

**PUBLIC COMMENTS &  
OPERATOR RESPONSES**

**Adams County  
Community and Economic Development Department  
Development Review Comments**

| Case Number: USR2016-00006 |         | Case Name: Ward Ivey      |   |  |
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| Applicant: Ward Petroleum  |         | Date Initiated: 3/13/2017 |   |  |
| Referral Comment No.       | Mapped? | Reviewer Initials         | County Comment  | Applicant Response<br>(August 27, 2017)  |
| 1                          | No      | JR                        | Staff has reviewed the concerns, which include public and environmental health. | <p>2, 3, 4. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject at <a href="https://www.colorado.gov/pacific/cdphe/oil-and-gas-health-assessment">https://www.colorado.gov/pacific/cdphe/oil-and-gas-health-assessment</a>.</p> <p>5. Property values are affected by many factors, and studies regarding the impacts of oil and gas development have come to differing conclusions. Property values are affected by economic development activity as well as proximity of many factors from infrastructure to other housing.</p> <p>6. A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County</p> <p>7. Ward submitted a traffic plan with our application and has been refining it. The current plan will be re-submitted to the County with our updated information for the AUSR application.</p> <p>8. Ward is not permitting or constructing the pipeline, but can confirm a pipeline will be connected by a gas gathering company to the Ivey pad assuming County approvals are obtained.</p> <p>10. Ward will acquire water from a source approved by the State Engineer.</p> <p>According to a report posted by the Colorado Oil and Gas Conservation Commission (COGCC) on their</p> |

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|   |     |    |   | <p>website, entitled “Water Sources and Demand for the Hydraulic Fracturing of Oil and Gas Wells in Colorado from 2010 through 2015” indicated the amount of water used for hydraulic fracturing is less than 0.08% of water consumed in the state.</p> <p>11. The plan for wastewater disposal is included in our application.</p> <p>12. Ward has prepared an Emergency Preparedness Plan with input from local fire districts and Adams County 12 School District.</p> <p>13. Ward holds liability insurance which meets the requirements of the State of Colorado.</p>  |
| 2 | Yes | JR | <p>Staff has reviewed the concerns, which include public safety, noise, and visual impacts.</p>   | <p>Ward is sensitive to community and citizen concerns about noise, light, and visual impact. We have taken steps to proactively manage noise by applying sound modeling from consultants to estimate sound levels to optimize the location and design of sound walls. The sound walls will be extended along the south side, the east side of the pad and along the north side of the pad. The wall will not be installed on a portion of the west side of the pad because an agricultural field is adjacent. Ward is also performing photometric analysis to reduce light exposure near our drilling locations. As another example, Ward has prepared visual simulations to show examples of the final site to scale from three different directions. Ward has taken steps to address these concerns as part of our site development plans.</p> |
| 3 | No  | JR | <p>In response to the questions:</p> <ol style="list-style-type: none"> <li>1) The ‘Will Serve’ letter from the North Metro Fire District is a requirement of the permit approval.</li> <li>2) The pipeline easements will be required at the time of permitting the pipeline through the County Conditional Use Permit process.</li> </ol> <p>The applicant should address the concerns noted in the letter:</p> <ol style="list-style-type: none"> <li>3) Provide a timeline of proposed construction, drilling, and production.</li> <li>4) Clarify the noise mitigation plans.</li> <li>5) Steel berm capacity</li> </ol> | <p>Please note: This response addresses the Adams County Communities for Drilling Accountability Now (ACCDAN) comments. Responses here to ACCDAN comments will be referenced in future mentions of these comments.</p> <ol style="list-style-type: none"> <li>1. Will serve letter from the North Metro Fire District has been obtained.</li> <li>2. A pipeline connection which will transport oil and produced gas is planned for the Ivey location. Pipeline easements and permitting are being conducted by another company.</li> <li>3. A specific date when construction, drilling and production would begin is still variable as the</li> </ol>   |

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|  |  |  | <ol style="list-style-type: none"> <li>6) Security fencing</li> <li>7) Provide clarification on the on-site equipment.</li> <li>8) Again, clarify intent of proposed equipment, if pipeline is planned.</li> <li>9) How will Big Dry Creek be protected from runoff?</li> <li>10) Consult with the City of Thornton about the road impacts.</li> <li>11) Where is the wastewater going?</li> <li>12) Provide clarification about the Traffic Impact Study numbers, with regard to a pipeline.</li> <li>13) Same as 12.</li> </ol> <p>Regarding the proximity to the school and bus routes, Adams 12 was consulted and provided comments, including school bus hours to avoid.</p> | <p>planning process continues, but it is expected drilling the initial 2 wells would occur in the spring of 2018; a 2-mile lateral to the north and a 3-mile lateral to the south. In that scenario, construction would require 14-21 days, then 16-20 days to drill two wells and another 21-28 days to complete both wells. After evaluating the first two wells, Ward would return to drill the remaining 24 wells within 1-2 years. Once Ward returns to the site, it is conservatively estimated that drilling the remaining 24 wells would require approximately 192-240 days and completion operations would require another 222-285 days. With continuing advancement in drilling and completion technology, these projections may be shortened.</p> <ol style="list-style-type: none"> <li>4. The noise wall drawing submitted with the application was conceptual. It will be placed along the south side, extended up the east side of the pad and along the north side of the pad. The wall will not be installed on the west side because it is adjacent to an agricultural field.</li> <li>5. The capacity of the berm is 1.5 times the largest tank and an allowance for precipitation as required in the regulations.</li> <li>6. The site will be perimeter fenced consistent with the requirements of the COGCC and Adams County.</li> <li>7. A site plan has been provided with the original application. In addition to the wells, the site will have separators, tanks, emission control devices, and a vapor control unit.</li> <li>8. Ward plans to connect a pipeline to the site. A pipeline connection will reduce the number of storage tanks at the site. What was originally submitted was a non-pipeline scenario since the pipeline connect was unknown then. However, at this point it appears a pipeline route has been identified. While final design of the number of tanks will be depending upon production, it is anticipated the number of oil tanks would be in the range of 6-10 at the site.</li> </ol> |
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|  |  |  |  | <ol style="list-style-type: none"><li>9. A storm water management plan was submitted with the application; this plan includes best management practices to manage runoff.</li><li>10. A meeting was held with the City of Thornton regarding traffic aspects and options along 152<sup>nd</sup> St to access the site. A deceleration lane will be installed to access the site from 152<sup>nd</sup> Street. Trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li><li>11. Waste water will be trucked from the site to one of several offsite commercial Class II Underground Injection Control (UIC) wells.</li><li>12. The total number of truck trips during drilling and completion does not anticipate pipelines being used because the pipelines will be put in service after completion operations to transport oil and produced gas.</li><li>13. The 144 one-way truck trips are for operations and maintenance trips associated with well workovers/repairs. The number is the same with or without pipelines. The 21 weekday trips are peak traffic which occurs during development. An updated Traffic Impact Study will be submitted to Adams County.</li><li>14. A meeting was held with Adams 12 schools regarding safety planning and bus schedules. Adams 12 Five Star Schools commented on consideration being given to limit truck trips during certain hours. Ward will strive to manage truck traffic as requested by the Adams 12 Five Star Schools to the extent possible, but some deliveries and associated truck traffic is inevitable at various times of the day.</li><li>15. Trucks for the Ivey project will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. The bridge north of E-470 on York Street will not be used by trucks. The main route to the Ivey location uses the same route along York Street and 152<sup>nd</sup> which many heavy trucks use daily.</li></ol> |
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| 4 | Yes | JR | Staff has reviewed the comments, which include concerns about noise and public safety.                   | <ul style="list-style-type: none"> <li>• A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. A sound wall is planned to be erected around the south, east, and north sides of the pad.</li> <li>• The location is in an open field with the nearest home 1,500' away.</li> <li>• A traffic plan was completed and submitted to Adams County; a revision is under development and will be submitted with final submission of the AUSR.</li> <li>• The project plan does not use surface acreage in Wadley Farms. COGCC regulations require that wellbore designs protect aquifers used for domestic sources of water.</li> <li>• The location is outside the city limits of Thornton, but Ward Petroleum has met with the City of Thornton to discuss their perspectives about the project including requirements to access the site off 152<sup>nd</sup> Street. This street is within the City of Thornton.</li> <li>• The pad is outside the boundary of the Open Space. However, plans are in place to screen the location with landscaping between Big Dry Creek and the site. There is also an existing pad to the east of the Ivey location.</li> <li>• The site complies with all setback requirements of the COGCC to ensure safety.</li> <li>• Traffic plans are discussed in response to Referral Letter #3, and trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> </ul> |
| 5 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic, environmental effects, and noise. | <ul style="list-style-type: none"> <li>• Ward is sensitive to community concerns and has relocated and enhanced design elements to respond to community comments, as discussed in response to Referral Letter #2.</li> </ul>  |

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|   |     |    |   | <ul style="list-style-type: none"> <li>• As discussed in response to Referral Letter #1, CDPHE recently published information on health impacts from oil and gas development.</li> <li>• Further, Ward meets or exceeds state regulations designed to protect public health and the environment.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• A pipeline connection which will transport oil and gas will further reduce truck traffic during production operations.</li> <li>• Noise mitigation is discussed in response to Referral Letter #2. Sound levels during drilling and completion operations will be mitigated using a sound wall.</li> </ul>   |
| 6 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic and public and environmental safety.  | <ul style="list-style-type: none"> <li>• Ward is sensitive to community member concerns as is discussed in response to Referral Letter #2.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• Ward has developed a safety plan with input from Adams County, North Metro Fire and the Adams County 12 School District.</li> <li>• The site will be equipped with remote/automation to monitor conditions at the site and would allow for remote shut-in if needed.</li> <li>• As discussed in response Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> </ul> |
| 7 | No  | JR | Staff has reviewed the concerns, which include visual impacts, public health and safety, and traffic.<br><br>Regarding transparency of the County permit process, letters are sent to property owners within ½ mile of the parcel boundary at least two times during the process (Neighborhood Meeting invitation and Request for Comments). The application and all case materials are | <ul style="list-style-type: none"> <li>• There are no plans to expand the Ivey well pad to accommodate 52 wells.</li> <li>• The visual simulations/renderings shown at the neighborhood meeting were conceptual, but were to scale from three different directions. The final approved landscaping plan will be the basis for screening the location from view and is subject to approval by Adams County.</li> </ul>  |

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|    |     |    | posted on the County website and the property is posted with a Public Notice sign with information about the application and contact information for the County. | <ul style="list-style-type: none"> <li>As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>As discussed in response to Referral Letter #3, pipelines will be installed.</li> <li>As discussed in response Referral Letter #1, Ward has prepared an emergency response plan with input from local emergency responders and the Adams County 12 school district. The site will be equipped with remote/automation to monitor conditions at the site and would allow for remote shut-in if needed.</li> <li>As discussed in response to Referral Letter #1, CDPHE recently published information regarding health impacts from oil and gas development.</li> <li>As discussed in response to Referral Letter #3, Ward submitted a preliminary traffic plan and has been refining it for submittal with our updated AUSR permit application.</li> <li>The community meeting met the requirements of the Adams County Oil and Gas AUSR process. The size of the meeting room is important to allow an appropriate number of people to have an effective degree of interaction with Ward representatives.</li> </ul> |
| 8  | Yes | JR | Staff has reviewed the comments, which include concerns about public and environmental health and safety.  | Ward has reviewed this correspondence and is sensitive to community concerns as discussed in response to Referral Letter #2.   |
| 9  | No  | JR | Staff has noted the comment.   | Ward has reviewed this correspondence and noted the concerns.  |
| 10 | No  | JR | Staff has reviewed the comments, which include concerns about traffic, noise, lights, and public safety.   | Ward has reviewed this correspondence and noted the concerns.  |
| 11 | No  | JR | Staff has reviewed the comments, which include concerns about traffic, air quality, noise, and lights.   | <ol style="list-style-type: none"> <li>The plan for pipeline are discussed in response to Referral Letter #3.</li> <li>The traffic plan is discussed in response to Referral Letter #3. Additionally, Ward is installing a deceleration lane on westbound 152<sup>nd</sup> Avenue. Truck</li> </ol>  |

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|    |     |    |  | <p>traffic will not be permitted to travel west of the site on 152<sup>nd</sup> Avenue.</p> <ol style="list-style-type: none"> <li>4. The pipeline planned to the site will reduce the number of oil tanks initially planned for the site.</li> <li>5. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>6. With the main truck traffic utilizing E-470 to York Street, the bridge north of E-470 on York will not be used by truck traffic.</li> <li>7. Ward complies with all applicable requirements of the CDPHE and applicable air quality regulations. Response to Referral Letter #1 addresses a recent CDPHE information regarding health impacts from oil and gas development.</li> <li>8. While the photo simulation included with the permit application is conceptual, a landscape plan will be submitted with the purpose to screen the location and be subject to approval by Adams County.</li> <li>9. A sound wall is planned to be erected around the south, east, and north sides of the pad.</li> </ol> |
| 12 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic, groundwater, and air quality. | <ol style="list-style-type: none"> <li>1. The casing and cementing requirements of the COGCC are designed to protect public sources of groundwater. In addition, baseline water well testing requires sampling and monitoring of at least 4 wells within ½ of the site prior to drilling, after the wells are completed and one cycle thereafter. The requirement has been effective at assessing groundwater quality in the vicinity of oil and gas operations.</li> <li>2. Even after the required testing is completed, any changes in water quality which could be related to nearby oil and gas development will be investigated by the COGCC.</li> <li>3. A Traffic Impact Study (TIS) has been prepared which will be used to determine any impacts on roads during the project for purposes of determining road impact fees. Traffic is discussed further in response to Referral Letter #3.</li> <li>4. A pipeline will be constructed to the site to transport oil and gas from the site. This will reduce truck</li> </ol>  |

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|    |    |    |  | <p>traffic during the life of the project. The pipeline is discussed further in response to Referral Letter #3.</p> <p>5. As required by the Colorado Department of Public Health and Environment regulations, any tank vapors of VOC are sent to an emissions control device for combustion. When operating properly, these devices do not result in a flare/open flame resulting in light. CDPHE also has a leak detection program which is implemented by Ward to further reduce fugitive VOC emissions. Compliance with Regulation #7 of the Air Quality Control Division will significantly reduce VOC emissions and overall air quality.</p> <p>6. A landscape plan will be submitted to provide screening from the Ivey location to the proposed Big Dry Creek trail. The plan will be subject to approval by the Adams County Planning Department.</p> <p>7. Ward will acquire water from a source approved by the State Engineer. Source water is discussed further in response to Referral Letter #1.</p> <p>8. Ward has developed an emergency response plan as discussed in response to Referral Letter #1.</p> |
| 13 | No | JR | Staff has noted the comment.   | Comment noted.  |
| 14 | No | JR | Staff has reviewed the comments, which include concerns about road quality, traffic impacts, and flooding potential. | <ol style="list-style-type: none"> <li>1. A pipeline will be installed for oil and produced gas production from the site.</li> <li>2. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>3. A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>4. The pipeline connecting to the Ivey site will transport oil and gas offsite.</li> </ol>   |
| 15 | No | JR | Staff has reviewed the comments, which include concerns about traffic, flooding potential, and aesthetics.           | <ul style="list-style-type: none"> <li>• Comment noted.</li> <li>• The site was selected based the location of leases, the spacing unit and the planned drilling objectives.</li> <li>• Pipelines will be installed to transport oil and gas from the site.</li> </ul>  |

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|    |     |    |   | <ul style="list-style-type: none"> <li>While the comment did not specify the dimensions for “low profile”, Ward will be installing tanks no greater than 16’ high.</li> </ul>   |
| 16 | No  | JR | Staff has reviewed the comments, which include concerns about public health and safety.                             | Ward has reviewed this correspondence and noted the concerns.   |
| 17 | No  | JR | Staff has noted the comment.  | Ward has reviewed this correspondence and noted the concerns.   |
| 18 | Yes | JR | Staff has reviewed the comments, which include concerns about earthquakes, public health, and environmental safety. | <ol style="list-style-type: none"> <li>Comment noted.</li> <li>Air quality monitoring can be requested of the Colorado Air Quality Division.</li> <li>See comment above.</li> <li>Pipelines will be used to transport oil and produced gas from the site.</li> <li>The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>The site is not located within a 100-year flood plain.</li> <li>See comment #4 above.</li> <li>Comment noted.</li> <li>Comment noted.</li> <li>Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information referenced in response to Referral Letter #1.</li> <li>Comment noted.</li> <li>An emergency response plan has been prepared with input from emergency responders and the Adams 12 School District.</li> <li>Ward prioritizes operational safety and therefore implements best management practices (BMP) throughout our operations. For example, a number of best management practices are included in the storm water management plan.</li> <li>Ward plans to use pipelines for oil and gas production which are scheduled to be operational following drilling and completion of the wells.</li> <li>Comment noted.</li> <li>Comment noted.</li> <li>In extremely rare cases hydraulic fracturing has been linked to seismicity; however, to-date</li> </ol> |

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|    |     |    |   | <p>causation is inconclusive as specific, pre-existing geological conditions must be present for this to occur. While also rare, seismicity is more commonly linked to produced water being pumped back into the formation it came from to enhance oil recovery, or pumped into an injection well for permanent disposal. Data from the U.S. Geological Survey (USGS), found that induced seismicity is linked to less than 1% of all U.S. injection wells. Colorado has a one of the best permitting programs for underground injection control in the country, and requires operators to submit detailed documentation on the geology where they plan to drill or inject water prior to receiving a permit. Colorado's regulatory program has proven to be very successful in mitigating any risk from induced seismicity.</p> <p>18. See comment above.<br/>19. Comment noted.</p> |
| 19 | No  | JR | Staff has reviewed the comments, which include concerns about traffic and noise.                                      | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.   |
| 20 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic and public and environmental health and safety. | <ul style="list-style-type: none"> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>• The community meetings met the requirements of the Adams County Oil and Gas AUSR process. The size of the meeting room is important to allow an appropriate number of people to have an effective degree of interaction with Ward representatives.</li> <li>• The bridge at 156<sup>th</sup> and York will not be utilized for truck traffic. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. More information on traffic is addressed in response to Referral Letter #3.</li> </ul>   |

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|    |     |    |  | <ul style="list-style-type: none"> <li>• Ward has developed an Emergency Response Plan with input from Adams County, North Metro Fire and the Adams County 12 School District. It is important to note during production operations the site will have automation/remote monitoring so that the site can be shut down remotely if it was ever necessary.</li> <li>• As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> </ul> |
| 21 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic, home prices, and site security. | <ul style="list-style-type: none"> <li>• Ward has prepared a traffic management plan to minimize traffic and prevent incidents.</li> <li>• A sound wall is planned to be erected around the south, east, and north sides of the pad.</li> <li>• The site will have security fencing consistent with COGCC and Adams County requirements.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. A Traffic Impact Study (TIS) has been prepared by Ward to produce the trip generation and vehicle counts to better plan for the impact of the traffic associated with the Ivey location.</li> </ul>  |
| 22 | No  | JR | Staff has reviewed the comments and is considering the recommended BMPs to be added as potential COAs. | <ul style="list-style-type: none"> <li>• Comment noted.</li> <li>• Ward will be utilizing pipelines for oil and produced gas production, thus reducing the truck traffic during production operations. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• A traffic study has been prepared which will be used to determine any impacts on roads during the project for purposes of determining road impact fees if the Adams County has not already implemented a fee schedule.</li> <li>• BMP comment noted.</li> </ul>  |
| 23 | No  | JR | Staff has noted the comment.   | Comments noted.   |

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| 24 | Yes | JR | Staff has reviewed the comments, which include concerns about earthquakes and public health.                                  | Comments noted.  |
| 25 | Yes | JR | Staff has reviewed the comments, which include concerns about property values.  | As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. Real estate values are addressed in response to Referral Letter #1.   |
| 26 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic impacts and public and environmental health and safety. | <ol style="list-style-type: none"> <li>1) Pipelines are being installed for oil and produced gas production thus reducing truck trips from the site.</li> <li>2) The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>3) The COGCC has both bonding and plugging and abandonment requirements to address this concern. Comment noted.</li> </ol>  |
| 27 | Yes | JR | Staff has reviewed the comments, which include concerns about public health, flood potential, and traffic.                    | <p>Slide #1</p> <ol style="list-style-type: none"> <li>1. A pipeline will be installed to transport oil and produced gas.</li> <li>2. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. This will eliminate using the York Street bridge at Big Dry Creek north of E-470.</li> <li>3. There is no construction planned with the flood plain.</li> <li>4. See comment #1, above.</li> </ol> <p>Slide #2</p> <p>Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information which can be found with response to Referral Letter #1. In addition, Ward has prepared an emergency response plan with input from emergency responders and the Adams 12 schools.</p> <p>Slide #9</p> <p>Air inversions are common along the Front Range, but oil and gas operations are required by the CDPHE to control emissions, particularly those of volatile organic</p> |

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|    |     |    |   | <p>compounds (VOCs), through emission control devices (ECD's) and leak detection and repair (LDAR).<br/> Slide #10<br/> See response to slide #2.<br/> Slides #11-16<br/> See response to slide #1<br/> Slide #16<br/> A landscape plan designed for the Ivey site will provide screening between Big Dry Creek and will be subject to approval by Adams County Planning. Note there is an existing well pad located between the Ivey pad and Big Dry Creek.<br/> Slide #17<br/> Comment noted.</p>   |
| 28 | Yes | JR | <p>Staff has reviewed the comments, which include concerns about traffic and public and environmental safety, noise, lights, and vibrations. Would like a moratorium.</p> | <ul style="list-style-type: none"> <li>• The production tanks will be located inside a steel berm containment area with capacity sufficient to hold at least 150% of the largest tank with an allowance for precipitation. Ward is also installing automation equipment to monitor operating parameters at the well. This will allow for a quick response to an incident like a spill. Ward will have a Spill Prevention, Control and Countermeasures (SPCC) plan for the site.</li> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject as noted in response to Referral Letter #1. Even though well failures are very rare, Ward has developed an emergency response plan for the Ivey location in the unlikely event an incident of this type ever occurred.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• The direction of the wellbore is dictated by the mineral lease and the spacing pattern approved by the Colorado Oil and Gas Conservation Commission.</li> <li>• Other comments noted.</li> </ul> |

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| 29 | No  | JR | Staff has reviewed the comments, which include concerns about flooding potential and public and environmental safety.   | A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. Oil and gas operations are required by the Colorado Department of Public Health and Environment to control emissions, particularly those of volatile organic compounds (VOC's), through combustion devices and leak detection. Air emissions are discussed further in response to Referral Letter #12. |
| 30 | Yes | JR | Staff has reviewed the comments, which include concerns about public health and safety.   | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.<br>An emergency response plan has been prepared with input from emergency responders and the Adams 12 school district.<br>Real estate values are discussed in response to Referral Letter #1.   |
| 31 | No  | JR | Staff has reviewed the comments, which include concerns about traffic, noise, smells and lights.  | Comment noted.  |
| 32 | No  | JR | Staff has reviewed the comments, which include concerns about traffic. The applicant should provide details about the visual mitigation plan, including landscaping and consider the idea of using of buildings to allow the facility to better blend in with the area. | <ul style="list-style-type: none"> <li>• A deceleration lane will be installed on westbound 152<sup>nd</sup> Avenue to the site. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• A landscaping plan has been prepared for the site for approval by the Adams County Planning Department.</li> </ul>   |
| 33 | Yes | JR | Staff has reviewed the comments, which include concerns about public health, traffic, and has requested the applicant to use a pipeline.  | <ul style="list-style-type: none"> <li>• Oil and gas operations are required by the Colorado Department of Public Health and Environment to control emissions, particularly those of volatile organic compounds (VOC's), through combustion devices and leak detection.</li> <li>• A pipeline will be installed for oil and produced gas from the site which will reduce traffic from the site.</li> </ul>  |
| 34 | No  | JR | Staff has noted the comment.  | Comment noted.  |
| 35 | Yes | JR | The comments suggest that the use of a pipeline be mandatory.   | A pipeline will be installed for oil and produced gas from the site which will reduce traffic.  |

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| 36 | No | JR | Staff has noted the comment.  | Ward appreciates the support of community members. Comment noted.   |
| 37 | No | JR | Staff has reviewed the comments, which include concerns about public and environmental health, specifically air quality.            | <ul style="list-style-type: none"> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>• A reference to a Garfield County air study and concerns about methylene chloride were not evident with a study conducted on the Front Range for oil and gas operations by Colorado State University.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. This will eliminate concerns over truck traffic on narrow bridge located at York Street and Big Dry Creek.</li> <li>• Ward will have secondary containment around all of the tanks on the site during long term production operations for spill management if it occurs. Ward will have a Spill Prevention, Control and Countermeasures (SPCC) plan for the site.</li> <li>• A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> </ul> |
| 38 | No | JR | Staff has reviewed the comments, which include concerns about the potential for flooding, environmental impacts, and public health. | <ul style="list-style-type: none"> <li>• A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. All the storage tanks will be placed within secondary containment using a metal berm to hold 150% of the largest tank plus an allowance for precipitation.</li> </ul>   |
| 39 | No | JR | Staff has noted the comment.  | Comment noted.  |
| 40 | No | JR | Staff has reviewed the comments, which include concerns about visual impacts, traffic impacts, and environmental contamination.     | <ol style="list-style-type: none"> <li>1. The will serve letter has been obtained.</li> <li>2. A pipeline is planned for the site as discussed in response to Referral Letter #3.</li> <li>3. A specific date when construction, drilling and production would begin is still variable as the</li> </ol>  |

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|    |    |    |  | <p>planning process continues, but it is expected drilling the initial 2 wells would occur in the spring of 2018; a 2-mile lateral to the north and a 3-mile lateral to the south. In that scenario, construction would require 14-21 days, then 16-20 days to drill two wells and another 21-28 days to complete both wells. After evaluating the first two wells, Ward would return to drill the remaining 24 wells within 1-2 years. Once Ward returns to the site, it is conservatively estimated that drilling the remaining 24 wells would require approximately 192-240 days and completion operations would require another 222-285 days. With continuing advancement in drilling and completion technology, these projections may be shortened.</p> <ol style="list-style-type: none"> <li>4. A sound mitigation plan includes a wall around 3 sides of the pad as discussed in response to Referral Letter #2.</li> <li>5. Site security, which includes fencing, will be installed. Fencing requirements will be consistent with Colorado Oil and Gas Conservation Commission rules and the Adams County code.</li> <li>6. The onsite production facilities submitted with the application include well heads, tanks, separators, emission control devices and other associated production related equipment.</li> <li>7. Flowback water from hydraulic fracturing will be trucked to an offsite commercial disposal facility. A storm water management plan has been submitted as part of the application. As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>8. An updated traffic plan will be submitted to the county with an updated application.</li> <li>9. Comment noted.</li> </ol> |
| 41 | No | JR | Staff has reviewed the comments, which include concerns about traffic and public and environmental safety. | <ol style="list-style-type: none"> <li>1. Regarding health impacts from oil and gas development, the Colorado Department of Public</li> </ol>  |

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|    |    |    |  | <p>Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</p> <ol style="list-style-type: none"> <li>2. Comment noted.</li> <li>3. An updated traffic plan will be submitted to the county with the updated information for the AUSR permit application.</li> </ol> |
| 42 | No | JR | Staff has reviewed the comments, which include concerns about traffic and public health and safety.                      | Comments noted.   |
| 43 | No | JR | Staff has reviewed the comments, which include concerns about public and environmental health.                           | Comments noted.   |
| 44 | No | JR | Staff has noted the comment.   | Comments noted  |
| 45 | No | JR | Staff has reviewed the comments, which include concerns about traffic and public safety.                                 | Comments noted.   |
| 46 | No | JR | Staff has reviewed the comments, which include concerns about public health, earthquakes, water quality and home values. | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject reference in response to Referral Letter #1.  |
| 47 | No | JR | Staff has reviewed the comments, which include concerns about public health.   | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.   |
| 48 | No | JR | Staff has reviewed the comments, which include concerns about environmental impacts.                                     | Comments noted.   |
| 49 | No | JR | Staff has reviewed the comments, which include concerns about water quality.   | Baseline sampling will be conducted prior to drilling, after completion operations and another subsequent test as required by the Colorado Oil and Gas Conservation Commission and Ward's Memorandum of Understanding with Adams County will provide information regarding ground water quality.  |
| 50 | No | JR | Staff has reviewed the comments, which include concerns about traffic, public health, and the potential for flooding.    | <ol style="list-style-type: none"> <li>1. Comment noted.</li> <li>2. Comment noted.</li> <li>3. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>4. Comment noted.</li> </ol>  |

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|    |    |    |  | <ol style="list-style-type: none"> <li>5. A perimeter fence will be installed around the site for production operations consistent with the requirements of the COGCC and Adams County.</li> <li>6. An emergency response plan has been prepared as discussed in response to Referral Letter #1.</li> <li>7. A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> </ol>  |
| 51 | No | JR | Staff has reviewed the comments, which include concerns about public health, earthquakes, flooding potential, traffic, and wildlife. | <ol style="list-style-type: none"> <li>1. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>2. Drilling technology constantly improves allowing longer laterals such as one 3 miles long to be achieved as part of this project.</li> <li>3. Truck traffic to the site will use E-470 exiting at York Street.</li> <li>4. A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>5. Comment noted.</li> </ol> |
| 52 | No | JR | Staff has reviewed the comments, which include concerns about traffic and public and environmental safety.                           | <ol style="list-style-type: none"> <li>1. Comment noted.</li> <li>2. Air inversions are common along the Front Range, but oil and gas operations are required by the Colorado Department of Public Health and Environment to control emissions, particularly those of volatile organic compounds (VOC's), through combustion devices and leak detection. This is discussed in response to Referral Letter #12. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> </ol>   |

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|    |    |    |  | <p>Real estate values are discussed in response to Referral Letter #1.</p> <p>The site is not located within a 100-year flood plain.</p> <ol style="list-style-type: none"> <li>3. A pipeline connection is planned to this site to transport oil and gas. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>4. The pipeline will reduce the number of tanks onsite. The specific number of tanks included in the AUSR application represented a non-pipeline scenario. The number of tanks will be reduced with a pipeline and depend on the production rate of the wells. The visual simulation renderings are to scale.</li> </ol>   |
| 53 | No | JR | Staff has reviewed the comments, which include concerns about potential for flooding, public health and safety, and traffic.   | <ol style="list-style-type: none"> <li>1. Comment noted</li> <li>2. A pipeline connection is planned for the site to transport oil and produced gas; however, there will still be a need for separators, storage tanks emission control devices and other related ancillary equipment needed for operational reasons. The surface use agreement with the landowners allows this amount of space for the production-related equipment.</li> <li>3. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>4. A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>5. After drilling and completion, the site will have perimeter fencing consistent with the requirements of the COGCC and Adams County.</li> <li>6. Comment noted.</li> <li>7. An emergency response plan has been prepared for the site with input from emergency responders and the Adams County 12 school district.</li> </ol> |
| 54 | No | JR | Staff has reviewed the comments, which include concerns about public health, traffic, and other impacts. Many of the questions posed have been answered in the application | <ul style="list-style-type: none"> <li>• Once the wells are drilled associated with their respective leases and are economic, the leases are held by production.</li> <li>• This site is planned to have a maximum of 26 wells.</li> </ul>  |

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|  |  |  | <p>materials and some questions should be directed to the COGCC (re: subsurface).</p> | <ul style="list-style-type: none"> <li>• Separators will be installed on the site, but a pipeline is planned to be built to the site. Both oil and gas will be transported initially to a facility located south of Brighton then to a processing facility in Weld County.</li> <li>• There are no plans at this time to place compressors at the Ivey site.</li> <li>• The mineral rights are owned by over 160 individuals and entities.</li> <li>• Surface owners are compensated if any of the operations are located on their property. In this case, only the surface owner of the site where the Ivey pad exists is compensated.</li> <li>• The produced gas will not contain H2S.</li> <li>• Ward has an exemplary safety record where it operates. During our 50-year history operating 350 wells, including many within urban areas, Ward has had no unresolved environmental complaints and no unresolved issues with the Oklahoma Corporation Commission or the Colorado Oil &amp; Gas Conservation Commission.</li> <li>• The produced water will be trucked offsite for disposal into a commercial Class II underground injection well permitted by the Colorado Oil and Gas Commission with strict compliance standard to protect groundwater. None of the facilities where disposal of produced water would occur are near the Ivey location.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• There will be pipelines for oil and produced gas. The water will be hauled to commercial disposal facilities.</li> <li>• The Occupational Safety and Health Administration (OSHA) does not enforce the PSM standards at oil and gas production facilities per Memorandum found at 29 CFR 1910.119(a) nor to oil or gas well drilling or servicing operations pursuant to 29 CFR 1910.119(a)(2)(ii).</li> </ul> |
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|    |     |    |   | <ul style="list-style-type: none"> <li>Spills or releases are reported to the COGCC and Adams County. The threshold for a spill report is anything which reaches a waterway, over 1 barrel (42 gallons) outside of secondary containment and greater than 5 barrels even it remains within secondary containment. Ward will have a Spill Prevention, Control and Countermeasures (SPCC) plan for the site.</li> <li>The unnecessary or excessive venting or flaring of natural gas produced from a well is prohibited by the COGCC.</li> </ul> |
| 55 | No  | JR | Staff has reviewed the comments, which include concerns about public health and safety.                   | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.  |
| 56 | Yes | JR | Staff has reviewed the comments, which include concerns about public and environmental health and safety. | Comment noted.   |
| 57 | No  | JR | Staff has noted the comment.  | Comment noted.   |
| 58 | No  | JR | Staff has noted the comment.  | Comment noted.   |
| 59 | No  | JR | Staff has reviewed the comments, which include concerns about public and environmental health and safety. | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.  |
| 60 | Yes | JR | Staff has reviewed the comments, which include concerns about property values and environmental impacts.  | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject at referenced in response to Referral Letter #1.   |
| 61 | No  | JR | Staff has reviewed the comments and is considering the recommended BMPs to be added as potential COAs.    | <ul style="list-style-type: none"> <li>A closed mud system will be used during drilling which means that there will not be any open tanks or pits.</li> <li>A pipeline is being installed to transport oil and gas from the site which will reduce trucking.</li> <li>As discussed in response 1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will</li> </ul>  |

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|    |    |    |   | <p>be placed in the floodplain. Ward will discuss any additional requirements with the County.</p> <ul style="list-style-type: none"> <li>• Air quality is referenced in response to Referral Letter #12.</li> </ul>   |
| 62 | No | JR | Staff has reviewed the comments, which include concerns about air quality, flooding potential, and public health. | <ul style="list-style-type: none"> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>• A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>• Air inversions are common along the Front Range, but oil and gas operations are required by the Colorado Department of Public Health and Environment to control emissions, particularly those of volatile organic compounds (VOC's), through combustion devices and leak detection.</li> <li>• Other comments noted.</li> </ul>  |
| 63 | No | JR | Staff has reviewed the comments, which include concerns about traffic, public health, and aesthetics.             | <ul style="list-style-type: none"> <li>• A very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. An emergency response plan has been prepared with input from emergency response agencies and the Adams 12 School district for the site. A perimeter fence will be installed around the site consistent with the requirements of the COGCC and Adams County.</li> <li>• There has been no associated seismic activity with drilling operations. Seismic activity is discussed further in response to Referral Letter #18.</li> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> </ul> |

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|    |     |    |  | <ul style="list-style-type: none"> <li>• A revised traffic study is being submitted. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• A pipeline will be installed to transport oil and gas which will reduce truck traffic. Traffic control will be utilized at the entrance to the site. A deceleration lane will be installed off westbound 152<sup>nd</sup> to the site. Landscaping will be designed to screen production equipment from views of the site from various viewpoints.</li> <li>• The design of the noise wall is based on a noise study prepared by outside consultants.</li> <li>• The community meetings have been held consistent with the requirements of Adams County.</li> </ul> |
| 64 | Yes | JR | Staff has reviewed the comments, which include concerns about the potential for flooding, truck traffic, emergency response plans. | <ol style="list-style-type: none"> <li>1. Comment noted.</li> <li>2. As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>3. Pipelines will be installed to the site to transport oil and produced gas. This will reduce truck traffic and the number of storage tanks.</li> <li>4. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>5. An emergency response plan has been prepared with input from emergency responders and the Adams 12 School District.</li> </ol>         |
| 65 | Yes | JR | Staff has reviewed the comments, which include concerns about public health, earthquakes, and property values.                     | <ol style="list-style-type: none"> <li>1. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>2. Seismicity is discussed in response to Referral Letter #18.</li> <li>3. Comment noted.</li> <li>4. Comment noted.</li> <li>5. Comment noted.</li> </ol>  |

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| 66 | No | JR | Staff has reviewed the comments, which include concerns about public health and safety.  | <ul style="list-style-type: none"> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>• A pipeline will be installed to transport oil and produced gas from the site.</li> <li>• Incidents involving truck rollovers and the spill of its contents are fully investigated to prevent a reoccurrence.</li> <li>• Ward will have a Spill Prevention, Control and Countermeasures (SPCC) plan for the site.</li> </ul>   |
| 67 | No | JR | Staff has reviewed the comments, which include concerns about public health, emergency situations, traffic, and property values. | <ol style="list-style-type: none"> <li>1. Comment noted.</li> <li>2. Air inversions are common along the Front Range, but oil and gas operations are required by the CDPHE to control emissions, particularly those of volatile organic compounds (VOCs), through emission control devices (ECD's) and leak detection and repair (LDAR). Ward's compliance with Regulation #7 of the Air Quality Control Division will significantly reduce VOC emissions and overall air quality.</li> <li>3. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>4. See comment above.</li> <li>5. Comment noted.</li> <li>6. As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. Ward will have a Spill Prevention, Control and Countermeasures (SPCC) plan for the site.</li> <li>7. An updated traffic plan will be submitted to the county for the AUSR application.</li> </ol> |

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|    |     |    |   | <p>8. A pipeline plan is not submitted as part of Ward's AUSR application because a separate entity is installing the pipeline. The company installing the pipeline will work with the county separately regarding routing.</p> <p>9. Pipeline applications will be submitted by the entity installing them and will be reviewed by the county.</p> <p>10. The water supply source is discussed in response to Referral Letter #1.</p> <p>11. At this time, produced water, which is classified as a non-hazardous waste by the EPA, will be transported by truck to an offsite commercial Class II Underground Injection Control well for the disposal of produced water.</p> <p>12. In reference to naturally occurring radioactive material (NORM) from oil and gas operations, the COGCC conducted a 2014 study entitled "Analysis of Naturally Occurring Radioactive Materials (Norm) In Drill Cuttings, Greater Wattenberg Field, Weld County". The study found that concentrations of NORM in drill cuttings from newly drilled wells in the Greater Wattenberg Area of Weld County contained no radionuclide activity levels that indicate that NORM in drilling cuttings exceed radionuclide activity levels observed in background samples. In many cases, radionuclide activity levels in background samples were found to be higher than levels from drill cuttings. An emergency response plan has been prepared with input from appropriate emergency responders.</p> <p>13. Comment noted.</p> <p>14. Comment noted.</p> <p>15. Comment noted.</p> |
| 68 | No  | JR | Staff has reviewed the comments, which include concerns about public health and safety. | <p>1. Comment noted.</p> <p>2. Comment noted.</p> <p>3. Comment noted.</p>  |
| 69 | No  | JR | Staff has noted the comment.  | Comment noted.  |
| 70 | Yes | JR | Staff has reviewed the comments, which include concerns about public health.            | <ul style="list-style-type: none"> <li>Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently</li> </ul>  |

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|    |     |    |  | <p>published information on the subject referenced in response to Referral Letter #1.</p> <ul style="list-style-type: none"> <li>Water wells will be tested pursuant to the Colorado Oil and Gas Commission and the Memorandum of Understanding between Ward and Adams County.</li> </ul>   |
| 71 | No  | JR | Staff has reviewed the comments, which include concerns about air quality, water quality, traffic impacts, and property values.  | <ol style="list-style-type: none"> <li>Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>Ground water will be assessed through baseline sampling a required by the Colorado Oil and Gas Commission and the Memorandum of Understanding between Ward and Adams County.</li> <li>The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>Comment noted. Real estate values are discussed in response to Referral Letter #1.</li> <li>Produced water will be trucked to an offsite commercial disposal facility.</li> </ol> |
| 72 | No  | JR | Staff has reviewed the comments, which include concerns about public health, noise, and home values.   | Comment noted.  |
| 73 | Yes | JR | Staff has reviewed the comments and is determining which may be used as potential COAs on the permit.  | See comments to Referral Letter #2.   |
| 74 | Yes | JR | Staff has noted the comment. The applicant was required to send notification of the neighborhood meeting to property owners within ½ mile of the parcel boundary, which included City of Thornton residents. | Invitations to the neighborhood meeting followed the requirements of the Adams County code.   |
| 75 | Yes | JR | Staff has reviewed the comments, which include concerns about traffic, flooding potential, lights, noise, and visual impacts.  | <ol style="list-style-type: none"> <li>Comment noted</li> <li>Pipelines will be installed to the site to transport oil and natural gas which will reduce truck traffic.</li> <li>The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol</li> <li>As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> </ol>   |

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|    |     |    |  | <p>5. The site will be secured and monitored remotely. A landscape plan will be developed to screen the site. The road to the site will be graveled.</p> <p>6. A noise wall 32' high and will be installed around 3 sides of the site.</p>  |
| 76 | No  | JR | Staff has reviewed the comments, which include concerns about public health, traffic, and new homes being built nearby.        | <ul style="list-style-type: none"> <li>• As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>• An emergency response plan is prepared with input from emergency responders and Adams 12 School District.</li> <li>• A perimeter fence will be installed consistent with the requirements of the COGCC and Adams County.</li> <li>• Seismicity is discussed in response to Referral Letter #18.</li> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>• An emergency preparedness plan has been developed with not only input from emergency responders, but also from Adams 12 schools.</li> <li>• A revised transportation plan will be submitted regarding traffic count. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> <li>• The landscape plan will be developed to screen the site. An existing well site already exists between the Ivey site and Big Dry Creek.</li> </ul> |
| 77 | No  | JR | Staff has reviewed the comments, which state that oil and gas operations are safe and impacts have been mitigated effectively. | Comment noted.  |
| 78 | Yes | JR | Staff has reviewed the comments, which include concerns about air quality, flooding potential, aesthetics, and                 | <ul style="list-style-type: none"> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public</li> </ul>  |

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|    |    |    | property values. Regarding emergency planning, the operator has met with the local fire districts and departments to do table top exercises and discuss emergency planning. An Emergency Preparedness Plan has been submitted with the permit application. | <p>Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</p> <ul style="list-style-type: none"> <li>• Pipelines will be used to transport oil and natural gas from the site.</li> <li>• Oil and gas operations are required by the Colorado Department of Public Health and Environment to control emissions, particularly those of volatile organic compounds (VOC's), through combustion devices and leak detection.</li> <li>• The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol</li> <li>• An emergency preparedness plan has been developed with not only input from emergency responders and Adams 12 School District.</li> <li>• As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>• A perimeter fence will be installed around the site after drilling and completion operations concludes which meets the requirements of the COGCC and Adams County.</li> <li>• A landscape plan will be submitted to the county for approval.</li> </ul> |
| 79 | No | JR | Staff has reviewed the comments, which include concerns about public health and traffic impacts.   | <ol style="list-style-type: none"> <li>1. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>2. Comment noted.</li> <li>3. A revised traffic plan is being submitted with our updated AUSR application. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. Pipelines will be used to transport oil and natural gas from the site.</li> </ol>   |
| 80 | No | JR | Staff has noted the comment.   | Comment noted.   |

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| 81 | No  | JR | Staff has noted the comment.   | Oil and natural gas will be transported via pipeline offsite for additional processing.  |
| 82 | No  | JR | Staff has reviewed the comments, which include concerns about environmental impacts and earthquakes.           | <ul style="list-style-type: none"> <li>• Baseline sampling will be conducted prior to drilling, after completion operations and another subsequent test as required by the Colorado Oil and Gas Conservation Commission and Ward's Memorandum of Understanding with Adams County will provide information regarding ground water quality.</li> <li>• Oil and gas operations are required by the Colorado Department of Public Health and Environment to control emissions, particularly those of volatile organic compounds (VOC's), through combustion devices and leak detection. Since both methane and VOC's are produced together, the current rules reduce emissions of both.</li> <li>• Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>• The Colorado Oil and Gas Conservation Commission has extensive rules regarding well control equipment and other safety requirements including blow-out prevention equipment.</li> <li>• Waste disposal from the site will be managed pursuant to the requirements of the Colorado Oil and Gas Commission and Adams County.</li> <li>• The water supply source will be selected based on legally available capacity as allowed by the State Engineer.</li> <li>• Seismicity is discussed in response to Referral Letter #18.</li> </ul> |
| 83 | No  | JR | Staff has noted the comment.   | Comments noted.  |
| 84 | No  | JR | Staff has reviewed the comments, which include concerns about public health, earthquakes, and property values. | See response to Referral Letter #67.   |
| 85 | Yes | JR | Staff has noted the comment.   | Comments noted.  |
| 86 | No  | JR | Staff has reviewed the comments, which include concerns about flood potential and traffic impacts.             | <ul style="list-style-type: none"> <li>• As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is</li> </ul>  |

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|    |     |    |   | <p>within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</p> <ul style="list-style-type: none"> <li>• Comment noted.</li> <li>• An updated traffic plan will be submitted to the county with the updated information to the County for our AUSR application.</li> <li>• Comment noted.</li> <li>• A landscaping plan will be submitted.</li> <li>• The application was submitted based on the current density which would not include the site in an Urban Mitigation Area.</li> <li>• The volume of the steel containment berm is 150% of the single largest tank with an allowance for precipitation. This is consistent with current regulation.</li> <li>• Flowback water will be transported by truck to an offsite commercial Class II Underground Injection Control facility.</li> <li>• Pipelines will be used to transport oil and produced gas from the site.</li> </ul> |
| 87 | Yes | JR | Staff has reviewed the comments, which include concerns about public health, flood potential, environmental impacts, and property values. | <ul style="list-style-type: none"> <li>• As discussed in response to Referral Letter #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. Spill containment around the tanks will be employed as required by the regulations. Ward will have a Spill Prevention, Control and Countermeasures (SPCC) plan for the site.</li> <li>• As discussed in response to Referral Letter #1, CDPHE recently published Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> </ul>   |

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| 88 | No  | JR | Staff has noted the comment.   | Comment noted.  |
| 89 | No  | JR | Staff has reviewed the comments, which include concerns about traffic impacts. Regarding informing nearby home owners, letters are sent to property owners within ½ mile of the parcel boundary at least two times during the permit process (Neighborhood Meeting invitation and Request for Comments). The application and all case materials are posted on the County website and the property is posted with a Public Notice sign with information about the application and contact information for the County. | Comment noted. <ul style="list-style-type: none"> <li>Ward did not submit separate best management practices (BMP's) because our current operating standards incorporate many existing BMP's.</li> <li>The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> </ul>  |
| 90 | Yes | JR | Staff has reviewed the comments, which include concerns about public health.   | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.   |
| 91 | No  | JR | Staff has noted the comment.   | Comments noted.   |
| 92 | No  | JR | Staff has reviewed the comments, which include concerns about traffic and public health and safety.  | The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol. Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.  |
| 93 | No  | JR | Staff has reviewed the comments, which include concerns about public health, air quality, and traffic.   | <ul style="list-style-type: none"> <li>Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.</li> <li>The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li> </ul> |
| 94 | Yes | JR | Staff has reviewed the comments, which include concerns about public health.   | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.   |
| 95 | Yes | JR | Staff has reviewed the comments, which include concerns about public health, air quality, and traffic.   | Regarding health impacts from oil and gas development, the Colorado Department of Public Health and Environment (CDPHE) recently published information on the subject referenced in response to Referral Letter #1.   |

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| 96 |  |  |  | <p>Adams 12 Five Star Schools commented on Emergency Planning and requested see “Roles &amp; Responsibilities” section expanded of the Emergency Response Plan. Ward and its safety consultants met with Adams 12 Five Star Schools and clarified roles and responsibilities for the plan.</p> <p>Adams 12 Five Star Schools also commented on consideration being given to limit truck trips during the following hours:</p> <ul style="list-style-type: none"> <li>• 7-9AM Mon-Fri</li> <li>• 1-4PM Mon-Tue, Thurs.-Fri</li> <li>• 11-1PM Wed</li> </ul> <p>Ward will strive to manage truck traffic as requested by the Adams 12 Five Star Schools to the extent possible, but some deliveries and associated truck traffic is inevitable at various times of the day.</p>   |
| 97 |  |  |  | <p>City of Thornton commented on the following topics:</p> <ul style="list-style-type: none"> <li>• A formal landscaping plan: Ward will be submitting a landscape plan to Adams County for approval.</li> <li>• Wildlife Study: a wildlife survey has been conducted of the site; however, the current use of the land is agricultural.</li> <li>• Vegetated Buffer: the city was concerned about screening the trail proposed along Big Dry Creek. The landscape plan has been designed to provide a vegetative buffer of trees and shrubs where the proposed trail will come in closer proximity to the site.</li> <li>• Water Quality Testing: Ward is complying with state storm water requirements and Spill Prevention, Control and Countermeasures to minimize risks to surface water. Rule 609 of the COGCC also requires baseline testing of up to four water wells within a ½ mile of the site. Pursuing ongoing water quality testing is questionable considering the existing regulatory requirements Ward must meet and the large number of non-point sources of pollution which enter the Big Dry Creek drainage. Any data acquired with ongoing monitoring would</li> </ul> |

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|  |  |  |  | <p>require tracing numerous non-point sources of pollution which is not feasible.</p> <ul style="list-style-type: none"> <li>• Fencing, tank design, and signage: The Colorado Oil and Gas Conservation Commission (COGCC) and Adams County have fencing requirements which will be met. The tank design has utilized lower profile tanks and permanent signage for the site will be consistent with COGCC requirements. Additional safety signage can be implemented where the Big Dry Creek Trail is near the site boundary.</li> <li>• A lighting plan for evaluation: A photometric plan for the site has been completed and will be submitted to Adams County and will be made available to the City of Thornton.</li> <li>• Noise Wall: As noted above in previous comments, a noise wall will be installed on three sides with the west side being open since it is adjacent to an agricultural field.</li> <li>• Gating and Security: A security gate will be installed and manned while drilling and completion operations are underway.</li> <li>• Traffic Management: <ul style="list-style-type: none"> <li>○ It is planned to have pipelines in service prior to production commencing at the site. The oil product line is being built by a midstream pipeline company, and is currently in the permitting process. The Traffic Impact Study (TIS) has been revised to show the possible impact of trucking oil, but at the request of Adams County. A temporary pipeline will be used for fracturing water.</li> <li>○ The volumes of traffic shown in the TIS are based on calculations of material deliveries, and on site observations at drilling and completion sites. The additional traffic for the residential construction and for the oil and gas sites is similar. During periods of gravel hauling,</li> </ul> </li> </ul> |
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|  |  |  |  | <p>the residential construction traffic can be heavy; however, the constructors can manage the traffic safely. Traffic that is heavier than the residential construction gravel truck traffic is not anticipated for the Ivey Pad project. The majority of the oilfield trucks are the same size and weight as a gravel truck.</p> <ul style="list-style-type: none"><li>○ The route to the Ivey site has been modified to use E-470 as the main route. The trucks will be routed down E-470 unless otherwise directed by the Colorado Highway Patrol.</li><li>○ Regarding access from 152<sup>nd</sup> to the site, a project is in progress to design and install a deceleration lane.</li><li>○ The access road design will be evaluated in conjunction with the turn lane design. Design will be done to prevent tracking onto 152nd Avenue, which may be accomplished by a combination of track pads or pavement. A Traffic Control Plan (TCP) is being filed with Adams County, which will show signage at the site. It is anticipated that more than half of the vehicles will be pickups and cars, including personal vehicles of employees commuting to the site. It is reasonable for pickups and cars to enter and leave the site from the south.</li><li>○ Regarding a traffic impact fee, the BBC/Felsburg, Holt and Ullevig study for the City of Thornton has been reviewed. A Pavement Condition Index (PCI) Survey per ASTM D6433-16 has been performed for about one mile in each direction from the proposed site. The PCI to the south will serve as a control, because heavy vehicles from Ivey Pad will not be using</li></ul> |
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|    |  |  |  | <p>this section. Ward will be discussing in with the City a traffic impact fee.</p> <ul style="list-style-type: none"> <li>• Flaring: the city requested no flaring, but notification if it did occur. While flaring is not expected at the site, in emergency situations it may be required. Approval to proceed to flare would be acquired by the COGCC, but the city would be notified.</li> <li>• Emergency Response Planning: Ward and its safety consultants have engaged both the City of Thornton and the North Metro Fire Rescue District for preparation of our Emergency Response Plan. Ward has also conducted tours of an existing sites with emergency response personnel and dispatch teams to familiarize them with the different types of equipment and procedures existing at Ward locations.</li> </ul>  |
| 98 |  |  |  | <ul style="list-style-type: none"> <li>• A pipeline for natural gas and oil will be installed prior to production commencing. Even though the pipeline is anticipated, the Traffic Impact has evaluated both a pipeline and non-pipeline scenario.</li> <li>• As discussed in response to Referral Comment #1, a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County.</li> <li>• Erosion control plans will be developed for the Construction Drawing submittals to the City of Thornton for the turn lane. Drawings are to be submitted to City of Thornton Development Engineering because the turn lane is in their jurisdiction and will be within their Right-of-Way. It is anticipated that the City will refer the drawings to the County. Stormwater related best management practices will be used onsite to control erosion and sedimentation.</li> <li>• An analysis of drainage and grading will be performed for the turn lane project, to be submitted</li> </ul> |

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|  |  |  |  | <p>to the City. It is anticipated that the drawings will be referred to the County for review.</p> <ul style="list-style-type: none"><li>• Access to the site will include a deceleration lane off 152<sup>nd</sup> Street with an access road to the site which is required by the City of Thornton which precludes the use of the existing access point: the existing access point is too close to the end of bridge THN-152WAS-BDC. The turn lane will not fit between the bridge and the existing access point. Accordingly, use of the existing access point is not planned for the project. The possibility of using an existing access point farther down the parcel, labeled "Existing farm access" in the figure, was discussed with the City of Thornton at a meeting on July 20, 2017, and it was agreed that this plan would work. The access will need to be upgraded. Ward believes the second access meets the exception in Chapter 8, page 8, Table 8.2, which reads "Additional access would significantly benefit safety and operation of the highway or street and is necessary to the safe and efficient use of the property." Having a turn lane will benefit the safety and operation of the street and the property.</li><li>• The turn/deceleration lane will be in the City of Thornton. Legal descriptions, exhibits, and easement documents will be developed and submitted with the Construction Documents to City of Thornton Development Engineering and County Engineering.</li><li>• A survey completed by a licensed surveyor with the State of Colorado indicates a very small portion of the oil and gas location is within the 100-year floodplain; however, no facilities or wellheads will be placed in the floodplain. Ward will discuss any additional requirements with the County. This survey information will be submitted to the County Engineering Department for confirmation. A site plan indicates the location of the proposed structures and the distance from the established floodplain boundaries.</li></ul> |
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- “A specific date when construction, drilling and production would begin is still variable as the planning process continues, but it is expected drilling the initial 2 wells would occur in the spring of 2018; a 2-mile lateral to the north and a 3-mile lateral to the south. In that scenario, construction would require 14-21 days, then 16-20 days to drill two wells and another 21-28 days to complete both wells. After evaluating the first two wells, Ward would return to drill the remaining 24 wells within 1-2 years. Once Ward returns to the site, it is conservatively estimated that drilling the remaining 24 wells would require approximately 192-240 days and completion operations would require another 222-285 days. With continuing advancement in drilling and completion technology, these projections may be shortened.”
- No specific timeline is set when the LACT and pipeline would be installed, but it is estimated it would be sometime in the spring or summer of 2018.
- The purchaser of the LACT oil/produced oil is expected to be Discovery Midstream.
- The LACT oil purchaser’s CDP (Central Delivery Point) is located in Section 24 T1S-R67W.
- Ward will not be operating the oil gathering pipeline system.
- After LACT and oil gathering systems are online oil storage capacity will be reduced at the site. At this time it is estimated when 2 wells are drilled and completed there will be 6-10 oil tanks on the site.
- Well control automation is being utilized and can recognize upset conditions or irregular pressure trends with the operation of the wells. Ward can shut-in the wells and the associated equipment from a remote location.
- During completions, source water will be obtained through a water broker to identify a State of Colorado authorized supply. The water will be piped

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|  |  |  |  | <p>to the location through aboveground temporary pipelines.</p> <ul style="list-style-type: none"> <li>Water being utilized for completions will be staged on site using above ground lined tanks capable of holding 8,000-40,000 barrels of source water.</li> </ul> |
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**Referral Agency Comments:**

Adams 12 Five Star Schools:

- 1) Emergency Planning – wishes to see “Roles & Responsibilities” section expanded.
- 2) Traffic Plan – Limit truck trips during the following hours:
  - a. 7-9AM Mon-Fri
  - b. 1-4PM Mon-Tue, Thur-Fri
  - c. 11-1PM Wed

City of Thornton:

- 1) Site Mitigation –
  - a. Elaborate on visual mitigation measures.
  - b. Conduct a wildlife study.
  - c. Install a vegetated buffer.
  - d. Conduct ongoing water quality testing.
- 2) Traffic Management –
  - a. Provide a traffic study that contemplates the scenario if a pipeline is not in place.
  - b. Utilize E-470 for the truck traffic.
  - c. Install a deceleration lane and signage on 152<sup>nd</sup> Parkway.
  - d. Negotiate an Access Road Permit and Fee.
- 3) Emergency Response
  - a. Notify the City prior to flaring (which should only occur in emergency situations).
  - b. Continue to work with the Thornton Fire Department and North Metro Fire District, including initial and ongoing response training.

United Power:

No objection.

## County Comments:

### Planning:

1. Current zoning is Agricultural-3, which purpose is for dry land or irrigated farming, pasturage, or other related food production uses.
2. The future land use is Mixed Use Employment, so take that into consideration when developing the long-term visual mitigation plan.
3. The adjacent parcel is a designated open space, so take that into consideration when developing the landscape and visual mitigation plan.
4. The NRCO partially covers the parcel, but the proposed development is not within it.
5. The floodplain partially covers the parcel. (See Engineering comments.)
6. Consult the City of Thornton. (See City of Thornton comments.)
7. Consult with E-470 Authority.
8. A landscape and visual mitigation plan will be required that conforms to section 4-16 of the Adams County Development Standards and Regulations. Consider using a berm for visual mitigation from the existing and proposed residences, as well as a decorative fence. The visual mitigation/landscape plan must also outline a watering plan to keep the plantings alive.

### Engineering:

1. The Traffic Impact Study is based on the water and oil pipelines being in place. Will they be installed prior to production?
  - a. If not, provide a Traffic Impact Study (signed and stamped by a licensed professional engineer) that takes into account the possibility that a pipeline will not be in place for production.
2. According to FEMA, the site is located within a special flood hazard area; a floodplain use permit will be required.
3. Erosion and sediment control BMPs are required for compliance with Federal, State, and Local water quality construction requirements.
4. A grading and drainage plan will be required if any change in grade or improvements to the site are proposed.
5. No additional accesses will be granted onto 152<sup>nd</sup> Parkway. The existing access road will be required to be upgraded, including its orientation, width, and material.
6. The applicant must submit legal descriptions, exhibits, and easement documents for any proposed easements on the site.
7. Have a survey completed by a licensed surveyor with the State of Colorado showing the floodplain boundaries of the site. The site plan shall show the location of the proposed structures and the distance from the established floodplain boundaries.

### Oil & Gas Inspector Comments:

1. Are all wells going to be drilled and completed concurrently?
2. What kind of timeline does ward have as far as LACT and oil pipeline commissioning?
3. In regards to the LACT infrastructure, who is the purchaser of LACT oil?
4. Where is the LACT oil purchasers CDP?
5. Is Ward operating the oil gathering system?
6. After LACT and oil gathering systems are online, will oil storage capacity be reduced at the battery?
7. What kind of well control automation is being utilized, and can it recognize upset conditions or irregular pressure trends?
8. During completions, where is water being sourced from?
9. Is water utilized for completions going to be staged onsite? If so, what kind of container(s) will be used?

ENG1: The Traffic Impact Study analysis is based on the fact that a water pipeline and an oil pipeline will be installed to support the wellpad. Will the pipelines be installed before the wellpads go into operation? If not when will the pipelines be installed and does the traffic impact study account for the possibility that the pipelines will not be installed to support the wellpad?

ENG2: Flood Insurance Rate Map – FIRM Panel # (08001C0302H), Federal Emergency Management Agency, March 5, 2007. According to the above reference, the project site is located within a special flood hazard delineated area; A floodplain use permit will be required.

ENG3: The project site is not within the County's MS4 Stormwater Permit area. The installation of erosion and sediment control BMPs are expected. The applicant shall be responsible to ensure compliance with all Federal, State, and Local water quality construction requirements.

ENG4: The applicant's proposed scope of work shows the new addition of impervious surface is less than 3,000 square feet. A drainage study and analysis is not required. A grading and drainage plan will be required for any propose change in grade or improvements to the site.

ENG5: 152nd Parkway is classified as a section line arterial street. No more than one access shall be provided to an individual parcel or to contiguous parcels under the same ownership unless it can meet the exceptions identified in Chapter 8, page 8-4, Table 8.2. Applicant must use the existing access point onto 152nd Parkway. The applicant is required to upgrade access to current standards which shall include the orientation of access onto 152nd Parkway, the width of access, and the type of material used in the construction of the access point.

ENG6: Applicant must submit legal descriptions, exhibits, and easement documents for any proposed easements on the site. These documents must be reviewed and approved by Development Engineering and recorded at the Clerk and Records Office. The record number along with the book and page number must be shown on the approved site plan.