in City rights of way	**17-54-090(D).** Chains. Traction chain must be removed from heavy equipment on City streets.	No differences.
15. Hazardous Materials Disclosure, Storage & Use. All chemicals must be disclosed to the City (unless disclosure is protected by existing laws or regulations) before bringing on site and no permanent storage of drilling and completions chemicals. Drilling and completion chemicals must be removed at most 60 days after completion. List of chemicals disclosed on FracFocus in advance of drilling. The following chemicals, identified in the 2015 University of Colorado study, shall be banned and this list shall be reevaluated at least every five years: [list of 19 different chemicals] All refueling must be done over impervious material. Comply with all applicable law and provide City with evidence of such compliance prior to drilling.	**17-54-060.** All applications for use permitted by special review approved by the city council pursuant to chapter 17-54-050, B.M.C., for an oil and gas facility shall include the following information which will be subject to review and approval by the City:… (CC) Hazardous Materials Management Plan that identifies hazardous materials that will be used or stored at the facility or site, (including those disclosed through the "Frac Focus" process), the physical hazards they present, the quantity on hand (daily and maximum), the storage method and location, and any other pertinent information that is of value to employees exposed to the materials and/or first responders in the event of an accident or incident. **17-54-090(K).** Routine field maintenance of equipment involving hazardous materials within three hundred (300) feet of any water body is prohibited. All fueling must occur over impervious	Regulations do not list specific banned hazardous materials.

	material and shall not be done during storm events.	
16. Color. Color of facilities must be uniform, non reflective, blended to landscape and subject to prior approval by the City.	**15-54-090 –** Conditions of approval applicable to use by special review applications…(A). Color. Facilities must be painted in a uniform, non-reflective color that blends with the surrounding landscape.	None.
17. Cultural & Historic. Require operator to assess historical and cultural resources in and around the proposed oil and gas development and share such information and proposed mitigation measures to the City for advance approval prior to construction. Require operator to have approval from the State Historic Preservation Office regarding any historical or cultural resources potentially affected by the proposed development, and to provide a copy of such approval to the City, in consultation with the surface owner and subject to any confidentiality requirements.	**17-54-090(BB).** Historical and Cultural Resources. Require operator to assess historical and cultural resources in and around the proposed oil and gas development and share such information and proposed mitigation measures to the City for advance approval prior to construction. Require operator to have approval from the State Historic Preservation Office regarding any historical or cultural resources potentially affected by the proposed development, and to provide a copy of such approval to the City, in consultation with the surface owner and subject to any confidentiality requirements. **17-54-060.** All applications for use permitted by special review approved by the city council pursuant to chapter 17-54-050, B.M.C., for an oil and gas facility shall include the following information which will be subject to review and approval by the City:…(EE) Historical	The draft regulations have a few more requirements regarding historical and cultural resources.

	and Cultural Resources Plan that demonstrates compliance with the standards of Section 17-54-060. Operator to assess historical and cultural resources in and around the proposed oil and gas development and share such information and proposed mitigation measures with Broomfield for advance approval prior to start of site construction. **17-54-070(S).** Cultural and Historic Resources. Oil and gas operations shall, to the maximum extent practicable, avoid causing degradation of cultural or historic or archaeological resources, sites eligible for City designation as an historical landmark, or sites in the National Historic Register. Require operator to have approval from the State Historic Preservation Office detailing required protection and mitigation measures to be implemented to preserve any historical or cultural resources potentially affected by the proposed operations, and to provide a copy of such approval to Broomfield, in consultation with the surface owner and subject to any confidentiality requirements.	
18. Discharge Valves. Discharge valves must be secured, inaccessible to the public, and within secondary containment	**17-54-090(E).** Discharge Valves. Discharge valves must be secured, inaccessible to the public and	No differences.

area. Open-ended discharge valves shall be placed within the interior of the tank secondary containment.	located within the secondary containment area. Open-ended discharge valves must be placed within the interior of the tank secondary containment.	
19. Dust Suppression. No visible dust. No untreated produced water nor process fluids can be used for dust suppression. Avoid creating dust within 300 feet of surface water. Safety data sheets must be submitted for any chemical based suppressant. Required grading, drainage, dust mitigation & erosion control plan.	**17-54-060.** All applications for use permitted by special review approved by the city council pursuant to chapter 17-54-050, B.M.C., for an oil and gas facility shall include the following information which will be subject to review and approval by the City:…(X). Grading, drainage, & erosion control plan that demonstrates compliance with the standards of Section 17-54-060. **17-54-090(F).** Dust Suppression and Fugitive Dust. Dust associated with on-site activities and traffic on access roads must be minimized throughout construction, drilling and operational activities such that there are no visible dust emissions from access roads or the site to the extent practicable given wind conditions. **17-54-100(A)(1)(t).** 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 the Well Sites to the extent practical given	The regulations are more specific and longer, but are generally substantially the same as the LCR. Regulations allow use of water as a dust suppressant within 300 feet of surface water, while LCR does not mention this.

	wind conditions. No untreated produced water or other process fluids shall be used for dust suppression. The operator will avoid creating dust or dust suppression activities within three hundred (300) feet of the ordinary high-water mark of any waterbody, unless the dust suppressant is water. Material Safety Data Sheets (MSDS) for any chemical based dust suppressant shall be submitted to the City prior to use.	
20. Electric Equipment. All drilling will be done using electric line power. All equipment that can be powered by electric power shall be in order to mitigate noise and to reduce emissions.	**17-54-100(A)(1)(a).** Drilling activities conducted with electricity provided by utility electric line power. **17-54-090(I)(3).** Emission Control Regulations. To the extent used, all equipment must comply with the following: i. Electrification from the power grid or from renewable sources of all permanent operation equipment that can be electrified.	The regulations give the option of renewable power.
21. Emergency Plan. Operators must complete the City's detailed Emergency Plan template, and operators shall pay for any necessary training and equipment of emergency response personnel. CIty and North Metro Fire Rescue District (NMFD) must approve the Emergency Plan.	**17-54-060(R).** Emergency Preparedness and Response. Each applicant with an operation in the City is required to complete the City's detailed Emergency Preparedness and Response Plan template. In addition, each Operator must submit an Emergency Preparedness and	Regulation does not state that operator must provide 24-hour contact information for contractors and sub-contractors (although this could be in the City's Emergency Preparedness and Response Plan template).

Emergency Plan template shall identify and cover all types of emergencies, and identify and provide 24-hour contact information for contractors and subcontractors. Plan shall include a notification system for potentially affected citizens and occupied buildings and an evacuation plan.	Response Plan that must be approved by the City and North Metro Fire Rescue District (NMFRD) in order to be deemed complete that demonstrates compliance with the following: a. The standards of Section 17-54-060. b. Contains adequate provisions to ensure Operator will cover all costs associated with response and remediation including any additional on-site and regional specialized equipment and supplies necessary to respond to any emergency incident at their facilities. c. Operator must cooperate and train with Broomfield and NMFRD emergency responders as requested. d. Operator must immediately notify Broomfield, surrounding communities, and any nearby schools of an emergency event and develop emergency protocols with the NMFRD, Broomfield's Department of Public Health and Environment, and the Broomfield Police Department. e. Operator must provide to Broomfield safety and security protocols for the facility site, including evacuation plans subject to approval by NMFRD. f. Operator must provide a copy of any Spill Prevention, Control, and Countermeasures (SPCC) plan to Broomfield if required by USEPA rules	The regulation provides more detailed requirements regarding emergency preparedness and response than the LCR does.

	and a copy of a listing of hazardous chemicals used on site if required by USEPA CERCLA Community Right to Know rules. g. Operator must maintain onsite storage of absorption boom and granulated materials for ready deployment in case of leaks. Notify first responders of the location of said materials. **17-54-050(K)** Emergency Preparedness and Response. Oil and gas operations shall, to the maximum extent possiblepracticable, avoid risks of emergency situations such as explosions, fires, gas, oil or water pipeline leaks, ruptures, hydrogen sulfide or other toxic gas or fluid emissions, and hazardous material vehicle accidents or spills. Oil and gas operations shall ensure that, in the event of an emergency, adequate practices and procedures are in place to protect public health and safety and repair damage caused by emergencies. **17-54-090(G).** Emergency Preparedness and Response Plan. The Applicant must implement the Emergency Preparedness and Response plan approved by the City and County Manager. The plan must be updated on an annual basis, or as conditions change, such as responsible field personnel and ownership or in	

	response to Accident. **17-54-090(FF)(11).** Contractors. Written procedures describing how Operator screens, oversees, shares process safety and emergency response and preparedness information with Contractors;	
22. Air Quality. The installation and operation of any oil and gas operation shall, to the maximum extent practicable, avoid causing degradation to air quality. To the maximum extent practicable, Operator must eliminate, capture, or minimize all potentially harmful emissions and dust associated with onsite activities and traffic on access roads must be minimized. The plan must demonstrate compliance with the following: A. all applicable state, local and federal regulations including regulations promulgated by CDPHE, COGCC and US EPA, as such regulations exist now or more stringent requirements adopted in the future; B. 2017 Centers for Disease Control (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) and U.S. Environmental Protection Agency (USEPA) IRIS ambient air quality	**17-54-060** - All applications…shall include the following information which will be subject to review and approval by the City: (N) Protocol for Air Modeling Plan subject to review by the City that demonstrates that emissions from the proposed Facilities meet the following: (1) EPA and state emission standards, including demonstrating compliance with 2017 Centers for Disease Control Agency and Toxic Substances and Disease Registry and USEPA Integrated Risk Information System ambient air quality guidelines or future more stringent guidelines for benzene, toluene, ethylbenzene, and xylene, and other air toxics. (2) Facility emissions inventories and air quality impact studies for drilling, completions and operations based upon proposed equipment use, and operation phases, and any emissions reductions associated with plugging	LCR requires use of Tier 4 engines, while 17-54-100(A)(1) requires use of Tier 4 or better diesel engine, diesel and natural gas co-fired Tier 2 or Tier 3 engines, natural gas fired spark ignition engines, or electric line power for hydraulic fracturing pumps. LDAR requirements in the 17-54-090(I)(2) are more detailed than those in the LCR. 17-54-090(I)(5) requires self-reporting submissions be provided to the City, while the LCR does not.

guidelines or future more restrictive guidelines for benzene, toulene, ethyl benzene and xylene (BTEX) and other air toxins. C. Minimization of Emissions. To protect air quality, emissions control measures may be required during construction, drilling, hydraulic fracturing, flowback, production and abandonment and reclamation stages, including, but not limited to, one or more of the following: 1. Drilling activities conducted with electricity provided by electric line power 2. Electrification from the power grid or from renewable sources of all permanent operation equipment that can be electrified. 3. A minimum of tier 4 engines, natural gas fired spark ignition engines, or electric line power for fracking pumps 4. Limitations on truck traffic to and from the site. 5. Implementation of "tankless" production techniques. 6. Environmentally sensitive and efficient production techniques, such as using	and abandonment. (3) Demonstration that Facility will not result in any increase of (volatile organic compounds (VOCs) from Operator's existing and planned development in the City. Operator may include anticipated reductions from plugging and abandoning existing wells located in City when modeling total VOCs from existing and future development and related activities. (O) Protocol for Air Monitoring Plan that describes how the operator will conduct baseline monitoring within 500 feet of a proposed facility prior to construction and during the drilling, completion and production phases of development.. The plan must include monitoring for all potential emissions, including but not limited to, methane, VOCs, Hazardous Air Pollutants (HAPs), Oxides of Nitrogen (NOx), Particulate Matter (PM), Fine Particulate Matter (PM 2.5), and Carbon Monoxide (CO). Operator must pay for the baseline and ongoing monitoring. Baseline testing must be done by a consultant approved by the City. (P) An Air Quality Mitigation Plan that demonstrates compliance with the following: 1. EPA, CDPHE and COGCC standards	

natural gas onsite rather than flaring. 7. Use of quiet design mufflers (also referred to as hospital grade or dual dissipative) or equivalent. 8. Use of acoustically insulated housing or covers to enclose the motor or engine. 9. Manufacture test or other data demonstrating hydrocarbon destruction or control efficiency that complies with a design destruction efficiency of 98% or better. 10. The use of 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. 11. Proof that any flare, auto ignition system, recorder, vapor recovery device or other equipment used to meet the hydrocarbon destruction or control efficiency requirement is installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals. 12. Emissions controls of 90% or better	for emissions and odors. If these rules become more stringent in the future, the operator will update their Air Quality Mitigation Plan to comply with the revised guidelines as such regulations exist or future more stringent regulations. 2. Compliance with 2017 CDC Agency for Toxic Substances and Disease Registry and USEPA Integrated Risk Information System ambient air quality guidelines. If these guidelines become more stringent in the future with more restrictive guidelines for benzene, toluene, ethylbenzene and xylene (BTEX), and other air toxins, the operator will update their Air Quality Mitigation Plan to comply with the revised guidelines. 3. The provisions of Section 17-54-060. **17-54-070(J).** Air Quality. The construction and operation of any oil and gas operation shall to the maximum extent practicable, avoid causing degradation to air quality. To the maximum extent practicable, the installation and operation of any oil and gas operation must eliminate, capture, or minimize all potentially harmful emissions and dust associated with onsite activities and traffic on access roads must be minimized and demonstrate how gas leaks and air	

for glycol dehydrators. 13. Zero-emission desiccant dehydrators. 14. Hydrocarbon control of 98% or better for crude oil, condensate, and produced water tanks with uncontrolled actual emissions of VOCs greater than two (2) TPY VOC's. 15. Year-round application of odor requirements as set forth in 5 C.C.R. 1001-9, § XII (as amended). 16. Drilling, completion and operation of wells using closed loop pitless systems for containment and/or recycling of all drilling, completion, flowback and produced fluids capable of reducing emissions by 98% or better. 17. Emission controls of hydrocarbon emissions of 98% or better for centrifugal compressors and reciprocating compressors. 18. Dry seals on centrifugal compressors. 19. Routing of emissions from rod-packing and other components on reciprocating compressors to vapor collection systems.	emissions releases will be prevented and mitigated. **17-54-090(I). Air Quality.** 1. Flares and Combustion Devices. To the extent used, all flares, thermal oxidizers, or combustion devices shall be designed and operated as follows: i. The flare and or combustor must be fired with natural gas. i. The flare and or combustor must 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. v. The flare and or combustor must be operated with a flame present at all times when emissions may be vented to it. v. All combustion devices must be equipped with an operating auto-igniter. i. If using a pilot flame ignition system, the presence of a pilot flame must be monitored using a thermocouple or other equivalent device to detect the presence of a flame. A pilot flame must be maintained at all times in the flare's	

20. Reduction or elimination of emissions of associated gas from hybrid gas-oil wells (i.e. gas that is co-produced from a well that primarily produces oil), including prohibition of uncontrolled venting. 21. Emission control of 90% or better during liquids unloading (i.e. maintenance activities to remove liquids from existing wells that are inhibiting production), including the installation of an automated plunger lift and the use of flares or thermal oxidizers to control any venting that cannot be eliminated. 22. Reduction or elimination of emissions from oil and gas pipeline maintenance activities such as pigging or blowdowns, including routing emissions to a vapor collection system. If any maintenance activity will involve the intentional venting of gas from a well tank, compressor or pipeline, the operator shall provide 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 was necessary, a description of the vapors will likely be vented and what steps will be taken to limit the duration of venting and what steps the operator proposes to	pilot light burner. A telemetry system must be in place to monitor pilot flame and must activate a visible and audible alarm in the case that the pilot goes out. vii. If using an electric arc ignition system, the arcing of the electric arc ignition system must pulse continually and a device must be installed and used to continuously monitor the electric arc ignition system. 2.Leak and Detection and Repair. Operator shall develop and maintain a leak detection and repair program using modern leak detection technologies for equipment used on the well site. If an infrared (IR) camera is used, operators must retain an infrared image or video of all leaking components before and after repair. Such records must be maintained for two years and must be made available to the City upon request. Any leaks discovered shall be reported to the City immediately upon discovery. Operators must repair leaks immediately. If the leak presents an immediate hazard to persons or property, the operator may not operate the affected component, equipment or pipeline segment until the operator has corrected the problem. In the event of leaks that do not pose an immediate hazard to persons or property, if more than 48-hours repair	

undertake to minimize similar events in the future. If emergency venting is required, or if accidental venting occurs, the 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 time of the event, with the information listed above and with an explanation as to the cause and how the event will be avoided in the future. 23. Proof of compliance with State-required dust control measures and imposition of an opacity requirement as tested using EPA Method 9. 24. Odor reduction or elimination outside a specified distance from the well site. Adopt ordinance on odor that is enforceable by local police and court. 25. Use of an automated tank gauging system. 26. Consolidation of product treatment and storage facilities 27. Centralization of compression facilities 28. Telemetric control and monitoring systems, including surveillance monitors to detect when pilot lights on control	time is needed after a leak is discovered, Operator must contact the City and County Manager and provide an explanation of why more time is required must be submitted to the City and County Manager. Continuous monitoring to detect leaks or measure hydrocarbon emissions and meteorological data may be required. Any continuous monitoring system must be able to alert the operator of increases in concentrations. At least once per year, the operator shall notify the City five business days prior to an LDAR [DEFINE] inspection of its facilities to provide the City the opportunity to observe the inspection. Operator must make all records required to be kept by CDPHE available to the Inspector. 3.Emission Control Regulations. To the extent used, all equipment must comply with the following: i. Electrification from the power grid or from renewable sources of all permanent operation equipment that can be electrified. ii. Use of acoustically insulated housing or covers to enclose the motor or engine. iii. Any flare, auto ignition system, recorder, vapor recovery device or other equipment used to meet the hydrocarbon destruction or control	

devices are extinguished 29. Shut down protocols, approved by the City, with notification and inspection provisions to ensure safe shut-down 30. Permitting emissions limits or work practice requirements for emissions, including VOC, benzene and NOx. 31. No open vents to atmosphere unless specifically approved by City after Operator proves to City that such venting is necessary for safety. 32. Flaring shall be eliminated or minimized to the maximum extent practicable. 33. Exhaust from all engines, motors, coolers, and all other equipment must be vented up and away from nearest residences. 34. Owner or operator agrees to participate in Natural Gas STAR program or other voluntary programs to encourage innovation in pollution control at well sites. D. Hydrocarbon Emissions Leak Detection and Repair and Air Quality	efficiency requirement shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals. iv. The use of 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. v. Dry seals on centrifugal compressors. vi. Routing of emissions from rod-packing and other components on reciprocating compressors to vapor collection systems. vii. Emission controls of hydrocarbon emissions of 98% or better for centrifugal compressors and reciprocating compressors. viii. Best management practices during liquids unloading (i.e. maintenance activities to remove liquids from existing wells that are inhibiting production), including the installation of automated artificial lift and the use of flares or thermal oxidizers to control any venting that cannot be eliminated. If manual unloading is permitted, operators shall remain onsite during any manual unloading.	

Monitoring. The Applicant shall be required to develop and maintain an acceptable leak detection and repair program using modern leak detection technologies such as infra-red cameras for equipment used on the well site. If an IR camera is used, operators must retain an infrared image or video of all leaking components before and after repair. Such records must be maintained for two years and must be made available to the City upon request. Any leaks discovered should be reported to the City immediately. Operators must repair leaks as quickly as practicable; 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. Continuous monitoring to detect leaks or measure hydrocarbon emissions and meteorological data may be required. At least once per year, the operator shall notify the City five business days prior to an LDAR inspection of its facilities to provide the City the opportunity to observe the inspection. Detailed recordkeeping of the inspections for leaking components. E. Air Quality Action Days. Operator shall respond to air quality Action Day advisories posted by the Colorado Department of Public Health and	ix. Reduction or elimination of emissions from oil and gas pipeline maintenance activities such as pigging or blowdowns. If any maintenance activity will involve the intentional venting of gas from a well tank, compressor or pipeline, beyond routine pipeline maintenance activity and pigging, the operator shall provide 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 the operator proposes to undertake to minimize similar events in the future. If emergency venting is required, or if accidental venting occurs, the 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 time of the event, with the information listed above and with an explanation as to the cause and how the event will be avoided in the future. x. Telemetric control and monitoring systems, including surveillance monitors to detect when pilot lights on control devices are extinguished.	

Environment for the Front Range Area by implementing suggested air emission reduction measures as feasible. Emissions reduction measures shall be implemented for the duration of an air quality Action Day advisory and may include measures such as: 1. Minimize vehicle and engine idling; 2. Reduce truck traffic and worker traffic; 3. Delay vehicle refueling; 4. Suspend or delay use of fossil fuel powered ancillary equipment; and 5. Postpone construction or maintenance activities, if feasible. Operator must submit a monthly report to the City that details which measures it implemented during any Action Day advisories. F. Compliance. The operator must submit an annual report each year to the city certifying (a) compliance with these air quality requirements and documenting any periods of non-compliance, including the date and duration of each deviation and a compliance plan and schedule to	xi. Exhaust from all engines, motors, coolers, and all other equipment must be vented up and away from nearest residences. xii. Operator agrees to participate in Natural Gas STAR program or other voluntary programs to encourage innovation in pollution control at well sites. xiii. Proof of compliance with State-required dust control measures and imposition of an opacity requirement as tested using EPA Method 9. xiv. Monitoring as needed to respond to emergency events such as process upsets or accidental releases. xv. Emission reduction measures to respond to air quality Action Day advisories posted by the Colorado Department of Public Health and Environment for the Front Range Area, including minimizing vehicle and engine idling; reducing truck traffic and worker traffic; delaying vehicle refueling; suspending or delaying use of fossil fuel powered ancillary equipment; and postponing construction activities. 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	

achieve compliance (b) that the equipment at the Well Sites 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. The annual report must contain a certification as to the truth, accuracy and completeness of the reports by a responsible corporate official. The operator may satisfy this reporting obligation in whole or in part by submitting its AQCC Regulations No. 7 semi- 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. G. Ambient Air Sampling Program. The Operator agrees to a Site specific ambient air quality testing program, subject to approval by the City, that includes: 1. Pre-construction baseline air quality testing within 500 feet of the Site by a consultant approved by the City and paid for by the Operator 2. Air quality monitoring of all oil and gas phases, including drilling, completions (principally hydraulic fracturing and flowback), and operations within 500 feet of the site by a consultant approved by the City	advisories. xvi. Shutdown protocols, approved by the City, with notification and inspection provisions to ensure safe shut-down and timely notification to local communities. xvii. Ongoing maintenance checks of all equipment to minimize the potential for gaseous or liquid leaks. 4.Air Quality Action Days. Operator shall respond to air quality Action Day advisories posted by the Colorado Department of Public Health and Environment for the Front Range Area by implementing suggested air emission reduction measures as feasible. Emissions reduction measures shall be implemented for the duration of an air quality Action Day advisory and may include measures such as: 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 or maintenance activities, if feasible. vi. Operator must submit a monthly report to the City that details which measures it implemented during any	

and paid for by the Operator. 3. Air quality modeling and emissions inventories based upon proposed development and equipment. 4. In addition, the City may require the Operator to conduct additional air monitoring as needed to respond to emergency events such as spills, process upsets, or accidental releases or in response to odor complaints within city limits. 5. Operator shall provide site specific ambient air quality testing, prior to drilling, and subject to approval by the City that includes: a. Site specific air quality control equipment from operators, prior to drilling, and subject to approval by the City. b. City Inspector access to the site upon notice; and infrared camera testing, or equivalent, by operator and City's inspector.	Action Day advisories. 5.Compliance. The Operator must submit annual reports to the City certifying (a) Compliance with these air quality requirements 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, (b) that the equipment at the Well Sites 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. The annual report must contain a certification as to the truth, accuracy and completeness of the reports, signed by a responsible corporate official. The 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. The Operator will also provide the City will 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 the Well Sites **17-54-100(A). Air Quality.**	

	1. To protect air quality, emissions control measures may be required during construction, drilling, hydraulic fracturing, flowback, production and abandonment and reclamation stages, including, but not limited to, one or more of the following: a. Drilling activities conducted with electricity provided by utility electric line power. b. The use of Tier 4 or better diesel engines, diesel and natural gas co-fired Tier 2 or Tier 3 engines, natural gas fired spark ignition engines, or electric line power for hydraulic fracturing pumps. c. The use of liquefied natural gas dual fuel hydraulic fracturing pumps. d. Limitations on truck traffic to and from the site. e. Implementation of tankless production techniques. f. Environmentally sensitive and efficient production techniques, such as using natural gas onsite rather than flaring. g. Use of quiet design mufflers (also referred to as hospital grade or dual dissipative) or equivalent. h. For any flares or combustion devices used, manufacture test or other data demonstrating hydrocarbon destruction or control efficiency that complies with a design destruction	

	efficiency of 98% or better. i. The use of desiccant gas processing dehydrators. j. Hydrocarbon control of 98% or better for crude oil, condensate, and produced water tanks with uncontrolled actual emissions of VOCs greater than two (2) TPY VOC's. k. Year-round application of odor requirements pursuant to COGCC and CDPHE regulations. l. No open vents to atmosphere unless specifically approved by City after Operator proves to City that such venting is necessary for safety. m. Filtration systems or additives to minimize odors from drilling and fracturing fluids except that operators shall not mask odors by using masking fragrances. n. Reduction or elimination of emissions of associated gas from hybrid gas-oil wells (i.e. gas that is co-produced from a well that primarily produces oil), including prohibition of uncontrolled venting and limits on flaring. o. Consolidation of product treatment and storage facilities within a Well Site. p. Centralization of compression facilities within a Well Site. q. Flaring shall be eliminated other than during emergencies or upset conditions; any flaring that is done must	

	be done with a flare that has a manufacturer specification of 98% destruction removal efficiency or better. r. Use of a pressure-suitable separator and vapor recovery unit (VRU) where applicable. s. Pipeline infrastructure for fresh water, produced water, natural gas, crude oil and condensate will be constructed and placed into service prior to the start of any fluid flow from any wellbore. t. 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 the Well Sites to the extent practical given wind conditions. No untreated produced water or other process fluids shall be used for dust suppression. The operator will avoid creating dust or dust suppression activities within three hundred (300) feet of the ordinary high-water mark of any waterbody, unless the dust suppressant is water. Material Safety Data Sheets (MSDS) for any chemical based dust suppressant shall be submitted to the City prior to use. u. Reduced Emission Completions for oil wells. Daily logs documenting reduced emission completions provided to the City. v. Reduced Emission Completions	

	for gas wells. Daily logs documenting reduced emission completions provided to the City. w. Closed loop, pitless drilling, completions and production systems without permanent on-site storage tanks for containment and/or recycling of all drilling, completion, flowback and produced fluids and any required venting routed to 98% effective emissions control devices. x. Plugging and abandoning existing wells. y. Use of other Best Management Practices as they become available z. The use of 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..	
23. Reduced Emission Completions (closed loop systems during drilling and completion). Reduced emission completions that comply with the most stringent federal or state requirements that apply at the time of all completion activities, that prohibit venting other than when necessary for safety, and operator providing daily logs to the City. Wells shall be drilled, completed, and operated using closed loop pitless and green	**17-54-100(A)(1).** To protect air quality, emissions control measures may be required during construction, drilling, hydraulic fracturing, flowback, production and abandonment and reclamation stages, including, but not limited to, one or more of the following:… u. Reduced Emission Completions for oil wells. Daily logs documenting reduced emission completions provided to	No differences.

completion systems for containment and/or recycling of all drilling, completion, flowback, and produced fluids and gas. Operator to provide daily logs to the City.	the City. v. Reduced Emission Completions for gas wells. Daily logs documenting reduced emission completions provided to the City. w. Closed loop, pitless drilling, completions and production systems without permanent on-site storage tanks for containment and/or recycling of all drilling, completion, flowback and produced fluids and any required venting routed to 98% effective emissions control devices.	
24. Exhaust. All exhaust, including, but not limited to, exhaust from all engines, motors, coolers, and all other equipment, must be vented up and away from nearest occupied building.	**17-54-090(H).** Exhaust. All exhaust, including but not limited to, exhaust from all engines, motors, coolers and other equipment must be vented up or in a direction away from the nearest occupied building.	No differences.
25. Sight and Access Security. Site shall be properly secured, including, but not limited to, security fencing or barriers to prevent unauthorized access to site. Site shall be properly secured prior to the start of drilling. Proposed fencing, barriers, and screening shall be included in visual mitigation plan.	**17-54-090(W).** Sight access and Security. Site shall be properly secured, including, but not limited to, security fencing or barriers to prevent unauthorized access to site. Site shall be properly secured prior to the start of drilling. Proposed fencing, barriers, and screening shall be included in visual mitigation plan.	No differences.
26. Flammable Material. The area twenty five feet around anything flammable shall be kept free of dry grass	**17-54-090(X).** Flammable Material. The area twenty five feet around anything flammable shall be kept free of dry grass	No differences.

or weeds, conform to COGCC safety standards and applicable fire code. The operators pre-application and application shall be reviewed by NMFRD.	or weeds, conform to COGCC safety standards and applicable fire code. The operators pre-application and application shall be reviewed by NMFRD.	
27. Flares and Combustions Devices. To the extent flares, thermal oxidizers, or combustion devices are required, they shall be designed and operated as follows: A. Must be fired with natural gas. B. The flare must 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. Must be operated with a flame present at all times when emissions may be vented to it, or other mechanism that does not allow uncontrolled emissions. D. All combustion devices must be equipped with an operating auto-igniter. E. If using a pilot flame ignition system, the presence of a pilot flame must be monitored using a thermocouple or other equivalent device to detect the presence of a flame. A pilot flame must be maintained at all times in the flare's pilot	**17-54-090(I)(1).** Flares and Combustion Devices. To the extent used, all flares, thermal oxidizers, or combustion devices shall be designed and operated as follows: i. The flare and or combustor must be fired with natural gas. ii. The flare and or combustor must 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. iii. The flare and or combustor must be operated with a flame present at all times when emissions may be vented to it. iv. All combustion devices must be equipped with an operating auto-igniter. v. If using a pilot flame ignition system, the presence of a pilot flame must be monitored using a thermocouple or other equivalent	No differences.

light burner. If the pilot flame goes out and does not relight, then if no telemetry system is in place, a visible alarm shall be in place on-site and activated. F. If using an electric arc ignition system, the arcing of the electric arc ignition system must pulse continually and a device must be installed and used to continuously monitor the electric arc ignition system.	device to detect the presence of a flame. A pilot flame must be maintained at all times in the flare's pilot light burner. A telemetry system must be in place to monitor pilot flame and must activate a visible and audible alarm in the case that the pilot goes out. vi. If using an electric arc ignition system, the arcing of the electric arc ignition system must pulse continually and a device must be installed and used to continuously monitor the electric arc ignition system.	
28. Floodplains. Operations and equipment are prohibited in floodways, as defined by Federal Emergency Management Agency, and only permitted in 100 year floodplain when alternative site outside of floodplain is shown to be more detrimental to health, safety and welfare of the public.	**17-54-070(T).** Floodplains and Floodways. Operations and equipment are prohibited in floodways, as defined by the Federal Emergency Management Agency. Operations and equipment shall not be located in the 100-year floodplain unless all alternate locations outside of the floodplain that allow for extraction or transportation of the resource are more detrimental to health, safety, welfare or the environment than the proposed location in the floodplain. All above-ground oil and gas operations approved in a floodplain must comply with the flood protection measures in Section 26-23. Tanks in the 500-year floodplain also require flood protection measures.	The regulations have a provision about tanks in the 500-year floodplain while the LCR does not.
29. Water Quality and Conservation. Add definition of 'water source" as: water	**17-54-060.** All applications…shall include the following information which	No differences.

wells that are registered with Colorado Division of Water Resources, including household, domestic, livestock, irrigation, municipal/public and commercial wells, permitted or adjudicated springs, and monitoring wells other than monitoring wells that are drilled for the purpose of monitoring water quality changes that are not associated with oil and gas activities. A. General Provisions. Operators must comply with COGCC regulations and City requirements. Oil and gas operations shall, to the maximum extent practicable, avoid causing degradation to wetlands within the City. B. Water Supply. Owner or operator must submit a water supply plan that contains the following: 1. An estimate of the amount of water needed for all phases of the oil and gas operation; 2. A list of all available physical sources of water for the project, and if multiple sources are available, analysis of which source is least detrimental to the environment; 3. A description of the physical source of water that the owner or operator proposes to use to serve the oil and gas operation;	will be subject to review and approval by the City: … (V) Water Supply Plan that demonstrates compliance with the standards of Section 17-54-060. Applicant must submit estimated water supply requirements and usage for the proposed development including: (1) An estimate of the amount of water needed for all phases of the oil and gas operation; (2) A list of all available physical sources of water for the project, and if multiple sources are available, analysis of which source is least detrimental to the environment; (3) A description of the physical source of water that the Applicant proposes to use to serve the oil and gas operation; (4) Water conservation measures, if any, that may be implemented within the oil and gas operation; and (5) An estimate of the amount of water that will be used at the site, where and how the water will be consumed, the amount of wastewater produced, and disposal plans for wastewater. (W) Water Quality Plan that demonstrates compliance with the standards of Section 17-54-060. Plan may include details such	

4. Water conservation measures, if any, that may be implemented within the oil and gas facility; and 5. An estimate of the amount of water that will be used at each site, where and how the water will be consumed, the amount of wastewater produced, and disposal plans for wastewater. 6. Use of city water is not allowed. 7. Chemicals Dangerous to Human Health. To prevent harm to human health, limitations or prohibitions on orally toxic chemicals in hydraulic fracturing fluids shall be established. 8. Decommissioned Oil and Gas Well Assessment a) Assessment and monitoring of wells that are plugged and decommissioned, removed from use and dry, or removed from use (abandoned wells) within one-quarter (¼) mile of the projected track of the borehole of a proposed well by a third party approved by the City. This may include: i. Based upon examination of COGCC and other publicly available records, identification of all abandoned wells located within one-quarter (¼) mile of the projected track of the borehole of a proposed well.	as Operator's plans for water quality testing, prevention of illicit or inadvertent discharges, stormwater discharge management, containment of pollutants, and spill notification and response as required by federal and state agencies. The owner or operator shall provide the City with the information it provides to the COGCC ensuring compliance with the water quality protection standards contained in COGCC Rule 317(B), 609, Rule 910, and any other applicable COGCC rules governing water quality protection. The owner or operator shall provide all water source test results to the City and maintain records of such results. The owner or operator shall provide its plans concerning downhole construction details and installation practices, including casing and cementing design, and shall inform the County how the plans establish that the operation does not create significant degradation to surface waters or drinking water aquifers. **17-54-070(R).** Wetlands Protection. Oil and gas operations shall, to the maximum extent practicable, avoid causing degradation to wetlands within City of Broomfield. Among other methods to achieve compliance with this standard, the proposed oil and gas operation shall not alter historic drainage patterns and/or flow	

ii. Risk assessment of leaking gas 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. iii. Notification of the City and COGCC of the results of the assessment of the plugging and cementing procedures. iv. Permission from each surface owner with an abandoned well on his/her property to access the property to test the abandoned well. If a surface owner has not provided permission to access after thirty (30) days from receiving notice, the Operator or Owner shall not be required to test the abandoned well. Notice to the surface owner will be sent Certified US Mail, return receipt requested, to assure that the owner receives proper notice. v. For each abandoned well for which access is granted, a soil gas survey of the abandoned well prior to production from the proposed well and again one (1) year and then every three (3) years after production has commenced. vi. Notification of the results of the soil gas survey to the City and the COGCC within three (3) months of conducting the survey or advise the City that access to the abandoned wells could not be obtained from the surface owner.	rates or shall include acceptable mitigation measures to compensate for anticipated drainage impacts. **17-54-090.** All of the following shall apply to all oil and gas operations in the form of conditions of approval applicable to each use by special review permit:…(S) Water Quality. A water quality control plan that establishes that all operations shall use most effective performance techniques and best management practices to minimize impacts to water quality, including plans for water quality testing, prevention of illicit or inadvertent discharges, and containment of pollutants as required by Broomfield code and state and federal agencies. (E) Water Quality. To minimize impacts to surface and sub-surface water bodies from oil and gas facilities, the following measures may be required, including, but not limited to, one or more of the following: 1. Chemicals Dangerous to Human Health. To prevent harm to human health, limitations or prohibitions on toxic, including orally toxic, chemicals in hydraulic fracturing fluids. No permanent storage of drilling and completions chemicals. Drilling and completion chemicals must be	

C. Bradenhead Monitoring. A requirement that the Operator or Owner 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. Valves used for annular pressure monitoring shall remain exposed and not buried to allow for visual inspection. The Operator or Owner shall take bradenhead pressure readings on a monthly basis and report those readings to the City. Such readings shall include the date, time, and pressure of each reading, and the type of fluid reported. D. Water Well Sampling and Testing. Using records of the Colorado Division of Water Resources, the Operator or Owner may be required to identify and offer to sample all available water sources located within one-half (1/2) mile of the radius of the proposed track of the borehole of a proposed well and within one-half (1/2) mile of the radius of the proposed oil and gas facility site. Sampling requirements may include: 1. Initial baseline samples and subsequent monitoring samples shall be collected from all available water sources	removed at most 60 days after completion. 2. Monitoring and Well Testing. To protect local water quality, the City may require the Applicant to implement a water quality monitoring and well testing plan. Water quality testing and control measures may be required, including, but not limited to, one or more of the following: a. Decommissioned Oil and Gas Well Assessment. Assessment and monitoring of plugged and decommissioned or removed from use and dry and removed from use oil and gas wells (abandoned wells) within one-quarter (¼) mile of the projected track of the borehole of a proposed well. This may include: (1) Based upon examination of COGCC and other publicly available records, identification of all abandoned wells located within one-quarter (¼) mile of the projected track of the borehole of a proposed well. (2) Risk assessment of leaking gas 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 (P&A) report filed with the COGCC. (3) Notification of the City and	

within a one-half (1/2) mile of the projected track of the borehole of a proposed well and within a one-half (1/2) mile radius of the proposed oil and gas facility site. 2. Initial collection and testing of baseline samples from available water sources shall occur within six (6) months prior to the commencement of drilling a well, or within six (6) months prior to the re-stimulation of an existing well for which no samples were collected and tested during the previous six (6) months. 3. Post-stimulation samples of available water sources shall be collected and tested pursuant to the following time frame: a. One sample within six (6) months after completion; b. One sample between twelve (12) and eighteen (18) months after completion; c. One sample between sixty (60) and seventy-two (72) months after completion, and d. For multi-well pads, collection shall occur annually during active drilling and completion. 4. Operator or Owner shall collect a sample from at least one up-gradient and two down-gradient water sources within a one-half (1/2) mile radius of the oil and	County Manager and COGCC of the results of the assessment of the plugging and cementing procedures. (4) Permission from each surface owner who has an abandoned well on the surface owner's property to access the property in order to test the abandoned well. If a surface owner has not provided permission to access after thirty (30) days from receiving notice, the Applicant shall not be required to test the abandoned well. (5) For each abandoned well for which access is granted, a soil gas survey of the abandoned well prior to production from the proposed well and again one (1) year and then every three (3) years after production has commenced. (6) Notification of the results of the soil gas survey to the City and County Manager and the COGCC within three (3) months of conducting the survey or advising the City and County Manager that access to the abandoned wells could not be obtained from the surface owner. b. Bradenhead Monitoring. A requirement that the Applicant equip the bradenhead access to the annulus between the production and surface casing, as well as any intermediate casing, with a fitting to allow safe a convenient determinations of pressure and fluid flow. Valves used for annular pressure monitoring shall remain exposed and not buried to allow	

gas facility site. If no such water sources are available, operator shall collect samples from additional water sources within a radius of up to one mile from the oil and gas facility site until samples from a total of at least one up-gradient and two down-gradient water sources are collected. Operator or Owner should give priority to the selection of water sources closest to the oil and gas facility site. 5. An Operator or Owner may rely on existing groundwater sampling data collected from any water source within the radii described above, provided the data was collected within the 12 months preceding the commencement of drilling the well, the data includes measurement of all of the constituents measured in Table 1 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 drilling the well. 6. Operator or Owner 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 or Owner could not obtain access to the water source from the surface owner. 7. Testing for the analytes listed in	for visual inspection. The Operator shall take bradenhead pressure readings on a monthly basis and report those readings to the City and County Manager. Such readings shall include the date, time, and pressure of each reading, and the type of fluid reported. c. Water Source Sampling and Testing. Using records of the Colorado Division of Water Resources, the Applicant may be required to identify and offer to sample all available water sources located within one-half (1/2) mile of the projected track of the borehole of a proposed well and within one-half (1/2) mile of the radius of the proposed well or multi-well site. Sampling requirements may include: 1. Initial baseline samples and subsequent monitoring samples shall be collected from all available water sources within (1/2) mile of the projected track of the borehole of a proposed well and one-half (1/2) mile radius of the well site or multi-well site. 2. Initial collection and testing of baseline samples from available water sources shall occur within 12 months prior to the commencement of drilling a well, or within 12 months prior to the re-stimulation of an existing well for which no samples were collected and tested during the previous 12 months.	

Table 1, and subsequent testing as necessary or appropriate. 8. Operator or Owner must follow standard industry procedures in collecting samples, consistent with the COGCC model Sampling and Analysis Plan. 9. Reporting the location of the water source using a GPS with sub-meter resolution. 10. Field observations. Reporting on damaged or unsanitary well conditions, adjacent potential pollution sources, odor, water color, sediment, bubbles, and effervescence. 11. Test results. Provide copies of all test results described above to the City, the COGCC, and the water source owners within 30 days after collecting the samples. 12. Subsequent sampling. If sampling shows water contamination, additional measures may 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.	3. Post-stimulation samples of available water sources shall be collected and tested pursuant to the following time frame: i. One sample within six (6) months after completion; ii. One sample between twelve (12) and eighteen (18) months after completion; and iii. One sample between sixty (60) and seventy-two (72) months after completion. 4. For multi-well pads, collection shall occur annually during active drilling and completion. 5. Operators shall collect a sample from at least one up-gradient and two down-gradient water sources within a one-half (1/2) mile radius of the well site or multi-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 or multi-well site until samples from a total of at least one up-gradient and two down-gradient water sources are collected. Operators should give priority to the selection of water sources closest to the well site or multi-well site. 6. An operator may rely on existing groundwater sampling data collected from any water source within the radii described above, provided the data was	

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, well location, and analytical data in electronic deliverable format to the City, the COGCC and the water source owners. g. Qualified Independent Professional Consultant. All abandoned well assessments and water source testing must be conducted by the Owner or Operator or, if requested by a surface owner, by a qualified independent professional consultant approved by the City. [Water Quality Analytes Table] The operator shall comply with COGCC Rule 609.	collected within the 12 months preceding the commencement of drilling the well, the data includes measurement of all of the constituents measured in Table 1 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 drilling the well. 7. The 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 from the surface owner of the water source, the operator must advise the City and County Manager that the Applicant could not obtain access to the water source from the surface owner. 8. Testing for the analytes listed in Table 1, and subsequent testing as necessary or appropriate. 9. Operators must follow standard industry procedures in collecting samples, consistent with the COGCC model Sampling and Analysis Plan. 10. Reporting the location of the water source using a GPS with sub-meter resolution. 11. Field observations. Reporting on damaged or unsanitary well conditions, adjacent potential pollution sources, odor, water color, sediment, bubbles, and effervescence.	

	12. Test results. Provide copies of all test results described above to the City and County Manager, the COGCC, and the water source owners within three (3) months after collecting the samples. 13. Subsequent sampling. If sampling shows water contamination, additional measures may be required including the following: 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 [DEFINE] or a mixture of thermogenic and biogenic [DEFINE] gas, an action plan to determine the source of the gas. c. Immediate notification to the City and County Manager, the COGCC, and the owner of the water source 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 and County Manager, the COGCC and the owner of the water source 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 source sampling in response to complaints from water source owners. f. Timely production and distribution of test results, well location, and analytical data in electronic deliverable format to the City and County Manager, the COGCC and the water source owners. 14. Qualified Independent Professional Consultant. All abandoned well assessments and water source testing must be conducted by the Applicant or, if requested by a surface owner, by a qualified independent professional consultant approved by the City and County Manager. [water quality analytes table – note: this table is identical to the table in the LCR]	
30. Landscaping/visual impacts. Operator shall submit a landscaping and visual mitigation plan to the City for approval that includes maintenance and irrigation requirements for the duration of operations until site reclamation. Operator shall be required to provide maintenance funding through bonding to ensure funds are available for upkeep. Required sound walls shall be included in the visual mitigation plan and must comply with the	**17-54-060.** All applications…shall include the following information which will be subject to review and approval by the City: (U). Landscaping and Visual Mitigation Plan. A preliminary visual mitigation plan in compliance with COGCC Rule 804, including but not limited to a list of the proposed colors for the production facilities, regardless of construction date, which are observable from any public highway, providing for	The regulations are stricter about colors that can be used.

color scheme approved by the City, blending with natural background.	paint that is uniform, noncontrasting, nonreflective color tones (similar to the Munsell Soil Color Coding System), and with colors matched to but slightly darker than the surrounding landscape, a listing of operations' equipment, proposed fencing, and screening. **17-54-090.** All of the following shall apply to all oil and gas operations in the form of conditions of approval applicable to each use by special review permit:… (DD) Landscaping and berming plan approved by City that includes maintenance and irrigation requirements for planted vegetation throughout the duration of operations including production. **17-54-100(F)(6).** Landscaping and irrigation. Operator shall submit a landscaping and visual mitigation plan to the City for approval that includes maintenance and irrigation requirements for the duration of operations until site reclamation. Operator shall be required to provide maintenance funding through bonding to ensure funds are available for upkeep. Required sound walls shall be included in the visual mitigation plan and must comply with the color scheme approved by the City, blending with natural background.	

31. Lighting. Operator shall minimize the amount of light from oil and gas activities to surrounding properties by using lighting that is downward facing. Operator shall provide a photometric study approved by City prior to start of construction to indicate impacts on surrounding properties. During the drilling and completion phases, consistent with applicable law, a minimum 32 foot wall around well pads to reduce light escaping site. Require, consistent with applicable law, best management practices, including downward shielded lighting and lumens measurement - absent ambient light.	**17-54-090(J).** Lighting. During all phases of development and operations, all lighting must be downward facing and Operator shall provide photometric study approved by City prior to start of construction to indicate impact on surrounding properties. During the drilling and completion phases, consistent with applicable law, a minimum 32 foot wall around well pads to reduce light escaping site. Require, consistent with applicable law, best management practices, including downward shielded lighting and lumens measurement outside of facility.	No differences.
32. Machine Maintenance/Fueling. No maintenance of equipment or maintenance involving hazardous materials within 300 feet of a water source. All fueling must occur over impervious material.	**17-54-090(K).** Maintenance of Machinery. Routine field maintenance of equipment involving hazardous materials within three hundred (300) feet of any water body is prohibited. All fueling must occur over impervious material and shall not be done during storm events. Operator shall operate and maintain all equipment in accordance with manufacturer specifications. Regular maintenance checks required for all equipment.	Regulations have more requirements than LCR.

Mud Tracking. Mud tracking on City streets must be *de minimus*. Operator shall take all practical measures to prevent mud and operator must clean up any mud tracked onto City streets from all construction and operations.	**17-54-090(Y).** Mud tracking. Mud tracking on City streets must be *de minimus*. Operator shall take all practical measures to prevent mud and operator must clean up any mud tracked onto City streets from all construction and operations.	No differences.
34. Noise Mitigation. • Obtain all power from utility line power or renewable sources and require the most current equipment to minimize noise impact during drilling, completions, and all phases of operation, such as electric drill rigs and other noise control measures. • Review industry standards as those progress, including the most current equipment. • Provide for sound controlled fracking equipment, including quiet fleets that reduce the noise of the pumps and motors associated with hydraulic fracturing. • May require additional noise mitigation if sound level exceeds 60 dB(A) at 500 feet from the source and 50 dB(A) at 1000 feet from source. Consider 5 dba lower during set night time hours. • Require the operator to address C scale noise/vibration through berming and other associated BMPs. During drilling and completion phases, require	**17-54-100(B).** Noise. 1. To reduce noise impacts, one or more of the following may be required: a. Obtain all power from utility line power or renewable sources. b. Utilize the most current equipment to minimize noise impact during drilling, completions, and all phases of operation including the use of "Quiet Fleet" noise mitigation measures for completions. c. Sound walls around well drilling and completion activities to mitigate noise impacts. d. Provide for sound controlled fracking equipment, including quiet fleets that reduce the noise of the pumps and motors associated with hydraulic fracturing. e. no unloading of pipe or other tubular goods between 6:00 p.m. and 8:00 a.m. f. No onsite power generation other than emergency power. **17-54-060.** All applications …shall include the following information which	The draft regulations do not contain all of the recommended maximum DP levels contained in the LCR.

at least a thirty two (32) feet high soundwall and hay bales to mitigate noise as appropriate on a case by case basis. Additional noise mitigation may be required in order to achieve the desired C scale noise at or below 60 db(C) at ____ feet from the source during drilling or hydraulic fracturing. • Require no unloading of pipe between 9:00 p.m. and 6:00 a.m. • Develop enforcement protocols for use of calibrated noise meter. • Ambient noise survey for each well site at baseline and during drilling, hydraulic fracturing, flowback, and operations • Noise modeling.	will be subject to review and approval by the City:…(K) Protocol to conduct noise modeling for each facility for pre-construction and active drilling, hydraulic fracturing, flowback and operations. (L) Noise Impact Mitigation Plan that demonstrates compliance with the standards of Section 17-54-060.	
35. Flowlines/Pipelines. Pursue the development of pipelines for transport of fresh water, produced water, oil, and gas to or from the oil and gas facility site and to gain permission of designated land owners, prior to drilling, and subject to approval by the City that includes: • Public/Private Improvement Permit from the City for all oil and gas pipelines • Enhanced pipeline (includes all pipelines, flowlines, gathering lines, etc.) inspection by operators including quarterly pressure testing and leak	**17-54-060** - All applications…shall include the following information which will be subject to review and approval by the City:…(C) A detailed site plan for all Well Sites that includes …a depiction of all visible improvements within 500 feet of the proposed location, to include … pipelines… as required by COGCC Rule 303.d(3)C, and the site plan requirements of the Broomfield Municipal Code, as amended. **17-54-090(P).** Pipelines (1) Any newly constructed or substantially modified oil and gas flow	Regulation does not require quarterly pressure testing required by LCR. Regulation does not require legal description to be recorded with the City recorder. Regulation does not require operator to use boring technology when crossing streams and rivers. Regulation does not require above-ground pipelines to be physically marked.

detection program with results provided in writing to the City • City to explore equipment to check for pipeline leaks from the surface Pursue additional State regulation of pipelines to include requirements for safety technology, more frequent testing, and mapping of all pipelines. Require underground oil, gas, and produced water export pipelines to be present before start of fluid flow from any well bore. Water supply to the site for drilling and completions use must be supplied by pipelines. All new flowlines shall have the legal description of the location recorded with the City Clerk and Recorder of the city within thirty (30) days of completion of construction. Abandonment of any recorded flowlines shall be recorded with the Clerk and Recorder of the City within thirty (30) days after abandonment. In addition, any newly constructed or substantially modified pipelines/flowlines on site shall meet the following requirements: A. Owners or operators may be	lines, crude oil transfer lines or gathering lines proposed as part of an Applicant's oil and gas operations are subject to use by review under Section 17-54-050. (2) To the maximum extent possibleracticable, and subject to any provisions contained elsewhere, flow lines, crude oil transfer lines and gathering lines outside Applicant's well pad shall be sited to avoid areas containing existing or proposed residential, commercial, and industrial buildings; places of public assembly; surface water bodies; and city open space. (3) To the maximum extent possibleracticable, without compromising pipeline integrity and safety, Applicant shall share existing pipeline rights-of-way and consolidate new corridors for pipeline rights-of-way to minimize impact. (4) For pipelines outside the well pad and subject to use by special review, setbacks from residential, commercial, or industrial buildings, places of public assembly, the high-water mark of any surface water body and sensitive environmental features will be determined on a case-by-case basis in consideration of the size and type of pipeline proposed and features of the proposed site. (5) ORequire shalloperator to shall comply with Broomfield's Public/Private Improvement Permit and easement	

required to conduct quantitative and qualitative risk analysis to identify potential threats associated with pipelines, likelihood of occurrence of threats, and area and resources that could be impacted by a pipeline incident B. To the maximum extent feasible, all flow lines, gathering lines, and transmission lines shall be sited a minimum of one-hundred and fifty (150) feet away from general residential, commercial, and industrial buildings, as well as the high-water mark of any surface water body. This distance shall be measured from the nearest edge of the pipeline/flowline. Pipelines and gathering lines that pass within 150 feet of general residential, commercial, and industrial buildings or the high water mark of any surface water body shall incorporate leak detection, secondary containment, or other mitigation, as appropriate. The mitigation plan for such pipelines and gathering lines shall be submitted to the city for review and approval. C. Flowlines that pass within 150 feet of general residential, commercial, and industrial buildings or the high water mark of any surface water body may be required to incorporate leak detection, secondary containment, or other	processes for all pipelines installed in Broomfield owned property or rights of way. Operator mMust also obtain public/private improvement permit for all pipelines located in right of way. **17-54-090(I)(2).** Leak detection and repair…At least once per year, the operator shall notify the City five business days prior to an LDAR [DEFINE] inspection of its facilities to provide the City the opportunity to observe the inspection. Operator must make all records required to be kept by CDPHE available to the Inspector. **17-54-090(Q).** Spills and Leaks. Chemical spills and releases, including spills of produced water, oil, condensate, natural gas liquids, all spills outside of secondary containment, and E & P waste, must be reported and cleaned up according to applicable state and federal laws, including the Oil and Pollution Act and the Clean Water Act, as applicable. Operators must report spills and hydrocarbon emissions leaks to the City and County Manager immediately and no later than twenty–four (24) hours of the time the leak or spill is discovered. Operators must submit a follow up report within 30 days of the incident that includes, the cause and duration of the	

mitigation, as appropriate. D. Owners or operators may be required to conduct quarterly pressure testing or leak detection inspections, including smart pigging, in order to identify flowline leaks or integrity issues. Reporting to City of location of any discovered abandoned flowlines is required. E. To the maximum extent feasible, pipelines shall be aligned with established roads in order to minimize surface impacts and reduce habitat fragmentation and disturbance. F. To the maximum extent feasible, operators shall share existing pipeline rights-of- way and consolidate new corridors for pipeline rights-of- way to minimize surface impacts. G. To the maximum extent feasible, operators shall use boring technology when crossing streams, rivers, or irrigation ditches with a pipeline to minimize negative impacts to the channel, bank, and riparian areas H. All new pipelines shall have the legal description of the location recorded	event, identification and quantity of the material(s) spilled, leaked or emitted, the corrective actions taken (including disposal of contaminated materials) and preventative measures put in place to prevent reoccurrence. **17-54-090(EE).** Risk Management. Operator shall submit a site-specific detailed quantitative and qualitative risk management plan that includes but is not limited to risk identification, qualitative and quantitative risk assessment, methods of risk avoidance and control that implement techniques to prevent the accident/loss and reduce the impact or cost of loss after it occurs associated with pipelines and other oil and gas facilities. **17-54-100(A)(1)(s).** Pipeline infrastructure for fresh water, produced water, natural gas, crude oil and condensate will be constructed and placed into service prior to the start of any fluid flow from any wellbore. **17-54-100(C)** Pipelines. 1. The following may be required: a. To the maximum extent feasible, site flow lines, crude oil transfer lines and gathering lines a minimum of one-hundred and fifty (150) feet away from general residential, commercial, and	

with the Clerk and Recorder of the City within thirty (30) days of completion of construction. I. Operators will submit to City all records required to be submitted to PHMSA or the PUC including those related to inspections, pressure testing, pipeline accidents and other safety incidents. J. Operators shall physically mark all pipelines above ground.	industrial buildings, as well as the high-water mark of any surface water body. This distance shall be measured from the nearest edge of the pipeline/flowline. b. Flowlines that pass within 150 feet of general residential, commercial, and industrial buildings or the high water mark of any surface water body may be required to incorporate leak detection, secondary containment, or other mitigation, as appropriate. c. Conduct leak detection inspections in order to identify flowline leaks or integrity issues. d. Make available to Inspector upon request intain all all records required to be kept by COGCC R. 1102.m. and of results of pressure tests and leak detection tests and make available to Inspector upon request. e. Submission to City of all records required to be submitted to PHMSA or the PUC including those related to inspections, pressure testing, pipeline accidents and other safety incidents.	
36. Removal of Debris. All excess debris shall be removed from an oil and gas facility site in a timely manner . No burning of debris permitted for any activity on well site, including, but not limited to, drilling, hydraulic fracturing, flowback, recompletion, redrilling or	**17-54-090(N).** Removal of Debris. All excess debris shall be removed during construction activities. No burning of debris permitted for any activity on well site, including, but not limited to, drilling, hydraulic fracturing, flowback, recompletion, redrilling or plugging and	No differences.

plugging and abandoning.	abandoning.	
37. Removal of Equipment. No permanent storage. When no longer used, equipment must be removed in 30 days unless surface owner agrees and City Manager or his designee agrees to temporary equipment to remain on site for more than 30 days.	**17-54-090(O).** Removal of Equipment. No permanent storage. When no longer used, equipment must be removed in 30 days unless surface owner agrees and city and county manager or his designee agrees to temporary equipment to remain on site for more than 30 days.	No differences.
38. Soil and Gas Monitoring. Develop and implement a site-specific soils testing and monitoring plan approved by Broomfield for existing oil and gas wellbores within 150 feet of proposed new wellbores associated with a new oil and gas development project that includes but is not limited to: • Baseline for the presence of hydrocarbons near any existing wellbores by a consultant approved by Broomfield and paid for by the operator; and • Periodic monitoring for the presence of hydrocarbons after drilling and hydraulic fracturing of new wellbores in the vicinity of the existing wellbores by a consultant approved by Broomfield and paid for by the operator.	**17-54-100(E)(1)(a).** Assessment and monitoring of plugged and decommissioned or removed from use and dry and removed from use oil and gas wells (abandoned wells) within one-quarter (¼) mile of the projected track of the borehole of a proposed well. This may include:…(5) For each abandoned well for which access is granted, a soil gas survey of the abandoned well prior to production from the proposed well and again one (1) year and then every three (3) years after production has commenced. (6). Notification of the results of the soil gas survey to the City and County Manager and the COGCC within three (3) months of conducting the survey or advising the City and County Manager that access to the abandoned wells could not be obtained from the surface owner.	No substantial differences.
39. Spills. Operator must notify City of all	**17-54-090(D).** Liquid spills and	Regulation contains more requirements

spills of any material which have a reportable spill quantity under any local, state or federal law, on permeable ground. Operator must keep a daily incident log that is to be submitted to the City monthly/quarterly for posting on City website.	releases. To minimize spills and releases from oil and gas facilities, the following measures may be required, including, but not limited to, one or more of the following: 1. Berms or other secondary containment devices around crude oil, condensate, and produced water storage tanks enclosing an area sufficient to contain and provide secondary containment for one-hundred fifty percent (150%) of the largest single tank. Berms or other secondary containment devices sufficiently impervious to contain any spilled or released material. Inspection of all berms and containment devices at regular intervals, but not less than monthly.. Maintenance of all berms and containment devices in good condition. A prohibition on the storage of ignition sources inside the secondary containment area unless the containment area encloses a fired vessel. 2. Construction of containment berms using steel rings, designed and installed to prevent leakage and resist degradation from erosion or routine operation. 3. Construction of secondary containment areas with a synthetic or engineered liner that contains all primary containment vessels and	than the LCR.

	flowlines and is mechanically connected to the steel ring to prevent leakage. For locations within five hundred (500) feet and upgradient of a surface water body, tertiary containment, such as an earthen berm, around Oil and Gas Operations. 4. A prohibition on more than two (2) crude oil or condensate storage tanks within a single berm. 5. Closed loop pitless drilling systems. 6. Notification to the City of all spills of a gallon or more that leaves the facility. 7. Operator must keep a daily incident log that is to be submitted to the City monthly/quarterly.	
40. Stormwater Control Plan. Operator shall submit a stormwater control plan for City approval and comply with all applicable law.	**17-54-060.** All applications…shall include the following information which will be subject to review and approval by the City:…(Y) Stormwater Management Plan that identifies possible pollutant sources that may contribute pollutants to stormwater, Best Management Practices (BMPs), sampling procedures (if required), and inspections that, when implemented, will reduce or eliminate any possible water quality impacts.	No substantial differences.
41. Temporary Access Roads. Operator will assure that temporary access roads	**17-54-090(R).** Temporary Access Roads. Operator will assure that	No differences.

are reclaimed and revegetated within 60 days of discontinued use. Erosion must be controlled while they are in use.	temporary access roads are reclaimed and revegetated within 60 days of discontinued use. Erosion must be controlled while they are in use.	
42. Trailers. A construction trailer(s) is permitted during active site construction, drilling, and completions only. No residential trailers will be allowed. Only equipment needed for project should be on site.	**17-54-090-(Z).** Trailers. A construction trailer is permitted during active drilling and completions only. No residential trailers will be allowed. Only equipment needed for project should be on site.	No substantial differences.
43. Transportation & Circulation. Prior to the start of construction, require operators to do a complete traffic study and report to determine any operational changes and geometric modifications necessary for extraction activities. This will include, but not be limited to: • Detail of access locations for each well site including sight distance, turning radius of vehicles and a template indicating feasibility of turning volumes in and out of each site for an average day and what to expect during the peak hour. • Anticipated truck traffic volumes will be converted to equivalent single axle loads and compared with existing volumes. • Core drill or boring samples of City roads will be used to determine the	**17-54-060(T)**. A traffic study and management plan. Operator to submit reasonable bond to cover any damage to public infrastructure during active drilling, completion and operation. Prior to the start of construction, Operator must complete traffic study and provide detailed traffic plan to determine any operational changes and geometric modifications necessary for extraction activities. This will include, but is not limited to: 1. Detail of access locations for each well site including sight distance, turning radius of vehicles and a template indicating feasibility, turning volumes in and out of each site for an average day and what to expect during the peak hour. 2. Anticipated truck traffic volumes will be converted to equivalent	No substantial differences.

adequacy of the existing roadway structure and determine if roadway section is adequate for extraction activities. • Truck routing map and truck turning radius templates, with a listing of required improvements deemed necessary at intersections along the route. • Identification of need for any additional traffic lanes. • Restriction of traffic to and from oil and gas facility site to periods outside of peak am and pm traffic periods. (generally 7-9am and 3-6pm) • A traffic study to determine impacts to City streets and required improvements. Require that operators follow applicable hazmat regulations and insure for exposure related to potential truck accidents. Establish criteria for impacts to streets to accommodate traffic generated by oil and gas operators that may cause long term degradation of infrastructure, including streets. Commitment by operator to fund infrastructure improvements required to support the extraction activities.	single axle loads and compared with existing volumes. 3. Core drill or boring samples of City roads will be used to determine the adequacy of the existing roadway structure and determine if roadway section is adequate for extraction activities. 4. Truck routing map and truck turning radius templates will be used to determine if improvements are necessary at intersections along the route. 5. Identification of need for any additional traffic lanes. 6. Restriction of traffic to and from facilities to periods outside of peak am and pm traffic periods (generally 7-9am and 3-6pm). 7. Require a traffic study to determine impacts to City streets. **17-54-070(BB).** Transportation, Roads, and Access. Oil and gas operations shall, to the maximum extent possible practicable, be designed and implemented to minimize or mitigate impacts to physical infrastructure of the city transportation system, ensure public safety, and maintain quality of life for other users of the city transportation system, adjacent residents, and affected property owners. Where available,	

Consider operators paying for significant degradation caused by operations and the resulting cost of repairs.	existing private roads must be used to minimize land disturbance unless traffic safety, visual concerns, noise concerns, or other adverse surface impacts dictate otherwise. Operator must fund infrastructure improvements required to support extraction activities and pay for significant degradation caused by operations and the resulting cost of repairs. Operator must comply with hazmat regulations and obtain adequate insurance for exposure related to potential truck accidents.	
44. Wastewater & Waste Management. Waste management plan approved by the City.	**17-54-060.** All applications…shall include the following information which will be subject to review and approval by the City:…(DD). Waste Management Plan that identifies waste types and associated hazards, the approximate quantities, storage method(s), transportation and management method(s), communication and training of employees, identification of individuals responsible for waste management by facility or site, spill and release prevention methods, emergency management strategies (including spill containment), and inspection types and frequencies. **17-54-060(V).** Applicant must submit estimated water supply requirements and usage for the proposed development	Regulations have more detailed requirements than the LCR.

	including:…(5) An estimate of the amount of water that will be used at the site, where and how the water will be consumed, the amount of wastewater produced, and disposal plans for wastewater.	
45. Weed Control. Weed control is required on the site and area for "flowlines" and pipelines until final reclamation and abandonment.	**17-54-070(L)** A weed control plan that to the maximum extent practicable, avoids causing degradation to vegetation. **17-54-090(T)** Weed Control. Required at the facility until final reclamation and abandonment.	Regulation does not specifically mention flowlines and pipelines.
46. General Maintenance. Operator shall operate and maintain all equipment in accordance with manufacturer specifications. Regular maintenance checks required for all equipment.	**17-54-090(K).** Maintenance of Machinery. Routine field maintenance of equipment involving hazardous materials within three hundred (300) feet of any water body is prohibited. All fueling must occur over impervious material and shall not be done during storm events. Operator shall operate and maintain all equipment in accordance with manufacturer specifications. Regular maintenance checks required for all equipment.	Regulation is more detailed and contains more requirements than LCR, but does contain all the LCR's requirements.
47. Enforcement. The Update Committee suggests that enforcement is a necessity and the City should consider utilizing all enforcement avenues available. Some specific areas of enforcement provisions	**17-54-270 -** Penalty. Subject to other applicable provisions of law, any person who constructs, installs, or uses, or who causes to be constructed, installed, or used, any oil, gas, or injection well,	The regulation's enforcement provision is broader than the LCR's suggestions and does not contain the specific enforcement provisions suggested by the LCR. The regulation provides that violations may be

suggested include: application fees based on the proposed project's impact to the City, higher fines for repeat offenses, self-reporting requirements, evidence of all violations of regulations in oil and gas operations under federal and state laws, per-day per-violation matrix based on severity of violation and impact to human health and property	production site, or well site in violation of any provision of this chapter or of the conditions and requirements of the oil and gas special use permit or administrative approval by memorandum of understanding, may be punished as provided in chapter 1-12, B.M.C. Each day of such unlawful operation constitutes a separate violation. **17-54-280 -** Civil action; enforcement. In case of any violation of this chapter, including but not limited to (a) nonconformance with a memorandum of understanding or special review permit, (b) nonconformance with plans submitted and approved by the city pursuant to this chapter, or (c) a building or structure is or is proposed to be erected, constructed, reconstructed, altered, or used, or any land is or is proposed to be used, in violation of any provision of this article or the conditions and requirements of the oil and gas special use permit or memorandum of understanding, the city attorney, in addition to the other remedies provided by law, ordinance, or resolution, may institute an injunction, mandamus, abatement, or other appropriate action or proceeding to prevent, enjoin, abate, or remove such unlawful erection, construction, reconstruction, alteration, or use. The enforcement provisions of this	punished as provided in chapter 1-12, B.M.C.

	chapter shall apply to all special review permits or memorandums of understanding adopted pursuant to this chapter and all operator agreements adopted on or after August 1, 2013.	
49. Transportation and Impact Fees. Transportation and road impact fees are recommended and City staff should determine recommended scope and structure.	None	The regulation does not have any provision regarding transportation or road impact fees, as suggested by the LCR.
50. Injection Wells. No injection wells allowed in Broomfield.	**17-54-090(CC)** Wastewater injection wells are prohibited in Broomfield.	The regulation uses the term "wastewater" while the LCR does not.
51. Alternative Site Analysis. Identify and locate oil and gas facilities to protect public health, safety, welfare and the environment. Require operator, prior to application submittal to Broomfield, to engage with Broomfield to identify and evaluate alternative oil and gas facilities and well sites (Sites). Possible Sites identified shall be evaluated based upon a Broomfield set of factors, or other mutually agreed methodology, prior to submittal of any spacing application to the Colorado Oil and Gas Conservation Commission (COGCC). Provide alternative Site analysis details as outlined in regulations. See attached Appendix A. Require operator to identify distance from	**17-54-050(C)** Alternative Site Analysis. At the pre-submittal meeting, Operator shall identify distance of proposed pad to residences, occupied buildings, water bodies, floodplains, and roadways in order to consult with the City to identify alternative sites. Possible alternative sites identified shall be evaluated based upon a set of factors identified by the City, or other mutually agreed methodology. To the extent reasonably feasible, Operator shall consult with the City on the alternative site analysis prior to submittal of any spacing application to the Colorado Oil and Gas Conservation Commission (COGCC).	Although language is a little different, both the LCR and the regulation cover the same substantive points

the Site to the closest residences, occupied buildings, water bodies, floodplains, and roadways.	**17-54-080** –Documents submitted prior to drilling…(L) a final alternative site analysis.	
52. Odor. Odor emitting from sites must be controlled. Operator to prevent odors from oil and gas operations from affecting the health and welfare of the public by proactively addressing and resolving complaints filed by impacted members of the community, in coordination with City's public health staff. Consider use of filtration systems. Operator is prohibited from masking odors from any oil and gas facility site by using masking fragrances. Consider developing an ordinance that uses police power and fees to address unresolved complaints.	**17-54-070(X).** Odor. Oil and gas operations must comply with Colorado Department of Public Health and Environment, Air Quality Control Commission, Regulation No.2 Odor Emissions, 5 CCR 1001-4, Regulation No. 3, 5 CCR 1001-5, and Regulation No. 7, 5 CCR 1001-9 Section VII and VIII. The operator must notify the City and County Manager no later than 24-hours after receiving an odor complaint. Odor emitting from sites must be controlled. Operator to prevent odors from oil and gas operations from affecting the health and welfare of the public by proactively addressing and, to the fullest extent possible, resolving complaints filed by impacted members of the community, in coordination with City and County of Broomfield public health staff. **17-54-100(A)(1)(k)** Year-round application of odor requirements pursuant to COGCC and CDPHE regulations. **17-54-100(A)(1)(m)** Filtration systems or additives to minimize odors from drilling and fracturing fluids except that operators shall not mask odors by using masking	Regulation is more detailed than LCR.

	fragrances.	
53. Reclamation. Require oil and gas site reclamation plan and reclaim not later than six (6) months of plugging and abandoning of well(s).	**17-54-060.** All applications…shall include the following information which will be subject to review and approval by the City:…(F) A plan for interim reclamation and revegetation of the well pad and final reclamation of the well pad. **17-54-090(M).** Reclamation. Operators will comply with COGCC interim and final reclamation requirements. Seeding will take place when climate is conducive to seed germination. Final well site reclamation will ensure compatibility with neighboring land uses at the time of reclamation. **17-54-090(U)** Well Abandonment or Decommissioning. The Applicant must comply with any COGCC rules regarding well abandonment, decommission, or reclamation. Upon plugging and reclaiming a well, the Applicant must provide the City with surveyed coordinates of the decommissioned or reclaimed well. Unless permanent physical marker of the well location. City inspector must be onsite during plugging and abandoning.	Regulation does not have six-month requirement set forth in LCR.

54. Fire and Explosions. Any accident or natural event involving a fire, explosion, detonation, or release of pressure shall be reported to the City and County of Broomfield within 24 hours. This report shall include such specifics as: • Fuel source • Location • Proximity to residences and other occupied buildings • Cause • Duration • Intensity • Volume • Specifics and degree of damage to properties • Injuries to person(s) • Inventory of combustible or explosive chemicals and supplies on site at the time • Estimate of economic costs • Emergency management response • Remedial and preventive measures to be taken within a specified amount of time This information will compiled annually and presented in a form accessible and understandable to the public and policy makers.	**17-54-070(K).** Emergency Preparedness and Response. Oil and gas operations shall, to the maximum extent practicable, avoid risks of emergency situations such as explosions, fires, gas, oil or water pipeline leaks, ruptures, hydrogen sulfide or other toxic gas or fluid emissions, and hazardous material vehicle accidents or spills. Oil and gas operations shall ensure that, in the event of an emergency, adequate practices and procedures are in place to protect public health and safety and repair damage caused by emergencies.	Regulation does not require reporting of all items listed in the LCR.
55. Variances. All variances, waivers,	**17-54-220 -** Variances generally.	The regulation is more detailed than the

exceptions, and similar modifications require written approval from the City.	A. *Variance request* . In both the use by special review permit and administrative approval by memorandum of understanding processes, an applicant may request a variance from any provision of this chapter. A request for a variance under this subsection may be included in the applicant's application and shall be processed, reviewed and granted, granted with conditions or denied in accordance with and as part of the use by special review permit or administrative approval by memorandum of understanding processes, as applicable. The variance provisions of chapter 16-36, B.M.C. shall not be applicable to a variance request under this chapter. B. *Operational conflicts variance for use by special review permit.* In the case of an application for a use by special review permit, a variance from the application of any provision of this chapter shall be granted if the provision is in operational conflict with the Act or COGCC regulations, meaning the application of the provision have the effect of materially impeding or destroying a state interest as expressed in the Act or COGCC regulations. This subsection does not apply in the case of an application for administrative approval by memorandum of understanding. (C) *Other variances grounds for*	LCR but contains all the LCR's requirements.

	variance. A variance from the application of any provision of this chapter shall be granted on the basis of one or more of the following grounds. A variance may be in the form of a waiver or modification, as applicable: 1. There is no technology commercially available at a reasonable cost to conduct the proposed oil and gas operations in compliance with the provision, and granting a variance from the operation of the provision will not have an adverse effect on the public health, safety, or welfare, or on the environment. 2. An alternative approach not contemplated by the provision is demonstrated to provide a level of protection of the public health, safety, and welfare, and of the environment, that would be at least equivalent to the applicable provision. 3. Application of the provision is impractical or would create an undue or unnecessary 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 operation site, inadequate public infrastructure to the site, or close proximity of occupied	

	buildings.	

Financial assurance. Operator may be required to provide financial security to guarantee compliance with any conditions of approval imposed by the City. The amount of security will be based on estimated costs to comply with the conditions of approval.